Crisil
Intelligence

Report on Indian Coking Coal Industry

Bharat Coking Coal Limited – (BCCL)

Report – 29th May 2025

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Abbreviations

Abbreviation	Full form
BCCL	Bharat Coking Coal Limited
BU	Billion units
CCL	Central Coalfields Limited
CCO	Coal Controller's Organization
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CESC	Calcutta Electric Supply Corporation
CMPDI	Central Mine Planning and Design Institute Limited
CM (SP) Act	Coal Mines (Special Provisions) Act, 2015
CPP	Captive power plant
CY	Calendar year (01 January to 31 December)
DPL	Durgapur projects limited
DRI	Direct reduced iron
DSCR	Debt service coverage ratio
DVC	Damodar Valley Corporation
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation and amortization
ECL	Eastern Coalfields Limited
EC/FC	Environment clearance/forest clearance
EHS	Environmental, health and safety
EJ	Exajoule (unit of energy)
EJ Area	East Jharia Area
FSA	Fuel supply agreement
FSI	Free swelling Index
GCV	Gross calorific value
GW	Gigawatt
Ha	Hectare
HEMM	Heavy earth moving machinery
HGI	Hardgrove Grindability Index
Mcum/Mm3	Million cubic metre

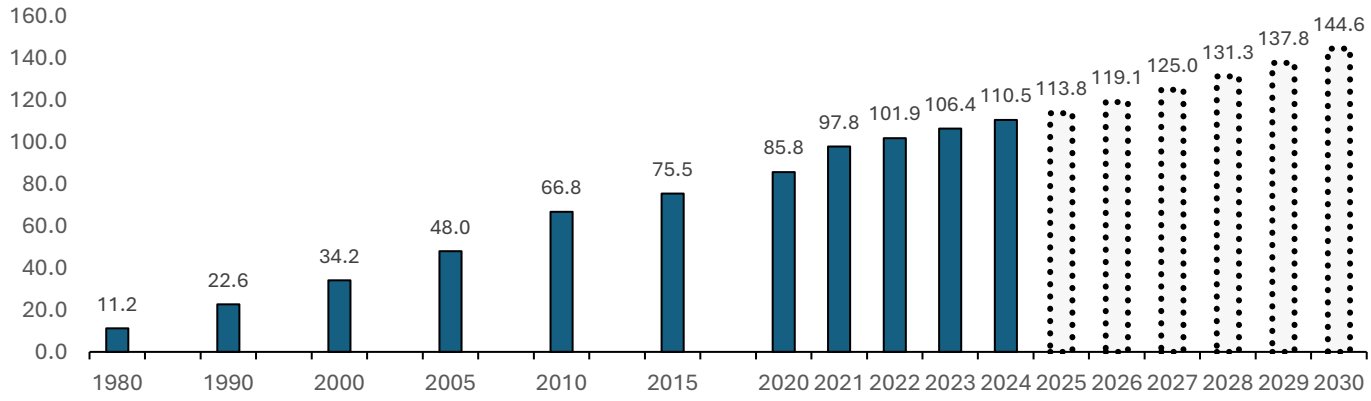
Abbreviation	Full form
MGR	Merry go round, rail circuit
MO/MDO	Mine operator/mine developer-cum-operator
MoEFCC	Ministry of Environment, Forest and Climate Change, Government of India
MoM	Ministry of Mines, Government of India
MoC	Ministry of Coal
MT/ MMT	Million metric tonne
MTPA	Million tonne per annum
MU	Million units
MW	Megawatt
NC	Non-coking coal
NCL	Northern Coalfield Limited
NDC	Nationally Determined Contributions
NEP	National Electricity Plan
NMET	National Mineral Exploration Trust
NRS	Non-regulated sector
OB	Overburden
OC/ OCP	Open cast/ Open cast project
OMS	Output Per Man Shift
Opex	Operational expenditure
PCI	Pulverized coal injection
PPA	Power purchase agreement
PRC	Peak rated capacity
R&R	Rehabilitation and resettlement
R&M	Repair and maintenance
ROM	Run-of-mine
SCCL	Singareni Collieries Company Limited
SDG	Sustainable Development Goals
SECL	South Eastern Coalfields Limited
STPP	Super thermal power plant
UNFCCC	United Nations Framework Convention on Climate Change
WCL	Western Coalfields Limited

1 Indian Macro-economic Overview

1.1 World economy and Indian economy snapshot

India is the world's fifth-largest economy, behind United States (US), China, Germany and Japan, and the fastest-growing major economy. Its growth rate (7.4% in 2024) is about double that of the global economy (3.9% in 2024)[1]. The global economy is driven by production and consumption of goods and services which are heavily reliant on the extraction and processing of natural resources. The mining industry provides the basic raw materials necessary for energy generation, manufacturing of steel, aluminum, cement and other essential products thereby playing a critical role in supporting the economic growth and development of the world as well as India. The global economy, as measured by the *International Monetary Fund (IMF),* has reached a significant milestone, crossing the $100 trillion mark (nominal) in 2022, representing a significant increase from $25 trillion mark in 1992 and $50 trillion mark in 2006 which is approximately doubling in every 15 years. As per the IMF's *World Economic Outlook (April 2025),* the global GDP is forecasted to grow from $111 trillion in 2024 to $145 trillion by 2030, at a CAGR of 4.57% underscoring the optimistic outlook for the world economy over the medium term.

Figure 1.1 World Nominal GDP from 1980 to 2024 and forecast from 2025 to 2030 in trillion US dollars

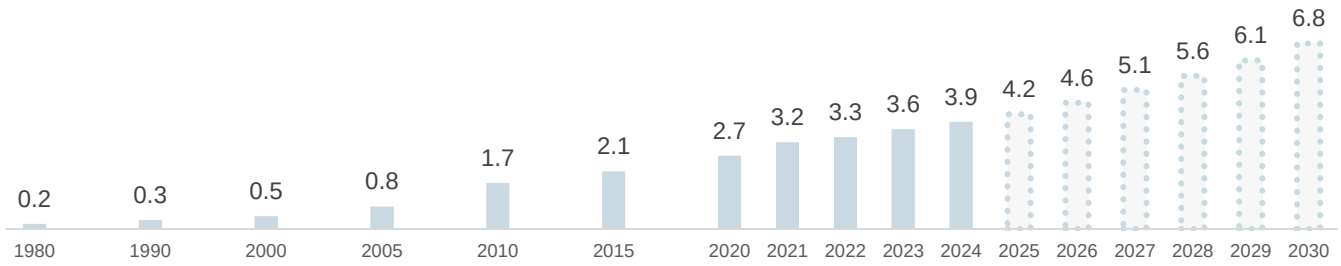


Source: International Monetary Fund (IMF) – World Economic Outlook (April 2025), IMF has forecasted till calendar year 2030

India's economy has undergone a transformative journey since the liberalization reforms of 1991, which have unleashed a period of rapid growth. Given the historical growth trajectory of India's economy, which has seen a significant expansion from about $0.2 trillion in 1980, $0.3 trillion in 1990, $0.5 trillion in 2000, $1 trillion in 2006, $2 trillion in 2014 and thereafter to $3.9 trillion in 2024 (nominal), driven by the country's rapid liberalization and integration into the global economy. India's GDP has doubled (approximately) in the last 9-10 years. The International Monetary Fund's (IMF) latest World Economic Outlook (April 2025) projects a steady expansion of the Indian economy, with the country's GDP anticipated to rise from $3.9 trillion in 2024 to $6.8 trillion by 2030, at 9.58% CAGR over the six-year period.

1 As per: International Monetary Fund (IMF) – World Economic Outlook (April 2025)

Figure 1.2 Indian Nominal GDP (Current Prices) from 1980 to 2030 in trillion US dollars



Source: International Monetary Fund (IMF) – World Economic Outlook (April 2025), IMF has forecasted till calendar year 2030 only

1.2 Real & Nominal GDP growth in India vs world's major economies

1.2.1 Nominal GDP

Nominal GDP measures the total economic output of a country at current market prices, reflecting the value of goods and services produced within a given period without adjusting for inflation. In contrast, Real GDP adjusts Nominal GDP for changes in price levels, providing a more accurate depiction of an economy's growth by accounting for inflation or deflation.

Table 1.1 Country-wise nominal GDP data (annual percent change)

Nominal GDP	CY 19	CY20	CY21	CY22	CY23	CY24	5Y-CAGR
World	1.4%	-2.6%	14.1%	4.2%	4.4%	3.9%	4.7%
US	4.3%	-0.9%	10.9%	9.8%	6.6%	5.3%	6.3%
China*	3.3%	3.6%	20.4%	0.6%	-0.2%	2.6%	5.2%
Euro area	-2.1%	-2.5%	12.6%	-3.1%	9.2%	3.8%	3.8%
Japan	1.5%	-1.2%	-0.3%	-15.4%	-1.1%	-4.4%	-4.7%
United Kingdom (UK)	-0.8%	-5.4%	16.5%	-0.6%	7.9%	8.1%	5.0%
India*	4.9%	-5.7%	18.4%	5.6%	8.7%	7.4%	6.6%

*Note: CY- Calendar Year, *Emerging Economies*
Source: IMF – World Economic Outlook (April 2025)

1.2.2 Real GDP

As per the *IMF's World Economic Outlook (April 2025)*, real global GDP of world contracted 2.7% in pandemic year 2020, after that growing at 6.6% in 2021, 3.6% in 2022, 3.5% in 2023, and 3.3% in 2024. IMF forecasts global real GDP growth at approximately 2.8% in 2025 on account of greater-than-expected resilience in the US and several large emerging markets and developing economies, as well as fiscal support in China.

Table 1.2 Country-wise real GDP data (annual percent change)

Real GDP	CY 19	CY20	CY21	CY22	CY23	CY24	5Y-CAGR
World	2.9%	-2.7%	6.6%	3.6%	3.5%	3.3%	2.8%
US	2.6%	-2.2%	6.1%	2.5%	2.9%	2.8%	2.4%
China*	6.1%	2.3%	8.6%	3.1%	5.4%	5.0%	4.9%
Euro area	1.6%	-6.0%	6.3%	3.5%	0.4%	0.9%	0.9%
Japan	-0.4%	-4.2%	2.7%	0.9%	1.5%	0.1%	0.2%
United Kingdom (UK)	1.6%	-10.3%	8.6%	4.8%	0.4%	1.1%	0.7%
India*	3.9%	-5.8%	9.7%	7.6%	9.2%	6.5%	5.3%

*Note: CY- Calendar Year, *Emerging Economies*
Source: IMF – World Economic Outlook (April 2025)

1.3 Nominal & Real GDP forecast for world's major economies

1.3.1 Nominal GDP

As per the IMF's World Economic Outlook (April 2025), the nominal GDP forecast for various regions and countries is as follows: the world's nominal GDP is expected to grow at a rate of 2.9% in CY25, 4.7% in CY26, 4.9% in CY27, 5.1% in CY28 and 4.9% in CY29 and CY30. India's expected nominal GDP growth is 7.1% in CY25, 9.9% in CY 26, 10.2% in CY27, 10.2% in CY28, 10.1% in CY29 and 10.1% in CY30.

Table 1.3 Country-wise nominal GDP data forecast (annual percent change)

Nominal GDP	CY25P	CY26P	CY27P	CY28P	CY29P	CY30P	5Y CAGR
World	2.9%	4.7%	4.9%	5.1%	4.9%	4.9%	4.9%
US	4.5%	4.0%	3.9%	4.3%	4.0%	4.0%	4.0%
China*	2.6%	5.9%	6.5%	6.4%	5.9%	5.6%	6.1%
Euro area	2.6%	3.8%	3.3%	3.3%	3.3%	3.3%	3.4%
Japan	4.0%	4.5%	3.4%	4.2%	2.5%	3.5%	3.6%
UK	5.3%	5.3%	4.9%	5.1%	5.5%	5.4%	5.2%
India*	7.1%	9.9%	10.2%	10.2%	10.1%	10.1%	10.1%

*Note: CY- Calendar Year, *Emerging Economies; P: Projected*
Source: IMF – World Economic Outlook (April 2025)

1.3.2 Real GDP

According to the IMF's World Economic Outlook (April 2025), the global economy is projected to experience a moderate growth trajectory, with real GDP forecasts indicate an increase in 5-year CAGR to 3.1% from CY25 to CY30 compared to the 5-year CAGR of 2.8% from CY19 to CY24, with a few regional variations. A closer examination of the regional forecasts reveals distinct trends. The United States is expected to experience a relatively moderate growth rate, with a 5- year CAGR of 2.0% from CY25 to CY30 which is slightly lower than the past i.e., 2.4%. In contrast, China's growth is slowing down, with a 5-year CAGR of 3.9% from CY25 to CY30, a

decline from its previous growth rates i.e., 4.9%. The Euro area and Japan are also forecasted to experience sluggish growth, with 5-year CAGRs of 1.2% and 0.6%, respectively, from CY25 to CY30.

Table 1.4 Country-wise real GDP data forecast (annual percent change)

Real GDP	CY25P	CY26P	CY27P	CY28P	CY29P	CY29P	5Y CAGR
World	2.8%	3.0%	3.2%	3.2%	3.2%	3.1%	3.1%
US	1.8%	1.7%	2.0%	2.1%	2.1%	2.1%	2.0%
China*	4.0%	4.0%	4.2%	4.1%	3.7%	3.4%	3.9%
Euro area	0.8%	1.2%	1.3%	1.3%	1.2%	1.1%	1.2%
Japan	0.6%	0.6%	0.6%	0.6%	0.5%	0.5%	0.6%
UK	1.1%	1.4%	1.5%	1.5%	1.4%	1.4%	1.5%
India*	6.2%	6.3%	6.5%	6.5%	6.5%	6.5%	6.4%

*Note: CY- Calendar Year, *Emerging Economies; P: Projected*
Source: IMF – World Economic Outlook (April 2025)

The IMF believes India will remain the fastest-growing major economy over the next five years, with a growth rate of approximately 6.4% (CAGR) from CY2025 to CY2030 and subsequent years.

1.4 Major Structural Reforms by the Indian Government to Assist Economic and Real Estate Growth

The Indian government has been actively working towards transforming the country's economy and real estate sector through a series of structural reforms. These reforms aim to improve the business environment, increase transparency, and attract foreign investment, ultimately driving the economic growth and development.

1.4.1 Real Estate (Regulation and Development) Act, 2016 (RERA)

The Real Estate (Regulation and Development) Act, 2016 (RERA)[5] is a significant reform that has brought transparency and accountability to the real estate sector. The Act came into force on 1 May 2016 with 61 of 92 sections notified. The remaining provisions came into force on 1 May 2017. It seeks to protect homebuyers as well as help in boosting investments in the real estate sector by bringing efficiency and transparency in the sale/purchase of real estate. The Act establishes Real Estate Regulatory Authority (RERA) in each state for regulation of the real estate sector and also acts as an adjudicating body for speedy dispute resolution.

1.4.2 Insolvency and Bankruptcy Code, 2016

The Insolvency and Bankruptcy Code (IBC), 2016 is an Indian law which creates a consolidated framework that governs insolvency and bankruptcy proceedings for companies, partnership firms, and individuals. For the real estate sector, where delays, fund diversion, and incomplete projects were common, the Insolvency and Bankruptcy Code created a structural framework for resolution, protecting the interest of homebuyers, lenders and developers alike. Homebuyers are considered financial creditors under the IBC, enabling them to initiate the Corporate Insolvency Resolution Process (CIRP) against a defaulting developer.

[5] *https://www.indiacode.nic.in/handle/123456789/2158*

1.4.3 Special Economic Zones (Fifth Amendment) Rules, 2023

The Special Economic Zones Act, 2005, is a law that provides a framework for establishing, developing, and managing Special Economic Zones (SEZs) in India to promote exports and related activities. The Special Economic Zone (SEZ) Rules, 2006, define the framework for establishing and operating SEZs in India, which are designated areas offering incentives and streamlined regulations to attract foreign investment and boost economic growth. The SEZ Act, 2005 and the SEZ Rules, 2006 form the legal basis, specifying procedures for approval, administrative setup, and operational guidelines. These rules aim to simplify processes for developers and units, ensuring a conducive environment for businesses to thrive.

1.4.4 Goods and Services Tax

The Indian real estate sector, contributing about 7.3%[7] to GDP, has traditionally been riddled with complex taxation including VAT, service tax, excise duty, stamp duty, and registration charges. The implementation of Goods and Services Tax (GST) on 1st July 2017 replaced many indirect taxes and brought about structural changes. The GST reform aimed to improve transparency, reduce tax cascading, and improve compliance in real estate, which had often been informal and fragmented.

1.4.5 Pradhan Mantri Awas Yojana (PMAY)

Pradhan Mantri Awas Yojana (Urban) Mission[8] launched on 25th June 2015 which intends to provide housing for all in urban areas by year 2022. The Mission provides Central Assistance to the implementing agencies through States/Union Territories (UTs) and Central Nodal Agencies (CNAs) for providing houses to all eligible families/ beneficiaries against the validated demand for houses for about 1.12 crore.

1.4.6 National Infrastructure Pipeline (NIP)

The National Infrastructure Pipeline[10] (NIP) for FY 2019-25 is a first-of-its-kind, whole-of-government exercise to provide world-class infrastructure to citizens and improving their quality of life. It aims to improve project preparation and attract investments into infrastructure. To draw up the NIP, a High-Level Task Force was constituted under the chairmanship of the Secretary, Department of Economic Affairs (DEA), Ministry of Finance. The NIP has been made on a best effort basis by aggregating the information provided by various stakeholders including line ministries, departments, state governments and private sector across infrastructure sub-sectors, as identified in the Harmonized Master List of Infrastructure. All projects (Greenfield or Brownfield, under conceptualization or under implementation or under Development) of project cost greater than Rs. 1000 million per project were sought to be captured.

1.4.7 National Logistics Policy (NLP)

The National Logistics Policy (NLP) was launched by the Prime Minister of India on September 17, 2022, to drive economic growth and business competitiveness through an integrated, seamless, efficient, reliable, green, sustainable, and cost-effective logistics network. The policy aims to reduce logistics costs, improve the Logistics Performance Index (LPI) ranking, and create a data-driven decision-support mechanism for an efficient logistics ecosystem. The policy has set targets to reduce logistics costs, improve the Logistics Performance Index ranking, and create a data-driven decision support mechanism for an efficient logistics ecosystem.

[7] *https://www.ibef.org/industry/real-estate-india*
[8] *https://pmaymis.gov.in*
[10] *https://indiainvestmentgrid.gov.in/national-infrastructure-pipeline*

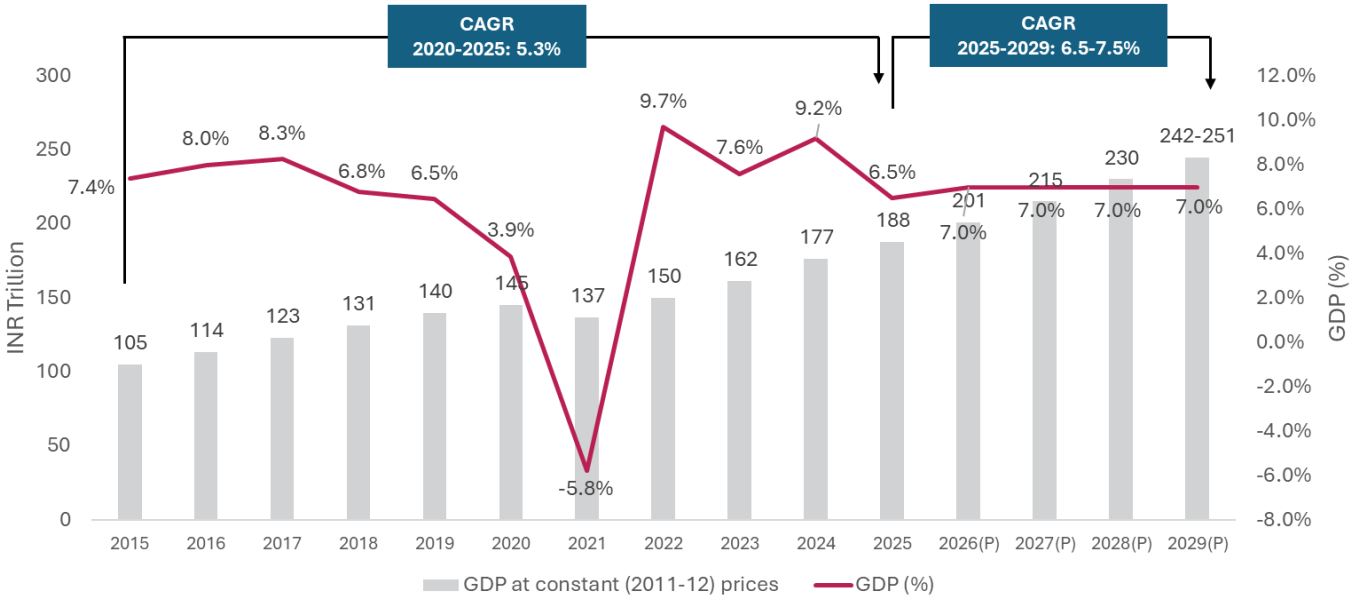
1.5 Economic survey and Union Budget analysis

The *Economic Survey 2024* suggested adoption of gasification technology in India which can revolutionize the coal sector. This will reduce the dependence on imports for various resources made with the help of coal, such as natural gas, methanol, ammonia and other products. This will help India in meeting its net zero carbon emissions goal. Additionally, the government has launched several coal initiatives, such as *Coal Gasification Mission*, to gasify 100 MMT of coal by 2030 through surface coal or Lignite Gasification projects. The Union Budget 2025-26 has identified mining as one of the six key domain areas thereby recognizing the mining sector's importance which is a significant development as it acknowledges the sector's potential to contribute to India's economic growth and development. The Indian government's budget for the next fiscal year aims to support economic growth through a combination of steady capital expenditure and consumption boost, while tightening the fiscal belt. Fiscal deficit is budgeted to reduce to 4.4% of GDP, down from 4.8% in the current fiscal, with a focus on reducing revenue expenditure. Capital expenditure remains at 3.1% of GDP, while the effective capital expenditure, including budgetary and internal and extra-budgetary resources, increases to 5.5% of GDP to lift the domestic economy and crowd-in private capex. At Rs 11.2 lakh crore the allocation for capital expenditure in fiscal 2026 marks a 10% increase on year. This is expected to support the growth of infrastructure sectors such as roads, railways, and urban development.

1.6 India GDP trends

The fastest growing among major economies, India became the fifth largest economy in the world in 2022[12]. As per data published by the National Statistical Office (NSO), the Indian economy logged 4.4% CAGR (Real) between fiscal 2019 and 2024[13]. Economic growth was supported by crude oil prices, soft interest rates and low current account deficit. GDP declined to -5.8% year-on-year in fiscal 2021 on account of the pandemic- induced lockdowns. However, post-pandemic, period turned out to be positive for India, since GDP of India grew 9.7% and 7.6% year-on-year in fiscal 2022 and fiscal 2023, respectively. The growth was on the back of strong pent-up demand across the sectors, driven primarily by manufacturing and construction sectors.

Figure 1.3: India's real GDP trend and outlook (at constant 2011-12 prices)



[12] *According to the International Monetary Fund's ("IMF") World Economic Outlook (April 2025).*
[13] *India follows financial year April 1 to March 31. Hence, the data published by the Indian government/ RBI/NSO is different from that of the IMF, which publishes data as per the calendar year – January 1 to December 31.*

Source: National Statistical Office (NSO), Crisil Intelligence

According to the *NSO*, real GDP growth reached to 6.5% on-year in fiscal 2025 from 9.2% in fiscal 2024. In absolute terms, India's GDP reached Rs 188 trillion in fiscal 2025 compared with Rs 177 trillion in fiscal 2024.

1.7 Sector wise contribution to GVA for last 5 years from fiscal 2020

1.7.1 GVA share of sectors in India

Gross Value Added (GVA) is a measure of the total value of goods and services produced within a country or region, minus the cost of intermediate inputs. It represents the contribution of each sector to the overall economy and is a key indicator of economic growth and development.

The Indian economy is broadly classified into three sectors: Primary, Secondary, and Tertiary. The Primary Sector, which includes agriculture, animal husbandry, forestry, and mining, is the foundation of the Indian economy, contributing around 16% to the country's GDP. The Secondary Sector, comprising manufacturing, construction, and energy generation, contributes around 29% to the GDP and has been growing rapidly, with significant investments in industries such as automotive, pharmaceutical, and IT hardware. The Tertiary Sector, which includes financial services, professional services, transportation, communication etc. is the fastest-growing sector, contributing around 55% to the GDP and driving the country's economic growth.

Table 1.5: Gross value added (GVA) at basic prices (base year: fiscal 2012) constant prices (Rs trillion)

Industry	2023	2024	2025(F)	Growth in the real GVA	
				2024	2025
Primary Sector	25.88	26.43	27.39	2.13%	3.65%
Agriculture, Livestock, Forestry & Fishing	*22.72*	*23.05*	*23.92*	1.44%	3.76%
Mining & Quarrying	*3.15*	*3.38*	*3.47*	7.09%	2.86%
Secondary Sector	41.59	45.62	48.57	9.69%	6.47%
Manufacturing	*25.05*	*27.52*	*28.98*	9.86%	5.32%
Electricity, Gas, Water Supply & Other Utility Services	*3.48*	*3.74*	*4.00*	7.53%	6.84%
Construction	*13.06*	*14.36*	*15.59*	9.94%	8.57%
Tertiary Sector	80.59	86.69	92.95	7.58%	7.22%
Trade, Hotel, Transport, Communication & Service related to Broadcasting	*27.78*	*29.56*	*31.29*	6.41%	5.85%
Financial, Real Estate & Professional Services	*34.05*	*36.92*	*39.60*	8.40%	7.28%
*Public Administration, Defence & Other Services**	*18.75*	*20.22*	*22.06*	7.81%	9.13%
GVA at Basic Prices	148.05	158.74	168.91	7.22%	6.41%

Source: RBI – Handbook of Statistics on the Economy 2022-23, Crisil Intelligence; 2024 data estimates (Provisional by NSO India); https://www.pib.gov.in/PressReleasePage.aspx?PRID=2090875; All years are fiscal years, F: Forecasted

Table 1.6: Gross value added (GVA) at basic prices (base year: fiscal 2012) current prices (Rs trillion)

Industry	2023	2024	2025(F)	Growth in the real GVA	
				2024	2025
Primary Sector	49.79	52.51	57.39	5.47%	9.29%

Industry	2023	2024	2025(F)	Growth in the real GVA	
				2024	2025
Agriculture, Livestock, Forestry & Fishing	*44.84*	*47.25*	*52.00*	*5.37%*	*10.04%*
Mining & Quarrying	*4.95*	*5.26*	*5.40*	*6.32%*	*2.60%*
Secondary Sector	63.19	68.67	73.41	8.67%	6.91%
Manufacturing	*35.36*	*38.20*	*40.71*	*8.01%*	*6.57%*
Electricity, Gas, Water Supply & Other Utility Services	*6.04*	*6.63*	*6.82*	*9.81%*	*2.85%*
Construction	*21.79*	*23.84*	*25.88*	*9.42%*	*8.57%*
Tertiary Sector	133.61	146.44	161.83	9.60%	10.51%
Trade, Hotel, Transport, Communication & Service related to Broadcasting	*44.10*	*46.85*	*50.57*	*6.22%*	*7.96%*
Financial, Real Estate & Professional Services	*55.20*	*60.64*	*66.87*	*9.86%*	*10.27%*
*Public Administration, Defence & Other Services**	*34.30*	*38.95*	*44.39*	*13.55%*	*13.96%*
GVA at Basic Prices	246.59	267.62	292.64	8.53%	9.35%

Source: RBI – Handbook of Statistics on the Economy 2022-23, Crisil Intelligence; 2024 data estimates (Provisional by NSO India); https://www.pib.gov.in/PressReleasePage.aspx?PRID=2090875; All years are fiscal years, F: Forecasted

1.7.2 Index of Eight Core Industries

The Index of eight core industries measures the combined and individual performance of production of eight core industries viz. Coal, Crude Oil, Natural Gas, Refinery Products, Fertilizers, Steel, Cement and Electricity. The growth rate of the core sector is a key indicator of a country's overall economic health, influencing industrial and economic performance. It has a multiplier effect on the entire economy, with core industries like steel, cement, and electricity being crucial for infrastructure development.

Table 1.7: Summary of the growth of Index of eight core industries (%)

Sectors	2019	2020	2021	2022	2023	2024	2025
Cement	13.3%	-0.9%	-10.8%	20.7%	8.7%	8.9%	6.3%
Coal	7.4%	-0.4%	-1.9%	8.5%	14.9%	11.8%	5.1%
Crude oil	-4.2%	-5.9%	-5.2%	-2.7%	-1.7%	0.6%	-2.2%
Electricity	5.2%	1.0%	-0.5%	7.9%	8.9%	7.1%	5.1%
Fertilizers	0.4%	2.6%	1.6%	0.7%	11.3%	3.7%	2.9%
Natural gas	0.9%	-5.7%	-8.1%	19.2%	1.5%	6.1%	-1.2%
Petroleum refinery products	3.1%	0.2%	-11.2%	8.9%	4.9%	3.6%	2.8%

Sectors	2019	2020	2021	2022	2023	2024	2025
Steel	5.1%	3.3%	-8.7%	16.9%	9.3%	12.5%	6.7%
Combined Index (Base year 2011-2012)	4.4%	0.3%	-6.4%	10.5%	7.8%	7.6%	4.4%

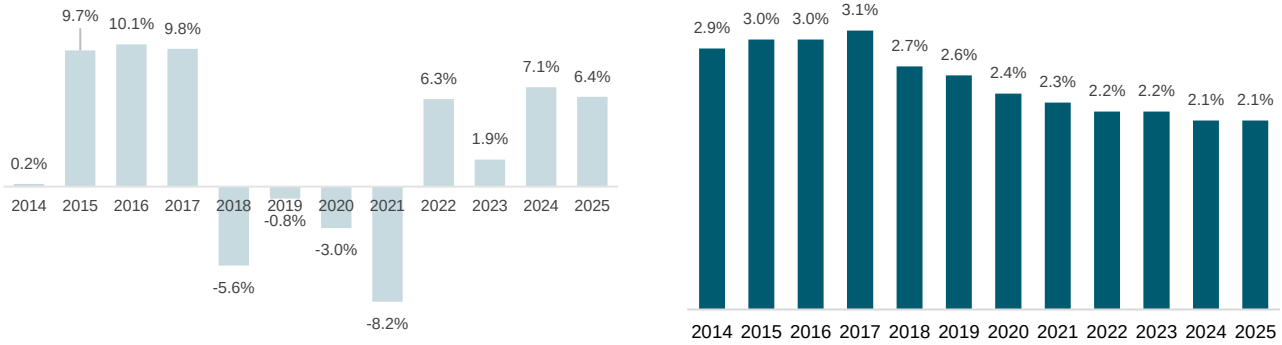
Source: Ministry of Commerce & Industries, all years are fiscal years

In terms of sectoral growth of the eight core industries, the coal sector grew (y-o-y) the maximum at 5.1% in fiscal 2025 as compared with 11.8% in fiscal 2024, among the Index of Eight Core Industries (ICI; base year 2011-12) as per Ministry of Commerce & Industries[19]. The combined Index of Eight Core Industries (ICI) increased 4.4% year-on-year in fiscal 2025.

1.8 Mining industry contribution to % of India's GDP in last 10 years

The mining and quarrying sector accounted for approximately 2.1% of the GVA (at constant prices) in fiscal 2025 i.e. Rs 3.47 trillion from Rs 3.17 trillion in fiscal 2019 (2.6% of GVA) recording a growth of 2.86% in 2025 over that in the previous fiscal. The last five-year CAGR was 1.8% (FY 2020-2025).

Figure 1.4: India's mining and quarrying GVA growth rate | Share of mining and quarrying in India's GVA



Source: Crisil Intelligence, RBI and NSO, Handbook of Statistics on Indian Economy- 2023, All years are fiscal years

Note: The fiscal 2024 numbers are taken from the press note on provisional estimates of Indian GDP by Ministry of Statistics and Programme Implementation dated May 31, 2024

1.9 Trends of key macro-economic indicators across India

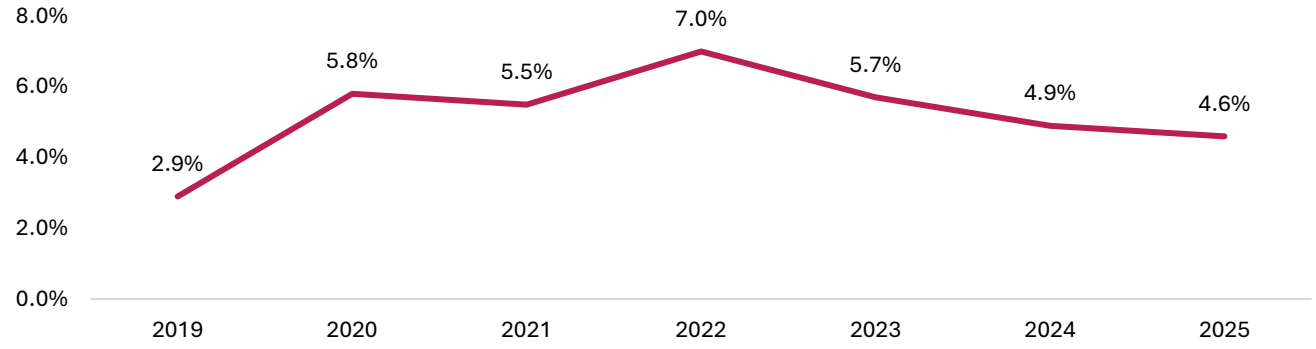
1.9.1 Consumer price index

India's average consumer price index (CPI) inflation rate was on the rise reaching 7.0% from 2.9% between fiscals 2019 and 2022. However, it decreased slightly to 5.7% in fiscal 2023. This rise is primarily led by surging food prices before moderating to an average of 4.6% in fiscal 2025. Although core and fuel inflation numbers have remained low, it is the food inflation that has been keeping CPI inflation above Reserve Bank of India's medium-level target

[19] *Department for Promotion of Industry and Internal Trade, Office of Economic Advisor press release dated August 30, 2024; Office of Economic Advisor*

rate of 4.0%. Going forward, CPI inflation is expected to moderate further to 4.3% on average in fiscal 2026 on the back of an expected dip in food inflation led by a favorable monsoon and high base effect[21].

Figure 1.5: CPI inflation trend

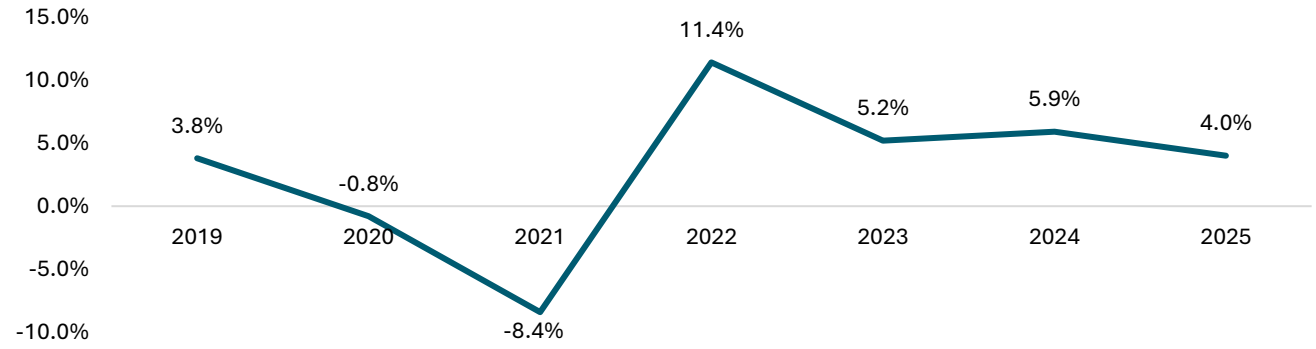


Source: Ministry of Statistics and Programme Implementation (MoSPI), Crisil Intelligence; All years are fiscal years

1.9.2 Index of Industrial Production

The Index of Industrial Production (IIP) averaged 2.3% between fiscal 2019 and fiscal 2023 before surging to 4.0% in fiscal 2025. The uptick was primarily led by a strong pick-up in sectors pertaining to the manufacturing of electrical equipment and basic metals. Further, there was an uptick in the consumer durables sector, which also supported the growth.

Figure 1.6: IIP growth trend for overall industry

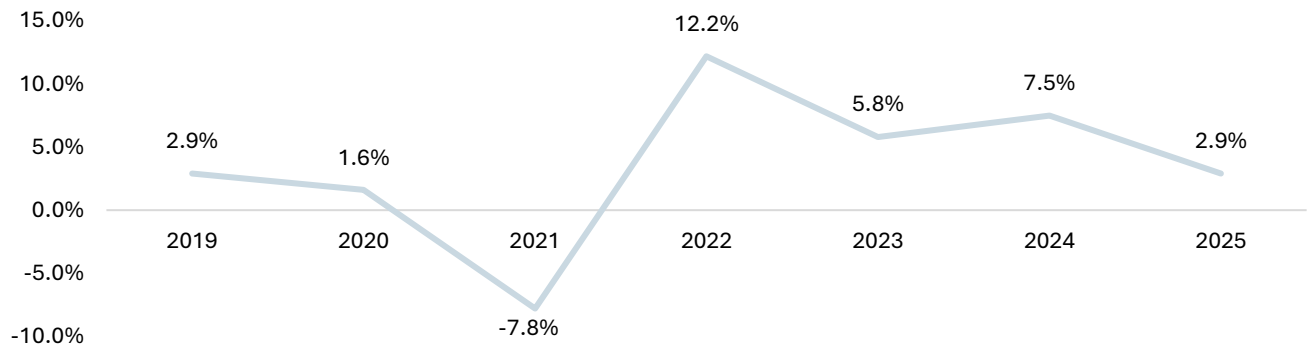


Source: Ministry of Statistics and Programme Implementation (MoSPI), Crisil Intelligence; All years are fiscal years

The mining industry in the Index of Industrial Production (IIP) has witnessed a notable resurgence since fiscal year 2021, as it rebounded from the disruptions caused by the COVID-19 pandemic when the overall index fell by about 8.4% and mining sector index fell by 7.8% thereafter achieving a growth of 12.2% in fiscal 2022 and then gaining further momentum to reach 7.5% in fiscal 2024. This upward trajectory was largely fueled by a robust increase in the extraction of essential minerals, including coal, iron ore and limestone which saw a significant surge in demand from key sectors such as power, infrastructure, construction, and manufacturing.

[21] *Crisil Report on Inflation and IIP soften dated February 2025*

Figure 1.7: IIP growth trend for mining sector



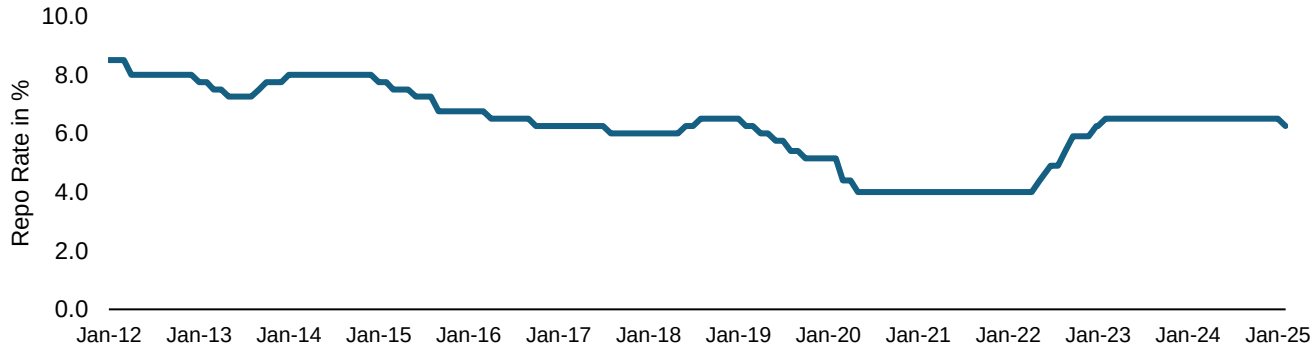
Source: Ministry of Statistics and Programme Implementation (MoSPI), Crisil Intelligence; All years are fiscal years

1.9.3 Interest Rates

Interest rates are a crucial component of a country's monetary policy, influencing borrowing costs, inflation, and economic growth. Across the world, interest rates have been trending downward in recent years with many central banks adopting accommodative monetary policies to stimulate economic growth. The United States has a federal funds rate of 4.25%-4.50%, while the European Central Bank has maintained an interest rate of 3.15% to encourage lending and investment.

In India, the Reserve Bank of India (RBI) has been actively managing interest rates to balance economic growth, inflation, and financial stability. As of December 2024, the repo rate was 6.5% thereafter it was reduced to 6.25% in February 2025. In April 2025 the repo rate was further reduced to 6.0%.

Figure 1.8: Repo rate in India in %

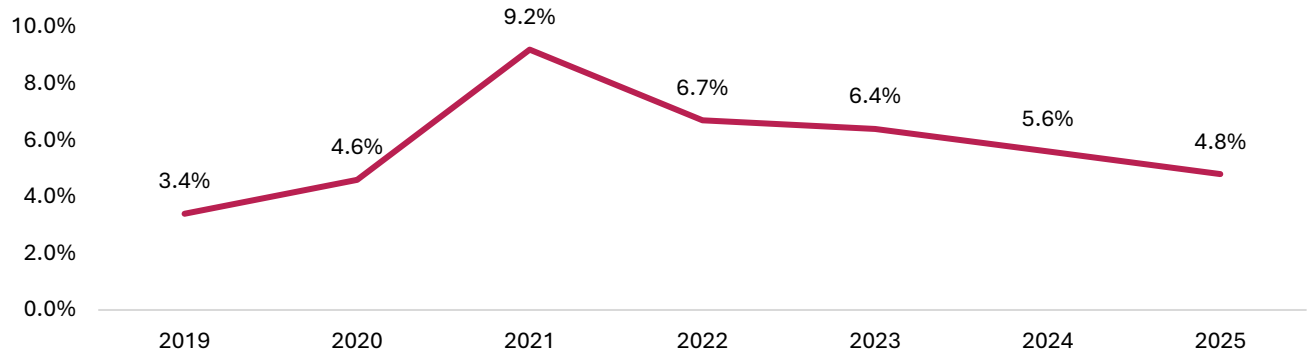


Source: Reserve Bank of India

1.9.4 Fiscal deficit

A fiscal deficit occurs when a government's total expenditure exceeds its total revenues, resulting in a shortfall that must be financed through borrowing or other means. Fiscal deficit is generally caused by higher government spending and reduced tax revenues. A large fiscal deficit can cause excessive borrowing by the government to finance the fiscal deficit leading to inflation. A persistent fiscal deficit can lead to a reduction in the government's credit rating, making it more expensive to borrow in the future.

Figure 1.9: Fiscal deficit of India as a % of GDP



Source: Indian Budget documents, Economic survey, all years are fiscal

Over the past few years, India's fiscal deficit as a percentage of GDP has exhibited significant fluctuations, with a pre-pandemic level of 3.4% in fiscal 2019, increasing to 4.6% in fiscal 2020 and peaking at 9.2% in fiscal 2021 due to the COVID-19 pandemic. However, the government has since initiated fiscal consolidation efforts, with the deficit narrowing to 6.7% in fiscal 2022 and further reducing to 4.8% in fiscal 2025.

1.9.5 Overview of other demographic factors in India

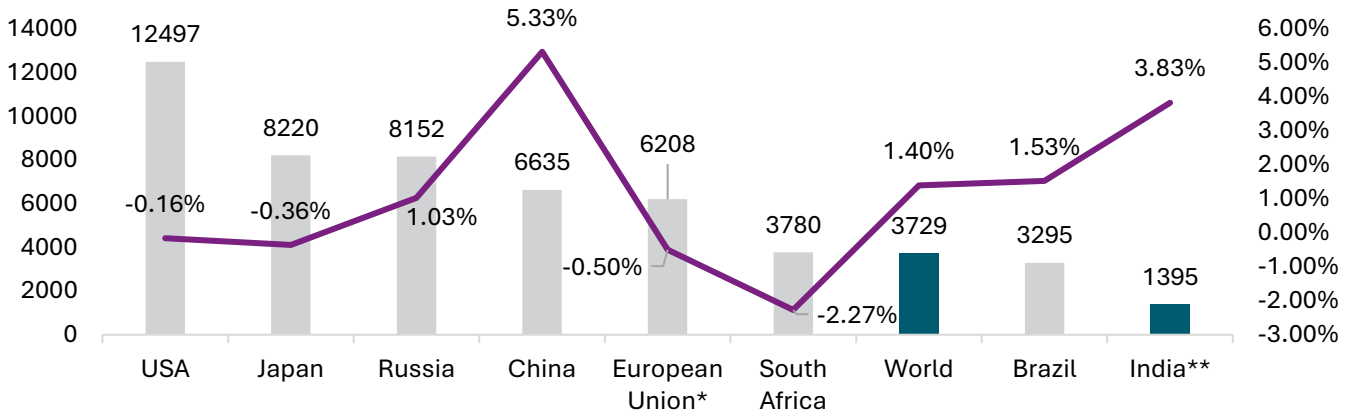
1.9.5.1 Per capita Electricity Consumption

The world's electricity consumption has been steadily increasing over the years, driven by growing populations, urbanization, and industrialization. As of 2023, global electricity consumption stands at approximately 29,925[24] terawatt-hours (TWh). India, being the most populous country in the world, is a significant contributor to global electricity consumption. The country's electricity consumption has been growing at a rapid pace, driven by its expanding economy, increasing industrial activity, and rising household incomes. As of 2023, India's electricity consumption at 1958[25] TWh accounts for approximately 7% of the global total, making it the third-largest electricity consumer in the world, after China (32% of global share) and the United States (15% of global share).

In terms of per capita electricity consumption, India still lags behind many developed countries, with an annual consumption of 1,395[26] kWh per person as of fiscal 2024 and was 1331[27] kWh per person for fiscal 2023. However, this figure is expected to increase significantly in the coming years, driven by the government's efforts to electrify all households and promote economic growth. A comparison of electricity consumption patterns across major countries reveals growth potential for India. The United States, for instance, has a per capita electricity consumption of 12,497 kWh, which is almost ten times that of India's. China, on the other hand, has a per capita electricity consumption of 6635 kWh, which is five times that of India. In terms of growth percentage, India's per capita electricity consumption has increased significantly over the past decade, with a rise of 46% i.e., CAGR 3.83% from 2013 to 2023.

[24] *BP (2024) Statistical Review of World Energy*
[25] *BP (2024) Statistical Review of World Energy*
[26] *https://pib.gov.in/PressReleasePage.aspx?PRID=2089243*
[27] *All India Electricity Statistics (General Review) by Central Electricity Authority*

Figure 1.10 Per capita electricity consumption in CY2023 in kWh/ person and CAGR (10 year) from 2013 to 2023



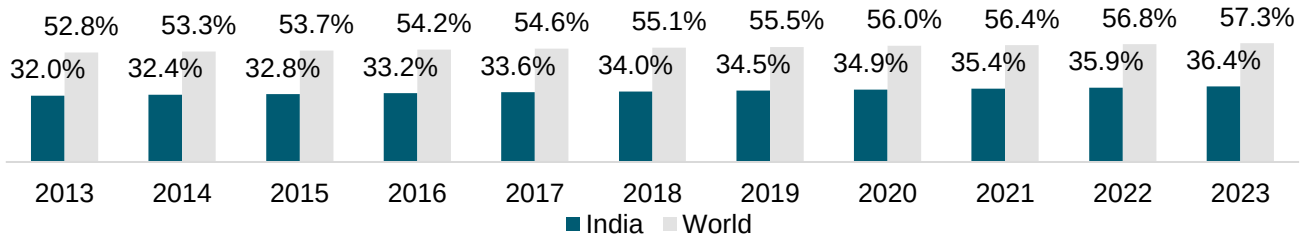
*Source: BP (2024) Statistical Review of World Energy, Our World in Data, Crisil Intelligence, All India Electricity Statistics (General Review) by Central Electricity Authority, *European Union data is for 2022, **India's data is for fiscal 2024, growth rate is the rise in per capita electricity consumption from 2013 to 2023*

Between fiscals 2023 and 2026, India's per capita electricity consumption is expected to grow at approximately 6% CAGR[29]. Per capita electricity consumption is expected to gradually improve in the long term as well, as power demand picks up on the back of improvement in access to electricity, in terms of quality and reliability, rising per capita income, increasing EV penetration, railway electrification, on account of intensive rural electrification, resulting in realization of latent demand from the residential segment, increased penetration of consumer durables.

1.9.5.2 Urbanization

According to World Bank, India is undergoing rapid urbanization, with its towns and cities expected to be home to 400 million people, by 2030. This represents a significant increase from 32% of the total population in 2013, with urban areas projected to contribute almost 70% to GDP. The success of this urban transformation will be crucial in realizing India's ambition of becoming a developed country by 2047, the 100th year of independence. To create livable, climate-resilient, and inclusive cities that drive economic growth, it is essential to invest in necessary infrastructure. As of 2023, the urban population of India accounts for 37% of the total population, with 523 million people living in urban areas. This represents a significant increase from 32% in 2013. In comparison to the rest of the world, India's urban population is one of the largest, with only China having a larger urban population at about 911 million people, about 60% of the population.

Figure 1.11 Share of urban population of India and the World from 2013 to 2023



Source: World Bank Group, all years are calendar year

1.9.6 Outlook on global GDP from 2023 to 2025

[29] *International Energy Agency*

The ongoing US-led tariff actions are causing global trade and growth concerns, leading to uncertainty and financial market volatility. The ongoing trade war between the US and China has taken a dramatic turn, with the US announcing a 145% tax on imports, surpassing the initially stated 125% rate. China has retaliated against the US with tariffs, imposing a 125% tariff on US products, in a significant escalation of the trade war between the two countries. This move has sparked a strong response from China, which has unveiled countermeasures against the US, leading to a significant downturn in US stocks. The impact of the US government's fiscal support for its fiscal deficit and prospects of slower Fed cuts have also elevated 10-year US Treasury yields. Rising yield and interest rate differentials with emerging markets, and the concerns about global growth have heightened the uncertainty and financial market volatility world over.

1.10 Growth drivers for increase in GDP in India

The Indian government's total capital expenditure was at Rs 9.5 trillion[32] in fiscal 2024. Given the government's capex push (capital expenditure has tripled in past five years, from Rs 3.1 trillion in fiscal 2019 to Rs 9.5 trillion in fiscal 2024), India's investment prospects are optimistic. In fiscal 2026 Government of India has allocated Rs. 11.2[33] trillion, which is a 10% increase from previous fiscal year 2025 of Rs. 10.2 trillion.

1.10.1 Manufacturing

Indian real GDP growth has been mainly due to significant 9.9% growth in the manufacturing sector in fiscal 2024 over -2.2% in fiscal 2023 and 7.1% growth in the mining and quarrying sector in fiscal 2024 over 1.9% in fiscal 2023. The manufacturing sector has grown at an average annual rate 5.2% over the past 10 years, despite numerous disruptions. The main growth drivers in the sector have been chemicals, wood goods and furniture, transportation equipment, medicines, machinery and equipment.

1.10.2 Infrastructure

In recent years, the funding of large-scale infrastructure projects has been aided by buoyant public sector investment. Between fiscal 2014 and fiscal 2024, the average daily speed of national highway construction grew nearly three times, from 11.7 km to approximately 34 km. In the past five years, capital spending on railroads has surged 77%, primarily due to large investments in new-line construction, gauge conversion and doubling. The operationalization of new terminal buildings at 21 airports in fiscal 2024 has increased the capacity to handle 62 million more passengers annually overall.

India rose from 54 in 2014 to 38 in 2023 in the World Bank *Logistics Performance Index*. Between 2014 and 2023, India's clean energy sector received Rs 8.5 trillion[34] in new investments. The *National Monetization Pipeline* included assets with a monetization potential of Rs 6 trillion during the four-year period.

1.10.3 Services

The services sector's share of the total GVA has increased to 54.6% (fiscal 2024), the level observed before the epidemic. As of March 31, 2024, there were 1,691,495 active firms in India. In 2022, India's services exports made up 4.4% of all commercial services exported worldwide. About 73% of India's services exports were made up of business and computer services, which increased 9.6% on-year in fiscal 2024. India's percentage of the world's exports of digitally delivered services climbed from 4.4% in 2019 to 6.0% in 2023. In 2023, the tourism industry saw

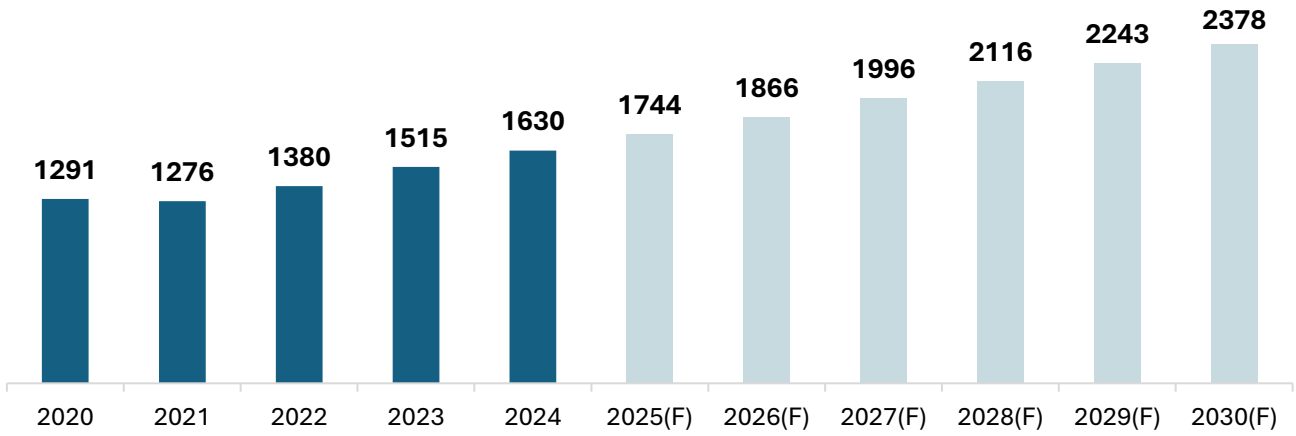
[32] *India Budget, Government of India*
[33] *Union Budget fiscal 2026*
[34] *Ministry of Finance, notified through Press Information Bureau dated 22nd July 2024*

over 9.2 million foreign visitor visits, indicating a 43.5% on-year rise. With a 33% on-year gain and 0.41 million units sold in the top eight cities, residential real estate sales in India reached their highest level since 2013.[35]

1.11 Energy requirements and availability of India

India's energy demand is rapidly growing, driven by economic expansion and population growth. The demand in fiscal 2024 is expected to be 16,29,670 MU at a CAGR of 6.0% from fiscal 2020 to fiscal 2024, driven by continued economic growth. The demand is expected to continue growing at an accelerated rate, reaching 23,77,763 MU by 2030, with a CAGR of 6.4% from fiscal 2025 to fiscal 2030. The analysis of India's electricity demand from 2020 to 2030 shows a steady increase in demand, with an accelerating growth rate in the later years. The peak demand is the highest amount of electricity demanded by the grid at a given time which has been increasing steadily over the years, with a CAGR of around 6.9% from fiscal 2020 to fiscal 2024. The peak demand in fiscal 2020 was 1,83,804 MW, with a slight shortfall of 1,271 MW. The peak demand in fiscal 2021 was 1,90,198 MW, with a shortfall of 803 MW. The peak demand in fiscal 2022 was 2,03,014 MW, with a shortfall of 2,475 MW. The peak demand in fiscal 2023 was 2,15,888 MW, with a shortfall of 8,657 MW. The peak demand in fiscal 2023 was 2,15,888 MW, with a shortfall of 8,657 MW. The increasing peak demand highlights the need for additional power generation capacity to meet the growing demand.

Figure 1.12: India’s electricity demand in Billion Units



Source: Central Electricity Authority- Annual Report of various years, Crisil Intelligence; All years are fiscal years, F: Forecast

Table 1.8: Peak Power Demand in India in MW

Fiscal Year	Peak Demand (MW)	Peak Demand (MW)	Demand not Met	
			MW	%
2020	1,83,804	1,82,533	1,271	0.7
2021	1,90,198	1,89,395	802	0.4
2022	2,03,014	2,00,539	2,475	1.2
2023	2,15,888	2,07,231	8,657	4.0
2024	2,40,174	2,39,978	196	0.1

Source: Central Electricity Authority- Executive summary of various months

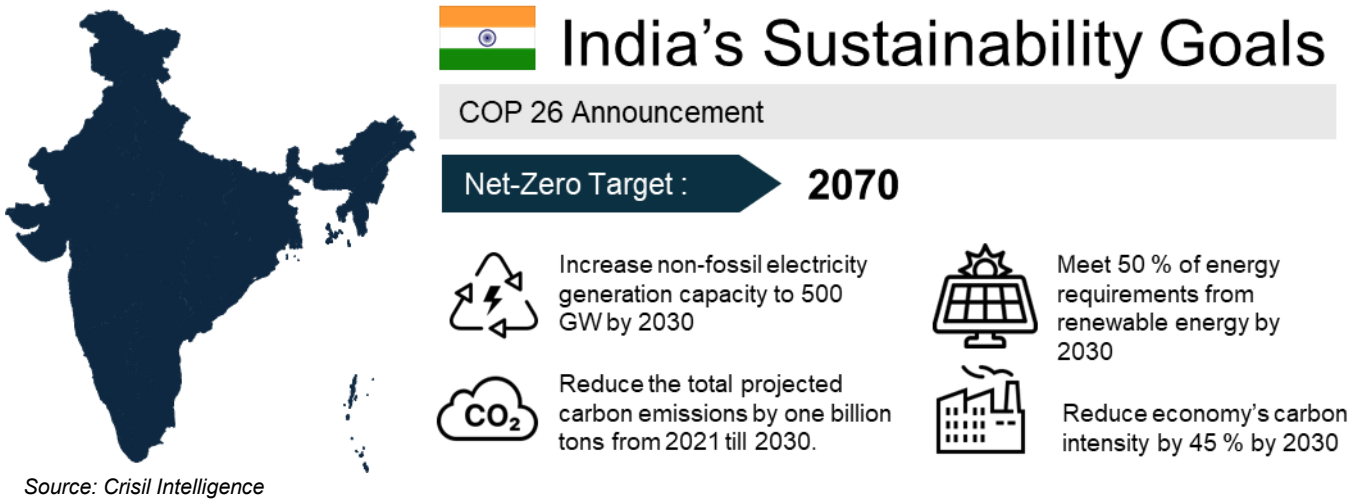
[35] *As mentioned in the economic survey report*

1.12 Outlook on Carbon Emission Reduction

As the world transitions towards a low-carbon economy, India's mining industry is poised to undergo a significant metamorphosis driven by the country's ambitious climate goals, mounting global pressure to adopt sustainable practices and the economic imperative to optimize energy consumption. The Indian government is commitment to attain carbon neutrality by 2070.

1.12.1 India's Sustainability Targets

Figure 1.13: India's COP26 Targets



Source: Crisil Intelligence

India has been an active participant in global climate action initiatives, significantly contributing to international efforts under the United Nations Framework Convention on Climate Change (UNFCCC).

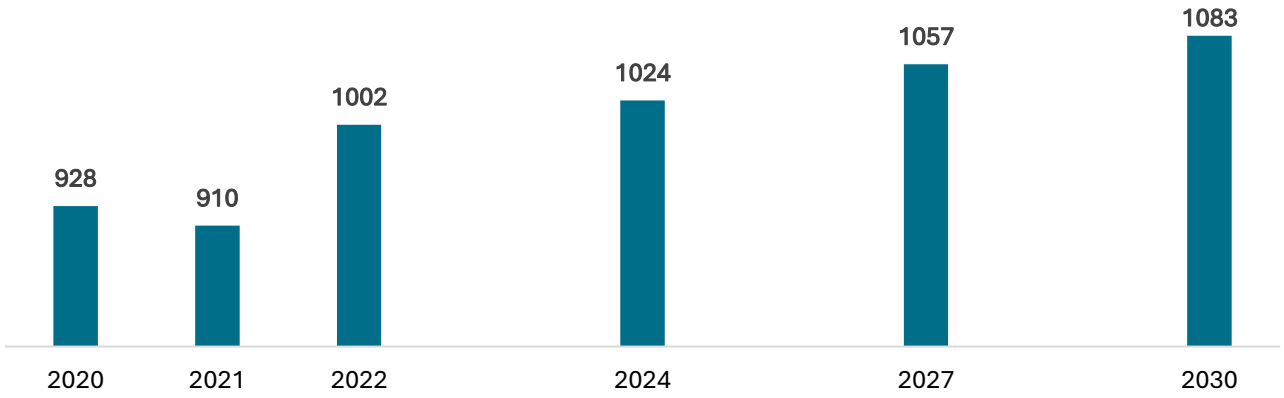
1.12.2 Emissions in the Power Sector

Coal is the largest source of carbon emissions from fossil fuels, accounting for approximately 41% of global CO_2 emissions[47]. The countries with the highest carbon emissions from coal in 2023[48] are 55.5% China (8,550 million tons CO_2), 13.2% India (2,031 million tons CO_2), 5.0% United States (776 million tons CO_2), 2.8% Russia (428 million tons CO_2), and 2.1% South Africa (330 million tons CO_2). The carbon emissions from coal in these countries are primarily due to the use of coal for electricity generation, industrial processes, and heating. The emissions from coal are not only a major contributor to climate change but also have significant health impacts, particularly in terms of air pollution.

India's National Electricity Plan (NEP) outlines a trajectory where absolute carbon dioxide emissions from electricity generation are projected to increase in the coming years reaching to about 1,100 MMT in fiscal 2032. This rise is attributed to the growing energy demands of the nation. However, a significant reduction in CO_2 emissions per unit of electricity generated is anticipated, reflecting improvements in generation efficiency and a shift towards cleaner energy sources owing to the ambitious renewable energy goals set by an Indian Government including achieving 50% of the nation's cumulative installed power capacity from renewable sources by 2030[49].

Figure 1.14: Total Projected CO_2 Emissions (MT) from the power sector

[47] *International Energy Agency (IEA)*
[48] *ourworldindata.org*
[49] *As per NDC submitted to UNFCCC in August 2022 as highlighted in PIB 13th November 2024*

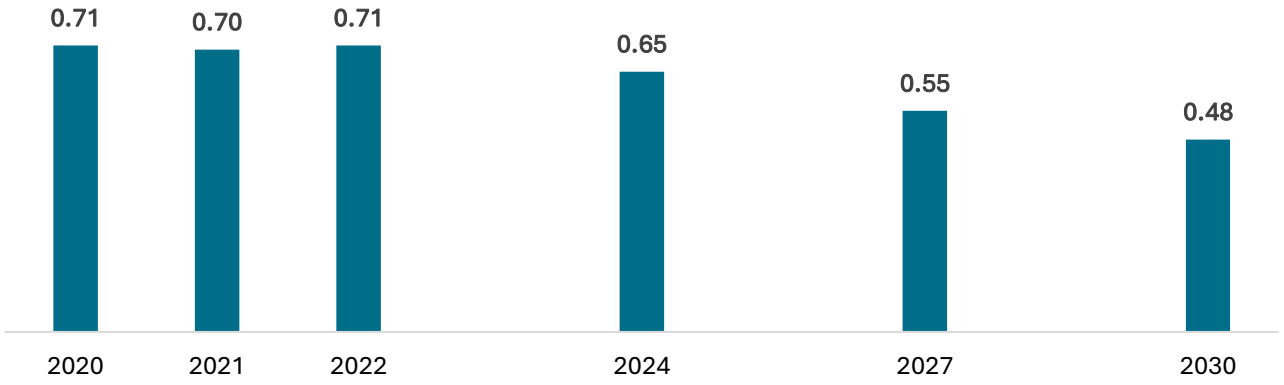


Source: National Electricity Plan 2022-32 by Central Electricity Authority, 2024 and 2030 numbers are interpolated, All years are fiscal years

According to NEP the share of non-fossil-based installed capacity is projected to increase from approximately 42.5% in April 2023 to 57.4% by fiscal 2027, and further to 68.4% by fiscal 2032.

This shift towards renewable energy sources plays a crucial role in decreasing emissions per unit of electricity generated. Ongoing improvements in power generation technologies and the implementation of energy-efficient practices contribute to lower emissions per kWh. The integration of cleaner technologies, such as supercritical and ultra-supercritical coal-fired power plants, enhances the efficiency of coal usage, thereby reducing emissions intensity, which is expected to reach to 0.42 kg CO_2/kWh_{net} by fiscal 2032.

Figure 1.15: Weighted Average Emission Rate ($kgCO_2/kwh_{net}$)



Source: National Electricity Plan 2022-32 by Central Electricity Authority, 2024 and 2030 numbers are interpolated, All years are fiscal years

1.12.3 Emissions in the Steel Sector

The steel sector in India emitted around 240 million tons of CO_2 in 2020, which is approximately 12% of the country's total CO_2 emissions. The carbon emissions of the steel sector in India are expected to rise at a CAGR of 6.49% from 240 MMT of CO_2 emission in 2020 to 450 MMT of CO_2 emission in 2030. The carbon footprint of steel is significant, with the production of one ton of steel resulting in around 1.8-2.2 tons of carbon dioxide emissions. The main contributors to the carbon footprint of steel are through the DRI-EIF route of steel making in India, while the scrap based EAF has the lowest emission intensity.

Table 1.9: Emission Intensity by Route-India (fiscal 2024)

S. No.	Process Route	CO_2 Emission Intensity(tCO_2/tcs)
1	Coal based DRI-EIF	2.70-3.10
2	SynGas DRI-EAF	2.50-2.90

S. No.	Process Route	CO_2 Emission Intensity(tCO_2/tcs)
3	BF-BOF	2.20-2.60
4	Natural Gas based DRI-EAF	1.40-1.60
5	100% scrap-based EAF	0.55-0.65
Average emission intensity in India		2.54

DRI- Direct Reduced Iron, EIF- Electrical Induction Furnace, EAF- Electric Arc Furnace, BF- Blast Furnace, BOF- Basic Oxygen Furnace

Source: Ministry of Steel

The coal sector must balance economic imperatives with sustainability. While India's immediate energy security needs justify continued coal reliance, integrating technological advancements and policy-driven incentives can create a structured transition towards lower emissions without undermining industrial competitiveness. Addressing emissions is not about eliminating coal but about making its usage more efficient and environmentally responsible.

India plays a significant role in the global economy, driven by its diverse industrial base, growing consumer market, and strategic geopolitical position. As one of the fastest-growing major economies expecting a strong real growth of 6-7% in this decade, India's contribution to global GDP continues to rise. The mining sector remains crucial, contributing approximately 2.1% to India's GDP. Mining plays a vital role in India’s economy, providing raw materials for various industries such as power, steel, cement, and infrastructure.

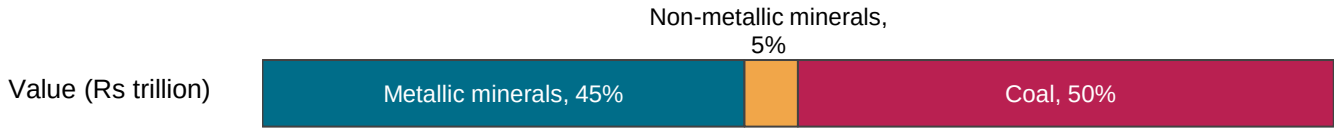
2 Indian Coal Mining Industry Overview

2.1 Minerals at the Core

2.1.1 Coal, Iron Ore, and Limestone in India's Power and Infrastructure Sectors

The main minerals mined in India are coal, iron ore, and limestone, which are intricately linked to the country's power, steel, and cement industries. Coal, the primary source of fuel for India's thermal power plants, accounts for over 75% of the country's electricity generation.[50] The power sector, which is heavily reliant on coal, is also closely tied to the steel and cement industries, as electricity is a critical input for the production of steel and cement.

Figure 2.1: Value in Rs trillion of minerals in India distribution



Source: Ministry of Mines, Government of India, total value of mineral production is Rs 2.83 trillion for fiscal 2025

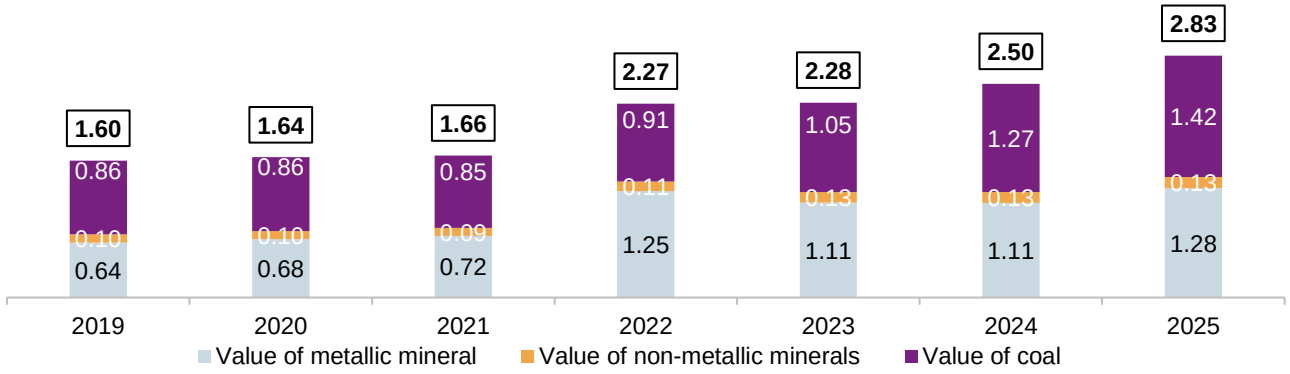
Coal and iron ore are the bedrock of India's mineral wealth, playing a critical role in driving the nation's industrial and economic progress. These minerals not only fuel the country's energy needs but also support the backbone of its manufacturing sector, particularly in steel production.

The value of minerals mined in India is approximately evenly split between the coal and non-coal minerals. Coal is undeniably the most crucial mineral for India, accounting for approximately 50%[51] of the total value of minerals mined in the country in fiscal 2025. Given India's large population (largest country by population in the world with approximately 1.44 billion people in 2024 according to IMF estimates) and rapidly growing economy (6.4% real GDP growth rate expected from CY2024 to CY2030, according to the IMF[52]), the demand for energy is ever-increasing, making thermal coal indispensable for ensuring energy security. The importance of coal is further underscored by its widespread use in various industries[53], from cement to chemicals, contributing significantly to India's industrial output.

Besides coal, metallic minerals contribute to the country's mineral wealth significantly, at approximately 45%[54] of the value of minerals mined in fiscal 2025. Iron ore, contributing approximately 34% to the total value of minerals mined in India, is another essential mineral that underpins India's economic framework. Approximately 76%[55] of the value generated by metallic minerals in India comes from iron ore, reflecting its importance. With India being the second largest producers of steel globally, the demand for high-quality iron ore is ever-growing. Given that the mining industry contributes approximately 2.1% to India's GVA, coal (50%) and iron ore (34%) contribute about 84% of the mining GVA.

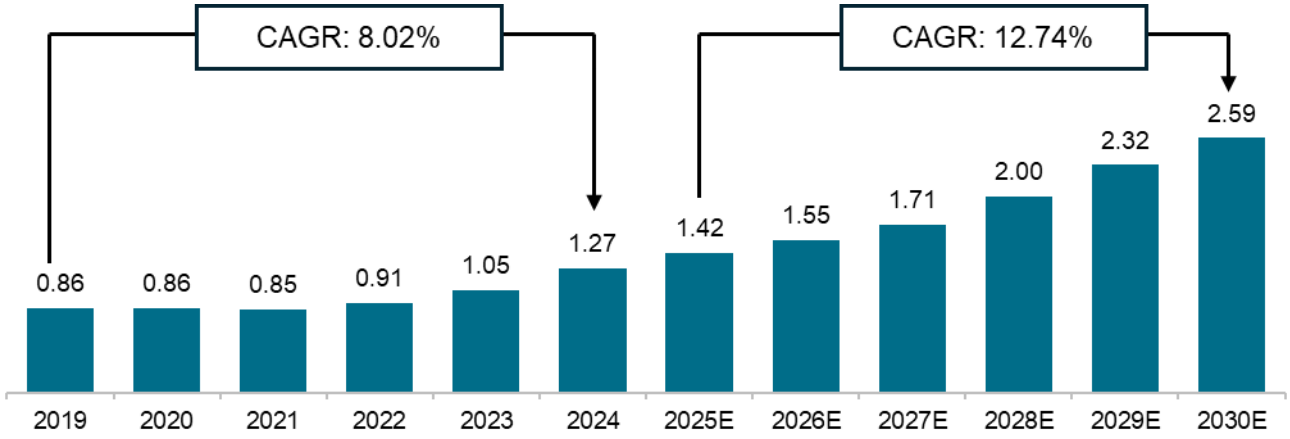
[50] *Central Electricity Authority (General Review)*
[51] *Ministry of Mines, Government of India, total Value of Mineral production*
[52] *As per International Monetary Fund (IMF)- World Economic Outlook (April 2025)*
[53] *Mentioned the share of coal demand in various sectors in detail in the coal demand & supply dynamics chapter*
[54] *Crisil Intelligence*
[55] *Ministry of Mines*

Figure 2.2: Value of minerals (coal and major minerals) in India (Rs trillion)



Source: Ministry of Mines and Crisil Intelligence, total value Rs approximately 2.83 trillion in fiscal 2025; All years are fiscal years

Figure 2.3: Value of coal produced in India and expected future value (Rs trillion)



Source: Ministry of Mines, Crisil Intelligence analysis assuming growth rate of 7.0% in coal supply growth; All years are fiscal years, E: Estimates

2.1.2 Mining policies and regulations

India's mining sector is a cornerstone of its economic strategy, playing a crucial role in ensuring security of energy and the critical mineral resources necessary for industrial growth. The country recognizes the importance of its vast mineral reserves in providing reliable and affordable energy essential for sustaining economic activities and driving industrialization. Additionally, with the growing geopolitical uncertainties and supply chain disruptions, India is strategically focusing on reducing its dependence of foreign sources for key minerals. By developing and safeguarding its domestic mineral resources, India aims to protect key industries, such as electronics, renewable energy and defense, from the vulnerabilities arising from global supply fluctuations.

2.1.2.1 Mines and Minerals (Development and Regulation) Act, 1957

The *MMDR Act* is the cornerstone of India's mining regulatory framework, governing all aspects of mineral development and regulation. The Act classifies minerals into major (coal being part of First Schedule, Part A of the Act) and minor, with different regulatory frameworks governing each. In 2015, the major amendments of the Act were approved with the introduction of a transparent, competitive bidding process for the allocation of mineral blocks, replacing the earlier first-come, first-serve system. In addition, the amendments made in post 2015 aimed to streamline the auction process, reduce bureaucratic delays and increase penalties for illegal mining activities.

2.1.2.2 National Mineral Policy, 2019

The *National Mineral Policy (NMP) 2019* was introduced to replace the policy of 2008, reflecting changes in the scenario of India's mineral resources. NMP is a comprehensive framework established by the government to guide the development and regulation of India's mineral resources. The policy aims to ensure the sustainable and efficient utilization of mineral resources. It promotes the adoption of modern technologies and practices that minimize environmental degradation, reduce waste and enhance resource efficiency. The policy advocates transparent and accountable governance in the mining sector and aims to attract both domestic and foreign investments in the exploration and mining sectors. The policy promotes value addition and mineral beneficiation within India, aiming to reduce the export of raw mineral and increase the export of value-added products.

2.1.2.3 Mineral Conservation and Development Rules, 2017

The Mineral Conservation and Development Rules, 2017, were established under the MMDR Act to ensure the systematic and scientific exploitation of minerals. The rules aim to conserve minerals and ensure their proper utilization, with a focus on minimizing wastage and ensuring environmentally responsible mining practices. It provides guidelines for the sustainable development of mines, including proper closure plans, restoration of mined areas and measures to mitigate environmental impact. It also consists of regulations for the health and safety of workers.

2.1.2.4 Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 (MCR)

The "Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules" govern the regulation of mineral concessions in India, excluding those related to atomic and energy minerals. MCR 2016 is a law framed under the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act). These rules replaced the older MCR 1960, aligning the mineral concession system with the 2015 MMDR Amendment, which introduced auction-based allocation of mining rights

2.1.2.5 Mineral Auction Rules, 2015

The Mineral (Auction) Rules, 2015 and subsequent amendments, primarily focus on establishing a fair and transparent bidding process for mineral blocks. These rules govern how mining leases (MLs) and composite licenses (CLs) are offered via auctions. They provide a transparent, fair and competitive bidding process for granting ML and CL. The Mineral Auction Rules define the auction parameters, including reserve price, bid parameter, auction process, eligibility criteria, payment terms, penalties for default, etc. to ensure transparent and competitive allocation of mineral blocks.

2.1.2.6 Mines & Minerals (Contribution to District Mineral Foundation) Rules, 2015

The District Mineral Fund (DMF) is a non-profit body that works to benefit the people and areas impacted by mining, funded by contributions from mining concession holders. Section 9B of the MMDR Act empowers State Governments to establish DMFs in districts affected by mining activities. According to the Mines & Minerals (Contribution to District Mineral Foundation) Rules, 2015, mining lease holder must pay an additional amount to the District Mineral Foundation (DMF) of the district where they operate, in addition to the royalty.

2.1.2.7 National Steel Policy, 2017

The National Steel Policy, 2017, formulated by the Ministry of Steel, aims to enhance the growth and sustainability of the Indian steel industry. It seeks to boost domestic steel production, reduce reliance on imports, and establish India as a global steel powerhouse. The policy aims to make India self-reliant in steel production by enhancing capacity to 300 MT and increasing per capita consumption to 160 kg by 2030-31.

Recommendations by Inter-Ministerial Committee:

Ministry of Coal, Govt. of India has assessed the sector-wise demand of coking coal and non-coking coal in the country by fiscal 2030 and likewise prepared coal logistic plan for effective and efficient evacuation of coal. Taking all these into consideration and to substitute the imports of coal the committee has come to the following recommendations for reducing coking coal imports:

i. Utilization of raw coking coal production by steel sector
ii. Adoption of Stamp-Charging Technology for steel making
iii. Enhancing Washing Capacity in the country
iv. Monetization of Old Washeries
v. Low ash thermal coal as PCI (Pulverized Coal injection) in Blast Furnace
vi. Enhancing Coal gasification based Direct reduced Iron (DRI)

2.1.2.8 Abandoned coal block auction policy[56]

To promote an optimum utilization of coal resources in the national interest, the Government is eager to include the private sector in operating closed/abandoned/discontinued mines through a mechanism that would benefit both the government and the private sector.

2.1.2.9 Environmental regulations

Environmental regulations play a critical role in ensuring responsible mineral extraction. *The Environment Protection Act, 1986, the Forest Conservation Act, 1980, and the Wildlife Protection Act, 1972* are key legislative frameworks that govern environmental aspects of mining. These laws mandate environmental impact assessments (EIA) for major mining projects, clearances for mining in forested areas and stringent measures to protect wildlife habitats.

2.1.2.10 Taxation on minerals

Royalty

As per Section 9 of the MMDR Act, the holder of a mining lease granted on or after the commencement of the Act has to pay royalty on any mineral removed or consumed by him or by his agent, manager, employee, contractor or sub-lessee from the leased area at the rate specified for that mineral in the *Second Schedule* of the Act.

District Mineral Fund

The District Mineral Foundation (DMF) was established as per Section 9B of the MMDR Act, to ensure that the benefits of mining extend to communities affected by these activities. Funded by contributions from mining leaseholders, the DMF focuses on the welfare of people in mining-affected areas, particularly in the fields of health, education, and infrastructure development.

National Mineral Exploration Trust Rules, 2015

The *National Mineral Exploration Trust Rules, 2015*, were established as per Section 9C of the MMDR Act to support mineral exploration activities in India, particularly for minerals that are crucial for national development but are under-explored. Mining companies are mandated to contribute 2% of the applicable royalty in the NMET fund.

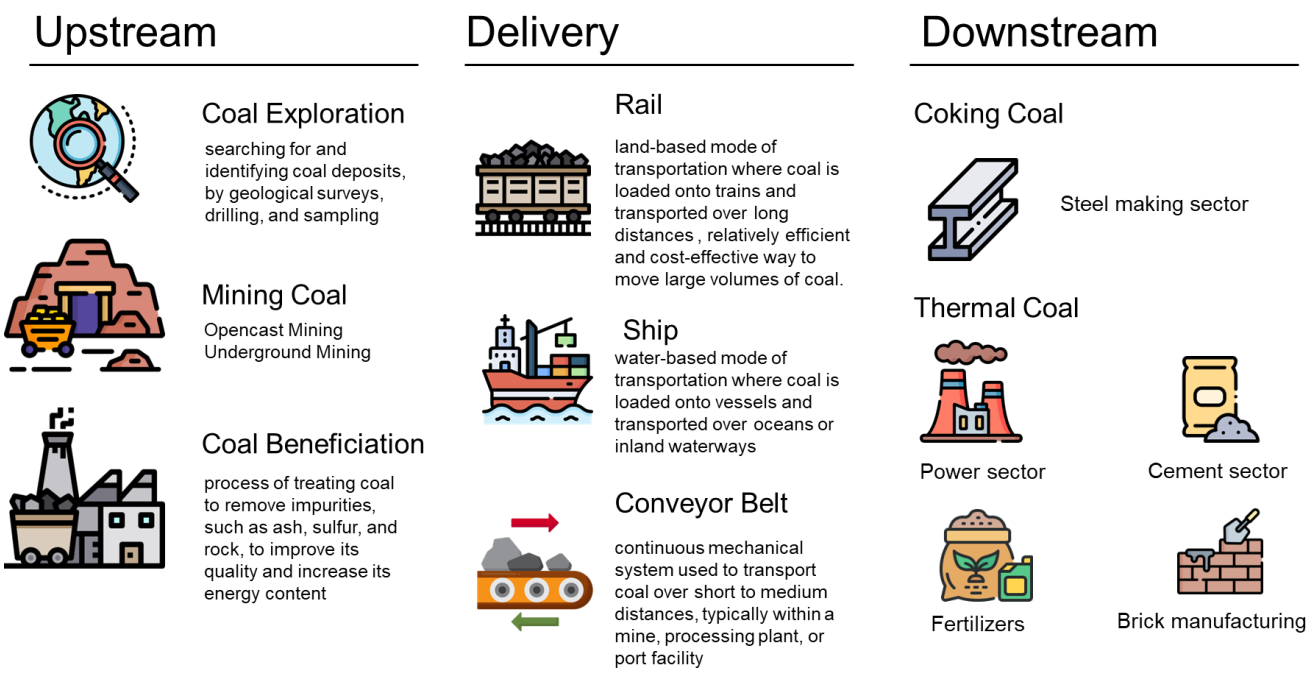
State Specific Taxes

In addition to the statutory taxes such as GST and GST compensation cess, there are specific charges which are levied by states which impact on the overall price of coal. Some of the key states which levy such taxes include Chhattisgarh, Madhya Pradesh, Jharkhand, and West Bengal.

[56] *https://coal.nic.in/sites/default/files/2022-02/17-02-2022.pdf*

2.2 Overview of the structure of Indian coal industry and major business drivers of coal industry (with specific focus on coking coal)

Figure 2.4: Coal's value chain



Source: Crisil Intelligence

2.2.1 Types of coal

Coal has been a cornerstone of human civilization for centuries. At its core, coal is a combustible black or brownish-black sedimentary rock that is composed of a high amount of carbon and hydrocarbons. Its unique properties make it an ideal source of energy, and it has been used for a variety of purposes, including electricity generation, industrial processes and domestic heating. On the basis of degree of coalification, there are five main types coal namely, anthracite, bituminous, subbituminous, lignite and peat. Further, coal is broadly categorized under coking coal and non-coking coal.

2.2.1.1 Coking Coal

Coking coal, also known as metallurgical coal possesses unique property of forming coke when heated in the absence of air at a temperature of 1030- 1060°C. Coke is a hard, porous substance essential for the blast furnace process in steelmaking. This characteristic distinguishes coking coal from non-coking coal, which lacks the ability to form coke and is primarily used for energy generation. According to the Ministry of Coal, the classification of coking coal is based on ash content[57].

2.2.1.2 Non-coking Coal

Thermal coal, also known as non-coking coal is primarily used for power generation and industrial applications where heat is needed. It is classified based on its energy content, ash content, sulfur content, and moisture content. In India thermal coal is classified as follows.

The gross calorific value (GCV) is the most critical parameter for thermal coal classification. It determines how much energy is released during combustion. Higher GCV values indicate better-quality coal for power generation. The

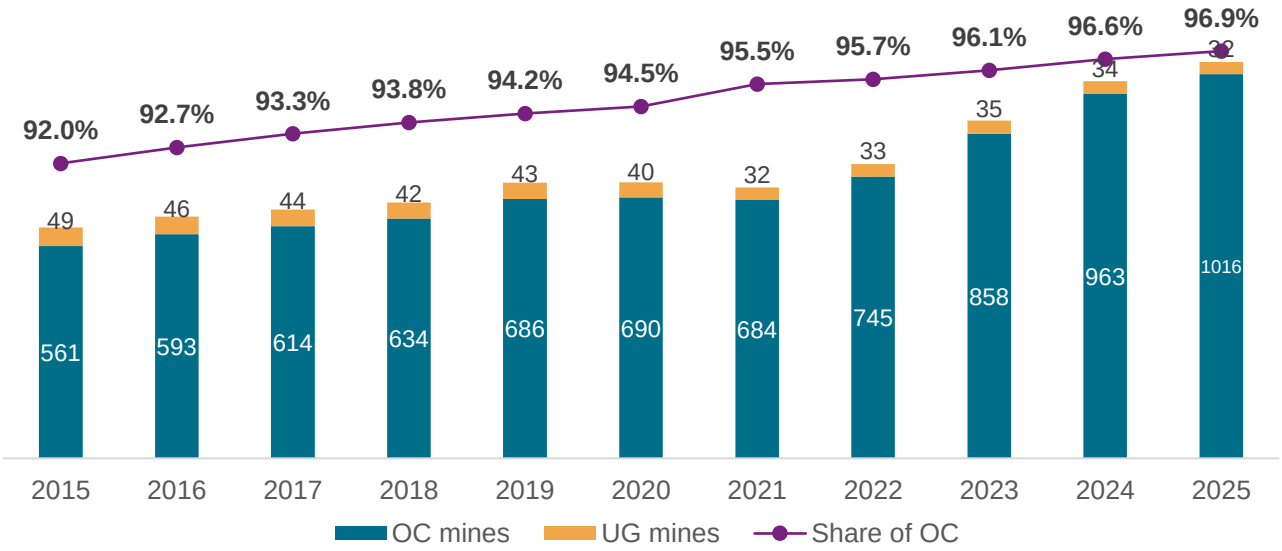
[57] *Coal Directory*

ash content of thermal coal is a crucial parameter as it impacts the efficiency of the combustion process. Lower ash content is preferred as it results in less slag formation and higher efficiency. Coal with high moisture content has a lower effective energy yield.

2.2.2 Coal mining

Broadly, coal mining is classified into Open-Cast (OC) Mining and Underground (UG) Mining, each with distinct methodologies, advantages, and challenges. In India coal is mined using both UG and OC methods. However, the majority of the coal extracted in India is through the OC method.

Figure 2.5 Share of coal production in OC and UG mines in India in MMT



Source: Coal Directory fiscal 2023-24, all years are fiscal years

The share of coal extracted from OC mines has increased over the years due to less mining cost and greater recovery. Since 2020, the total coal production has grown significantly, with the OC mining method dominating the industry. In fiscal 2025, the production of coal in India has been largely from OC mines i.e., 1016 MMT, and 32 MMT from UG mines. The trend is expected to continue, with OC mining remaining the preferred method of coal extraction in India. Coal mined from UG mines has declined consistently from 49 MMT in fiscal 2015 to 32 MMT in fiscal 2025 owing to expensive mining cost and operational complexities.

2.2.2.1 Opencast Coal Mining

Open cast coal mining is the dominant method of coal extraction in India, accounting for around 96.6% of the country's total coal production. This method involves removing soil and rock to expose coal seams, which are then extracted using heavy machinery and transported to power plants or other industries. Open cast mining is generally more cost-effective and safer than underground mining, and India's major open cast coal mines are located in the states of Madhya Pradesh, Chhattisgarh, and Odisha. The largest open cast coal mine in India is the Gevra mine in Chhattisgarh, which has a capacity of over 80 MMT of coal per year.

2.2.2.2 Underground Coal Mining

Underground coal mining is the traditional method of coal extraction in India, accounting for around 3.4% of the country's total coal production. This method involves digging tunnels and shafts to access coal seams, which are then extracted using conventional or mechanized methods. Underground mining is typically used for deeper coal deposits, and India's major underground coal mines are located in the states of Jharkhand, West Bengal, and

Chhattisgarh. However, underground mining is often hampered by geological challenges, safety concerns, and high production costs.

Although UG mining dominates global coal production, in India, only a small percentage of coal is extracted through this method. The majority of UG coal production in India uses the Board and Pillar's method, which involves creating pillars to support the roof while extracting coal. However, this method has a low coal recovery rate and is more suitable for shallow coal seams. The Longwall mining method, which uses advanced machinery, has a higher coal recovery rate but is not widely used in India due to its high cost and the small size of most UG mines. As a result, UG mining productivity in India is low, and production has been decreasing over the years.

2.2.3 Coal reserves and resources

As of 2023, the world's coal reserves are estimated to be 1,165.9 Billion MT[58], with most of these reserves located in the Asia-Pacific region. The top 5 countries with largest coal reserve include, USA, Russia, China, Australia and India, with all of them together contributing about 72% of the global coal reserves. As of April 1st, 2024, the geological resource of Indian coal have been estimated to be 389.42[59] billion metric tonnes (BMT) at various depths. The breakdown of these reserves by depth is as follows: 0-300 meters: 206.28 BMT (53%), 300-600 meters: 127.63 BMT (33%), 0- 600 meters: 15.41 BMT (4%) & 600-1200 meters: 40.10 BMT (10%). The coal resources in India are predominantly concentrated within 4 states such as Odisha, Jharkhand, Chhattisgarh and West Bengal, has been the backbone of India's coal production, which is home to approximately 80% of the country's total coal resources.

Table 10 Total coal resource across India in Billion Metric Tonnes as on 1st April 2024

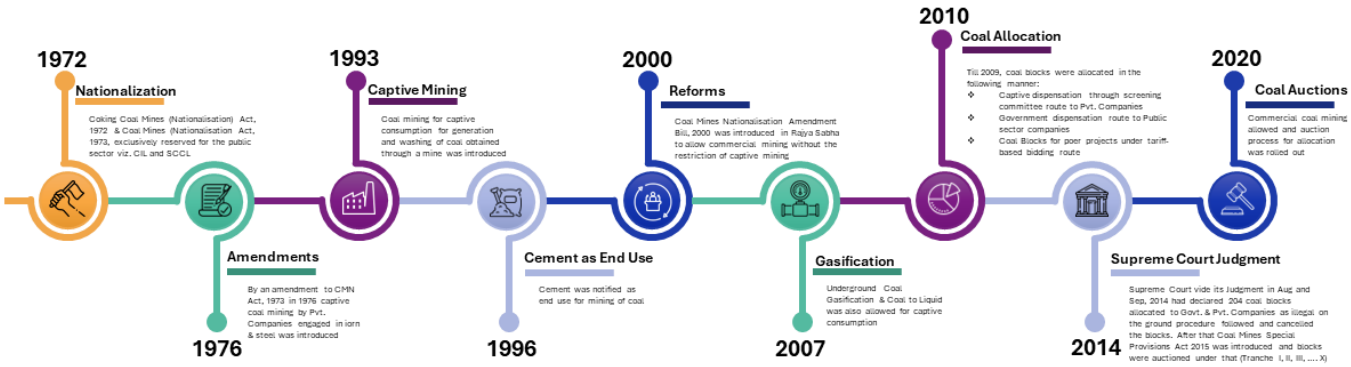
State	Resource (BT)	Resource (%)
Odisha	99.2	25%
Jharkhand	91.8	24%
Chhattisgarh	82.7	21%
West Bengal	34.0	9%
Madhya Pradesh	32.8	8%
Telangana	23.2	6%
Maharashtra	13.4	3%
Others	12.4	3%
India Total	389.4	100%

Source: Coal Directory 2023- 24

[58] *US Energy Information System*
[59] *Coal Directory of India, 2023-24*

2.3 Analysis of regulatory frameworks and policies governing coal sector

Figure 2.6: Coal sector: From nationalisation to commercialisation



Source: Crisil Intelligence

Participation in coal block auctions was no longer limited to captive users but open to any player, including international ones for mining and selling coal from India. In August 2020, 100% FDI was allowed, removing the last significant vestige of regulation in the coal mining industry. Recently, existing captive allottees have been allowed to sell up to 50% of their coal production in the open market subject to meeting end use plant requirement. Subsequently, eleven rounds of commercial coal block auctions have been concluded so far, resulting in successful auctions of 125 blocks. The 12th round (Tranche XII) was launched with Notice Inviting Tender (NIT) on March 27, 2025, and is underway (as of May 2025).

Figure 2.7: Key policies influencing the coal market

National Coal Distribution Policy 2007	Guiding policy for sale and distribution of coal in India, introduced Letter of Assurance (LoA)-Fuel Supply Agreement (FSA) regime, sale via nominated agencies and e-auction of coal
CMSP Act 2015	Auctions for allocation of coal block to end-users introduced
Linkage Auction Policy 2016	Policy for allocation of linkages to non-regulated sectors via auctions, prior FSAs are not renewed after the policy
SHAKTI Policy 2017	Policy for allocation of linkages to power plants, objective of fading away of LoA-FSA regime
MMDR Amendment Act 2020	Coal block auctions opened-up to commercial players as well and up to 50% of sale allowed from captive coal blocks

Source: Crisil Intelligence, Ministry of Coal

2.3.1.1 Mines Act 1952

he Mines Act of 1952 is a key piece of Indian legislation focused on regulating labor and safety in mines. It aims to protect the health, safety, and well-being of mine workers, and it also establishes the duties and responsibilities of

mine owners. The Act covers various aspects, including working hours, leave with wages, employment of women and children, and reporting of accidents and diseases.

2.3.1.2 Mineral Concession Rules, 1960 (MCR)

The *Mineral Concession Rules 1960* provide the procedural details for the grant of mineral concessions under the MMDR Act. This law defines the procedures for applying for reconnaissance permits, prospecting licenses and mining leases. It also outlines the rights and responsibilities of concession holders.

2.3.1.3 National Coal Distribution Policy (NCDP), 2007

The overarching policy guiding coal distribution and sale in India is the National Coal Distribution Policy (NCDP), 2007 and the various amendments thereof. The NCDP guides the overall framework for allocation of coal linkages to different sectors, distribution to MSME sectors and e-auction schemes to be conducted by CIL subsidiaries. The NCDP seeks to facilitate supply of assured quantities of coal to various categories of consumers at predetermined prices, taking into consideration regulatory regimes governing the end-use sectors. It also envisages an enlarged role for state governments in the supply of coal to a large number of small and medium industries. Under this policy, e-auction sales of coal were re-introduced to encourage the emergence of a proper coal market in the country.

2.3.1.4 The CMSP Act, 2015

The Coal Mines (Special Provisions) Act, 2015 brought reforms to the coal sector. The Act introduced a transparent and competitive bidding process for auctioning coal blocks. It also outlined the process for allocating coal blocks to public sector units and ultra-mega power projects. Since its implementation, the government has conducted multiple rounds of coal block auctions and allocations between January 2015 and November 2019.

2.3.1.5 Linkage Auction Policy

The MoC vide letter No. 23011/51/2015-CPD (Pt-I) dated February 15, 2016, issued policy guidelines for auction of linkages for the non-regulated sector. It was stipulated that all allocations of linkages/LOAs for the non-regulated sector, viz. cement, steel/sponge iron, aluminum and others [excluding fertilizer (urea sector)], including their CPPs, shall henceforth be auction-based. Also, there will be no renewal of existing FSAs of non-regulated sectors [except FSAs of CPSEs and fertilizer (urea)]. CIL and SCCL have accordingly been conducting linkage auctions for the non-regulated sector, including for steel, cement and sponge iron, and FSAs are signed with successful bidders by the subsidiary coal companies of CIL and SCCL.

2.3.1.6 SHAKTI Policy

The Government of India introduced the SHAKTI (Scheme for Harnessing and Allocating Koyla (Coal) Transparently in India) policy in 2017. The policy provided a new system of coal allocation under which power plants were segregated into different categories based on existing power purchase agreements and fuel supply agreements or linkages. The participants under the scheme could participate and source coal for short- and long-term linkages. The overall objective of the scheme was to ensure supply to power plants, minimize risk to the banks exposed to non-performing assets, reduce electricity bills, and decrease imports.

2.3.1.7 Coal Mines Regulations 2017

The Coal Mines Regulations, 2017 in India are a set of rules that govern the operation of coal mines, focusing on safety, health, and environmental protection. They outline the responsibilities of mine owners, agents, and managers, including safety precautions in mechanized opencast workings and ventilation requirements. The regulations also address various aspects of mine operation, including inspection, training, and the use of approved machinery.

2.3.1.8 Mission Coking Coal, 2021

The Ministry of Coal has embarked on an ambitious mission "Mission Coking Coal", aimed at enhancing domestic coking coal production to reduce the country's reliance on imports. This initiative is driven by the growing demand for coking coal from the steel sector, which is expected to drive economic growth. The mission seeks to increase

domestic raw coking coal production to 140 million tons (MT) by the financial year 2029-30. This mission aligns with broader initiatives like the National Steel Policy 2017, targeting reduced import dependency and securing a steady supply of coking coal through domestic exploration, beneficiation, and infrastructure development.

2.3.1.9 Government policies

Government policies significantly influence the energy sector, with recent initiatives focusing on reducing import dependency on coal and advancing sustainability.

2.3.1.10 Energy Policies

While India is making significant strides in renewable energy and green hydrogen, coal remains a critical component of the country's energy mix. To address the challenges and opportunities within the coal sector, the government has introduced several targeted policies. Additionally, the Integrated Coal Logistics Plan for Coal Mines/Blocks, introduced in February 2024, focuses on developing efficient and cost-effective coal logistics. This policy aims to streamline coal evacuation processes and enhance operational efficiency. The Coal Blocks Allocation (Amendment) Rules, 2023 further reflect the government's efforts to optimize the allocation, along with its plan to produce 1.5 BT (1,500 million tonne of coal) and management of coal resources, ensuring a more transparent and efficient process.

2.3.2 Coal sales channels in India

There are four types of coal blocks in India.

CIL / SCCL blocks – The majority coal blocks are owned by Coal India Limited (CIL) and Singareni Collieries Company Limited (SCCL). Prior to commercialisation of coal sector in India, all commercial production of coal in the country was routed through CIL/SCCL.

Captive coal blocks – A handful of coal blocks are with companies having specific end-uses. These are called captive blocks. These companies use coal for their internal consumption. Prior to 2015, blocks were awarded on a nomination basis for captive use. After CMSP Act 2015 came into force, coal blocks were allocated as captive blocks (for regulated sector and non-regulated sector). Within the auctioned segment, initially (CMSP tranches VIII, IX, X) companies were allowed to sell 25% of coal commercially after meeting their end use requirement.

Commercial coal blocks – After the commercialisation of the coal sector in 2020, the government started auctioning coal blocks for commercial production. Till date, the auction process of a total of 125 coal blocks has been completed with an estimated annual peak capacity of approximately 273 MTPA[62].

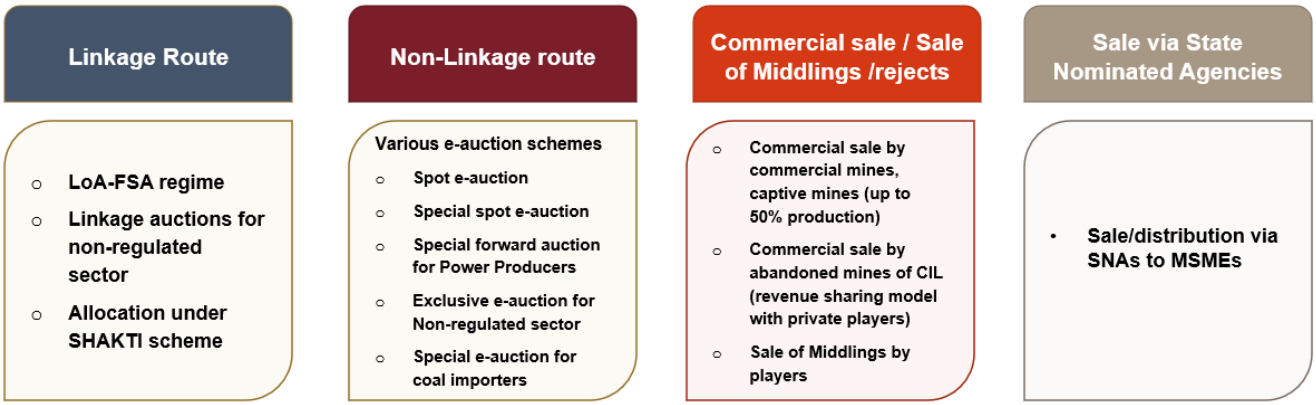
Abandoned mines/ discontinued blocks – In 2022, CIL started auctioning the discontinued coal mines for re-opening on revenue-sharing basis to bring them back into operation. These are classified here as abandoned/ discontinued blocks. By fiscal 2024, a total of 24 such mines have been awarded so far out of 34 identified mines. In fiscal 2024, CIL[63] awarded 11 such mines on revenue sharing models to successful bidders with a cumulative peak rated capacity (PRC) of 17.86 MTPA, while the total extractable reserves are estimated at 267.5 MMT. The abandoned blocks offered will be operated by mine operators who will develop and operate the block and sell the coal on behalf of the owner of mine. They will be required to share the final revenue generated from the sale proceeds with the owner of the mine (e.g. CIL and its subsidiaries) as per the coal mining agreement. A total of 6 such Abandoned mines/ discontinued blocks have been successfully auctioned by BCCL having a total Peak Rated Capacity (PRC) of approximately 8.4 MMTPA till fiscal 2025[64]. 4 mines namely Salanpur AGKC (1.4 MMTPA), PB Project (2.7 MMTPA), Madhuband (1.5 MMTPA) and Kharkharee (1.2 MMTPA) are expected to start coal production by fiscal 2026, Loyabad (1.3 MMTPA) and Amlabad (0.3 MMTPA) are expected to commence production by fiscal 2028 and

[62] *PIB dated 24th March 2025*
[63] *Source: Annual Report, CIL 2024*
[64] *BCCL*

fiscal 2029 respectively. Further, 4 blocks (Amalgamated Dharmabandh Colliery, Amal. East Bhuggatdih Simlabahal, Lohapatti and Begunia) are under auction process.

In India, coal is sold through various channels by CIL/ SCCL, and the price of coal depends on the channel through which it is sold. The existing sales channels can be primarily categorized as follows:

Figure 2.8 Classification of coal sales channels



Source: Crisil Intelligence

Existing coal sales channels in the country, mostly linkage routes and non-linkage route, are aligned with the sales and marketing policies and practices of CIL/ SCCL. Under the linkage route, coal is supplied to the central and state power generation companies at the notified prices of CIL/ SCCL, and to non-regulated sectors (NRS) on forward auction basis (linkage auctions). These form bulk of the CIL coal supplies. Besides, there are other sales channels such as spot auctions, special spot e-auctions, special forward auctions for the power sector, exclusive auctions for non-regulated sector (NRS) and for imported coal substitutions (these channels have now been merged into single window channel of selling). Auction terms, premiums and the overall ex-mine price of coal differ from one sales channel to the other. Commercial coal blocks are allowed to sell coal though any mechanism. Captive coal blocks are also allowed to sell up to 50% of their produce in the open market after meeting their end use. Further the abandoned mines are allowed to sell coal through an auction platform only as mentioned in the contract agreement.

2.3.3 Effect of global events on the coal sector and focus on renewal power

The coal sector has been significantly impacted by global events leading to a decline in its dominance and a shift towards renewable energy sources. Here are some key events and trends that have influenced the coal sector and the growth of renewable energy:

Global events impacting the coal sector:

1. Paris Agreement (2015): The Paris Agreement set a global goal to limit global warming to well below 2°C and pursue efforts to limit it to 1.5°C above pre-industrial levels. This agreement marked a significant shift towards reducing greenhouse gas emissions, which has led to a decline in coal demand.
2. China's energy policy shift (2017): China, the world's largest coal consumer, announced plans to reduce coal consumption and increase renewable energy capacity. This shift has had a significant impact on global coal markets.
3. European Union's climate policies (2019): The EU introduced the European Green Deal, aiming to become carbon neutral by 2050. This has led to a decline in coal-fired power generation and an increase in renewable energy investments.

4. COVID-19 pandemic (2020): The pandemic led to a global economic downturn, resulting in reduced energy demand and a decline in coal prices. This accelerated the transition to renewable energy sources, as governments and companies sought to reduce costs and mitigate climate risks.
5. Russia-Ukraine war (2022): Russia's invasion of Ukraine in February 2022 and the subsequent war continues to have a profound impact on global energy markets leading to imposition of sanctions on Russian producers thereby impacting the Russian coal trade flows, which would have significant implications for the global metallurgical coal market.

Factors influencing growth of renewable energy:

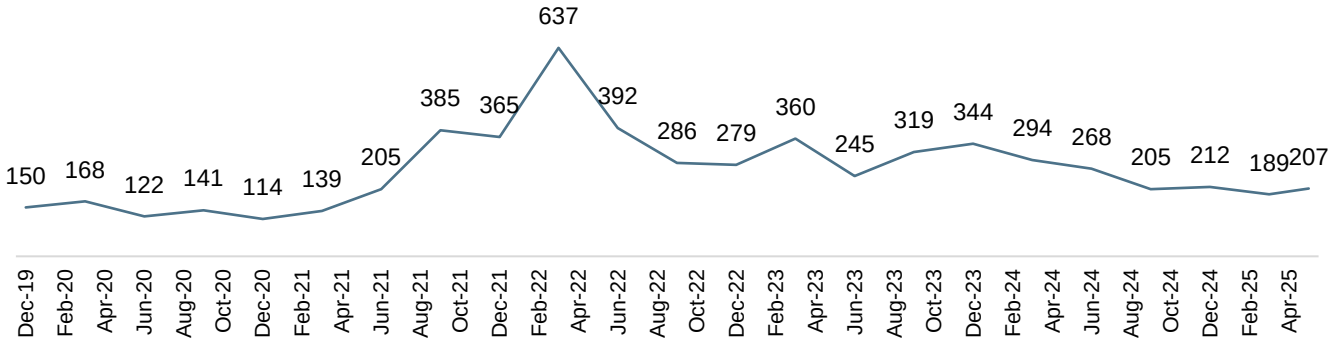
1. Cost competitiveness: The cost of renewable energy technologies, such as solar and wind power, has decreased dramatically, making them more competitive with fossil fuels. Since 2010, the cost of solar photovoltaic electricity has fallen 85%, and the costs of both onshore and offshore wind electricity have been cut by about half. Both of these renewable sources are now cost-competitive with fossil fuel electricity.
2. Government policies and targets: Policy support has been essential for the growth of renewable energy. Renewable energy tax credits and subsidies, feed-in tariffs, and competitive auctions have all helped reduce costs and spur deployment. Government investment in research and development has been essential in promoting innovation in renewable energy. China, Europe and the United States have become leaders in solar and wind through policy support, and worldwide, 165 countries have targets to increase renewable energy. India, in particular, has set ambitious targets through its Panchamrit Goals, which aim to reduce the country's carbon footprint and increase the share of non-fossil fuels in its energy mix.
3. Technological advancements: Improvements in energy storage, smart grids, and other technologies have enhanced the efficiency and reliability of renewable energy systems.
4. Attracts Incentives and Subsidies: The renewable energy sector attracts various incentives and subsidies that make it an attractive option for investors and developers. Incentives include tax credits, grants, and low-interest loans, which help to reduce the upfront costs of renewable energy projects.

The coal sector has been significantly impacted by global events, leading to a decline in its dominance and a shift towards renewable energy sources. As the world transitions to a low-carbon economy, the focus on renewable power will continue to grow, driven by declining costs, increasing investment, and government policies and targets.

2.3.4 Pricing trends of Coking Coal

The international trade in coking coal is driven by the demand from the steel industry. With global crude steel production rising to 1892 million tonne in 2023 from 1433 million tonne in 2010 at a CAGR of approximately 2%, the demand for coking coal has increased significantly. Asian countries, particularly China, Russia, India, Japan and South Korea, dominate the demand side, accounting for nearly 90% of the international market share. The majority of coking coal is supplied by Australia, United States, Mongolia, Russia and Canada, with almost 90% of the volume being seaborne. The supply of coking coal is dominated by Australia with about half of global exports and the demand of coking coal is dominated by China with about two third of global consumption. The price of coking coal in international trade is often benchmarked against Premium Hard Coking Coal (PCC), a high-quality coal used to produce metallurgical coke.

Figure 2.9 CNF Paradip, Premium HCC, Australia Origin (US$ per Ton)



Source: BigMint

In late 2021, Coking coal prices soar on supply disruptions and post-pandemic steel demand recovery, while in February 2022, Russian-Ukraine war sparked price surge, triggering panic buying. In 2023, steel mills reduced production due to thin margins, thus reducing coking coal demand.

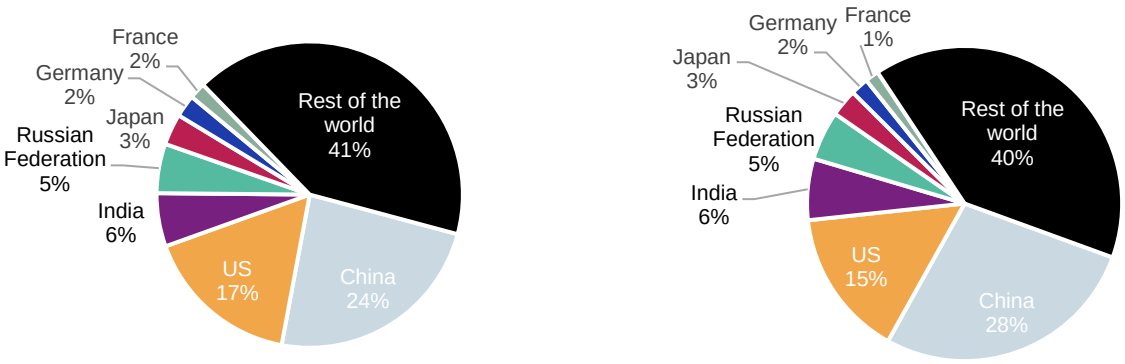
Price Outlook: Coking coal prices are on a correction trajectory as supply-side in Australia to witness some alleviation with mine expansions and new approvals, while demand-side sentiments remain steady with India being the major influencer.

2.4 India's energy requirements

India aspires to be a developed country by 2047, when it celebrates its 100th year of Independence. This includes achieving high per capita income with improved living standards, independence from want of basic amenities, eliminating energy poverty, ensuring self-reliance and jobs for the working-age population. A rising population combined with the twin forces of urbanization and industrialization underpins growth in energy demand. Further, driven by the imperatives of self-sufficiency and ensuring resilience to external shocks, India's growth, development and rise in consumption demand may soon be led by manufacturing.

According to estimates by BP (2024) Statistical Review of World Energy, global energy consumption rose at a CAGR of 1.6% between 2010 and 2023 (from 506 exajoule or EJ to 620 EJ). The country-wise share of energy consumption with major economies are as shown below:

Figure 2.10 :World's energy consumption (EJ) by major countries in CY2018 and CY2023



Source: BP (2024) Statistical Review of World Energy, Crisil Intelligence, CY- Calendar Year

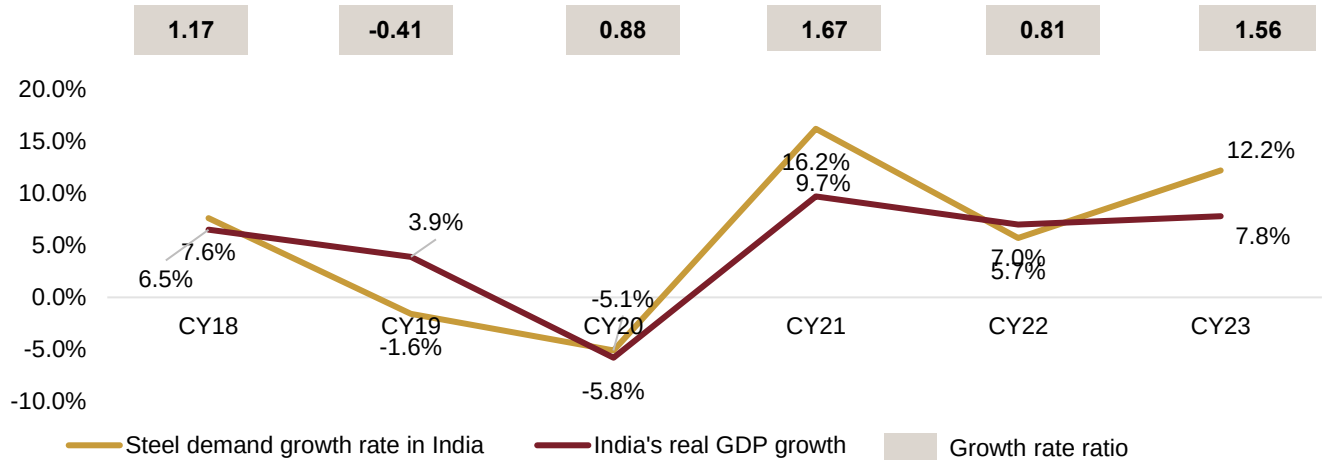
2.5 Coal's dominance in India's energy and power sectors

The growth in coal consumption parallels India's economic expansion over the past decade. The increased demand for energy, particularly from coal, highlights the country's industrial and infrastructural growth. As of 2023, India accounted for 13% of global coal consumption, standing as the second-largest consumer after China (which dominates with a 56% share). In terms of absolute figures, India's coal consumption, measured in EJ, has risen significantly. In 2013, India's coal consumption stood at 14.4 EJ. By 2023, this figure escalated to 21.9 EJ, underscoring a substantial increase in energy demand within the country.

2.6 Correlation of Steel sector with GDP growth

The demand growth of steel and GDP growth is highly correlated, with both following a similar trend since 2018[65]. When real GDP growth is high, steel demand growth tends to be high as well. The steel demand growth rate experienced a down cycle from CY19 to CY20, with a decline of -1.6% and -5.1%, respectively, due to the pandemic. The steel demand growth rate has been in an cyclical since CY21, with growth rates of 16.2%, 5.7%, and 12.2% in CY21, CY22, and CY23, respectively.

Figure 2.11: Growth in steel demand vs GDP in India



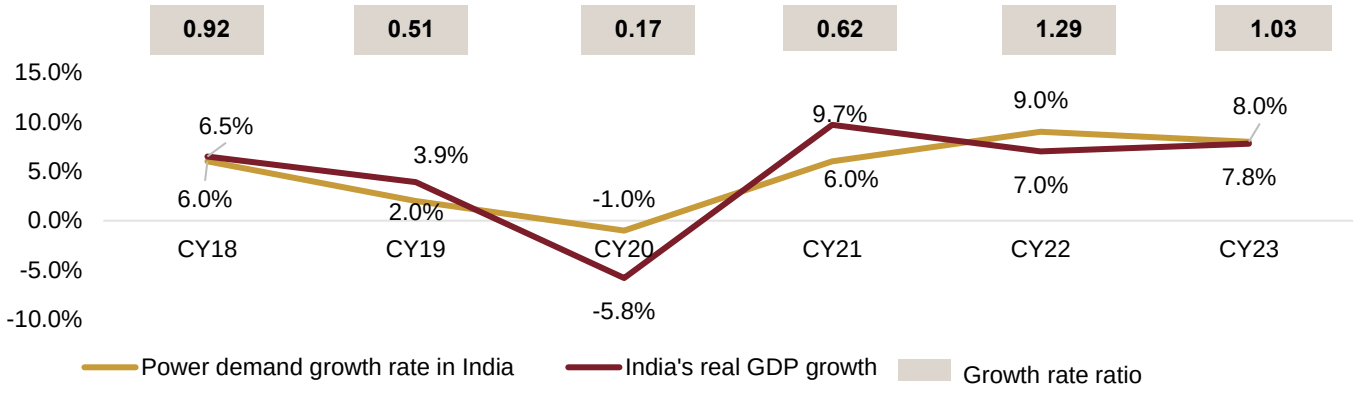
Note: All figures are adjusted to calendar year and the grey boxes represent the ratio of growth rate of India's steel demand and real GDP; the GDP growth rates are from IMF; CY- Calendar Year
Source: Crisil Intelligence, JPC report of various years, IMF

2.7 Correlation of Power with GDP growth

The demand growth of power and GDP growth is highly correlated, with both following a similar trend since 2018[66]. During the pandemic, the demand for power as well as GDP declined till 2021, after which demand for power grew at 9.0% in 2022. In the subsequent year, demand for power grew by 8.0%. The growing multiple of GDP and power in the past four years is a sign of growing power demand with GDP and growing GDP with power demand. The projections of power demand for the future are also high considering growth rates of power in the past two years (year 2022 and 2023).

[65] *Note: All years in this section are calendar years unless otherwise mentioned*
[66] *Note: All years in this section are calendar years unless otherwise mentioned*

Figure 2.12: Growth in power demand vs GDP in India

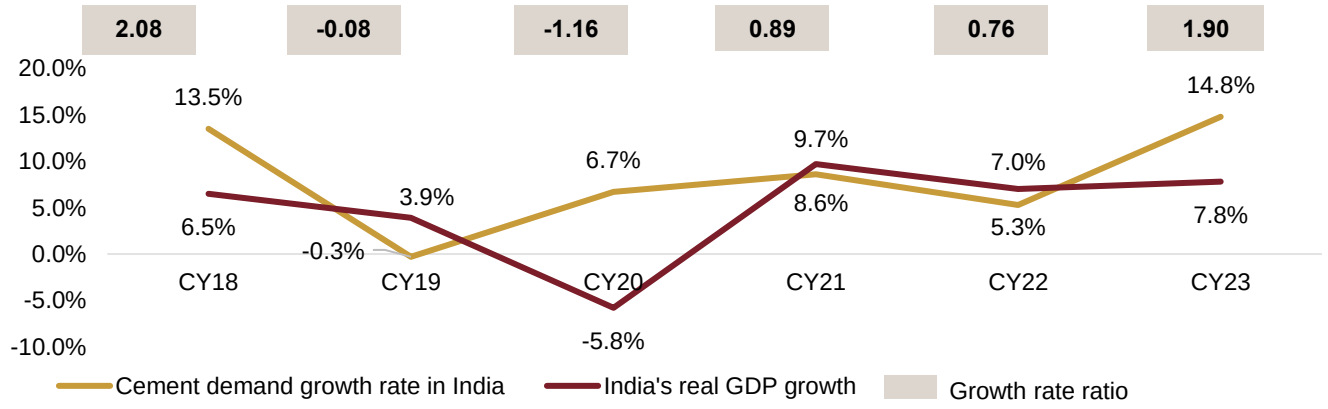


Note: All figures are adjusted to calendar year and the grey boxes represent the ratio of growth rate of India's power demand and real GDP; the GDP growth rates are from IMF; CY- Calendar Year
Source: Crisil Intelligence, Ministry of Power, IMF

2.8 Correlation of Cement with GDP growth

The growth of cement demand in India has been loosely tied to the country's GDP growth, with both exhibiting a similar trend over few years. Since 2018, cement demand has followed a pattern of growth, with some fluctuations, mirroring the trajectory of India's real GDP growth. During the pandemic, cement demand declined marginally in 2019 and grew at a slower pace in 2020, before rebounding in 2021 with an 8.6% growth rate. In the subsequent years, cement demand growth has continued to accelerate, with a notable 14.8% growth rate in 2023.

Figure 2.13: Growth in cement demand vs GDP in India



Note: All figures are adjusted to calendar year and the grey boxes represent the ratio of growth rate of India's cement demand and real GDP; the GDP growth rates are from IMF; CY- Calendar Year
Source: Crisil Intelligence, IMF

3 Indian coal market overview and assessment

3.1.1 Coal market structure

India's energy landscape also heavily depends on the fossil fuel, with the country consuming about 13% of the world's coal. Coal-based thermal power plants continue to dominate electricity generation in India, accounting for approximately 73% in fiscal 2024[67].

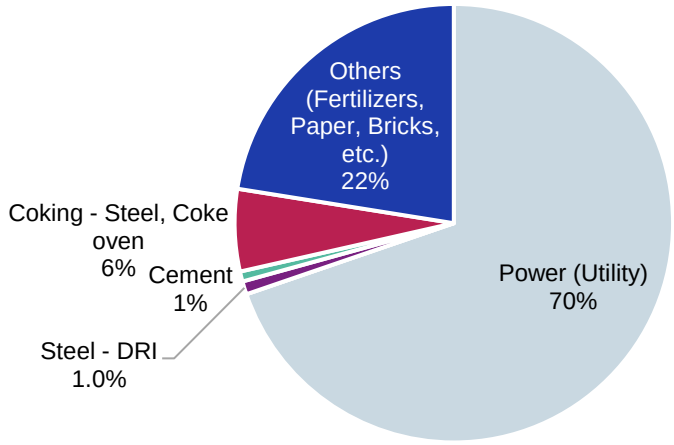
The India coal industry is highly fragmented with a presence of few large players and several medium and small players. CIL (313 operating mines) and Singareni Collieries Company Ltd (SCCL; 40 operating mines) dominates the coal production in the country with production by other captive and commercial players. In fiscal 2025, the combined coal supply of CIL (74%) and SCCL (7%) accounted for approximately 81% of the total domestic coal supply by volume (CIL- 781 MMT, SCCL- 69 MMT), with the remaining 19% supply (198 MMT) met via captive /other commercial blocks.

The following figure maps key agencies and players involved in the Indian coal market:

3.1.2 Demand of coal

Coal is a useful source of energy not only for the power sector (utilities and CPPs) but also for others such as steel, direct reduced iron (DRI), sponge, cement and bricks. The power sector comprising power utilities and captive power plants (CPPs) accounted for approximately 70% of coal consumption in fiscal 2024[68] and, thus, is central to the outlook for coal in the country.

Figure 3.1 India's coal demand by end-use sectors fiscal 2024



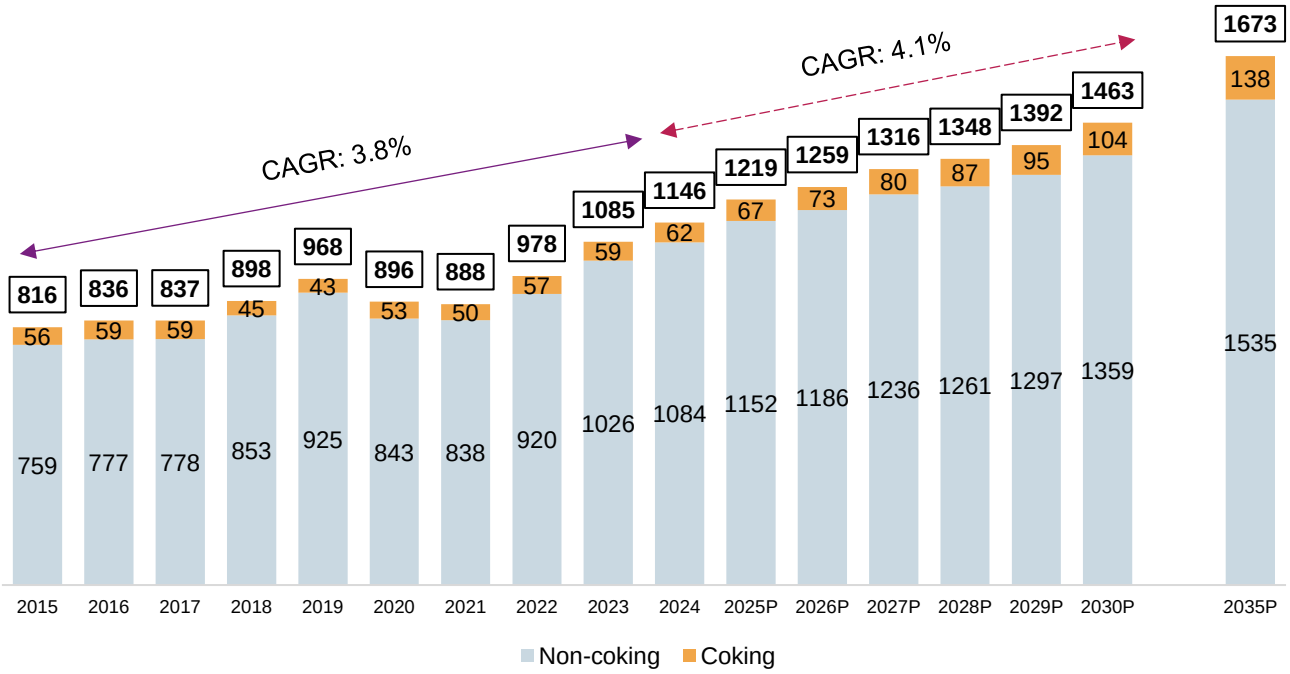
Source: Ministry of Coal Annual Report 2024-25; Others include imports as well which are being used in Power, Power (Captive), Cement, Steel-DRI etc. and hence the actual share of these sectors will vary

Coal demand grew by 3.8%, a 9-year CAGR between fiscal 2015 and 2024 and is expected to grow by 4.1% at 6-year CAGR between fiscal 2024 and 2030, with more than 60% contribution from power sector (thermal and captive) by fiscal 2030. During demand estimation, coal with levelized grade of G10 has been considered. It may be noted that the actual demand for raw coal will be higher as the average produced grade of coal is G11 and going forward the grade is expected to further reduce. Only non-coking coal has been levelized in this

[67] *As per CEA reports*
[68] *Actual demand as per Annual Report 2024-25 of Ministry of Coal*

case and coking coal has been considered at actuals. The growth in coal demand will likely continue till fiscal 2035.

Figure 3.2 Overall coal demand in India – thermal coal (non-coking) and coking coal (MMT)



Source: Crisil Intelligence; All years are fiscal years; P: Projected; Note: demand for coal is based on the G10 grade of coal for Power and CPP sectors

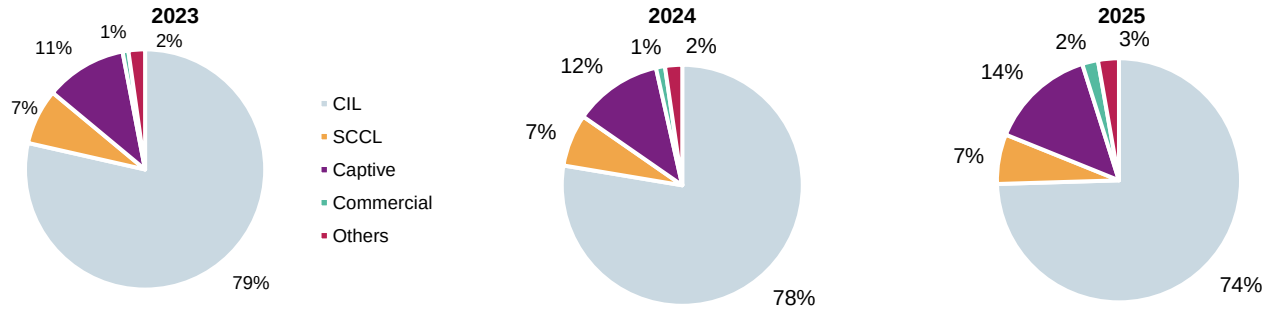
The demand of coal is dynamic and is driven by different factors such as: power utilities demand increase, expansion of thermal power capacity; capital investments in steel, aluminium and cement due to infrastructure focus by the government. However, Coal will continue to play a major role in the India's energy sector at least for the next few years.

3.1.3 Supply of coal

On the supply side, a duopoly structure is present in India with two supply sources, namely domestic and imported coal sources. The total raw coal production in India in fiscal 2025 was 1048 MMT from different sources with 5% increase from 997 MMT in fiscal 2024. The production in fiscal 2015 was 556 MMT, showing a 10-year CAGR growth of approximately 6.5% from fiscal 2015 to 2025. While non-coking coal used for power generation as well as in the industrial sector constitutes the largest share, the consumption of coking coal has been increasing over the years with rising steel production:

1. Non-coking coal accounts for approximately 94% of India's coal production in fiscal 2025.
2. Coking coal accounts for approximately 6% of total coal production, and it is used in steel making in the blast furnace - blast oxygen furnace route.

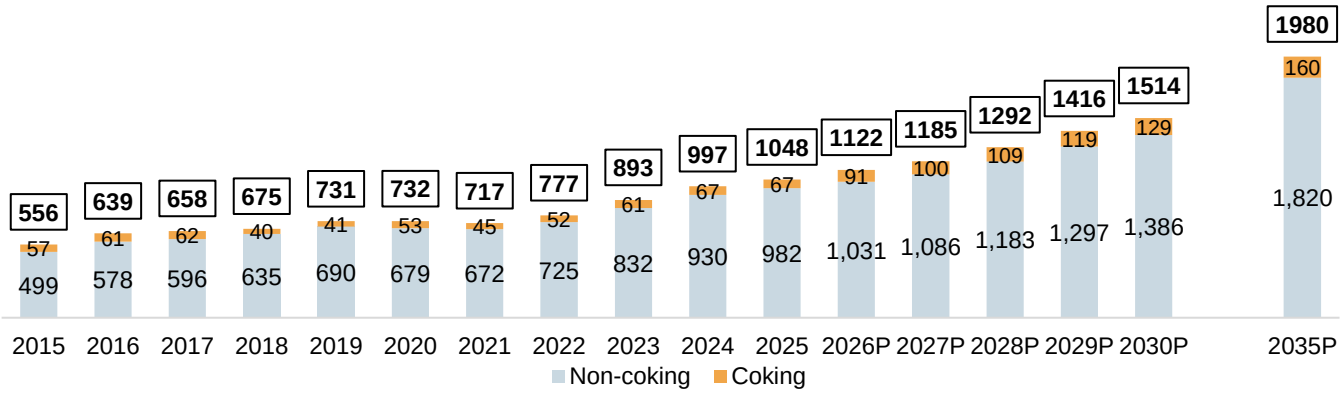
Figure 3.3 India's raw coal supply sources



Source: Ministry of Coal-Coal Directory of India for 2022-23, 2023-24; 2024- 25, Monthly Statistics for March 25 & Crisil Intelligence; All years are fiscal years

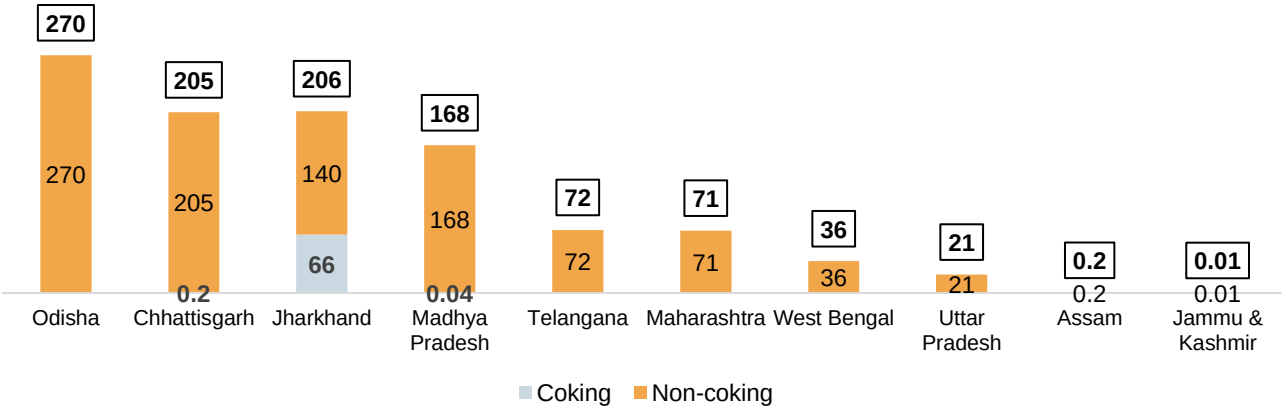
India produced 66.5 MMMT of coking coal out of 1048 MMT of raw coal production in fiscal 2025. Further, according to Crisil Intelligence estimates, raw coal production is expected to reach 1,514 MT by fiscal 2030 growing at a 5-year CAGR of 7.6% from fiscal 2025 to fiscal 2030.

Figure 3.4 India's raw coal production coal type wise – non-coking and coking (MMT)



Source: Past data as per Ministry of Coal-Coal Directory of India 2023-24, Monthly Statistical Report- March 2025, Ministry of Coal; Projections as per Crisil Intelligence; Year is fiscal year; P: Projected

Figure 3.5 State wise raw coal production in fiscal 2025

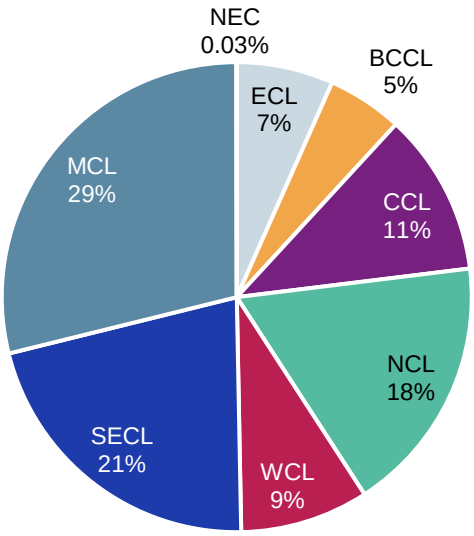


Source: Ministry of Coal- Monthly Statistical Report- March 2025

In fiscal 2025, 26% of the raw coal production was from Odisha (270 MMT), followed by 20% from Jharkhand (206 MMT), 20% from Chhattisgarh (205 MMT), 16% from Madhya Pradesh (168 MMT), collectively contributing approximately 82% of the total raw coal production. Remaining 18% are from other states like Telangana (72 MMT), Maharashtra (71 MMT), West Bengal (36 MMT), Uttar Pradesh (21 MMT), Assam (0.2 MMT) and Jammu & Kashmir (0.01 MMT).

Within CIL the highest production is from MCL (29%), followed by SECL (21%), NCL (18%), CCL (11%), WCL (9%), ECL (7%), BCCL (5%) and lastly NEC (0.03%).

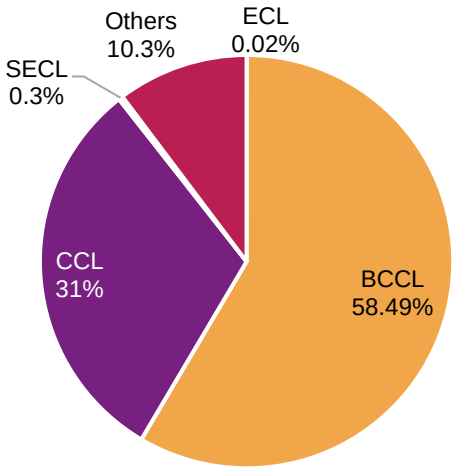
Figure 3.6 CIL subsidiary wise raw coal supply in fiscal 2025



*Source: Ministry of Coal- **Monthly Statistical Report- March 2025***

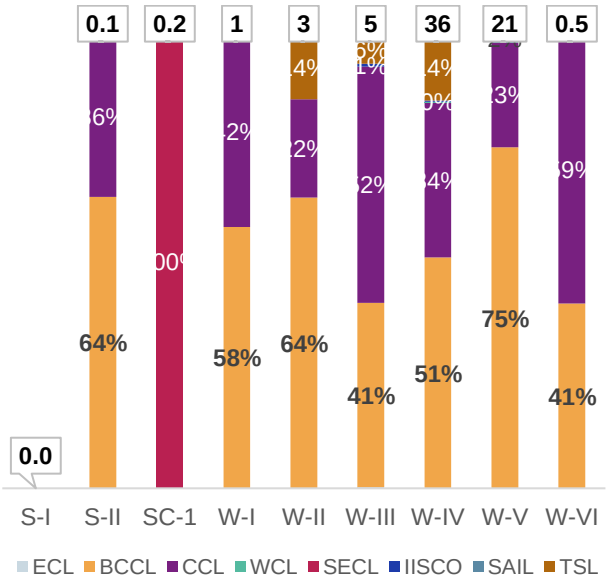
BCCL is the major contributor of coking coal production in India contributing approximately 58.50% in fiscal 2025 (38.9 MMT), followed by CCL (31%). BCCL producing coking coal of grades varying from Steel grade-II, Washery grade-I to VI.

Figure 3.7 Coking coal production from different companies in fiscal 2025



*Source: Ministry of Coal- **Monthly Statistical Report- March 2025***

Figure 3.8 Grade wise raw coal production of coking coal by different companies in fiscal 2024

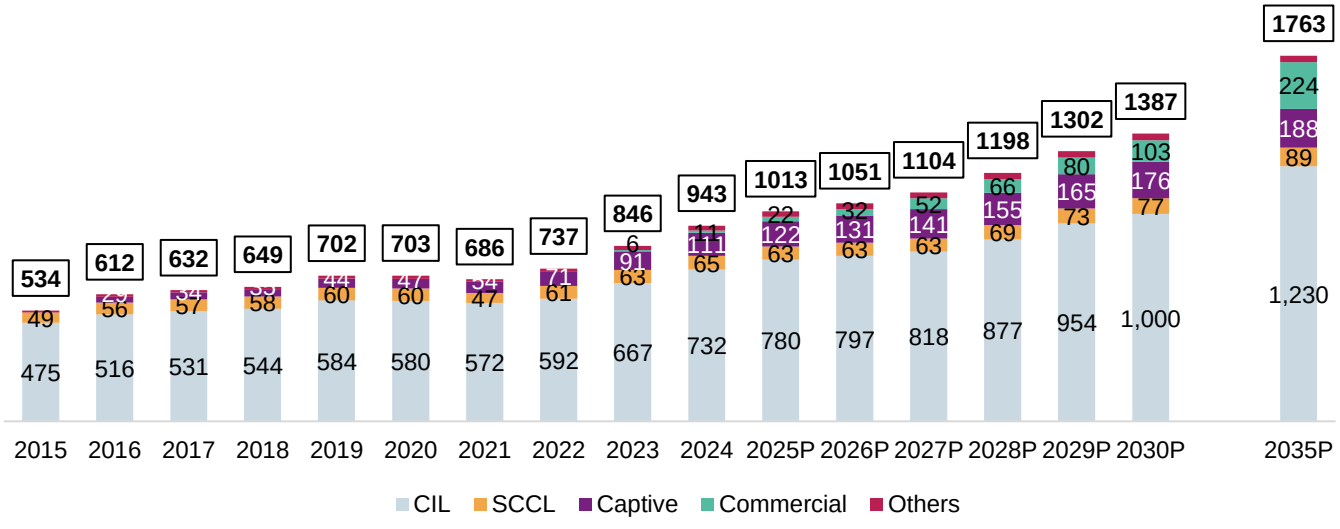


Company	S-II	SC-1	W-I	W-II	W-III	W-IV	W-V	W-VI
ECL	-	-	-	-	0.01	-	-	-
BCCL	0.06	-	0.71	2.21	1.87	18.12	15.95	0.20
CCL	0.04	-	0.52	0.75	2.40	12.15	4.93	0.28
WCL	-	-	-	-	-	.04	-	-
SECL	-	0.21	-	-	-	-	-	-
IISCO	-	-	-	-	0.03	0.10	-	-
SAIL	-	-	-	-	-	-	0.33	-
TSL	-	-	-	0.49	0.29	5.15	-	-
Total	0.1	0.2	1.2	3.4	4.6	35.6	21.2	0.5

Source: Ministry of Coal-Coal Directory of India for 2023-24

In order to draw a parallel with the coal demand estimated in the above section, the coal production has been levelized at the same grade of G10. Therefore, the estimated production in fiscal 2025 is 1013 MMT in comparison to the actual production of 1048 MMT. Going ahead, the projected raw coal production in fiscal 2035 will be 1763 MMT compared to a demand of 1673 MMT. Although, it appears to be supply surplus however, it is believed that market will adjust such that there is no oversupply in the market.

Figure 3.9 India's levelized (at G10) raw coal production scenario from different sources (MMT)

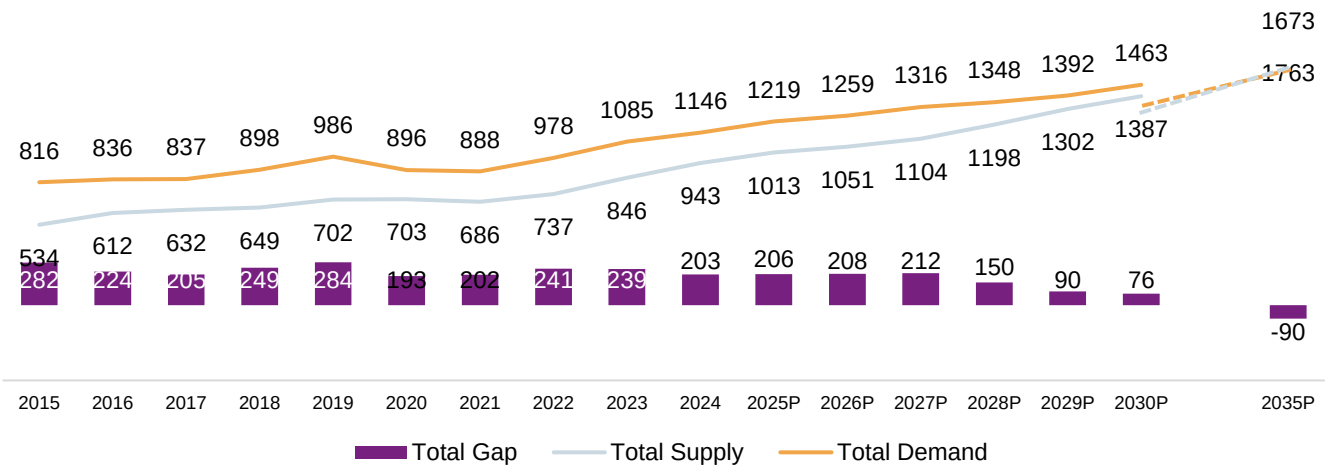


Source: Past data from Ministry of Coal-Coal Directory of India 2023-24, Projections by Crisil Intelligence; Year is fiscal year; Levelised production at G10 grade; P: Projected

3.2 Analysis of coal demand-supply

The total coal demand has been consistently increasing over the years, with a few minor fluctuations, while the total supply of coal has also been increasing, but at a slower rate than demand, resulting in a persistent gap. This gap is expected to narrow down to 76 MMT by fiscal 2030 from 206 MMT in fiscal 2025. The coal supply is expected to surpass the demand by fiscal 2035.

Figure 3.10 India's demand-supply gap of coal (MMT)

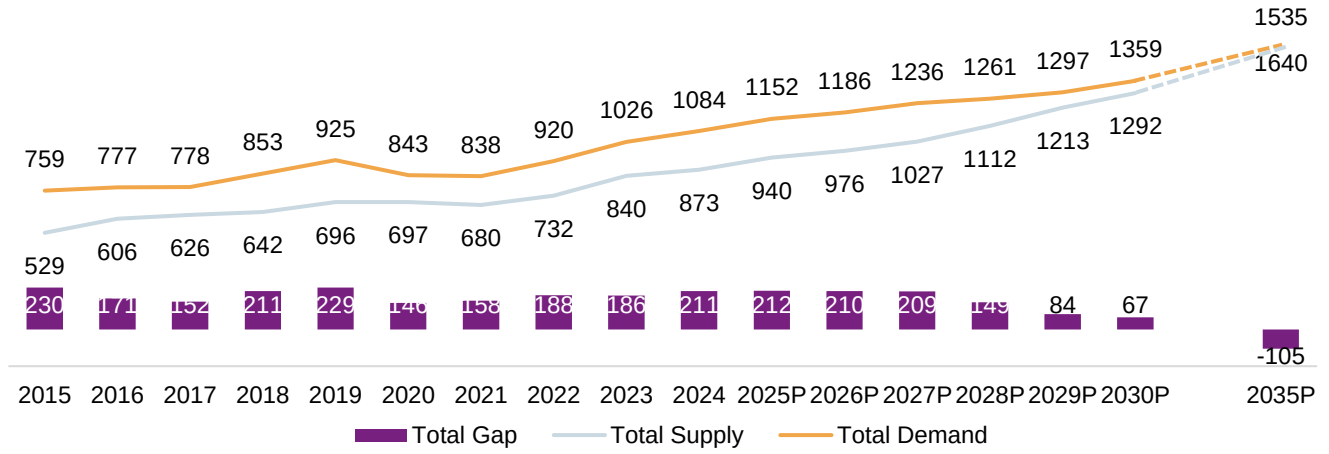


Source: Crisil Intelligence; Year is fiscal year; Coal supply levelized at G10 grade; P: Projected

Region wise demands show a high demand-supply gaps in the northern, southern and north-eastern regions as coal production is mainly concentrated in the eastern and western parts of India with major contributing states being Odisha, Chhattisgarh, Jharkhand and Madhya Pradesh.

The total non-coking coal demand has been consistently increasing over the years, while the total supply of non-coking coal has also been increasing, but at a slower rate than demand, resulting in a persistent gap. The gap is expected to narrow down to 67 MMT by fiscal 2030 and coal supply is expected to surpass the demand by fiscal 2035.

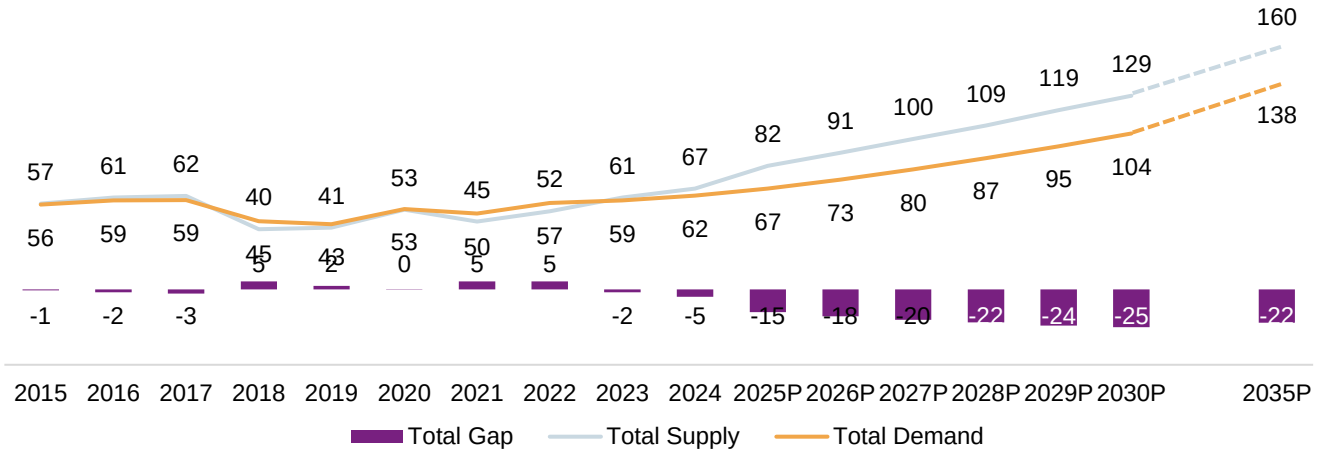
Figure 3.11 India's demand-supply gap of non-coking coal (MMT)



Source: Crisil Intelligence; Year is fiscal year; Coal supply levelized at G10 grade; P: Projected

In fiscal 2025, the coking coal demand is 67 MMT and is expected to reach 138 MMT in fiscal 2035. The total coking coal supply shows a surplus in most years, which is not the case as very limited coking coal is directly being used in steel industry owning to the inferior quality of Indian coking coal. Going ahead, though the coking coal supply is expected to be more than the demand, demand of coking coal for steel is expected to increase.

Figure 3.12 India's demand-supply gap of coking coal (MMT)



Source: Crisil Intelligence; Year is fiscal year; Coal supply levelized at G10 grade; P: Projected

The coal demand supply situation is quite dynamic in nature with following factors affecting the surplus supply of coal in India by 2030.

Factors favouring deficit to continue beyond fiscal 2029[69]

- Surrender of high-premium blocks by developers, considering surplus supply and low premiums in linkage auction from CIL.
- Efforts by the government / technology improvements for coking-coal washery will affect the supply of coking coal for thermal.
- Delay in the development of bigger blocks (capacity of 10 MMTPA and more) may disturb the demand-supply balance.
- After fiscal 2030, many of the mines of NCL and SCCL may be exhausted; further, CIL may also close its high cost/ high SR mines considering low recovery of cost.

Factors favouring surplus before fiscal 2029[70]

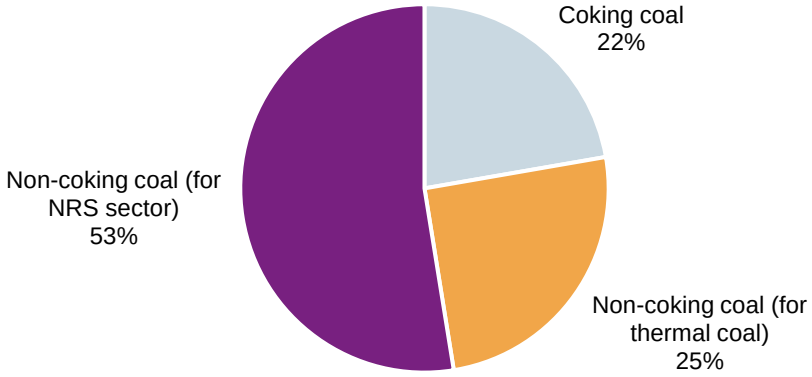
- Thermal-coal demand from coastal-based TPPs will continue to be import-dependent (approximately 18,000 MW capacity).
- Cement-based companies will continue to import coal due to higher quality requirements.
- Washery-grade coking-coal production being used for thermal / blending purpose shall be approximately 60-80 MT.
- Fast-track of clearances for blocks can start the blocks before scheduled consideration.

[69] *As per estimates only as market is dynamic*
[70] *As per estimates only as market is dynamic*

3.3 Historical coal imports trends

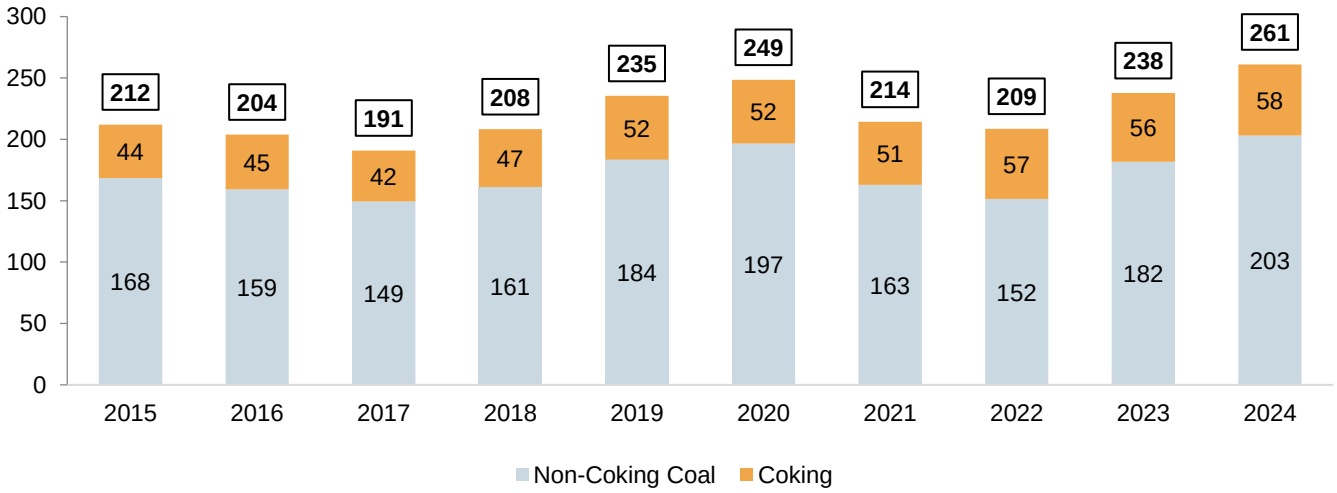
Domestic supply sources are not able to sufficiently cater to the overall demand for coal in India. As a result, India is the second largest importer of coal, accounting for about 18% of global non-coking coal imports. In fiscal 2024, India imported approximately 261 MMT of coal. Coal is imported by both power and non-power sectors in India. There are some power plants in the coastal regions with approximately 18,000 MW cumulative capacity that cannot use domestic coal and thus are dependent on imported coal for blending purposes.

Figure 3.13 India's type-wise coal imports in fiscal 2024



Source: Ministry of Coal Annual Report 2023-24; NRS: Non-regulated Sector (Steel, Sponge, CPP, Cement and others)

Figure 3.14 Coal imports by India since fiscal 2015 (MMT)



Source: Ministry of Coal-Coal Directory of India 2022-23, Ministry of Coal Annual Reports 2023-24, Year is fiscal year; P: Projected

Towards becoming self- reliant Government is having a lot of focus on increasing coal supply which will require more exploration to identify potential resources and mines to operationalise, appointing private contractors / Mine Developer and Operator (MDO) having capabilities to enhance production, capacity augmentation of CIL mines and focus on transport and logistic arrangements to provide coal at respective end-use plants.

Domestic coal production meets approximately 76% of the country's requirements, while approximately 24% coal is imported every year (on average from 2020 to 2024).

3.4 Coal logistics industry overview

3.4.1 Overview of India's coal logistics industry

Infrastructure is a vital cog in sustaining India's economic growth trajectory. In recent years, the government has taken several steps to accelerate infrastructure development, with focus on transportation, energy, smart cities, water, and social and digital infrastructure. The government has also made efforts to attract foreign investors through policy reforms.

In Union Budget 2024-25, the government outlined capital expenditure of Rs 11.11 trillion, i.e. equivalent to 3.4% of the GDP, towards the sector. This is an increase of 11.1% from the Rs 10.0 trillion earmarked in Union Budget 2023-24 and approximately 17% higher compared with actual expenditure of Rs 9.48 trillion in fiscal 2024.

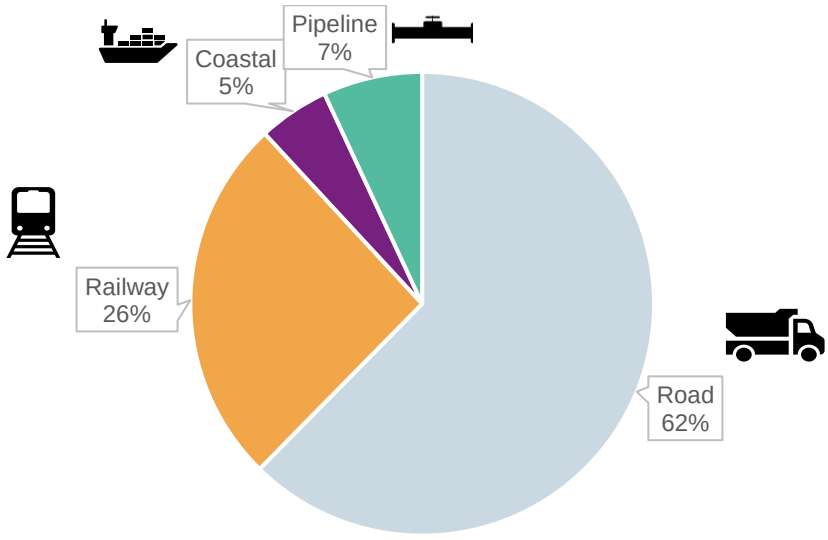
Within the infrastructure space, logistics is a vital component, playing a crucial role in the movement of goods and materials. The importance of logistics can be gauged from the nearly 50% of the budgetary allocation for fiscal 2025 towards the Ministry of Road Transport and Highways (Rs 2.78 trillion) and the Minister of Railways (Rs 2.56 trillion). And for the Ministry of Housing and Urban Affairs, the Centre has allocated Rs 0.28 trillion[71].

To be sure, India's logistics sector has been undergoing a transformative phase, driven by technological advancements, government initiatives, and increasing demands of a burgeoning consumer base. Consequently, the sector is projected to grow 8.8% annually to approximately Rs 40.7 trillion by 2029 from approximately Rs 26.7 trillion[72] in 2024.

In fact, through several initiatives, the government has target to raise the country's ranking in the *Logistics Performance Index*[73] to 25 from the current 38.

As per *analysis,* the total modal-wise freight movement in tonne-km, roads contributed 63% share of the movement, followed rail (26%), coastal (5%) and pipeline (7%)[74].

Figure 3.15 Mode-wise split of freight movement in tonne-km (fiscal 2025P)



Source: Crisil Intelligence - Domestic freight transportation services - February 2025

[71] *As per Union Budget 2024-25*
[72] *According to IBEF Infrastructure Industry Report, May 2024, which estimates the market at US$317.26 billion in 2024, and projects growth to US$484.4 billion in 2029*
[73] *World Bank*
[74] *Crisil Intelligence research report – Domestic freight transportation services – August 2024*

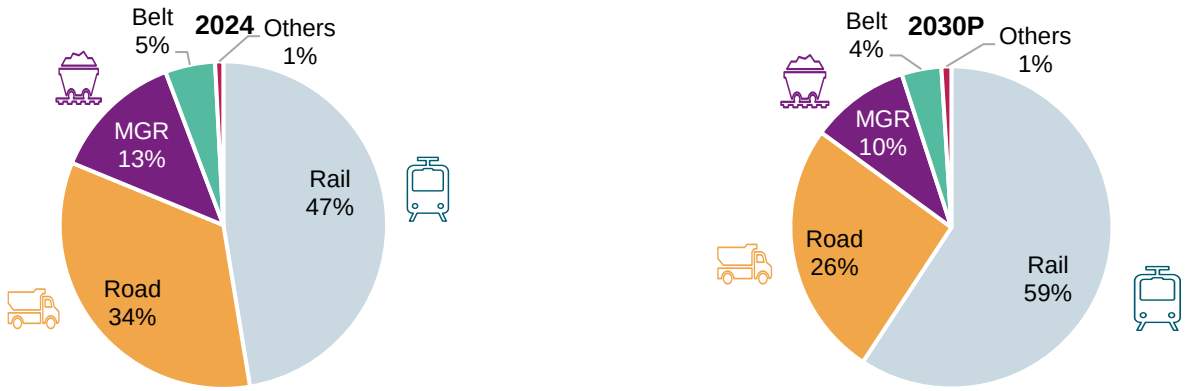
Coal Logistics

Coal is used in multiple industries, including power, CPP, steel, cement, sponge iron, bricks and paper. The coal logistic chain involves extraction of coal from the mine, which is loaded onto railway wagons, trucks or conveyor belts at the dispatch points. End-users such as steel, power and cement plants utilise the coal for production of required resource. In a few cases, coal is transported to washery plants to remove impurities or upgrade the coal to a higher calorific value and reduce ash.

Transportation of coal is dependent on coal demand, which is dependent on demand from the power and steel sectors, as well as sectors such as cement, bricks, etc.

The volume of coal dispatched in fiscal 2024 (973 MMT) by different modes was driven by rail (47%, 461 MMT domestic coal), followed by road (34%, 329 MMT), MGR (13%, 127 MMT), belt (5%, 48 MMT) and others including rope *1%, 8 MMT) in fiscal 2024. Railways contributed 47% of total domestic coal supplied in the country in fiscal 2024, which is expected to increase to 59% by fiscal 2030, according to *Integrated Coal Logistics plan for Coal Mines/Blocks*.[75]

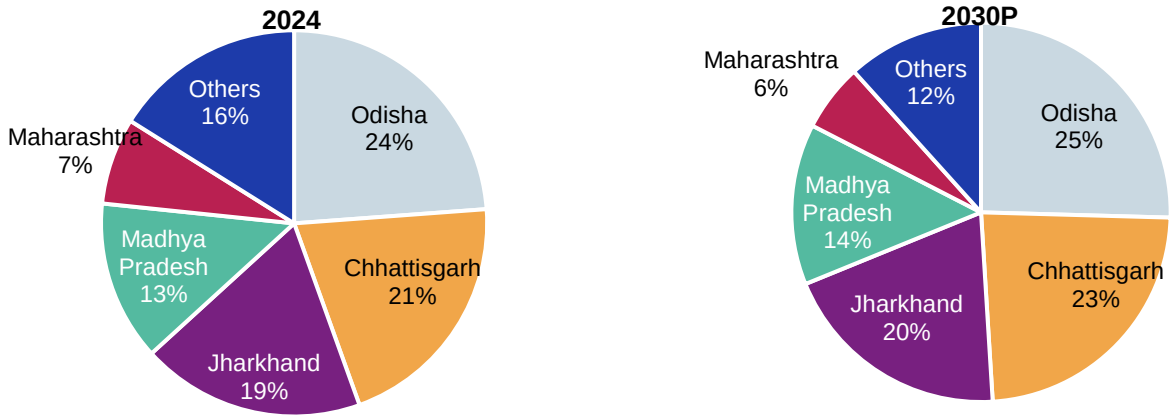
Figure 3.16 Coal handled by volume (MMT) through various modes in fiscals 2024 and 2030E



Source: Crisil Intelligence; Ministry of Coal-Coal Directory of India 2023-24; P: Projected

About 84% of coal supply in fiscal 2024 came from Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh and Maharashtra. However, the demand is pan India for coal.

Figure 3.17 State-wise coal supply in fiscals 2024 and 2030P (%)



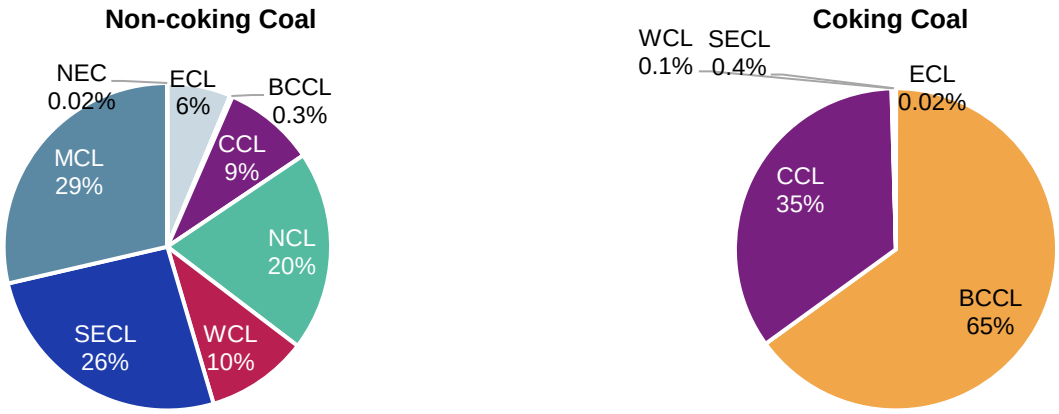
Source: Crisil Intelligence; Ministry of Coal-Coal Directory of India 2023-24; P: Projected

[75] *Ministry of Coal, September 2023*

Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh and Maharashtra dispatched 199 MMT, 169 MMT, 136 MMT, 104 MMT and 67 MMT, accounting for 82% of CIL's and SCCL's dispatch in fiscal 2024.

In fiscal 2024, CIL and its subsidiaries dispatched 753 MMT coal and SCCL dispatched 70 MMT, accounting for more than 80% of total raw coal despatch. CIL subsidiary wise coal despatch was as follows: MCL - 199 MMT, SECL – 181 MMT, NCL - 138 MMT, CCL - 83 MMT, WCL - 70 MMT, ECL - 44 MMT and BCCL - 39 MMT.

Figure 3.18 CIL subsidiary-wise coal supply in fiscal 2024 (%)



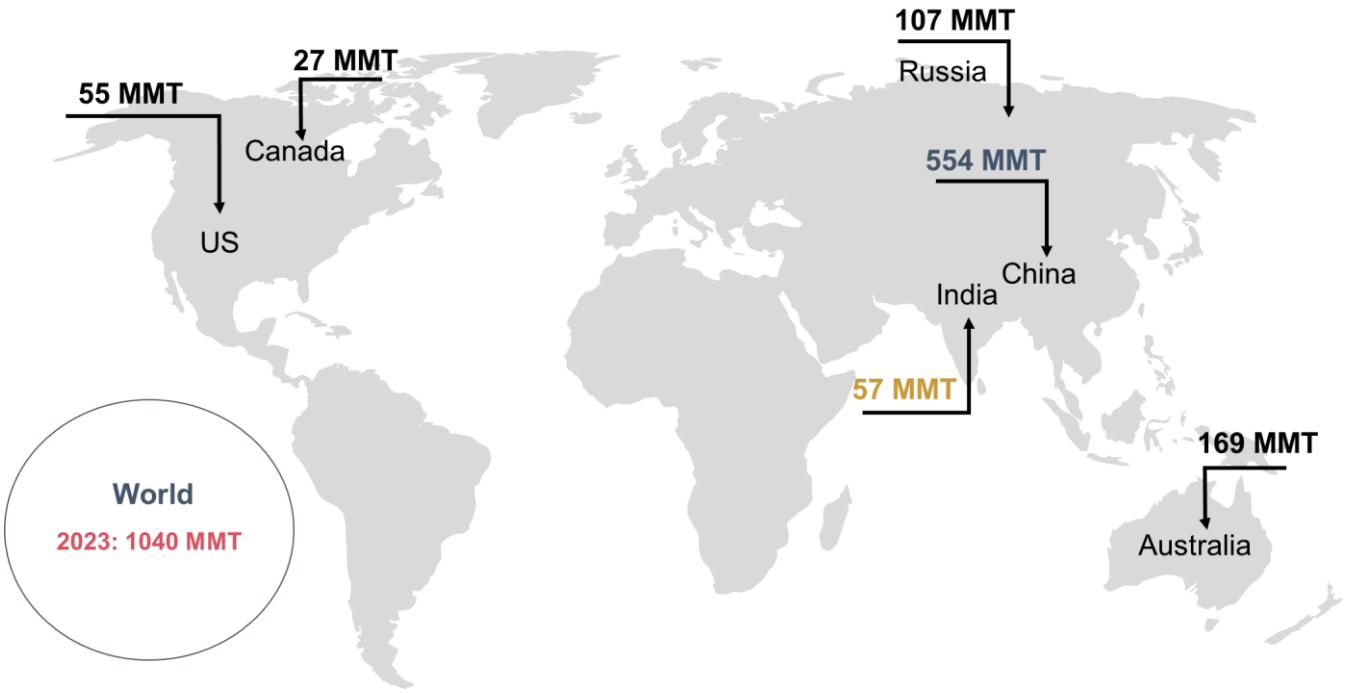
Source: Crisil Intelligence; Ministry of Coal-Coal Directory of India 2023-24

Out of 823 MMT dispatched, rail transported 435 MMT, followed by roads at 262 MMT, MGR at 111 MMT and belt at 13 MMT. Rail transported 53% of CIL's despatch, followed by road transport contributing 32%. Odisha and Jharkhand are hugely dependent on rail. Madhya Pradesh is much dependent on rail, at 43%. Chhattisgarh and Maharashtra transport over 40% of coal by roads.

3.5 International scenario of coking coal

In 2022, the total coking coal produced in the world was approximately 1036 MT. The largest producer was China with 55% share, followed by Australia- 16%, Russia- 10%, India- 6%, US- 5%, Canada- 2% and remaining by other countries like Mongolia- 2%, Poland, Mozambique & Indonesia- 1% each.

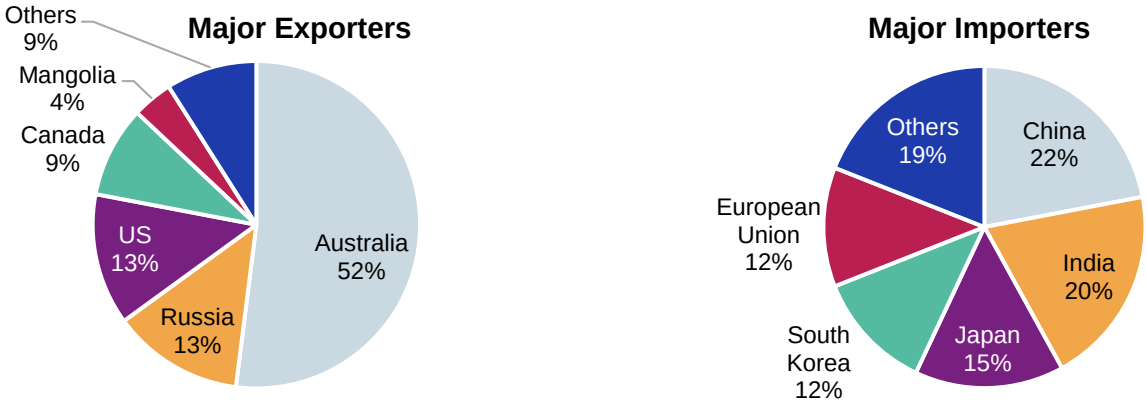
Figure 3.19 World coking coal production in 2023



Source: Coal Directory 2023- 24

In International trade, Australia dominates as the top exporter in coking coal market with a share of 52%, followed by Russia and US at 13% each. India is emerging to be the major importer with a share of 20%, just behind China at 22%.

Figure 3.20 Major exporters and importer of coking coal in 2022, %4



Source: Crisil Intelligence

To reduce dependence on countries like Australia, Russia, US and Canada, major Indian steel producers are acquiring coking coal mines abroad.

Table 3.1 Global presence of Indian steel players with coking coal mines abroad

Company	Country	Status of Mine	Capacity (MTPA)
SAIL	Mozambique	Operational	5.3 MTPA at stage 2 20 MTPA at stage 3

Company	Country	Status of Mine	Capacity (MTPA)
JSW Steel	Australia	Acquired in 2025	NA
	Mozambique	Exploring acquisition options	NA
JSP	Australia	Operational	1.2 MTPA
	South Africa	Operational	1.2 MTPA

Source: Annual Reports, Crisil Intelligence

3.6 Historical trend of manpower employed by CIL and its subsidiaries

The total manpower of Coal India Limited including its subsidiaries as on 1st January 2025 is 2,22,692 as compared to 2,51,978 as on 1st December 2021. The total manpower of CIL including its subsidiaries in 2025 decreased by approximately 3% as compared to 2024 and by approximately 12% as compared to 2021. The manpower strength is on a declining trend as more focus is on production of coal and OB through MDO route and contractual basis.

Table 3.2 CIL subsidiary wise manpower strength

SN	CIL Subsidiary	As on 1st December 2021	As on 1st December 2022	As on 1st April 2023	As on 1st April 2024	As on 1st January 2025
1.	ECL	53,636	51,857	51,074	48,711	47,678
2.	BCCL	39,706	37,687	37,037	33,920	32,599
3.	CCL	36,194	35,317	34,975	33,990	33,420
4.	WCL	36,113	34,599	34,390	33,352	32,442
5.	SECL	45,151	42,505	41,832	39,528	37,959
6.	MCL	21,930	21,746	21,827	21,493	21,184
7.	NCL	14,468	13,939	13,753	13,770	13,466
8.	NEC	824	697	667	585	558
9.	CMPDI	3,027	2,906	2,855	2,751	2,738
10.	DCC	191	157	133	113	Included in SECL
11.	CIL (HQ)	740	684	667	648	648
	Total Manpower	2,51,978	2,42,094	2,39,210	2,28,861	2,22,692

Source: Ministry of Coal Annual Reports 2021-22, 2022-23, 2023-24, 2024-25

Within CIL subsidiaries, the highest share of manpower in 2025 is of ECL with 21% (47,678 nos.) followed by SECl with 17% (37,959 nos.), CCL with 15% (33,420 nos.) and BCCL with 15% (32,599 nos.)

3.7 Drivers & Opportunities

Some of the major drivers and opportunity in coal sector are:

1. Increased power demand owing to economic expansion, rising population, increasing urbanisation and industrialisation: Between fiscals 2019 and 2024, the country's gross domestic product (GDP) logged 4.3%

CAGR. The per capita GNI (at current prices) increased from Rs 1.41 lakh in fiscal 2019 to Rs 1.70 lakh in fiscal 2023[76], largely driven by increased industrialisation, rapid growth of the services sector and urbanisation. During the period, energy demand clocked 5% CAGR, making the country the third largest energy consumer globally.

2. Rise in per capita consumption with increased electrification and deeper penetration of energy-intensive appliances such as air conditioning systems: The per capita electricity consumption rose from 1010 kWh in fiscal 2015 to 1,331[77] kWh in the fiscal 2023, clocking a CAGR of approximately 3.5%, owing to increased power availability, investments in the power sector, reduction in transmission and distribution losses and rising disposable income of households. Even so, the country's per capita energy consumption lags developed economies. In fact, per capita consumption is far lower than the global average of approximately 3,700[78] kWh. But, with consumption levels progressively converging towards those of higher income countries, demand for power will increase.
3. Growth in the manufacturing segment: Besides power generation, coal is also used directly in industry as fuel and as a reactant in the production of steel (coking coal). Sectors such as aluminium and cement, too, use large quantities of coal.
4. Infrastructure development: Coal finds application in the manufacture of steel and cement — two critical inputs for infrastructure development. Cement production in fiscal 2023 stood at 375 MT, up from 328 MT in fiscal 2019. Coal-based sponge-iron production also rose from approximately 28 MT to 36 MT during the period, logging a 4-year CAGR of 6.5% (from 2019 to 2023) and driving demand for non-coking coal.

3.8 Key threats and challenges

Some of the key threats and challeneges in coal sector are:

1. Mining industry's share decreasing in GVA: Gross Real GVA grew 7.2% in fiscal 2024 compared with 6.7% in fiscal 2023. The growth was mainly owing to a significant 9.9% growth in manufacturing in fiscal 2024 (-2.2% in fiscal 2023) and 7.1% growth in mining and quarrying (1.9% in fiscal 2023). Overall, despite the growth, the contribution of the mining and quarrying sector in real GVA declined from 2.6% in fiscal 2019 to 2.1% in fiscal 2024.
2. Capacity addition: With CIL increasing its production capacity (as per CIL's 1 BT plan, it targets 1 BT (1,000 MT) of production by fiscal 2027), more emphasis is placed on contract mining as there are internal constraints in departmental mining. Going ahead, the additional capacity is expected to be taken up by private players, but since the private contract mining business is highly staggered with limited players, taking up additional capacity by smaller players will be a challenge.
3. Approvals and processes for starting of mines: The allocation and operationalising of coal projects in India is subject to several processes and approvals. Coal projects require input from multiple agencies across various levels of government, reflecting the complex institutional structure. The government, too, has identified streamlining of processes for coal mines as one of its key priorities, and has undertaken structural reforms over the last few years such as incorporating a single-window clearance system and appointing third-party consultants. Nonetheless, coal projects continue to face challenges.
4. Land acquisition: Land acquisition is also a major challenge for operationalising coal projects in India. This is because large coal projects often involve acquisition of large swathes of land, including forest areas and scheduled areas.

[76] *NSO 2024 reports*
[77] *As per General Review 2024, Central Electricity Authority*
[78] *General Electricity Review, May 2024 by Ember, Sandbag Climate Campaign CIC*

5. Logistics issues: Logistics infrastructure is yet another major constraint in India. While demand for coal comes from across the country, production is concentrated in its eastern and central regions. As a result, domestically produced coal has to travel long distances to reach the demand centres. Logistics issues are further compounded by the lack of adequate rail infrastructure and high cost of coal transportation. The railways handle approximately 50% of the coal transported in India. Hence, challenges in the railway network have a direct bearing on coal transportation. Key issues include bottlenecks such as inadequate rail lines, shortage of railcars and line congestion. In India, dedicated coal freight corridors are not yet fully developed, and passenger services are given priority over freight.

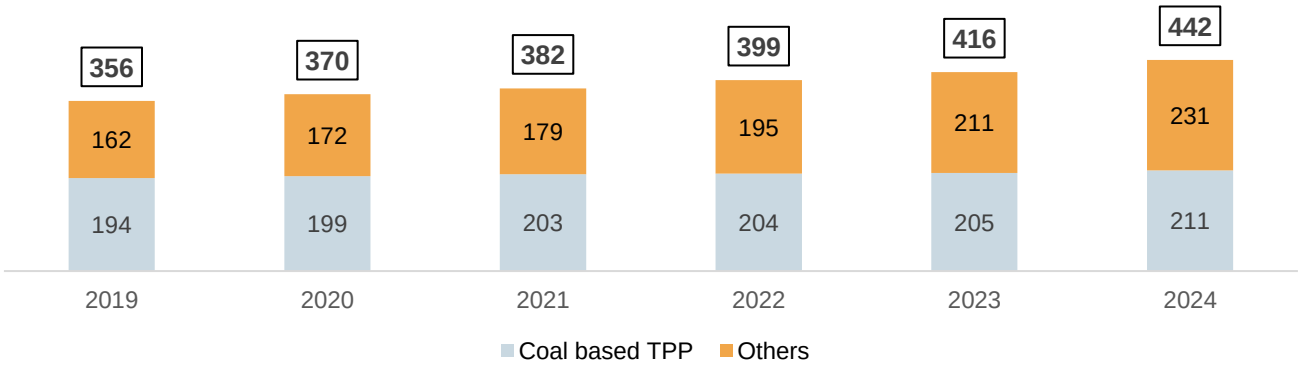
3.9 Overview of the key end use segments of coal

Power generation is the single-largest consumer of coal and is likely to be one of the major segments shaping the coal demand in future. In addition, industries such as steel and cement, which are key constituents of infrastructure development, are also highly dependent on coal.

3.9.1 Power (utilities)

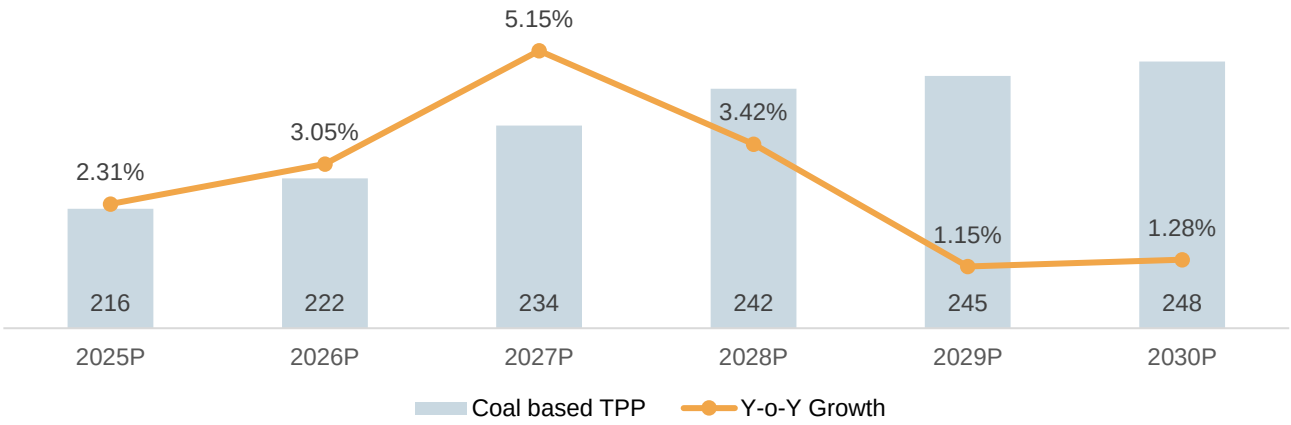
Growth in energy requirements has driven the Indian power (utilities) segment. As of March 2024, India has an installed capacity of 442 GW, comprising approximately 211 GW (48%) of thermal-based capacity, approximately 81 GW (19%) of solar capacity, approximately 46 GW (11%) of hydro-based generation capacity, and approximately 8 GW (2%) of nuclear power plants. In the past decade, India has more than doubled its installed power generation capacity from approximately 199 GW in fiscal 2012 to approximately 442 GW in fiscal 2024. India's installed capacity grew at 6% over fiscals 2012-2024, while that for coal, gas and renewables increased at 8%, 4%, and 17%, respectively. This growth is driven through private sector participation in power generation and focus on renewable energy capacity addition to reduce emissions intensity of India. The expansion has been primarily driven by coal-fired power generation capacity, and more recently, renewable generation. Over the past decade, coal generation capacity increased by 135 GW, while renewable capacity (excluding large-scale hydro) increased by 64 GW. CIL plays a pivotal role in India's energy generation with significantly contributing to the country's industrial growth.

Figure 3.21 India's installed electricity generation capacity growth (GW)



Source: Central Electricity Authority, Crisil Intelligence; Year is fiscal year

Figure 3.22 India's installed coal-based power generation capacity projection (GW)



Source: Projections by Crisil Intelligence; Year is fiscal year; P: Projected

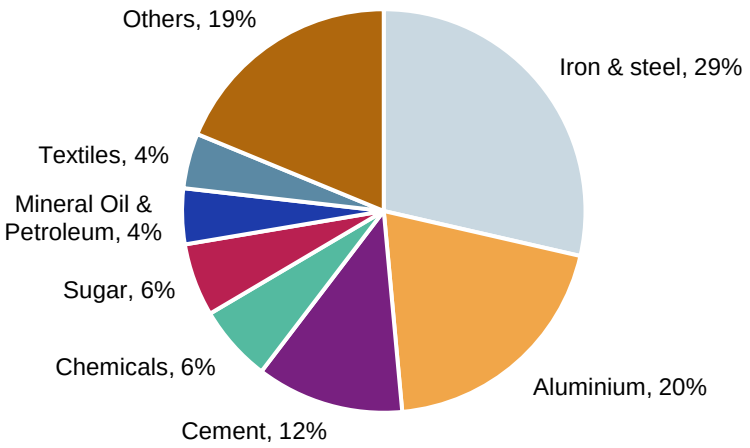
Coal's share in India's electricity generation is larger than that of the share of installed electricity capacity, given it tends to run at a higher utilisation rate compared with renewable generation. The share of coal-based generation is higher in the generation mix due to its lower plant load factor (PLF) of renewable energy, gas and hydro-based generation.

3.9.2 Power (captive)

A captive power plant is one which is dedicated to one or more industrial unit(s). As far as group captive is concerned, the beneficiaries should hold at least 26% of the equity and together consume 51% of the power generated during the year. Though dedicated, it may also inject electricity into the grid. Several industries, specifically energy-intensive industries such as aluminium, steel, sponge iron, cement, etc., which require a huge supply of electricity, tend to rely on their own generation (captive and cogeneration) rather than on grid supply, primarily for the reasons: 1) Non-availability of adequate grid supply 2) Poor quality and reliability of grid supply 3) High tariff because of heavy cross-subsidization.

The iron and steel industry's share in capacity is about 29% of the total captive capacity, the share of aluminium sugar is 20% and the corresponding figures for cement, chemicals and sugar are 12%, 6%, and 6%, respectively. However, in terms of generation, iron and steel and aluminium together constitute around 50% of the power generated by these captive units.

Figure 3.23 Industry-wise captive power capacity in fiscal 2024 (%)

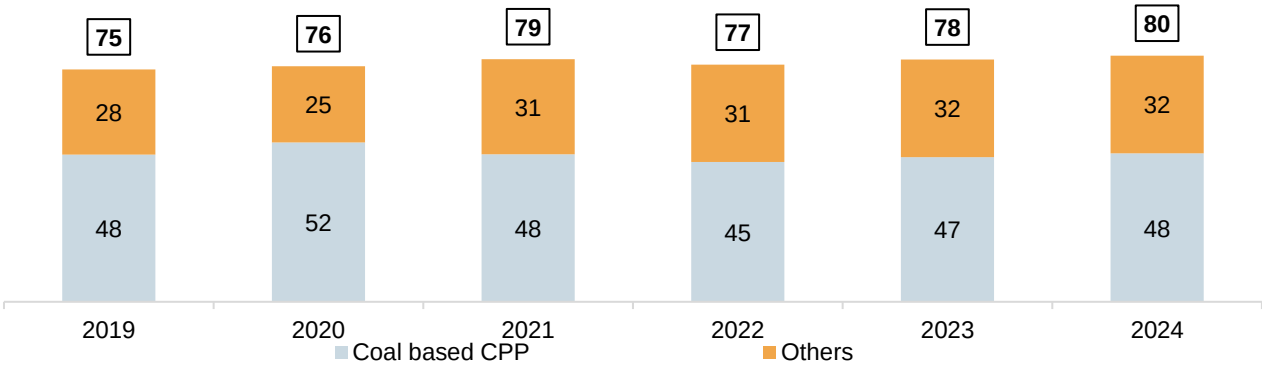


Source: Central Electricity Authority, Crisil Intelligence

Source-wise, coal continues to be the key fuel source for the majority of CPPs, with a share of over 60% of the tracked capacity. This includes CPPs that use domestic coal, imported coal, and coal blended with washery rejects, pet coke and lignite. The abundance of fuel and the competitive capital cost of setting up large-scale coal-based CPPs are the two main reasons for their greater adoption. Diesel comes next with a 23% share in tracked capacity.

Over the years, captive power plants (CPPs) have emerged as an effective alternative for commercial and industrial consumers to fulfil their energy requirements and hedge against the possible consequences of high grid power tariffs. The captive/group captive power plants have a total capacity of about 80 GW in fiscal 2024[79]. Considering, that India's total installed capacity (excluding captive) is about 442 GW as of March 2024, the share of captive units is significant.

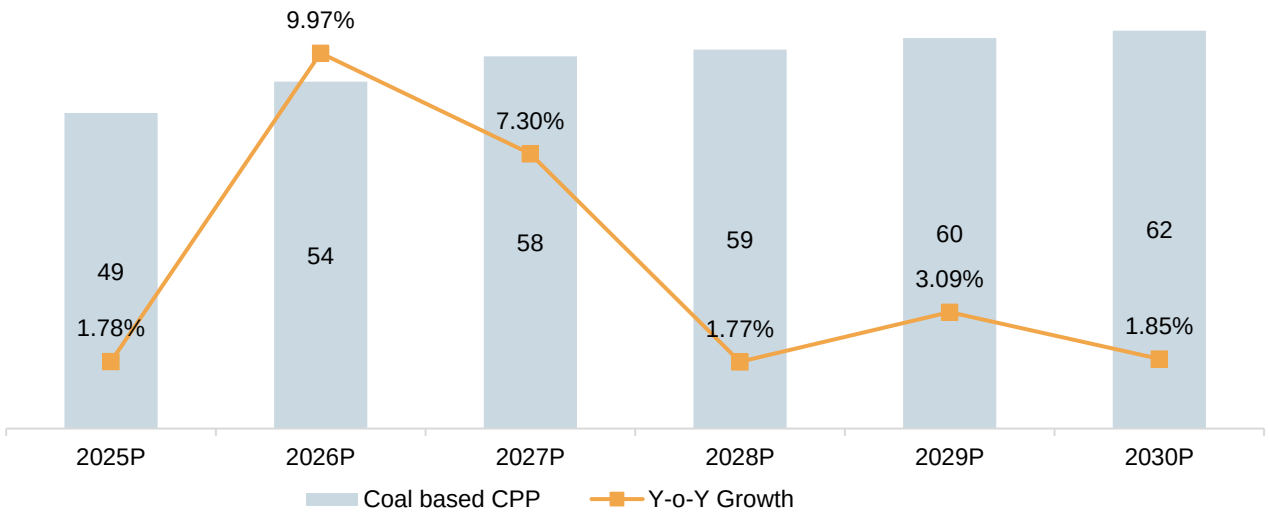
Figure 3.24 India's captive power plant installed capacity growth (GW)



Source: Central Electricity Authority, Crisil Intelligence; Year is fiscal year

[79] *As per CEA reports*

Figure 3.25 India's captive power plant installed capacity projection (GW)

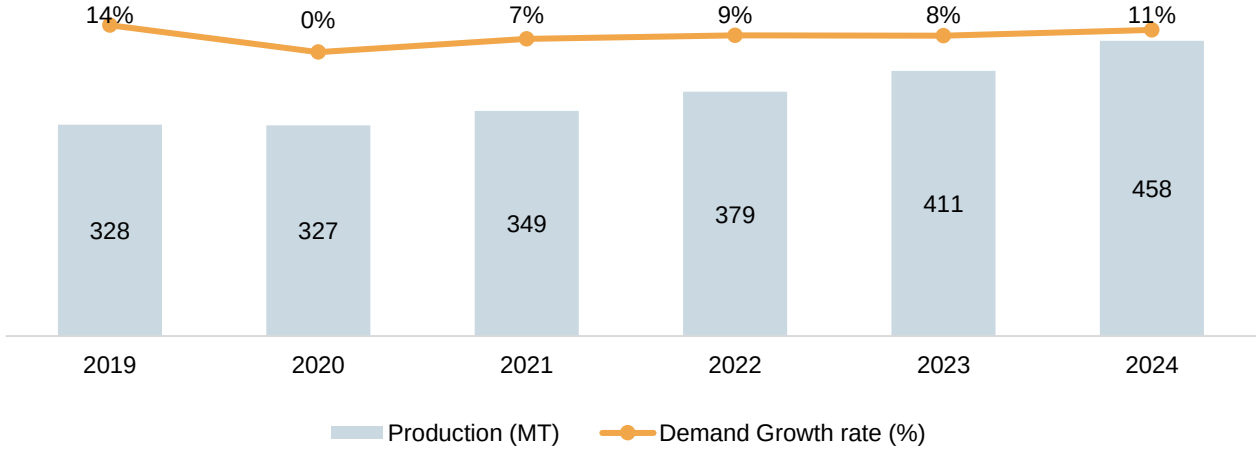


Source: Projections by Crisil Intelligence; Year is fiscal year; P: Projected

3.9.3 Cement

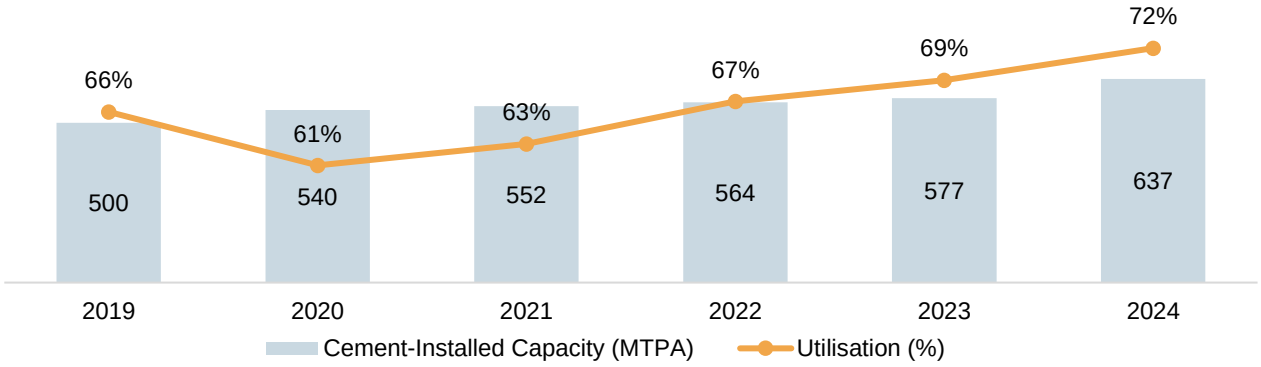
Demand for cement in India has logged a CAGR of 6.5% in the last 15 years, led by the housing segment, which accounts for around 65% share of the cement demand, followed by public infrastructure at 15% and industrial infrastructure with 20% share. Production capacity has outpaced cement production, which has led to a drop in capacity utilization of cement plants. The production growth rate and capacity additions have relatively slowed down in the last five years as compared to the previous periods.

Figure 3.26 Cement production over the years (MMT)



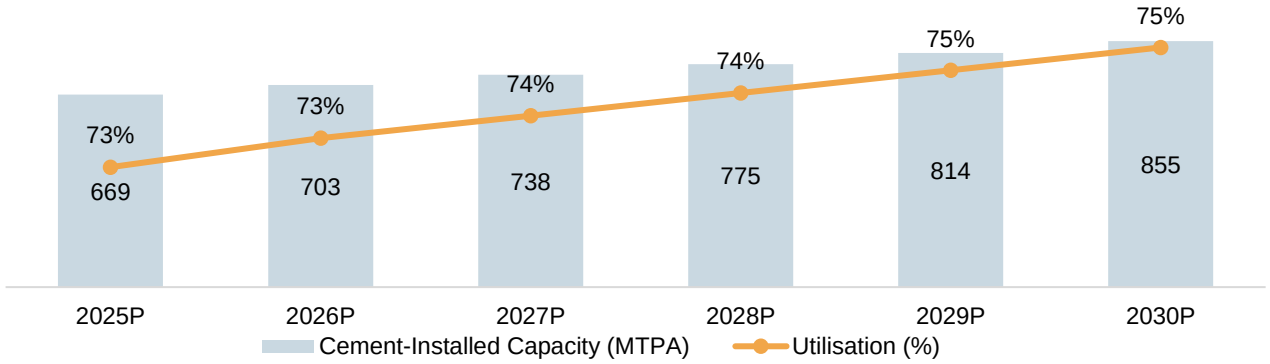
Source: IBEF; Crisil Intelligence; Year is fiscal year

Figure 3.27 Installed cement capacity over the years (MTPA)



Source: IBEF; Crisil Intelligence; Year is fiscal year

Figure 3.28 Installed cement capacity growth projections (MTPA)



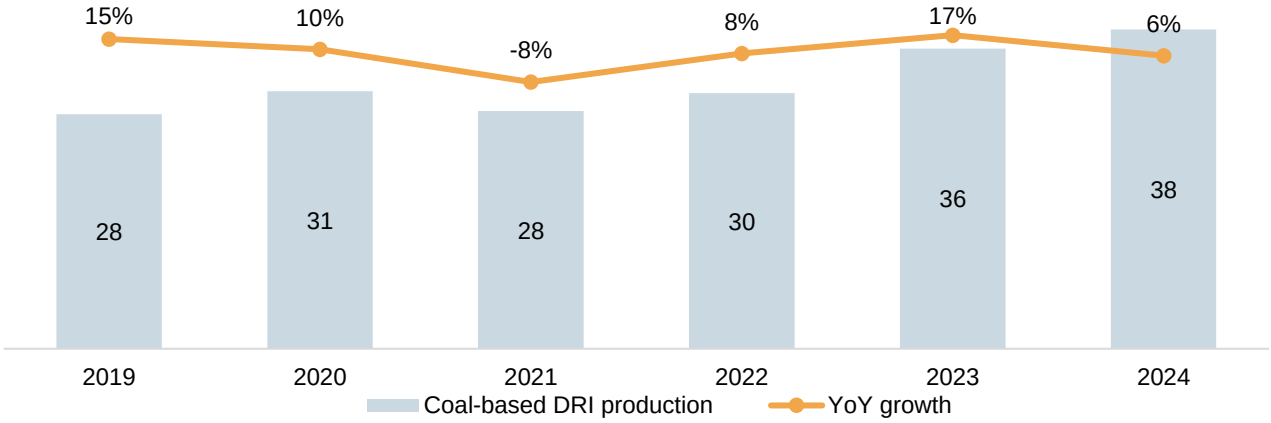
Source: IBEF; Crisil Intelligence; Year is fiscal year; P: Projected

Geographically, cement capacities are spread across the country. However, their presence is more concentrated in the southern sector with accessibility to limestone. The southern region accounts for 35% of the capacity, followed by the western and northern regions that comprise 27% and 25% capacity of cement production, respectively. The eastern sector accounts for only 10% of the overall capacity of cement plants in India.

3.9.4 Direct reduced iron (DRI)

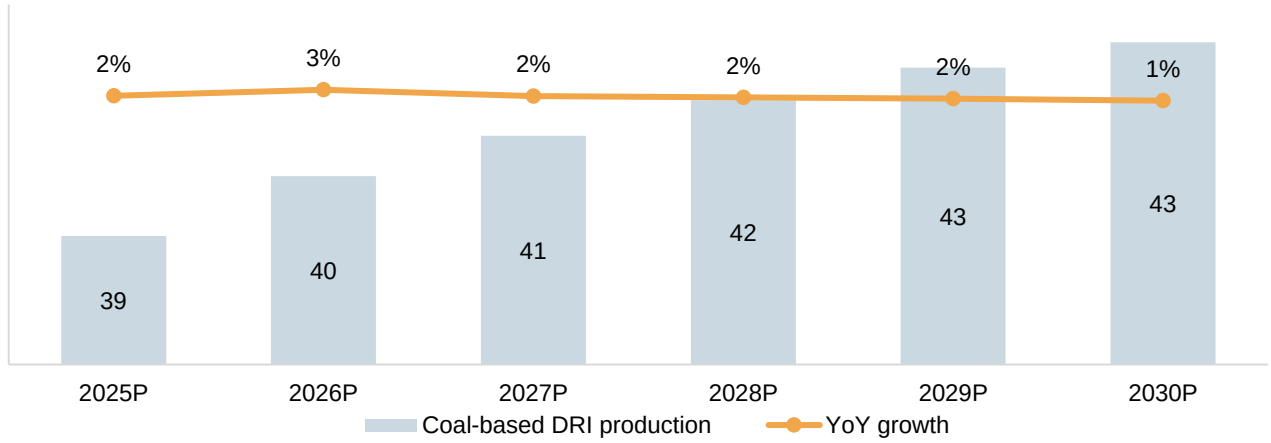
Direct reduced iron (DRI) forms an important sub-sector of the Indian steel sector. DRI is used in production of steel via electric arc furnaces and induction furnaces with these two routes accounting for 53% of the total steel production. The total annual DRI capacity is 60 million tonne (MT) in fiscal 2024 including both coal based (47 MT) and gas based (13 MT) with a production of 47 MT (coal based – 38 MT and gas based – 9 MT). There are around 312 DRI plants in India, spread largely across 7-8 states.

Figure 3.29 Coal based DRI production over the years (MT)



Source: Crisil Intelligence; Year is fiscal year

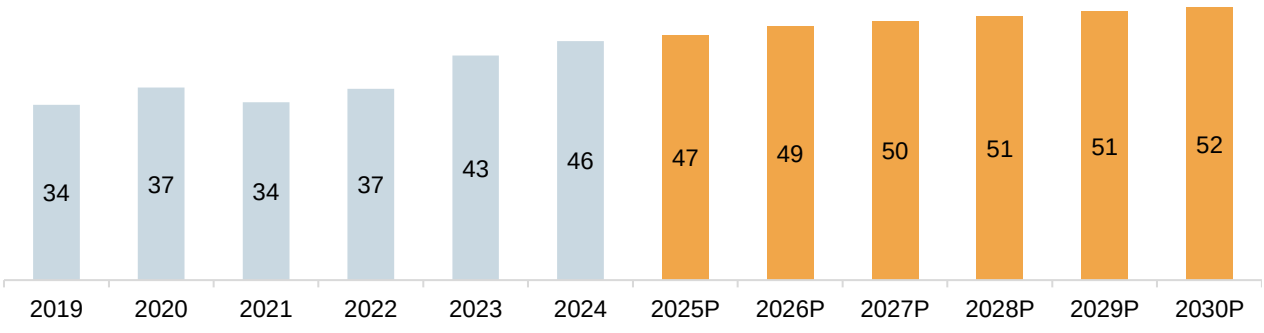
Figure 3.30 Coal based DRI production growth projections (MT)



Source: Crisil Intelligence; Year is fiscal year; P: Projected

Coal-based sponge iron plants are mostly present in the eastern and western regions, accounting for 66% and 40% of the total capacity, respectively, as these regions have easier accessibility to iron ore and non-coking coal.

Figure 3.31 Coal requirement in DRI (MMT)



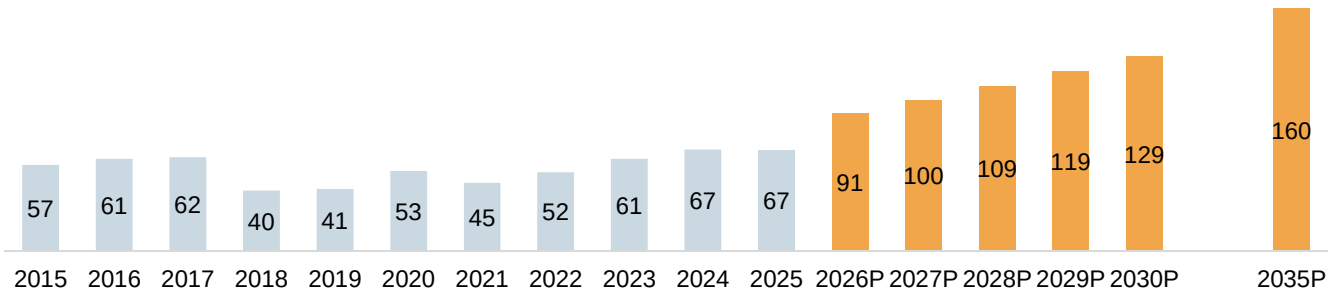
Source: Crisil Intelligence; Year is fiscal year

3.10 Importance of coal in the steel sector

Coking coal is very critical input in steel production which is very important for industrial development of the country. Coking coal is used to produce coke, the primary source of carbon used in steelmaking. Coking coal differs from thermal coal, which is used for energy and heating, by its carbon content and its coking ability.

Majority of the country's coking coal is being produced in Jharkhand. While the raw coking coal production in the country has registered a negative CAGR of 3.5% during fiscal 2016 to fiscal 2020, the production increased from 41 MMT in fiscal 2019 to 67 MT in fiscal 202, a CAGR growth of 10.3%. Out of the total coking coal produced, 100% is not used in the steel sector due to lower grade. In fiscal 2024, out of total coking coal dispatch of 64 MMT only 7 MMT (11%) was sent to Direct Feed, 6 MMT (9%) was washed and the remaining 80% of the coking coal was sent to Power Plants, Cement, Fertilizers and Others. BCCL, being the largest coking coal producer in the country hold a significant market share and benefit from economies of scale, bolstered by the strategic significance of coking coal in steel production.

Figure 3.32 Coking coal production in India (MMT)

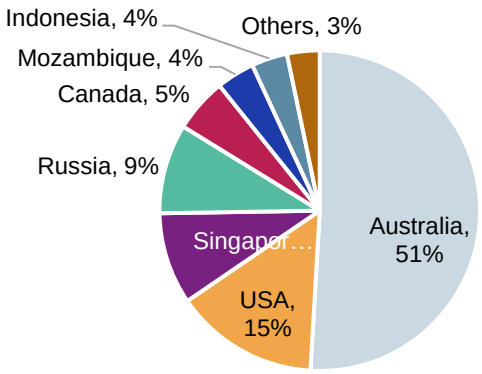


Source: Past data as per Ministry of Coal-Coal Directory of India 2023-24; Year is fiscal year; P: Projected

India imports around 90% of coking coal requirement, which was 58 MMT in fiscal 2024. As steel production rises in the country, the coal imports are likely to rise too. In fiscal 2024, almost 50% of the coking coal in the country is imported from Australia, leaving India highly dependent on Australia for supply of a critical raw material to the steel industry and exposing the industry to price volatility vulnerability.

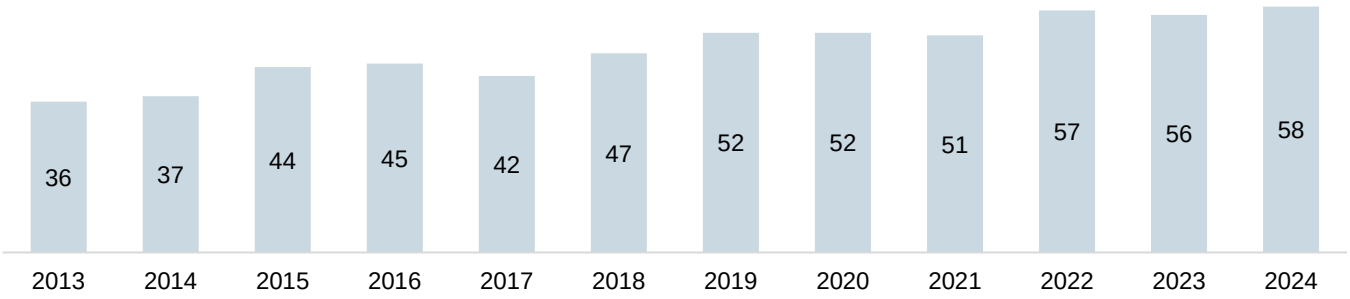
- Seaborne coking coal demand from India has always relied heavily on Australian exports
- Driven by a push from the Indian government, steel mills diversified their raw material sourcing, for instance, Canada, USA and Mozambique in recent years. The latter through upstream investments into new mines.

Figure 3.33 Country-wise import of coking coal in fiscal 2024 (%)



Source: Ministry of Coal-Coal Directory of India 2023-24

Figure 3.34 Coking coal imports by India since fiscal 2015 (MMT)



Source: Ministry of Coal-Coal Directory of India 2022-23, Ministry of Coal Annual Reports 2023-24, Year is fiscal year; P: Projected

To reduce reliance on coking coal imports, the Ministry of Steel and Ministry of Coal have made concerted efforts to raise the level of availability of domestic coking coal for use in steel industries. Following actions have been taken to improve the supply of domestic coking coal:

1. BCCL and CCL have offered a linkage auction of the raw coking coal for the steel sector. Tata Steel participated in the auction and got the linkage of 50,000 metric tons of raw coking coal from mines of CCL.
2. The Ministry of Coal has also taken an initiative to bundle setting up of washeries with linkage of coking coal. It has been envisaged that the agencies including steel industries, can set up greenfield washeries or revamp old washeries of BCCL, which will be provided linkage of coking coal.
3. Steel Authority of India Limited (SAIL) has entered into a Memorandum of understanding (MoU) with BCCL to get washed coking coal from BCCL washeries. SAIL has signed MoU for getting 1.8 MT of washed coking coal from BCCL washeries. Other than that, limited washed coking coal is also available. Presently, 4 new coking coal washeries are under construction/commissioning by BCCL.
4. To raise the availability of domestically produced coking coal to steel manufacturers, the Ministry of Coal has auctioned 16 coking coal blocks so far, out of which 4 blocks were auctioned in the year fiscal 2023. Out of these, JSW was allocated two coking coal blocks. JSW is planning to produce 1.54 MMTPA coking coal from the allocated blocks by 2027-28.

India is world's second largest steel producer and consumer. With installed capacity of 170 million tonnes in fiscal 2024 (production of 144 million tonnes in fiscal 24), India is poised for brownfield expansion of existing steel plants, backward integration of rerollers, forward integration of DRI or pig iron producers unfolding of a

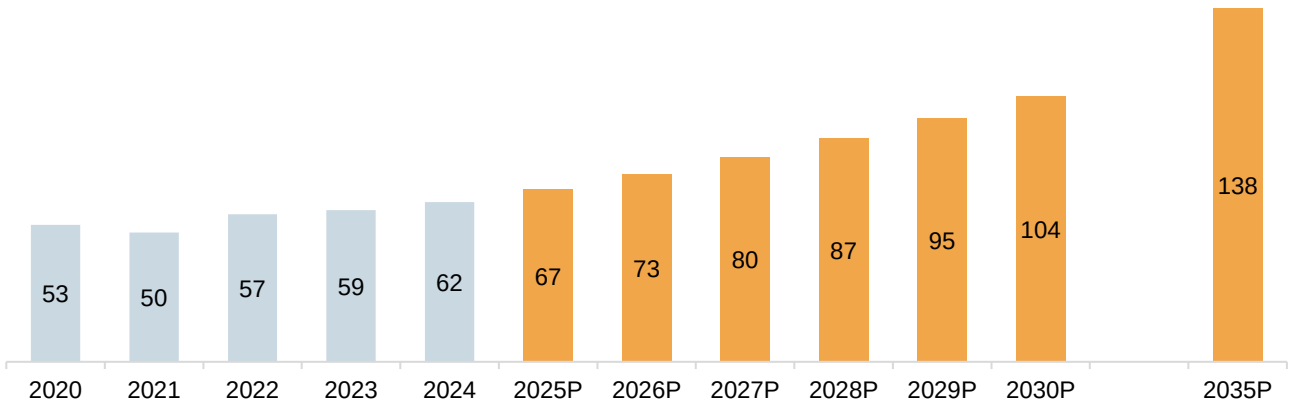
few greenfield projects, leading to a production of approximately 223 million tonnes by fiscal 2030, a CAGR of 7.6%.

Figure 3.35 Crude steel production by route (%)

Source: Crisil Intelligence; Year is fiscal year; P: Projected

Coking coal is mainly used in manufacturing steel through blast furnace route. Domestic coking coal is high ash coal (mostly between 18% - 49%) and is not suitable for direct use in the blast furnace. Therefore, coking coal is washed to reduce the ash percentage and Indian Prime Coking Coal and Medium Coking Coal (<18% ash) is blended with imported coking coal (approximately 9% ash) before utilisation in the Coke Ovens to make Coke for feeding into the Blast Furnace.

Figure 3.36 Coking coal demand for steel sector in India (MMT)



Source: Crisil Intelligence; Year is fiscal year; P: Projected

Coking coal demand has grown at a CAGR of 3.93% from fiscal 2020 to fiscal 2024 at 62 MMT. It is expected to further grow to 138 MMT by fiscal 2035 (CAGR of 7.51%). The rapid growth in coking coal demand underscores the steel sector's role as a major driver of coal consumption in India. As India continues to build infrastructure and expand its industrial base, the demand for steel – and by extension, coking coal – is set to increase. This trend also highlights the difficulty in substituting coking coal in steel production, making it a critical focus area for future energy and industrial policy. The growth in these key sectors presents both opportunities and challenges. While the increasing demand for coal in captive power and coking coal supports industrial growth and energy security, it also raises concerns about environmental sustainability and carbon emissions. Balancing these competing priorities will require strategic investments in cleaner technologies, efficient resource management, and policies that support both industrial growth and environmental goals.

3.11 Coking coal mining industry scenario

As on April 1, 2024, India has 36,813 MMT of coking coal resources. Of the total geological resources, 23,064 MMT are under the proved category, 11,801 MMT are under the indicated category and remaining 1,948 MMT are under inferred category.

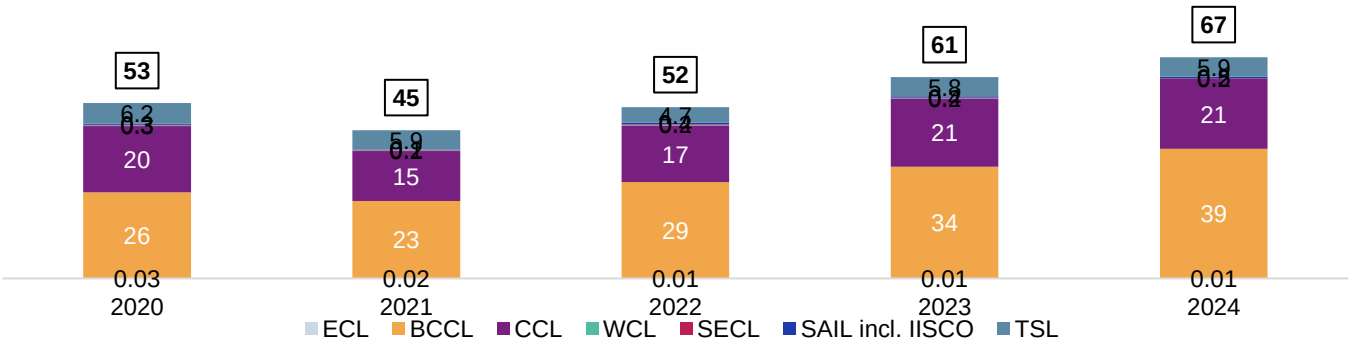
Table 3.3 Coking coal resources of India as on April 1, 2024

Coal Type	Measured (331)	Indicated (332)	Inferred (333)	Total (MMT)
Prime Coking	5133	311	0	5443
Medium Coking	17402	10409	1761	29572
Semi-Coking	530	1081	186	1797
Grand Total (MMT)	23064	11801	1948	36813

Source: Coal Directory 2023- 24

In fiscal 2024, the total coking coal produced in India was 67 MMT, out of which more than 50% was produced by BCCL (58.5%). Production share of CCL was approximately 32% while remaining was by ECL, WCL, SECL and other private companies including SAIL and Tata Steel.

Figure 3.37 Company-wise coking coal production (MMT)

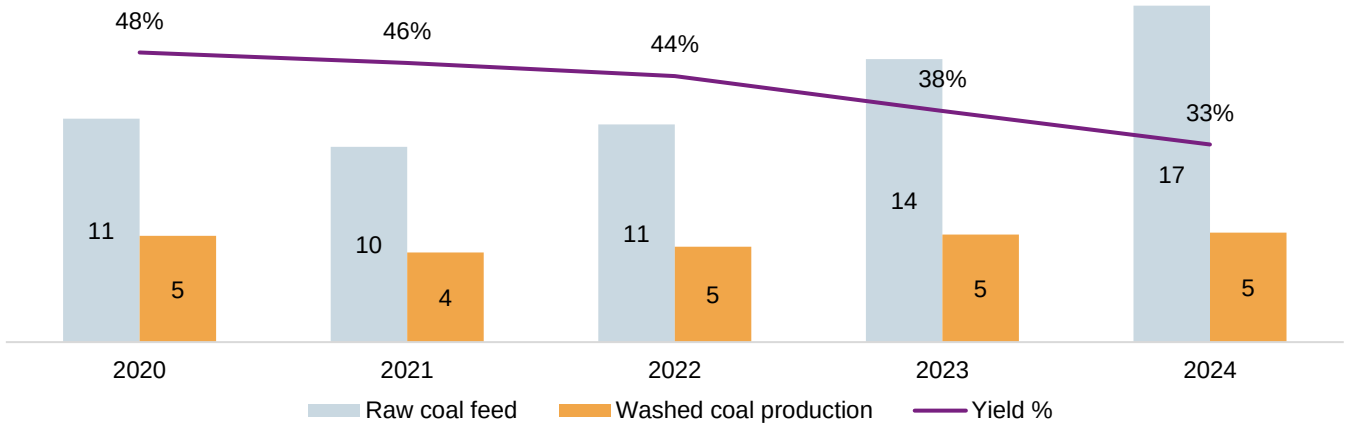


Source: Ministry of Coal-Coal Directory of India 2019-20, 2020-21, 2021-22, 2022-23, 2023-24, Year is fiscal year

3.12 Steel sector demand for domestic washed coal in light of changing technology and capacity enhancement for steel production

Over the last 5 years, only about 20-30% of coking coal produced was washed with an average yield of approximately 45% resulting in a final production of washed coal of only approximately 5 MT, used in blast furnaces. It may be noted here that Washery I-VI grade coking coal is required to be washed before utilization by the steel sector.

Figure 3.38 Coking coal washery performance (MMT)



Source: Coal Directory, 2020, 2021,2022,2023,2024

In India, as most of the coking coal is of low grade it cannot be directly used in steel sector and most of it is diverted to other sectors. Indian coking coal has high ash content and poor coking properties, thus, for efficient operation of Blast furnaces, Indian steel industry imports coking coal of good quality and blends it with inferior quality Indian coking coal.

Raw coking coal production in India during fiscal 2024 was 67 MMT out of which 62 MMT was below W-II grade. Total raw coking coal fed into washeries was approximately 17 MMT from which 5.4 MMT of washed coking coal was produced. Out of the total washed coal produced, 3.2 MMT was used in coke ovens plants for blending purposes with imported coal. Thus, 3.2 MMT of domestic coal was blended with imported coking coal to produce coke during fiscal 2024, while the total coking coal imports during that period was 58 MMT resulting in an average 6% domestic coking coal blending happening in India in fiscal 2024.

3.13 Probable demand for domestic washed coal in view of government focus on Import substitution

The Ministry of Coal (MoC) has set a goal to produce 1150 MMT[80] of domestic coal by fiscal 2026 and 1500 MMT by fiscal 2030[81] to advance the vision of Atma-Nirbhar Bharat ensuring India's energy security by substituting imported coal with domestic coal. In fiscal 2025, India produced approximately 1048 MMT coal.

India's import dependency is owing to various factors, including smaller and lower quality reserves of coking coal in India, less availability of high GCV coal, challenges in developing new coal mines related to land acquisition, delay on obtaining statutory clearance etc. and logistics constraints for evacuation. Domestic coal production has significantly increased from approximately 556 MMT in fiscal 2015 to approximately 1048 MMT in fiscal 2025, depicting a growth of approximately 88% in last ten years, so also the demand has significantly grown from 816 MMT to 1219 MMT in the last 10 years depicting a growth of 49%. However domestic coal production has been unable to meet the demand due to the above-mentioned challenges and desired quality of coal over the last decade. Hence this gap was met by imports. The Ministry of Coal, however, has taken several measures and efforts, to substitute coal imports.

[80] *Ministry of Coal, Action Plan 2025- 26*
[81] *PIB 9th August 2024*

approximately 60 MMT of annual imports continue to constitute import of coking coal due to lack of hard coking coal reserves in India, which can be utilized directly by steel mills in blast furnaces. India, despite having huge reserves of coal, has only a small part of it as coking coal, suitable for blast furnace operation. However, this coal is also characterized by relatively high ash content, low vitrinite, lower rank and inferior caking/coking properties. Therefore, under the present technology, they, at best, can be utilized as a blend to imported coking coals to some extent, and that too, after suitable washing. Due to the quality issue of Indian coking coal and also its limited availability in the country, Indian steel industries are highly dependent on low ash coking coal imports (on an average 85% and above).

According to "IMC Report on Augmentation and Consumption of Domestic Coking Coal by Steel Sector dated 16th July 2021" in order to achieve steelmaking capacity of 300 MTPA by fiscal 2031 (as per National Steel Policy 2017), huge volumes of coking coal (approximately 161 MMT of coking coal at 14 % ash) would be required. Indian steel industry fulfils approximately 90% of its coking coal requirements through imports at present. Growth in steel production is expected to push up demand for metallurgical coking coal of India. Consequently, the government's initiative on Aatmanirbhar Bharat and Mission Coking Coal launched by Ministry of Coal in August 2021 wherein the projected demand for domestic washed coking coal is 40 MMT by fiscal 2030 considering 25% blending with imported coal for steel making.

However, the implementation of stamp charging technology, as opposed to conventional top charging, across steel plants has the potential to reduce the percentage of hard coking coal in the blend and will facilitate usage of medium and semi- soft coal without impacting the coke. This enhances the blending ratio of Indian coking coal in the production of metallurgical coke. If this technology were to be adopted in all of India's steel plants, the blending of Indian coking coal could increase to around 35%, thereby necessitating approximately 56 MT of domestic washed coking coal. To meet this demand, it is estimated that around 170 MT of raw coking coal will need to be washed, which presents a substantial market opportunity for domestic coal producers and washeries.[82]

Coal Import Substitution Measures

The Government has brought in a series of reforms and measures to address import substitution of coal. The critical points to be considered in import substitution are assured supply of quality and of quantity of coal by companies that will help in bridging the gap between the requirement and indigenous availability & to improve the quality.

The Ministry of Coal sets vision 2030 focusing on increasing domestic production of coal by fiscal 2030 to nearly double fold through following in order to reduce non-essential import in the country:

a) Vision 2030: Increase in coal and lignite production from CIL, SCCL, NLCIL, captive and commercial coal blocks
b) Auction and operationalisation of more commercial/captive coal blocks.
c) Formulated Coal Logistic Policy and coal evacuation plan for efficient evacuation of coal.
d) Mission Coking Coal.
e) Underground Mining of Coal.
f) Technology Upgradation.

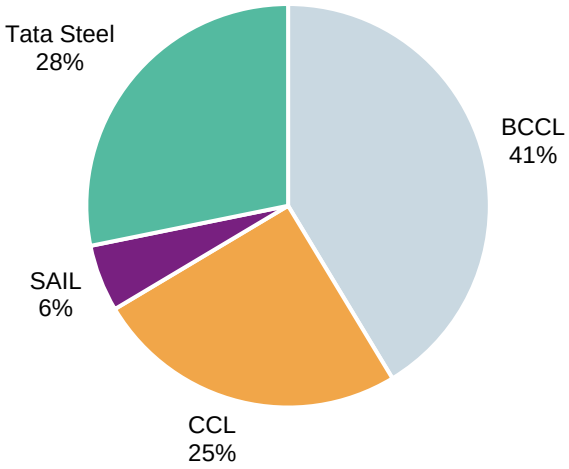
3.14 Capacity enhancement and production of washed coal by setting up washeries

The total installed capacity of major coking coal washeries in India during fiscal 2024 was approximately 37.3 MTPA; out of which, BCCL had the highest share of approximately 41%, followed by Tata Steel Limited (approximately

[82] *Mission Cking Coal, August 2021*

28%), CCL (approximately 25%), and SAIL (approximately 6%). Only approximately 45% of the total installed capacity of raw coking coal washeries in the country is being fed raw coking coal.

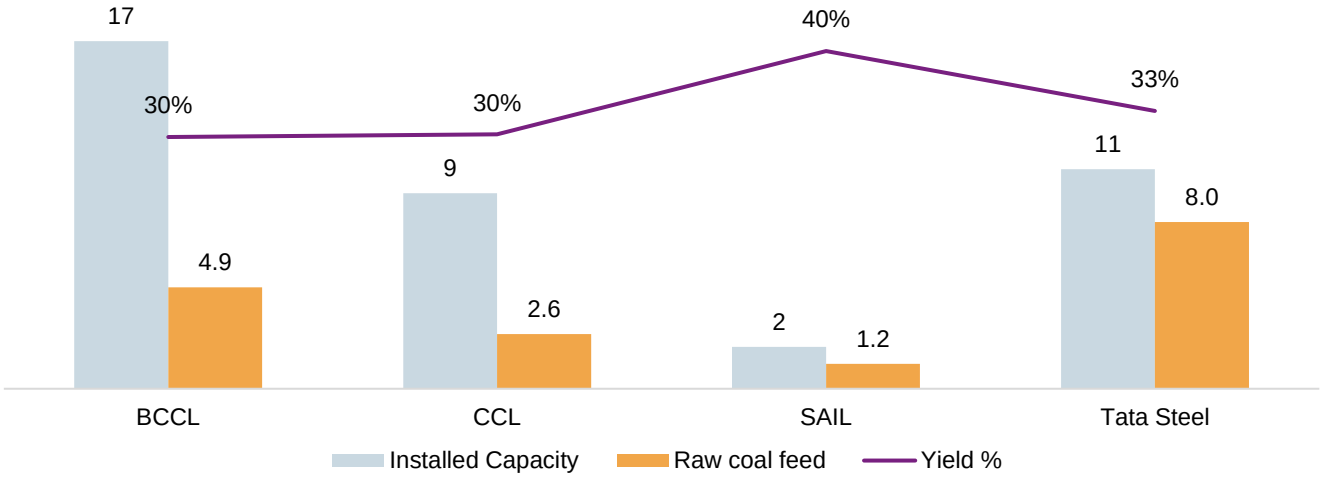
Figure 3.39 Share of raw coking coal washery capacity in fiscal 2024 (%)



Source: Research report "Enhancing Domestic Coking Coal Availability to Reduce the Import of Coking Coal"

SAIL has the highest average yield of 40% followed by Tata steel (33%), BCCL and CCL at 30% each.

Figure 3.40 Coking coal washery performance in fiscal 2024 (MMT)

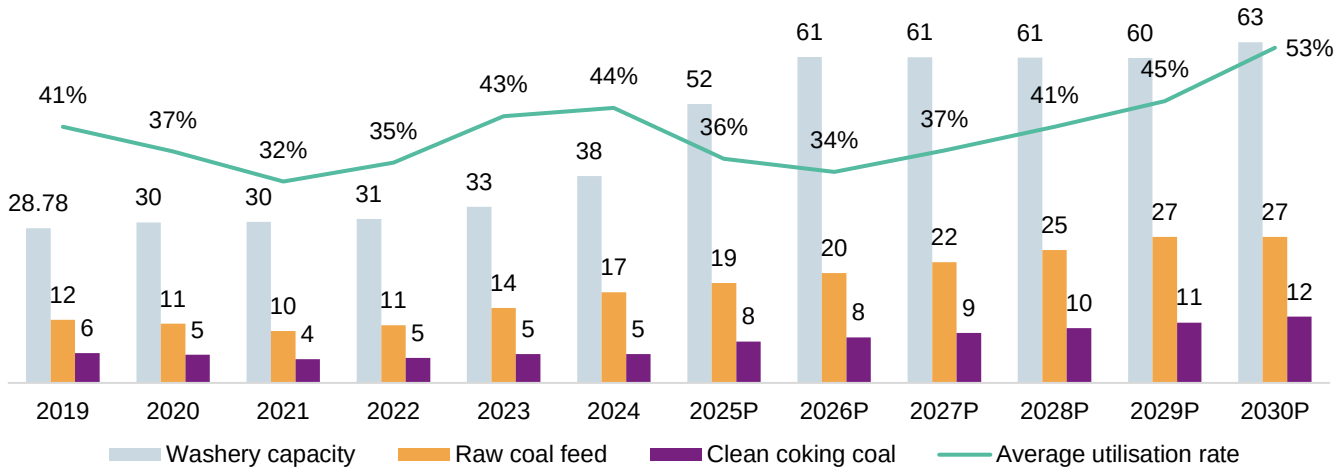


Source: Ministry of Coal-Coal Directory of India 2023-24, Crisil Intelligence

As per the planned expansions, it is expected that the total installed raw coking coal washery capacity will increase by approximately 100% to approximately 52 MTPA by fiscal 2025. With various capacity additions planned for coking coal washeries, it is expected that the total installed capacity of coking coal washery in the country will be 63 MT by FY30 as against 38 MT in fiscal 2024.

With the increase in washery capacity, the amount of raw coal that is fed to the washery is also expected to increase. The average utilization rate of the washeries is expected to increase in the coming years because of new installations with enhanced performance.

Figure 3.41 Coking coal washery capacity expansion (MMT)



Source: Ministry of Coal; Projections by Crisil Intelligence; Year is fiscal year; P: Projected

3.15 Coal Bed Methane (CBM) demand and supply possibilities

Coal bed methane (CBM) is an unconventional form of natural gas (which contains 90-95% methane) found in coal deposits or coal seams and recovered by drilling a number of wells into the coal seam. It is a primary clean energy source of natural gas. India has a coal reserve of 389 billion tonnes, the world's fourth-largest coal reserves. The prognosticated CBM resources in the country are about 92 TCF (Trillion cubic feet) (approximately 2600 BCM-Billion cubic meters) in 12 states of India. 90% of CBM resources are untapped.

Table 3.4 Key statistics of CBM operation in India of CBM resources in India as on 31st March 2024

Sl. No.	Particulars	Details
1.	Total CBM rounds completed	6
2.	No. of CBM Blocks awarded in 6 rounds	40
3.	Estimated CBM Resource in Country	2,600 BCM (91.8 TCF)
4.	CBM Resources (from 33 Blocks)	1,767.06 BCM (62.4 TCF)
5.	Established CBM Reserves (GIP) (8 CBM Blocks)	342 BCM (12.10 TCF)
6.	Avg. Gas Production (FY 2023-24)	1.83 MMSCMD
7.	No. of CBM Blocks in Development/Production Phase	8
8.	No. of CBM Blocks in Exploration	7
9.	No. of CBM Blocks Under Relinquishment	12
10.	No. of CBM Blocks Relinquished	12
11.	No. of blocks under Arbitration	1
12.	Annual CBM Production in FY 2023-24	650 MMSCM
13.	Cumulative Production up to FY 2023-24	6.4 BCM

Source: India's Hydrocarbon Outlook 2023-24, Directorate General of Hydrocarbons

3.15.1 Regulatory/ Policy environment

Directorate General of Hydrocarbons (DGH) under Ministry of Petroleum and Natural Gas (MoPNG) is the nodal agency for the CBM blocks (blocks are carved by DGH along with co-ordination from Ministry of Coal (MoC)/ Central

Mine Planning & Design Institute Limited (CMPDI). MoPNG framed policy - CBM Policy 1997 wherein CBM being Natural Gas is explored and exploited under the provisions of Oil Fields (Regulation & Development) Act 1948 (ORD Act 1948) and Petroleum & Natural Gas Rules 1959 (P&NG Rules 1959).

The CBM policy covered fiscal regime (licence fees, charges, surface rental, land acquisition charges, royalty, rights, commercial discovery bonus, Production Level Payments (bidding premium), and broad contract terms (size of the block, duration of contract- 38 years/40 years (tough area), relinquish conditions, marketing of gas etc.).

In 2017, MoPNG issued “Policy framework for early monetization of Coal Bed Methane” for providing marketing and pricing freedom and to address operational issues in the blocks. The policy allowed bidders to sell gas in market on arm’s length basis (through transparent competitive bidding to get best possible market price). Provision of further relaxations is also there in case no buyer is found on arm’s length basis. [In case discovered prices are less than the price notified (every six month) by the Petroleum Planning and Analysis Cell (PPAC) as per “New Domestic Natural Gas Pricing Guidelines, 2014”) the notified prices shall be applicable for payment of taxes/ royalties etc.].

4 Competition benchmarking across key players

4.1 Business profile of BCCL

Bharat Coking Coal Limited (BCCL) is a Public Sector Undertaking (PSU) and subsidiary of Coal India Limited (CIL) which is the largest coal producing company in the world with a production of 781 MMT in fiscal 2025 and domestic market share of 74%. Established with a mandate to mine and supply coking coal, BCCL plays a pivotal role in fueling the nation's steel sector, which relies heavily on its coal for production and manufacturing processes.

BCCL was founded on 1st January 1972 and was awarded the Miniratna status on 8th October 2014. The headquarters of BCCL is in Dhanbad, Jharkhand. BCCL has 32 operational mines, including 25 opencast, 3 underground and 4 mixed mines. BCCL holds total geological resources of 14,865 MMT out of which coking coal comprises of 7,910 MMT reserves. BCCL is the largest coking coal producer in the country, accounting for 58.50% of the domestic coking coal production in fiscal 2025. As of 01st April 2024, India's total coal resource is estimated to be 389.4 BT, with coking coal resources amounting to 36.8 BT. We hold 7.91 BT of these coking coal resources, as of 01st April 2024, making us the only source of prime coking coal in India.

The company has a robust fleet of Heavy Earth Moving Machinery (HEMM) of 520 vehicles comprising of dragline, shovel, dumper, dozer and drills. BCCL employed manpower of 32,118 individuals ensuring smooth operations and efficient delivery.

BCCL is a pioneer in modern mining technology and the market leader in coking coal washing, with the largest owned operational coking coal washing capacity of 13.65 MTPA (additional 1.7 MTPA operated by BCCL- TSL Washing Venture) in the country which is line with initiatives like Aatmanirbhar Bharat and Mission Coking Coal undertaken by Government of India towards self- sufficiency. As the market leader in coking coal, BCCL with its improving financials and expansion has opportunities to increase the production of coking coal and reduce imports. The revenue of operations of BCCL increased at a CAGR of 2.6% from fiscal 2023 to 2025 and reported a net profit margin of 8.5% in fiscal 2025. The company is debt-free with no long-term borrowings.

BCCL also ventured into Coal Bed Methane (CBM) production and solar energy projects, diversifying its portfolio and contributing to sustainable development. The company implemented highwall mining technology for underground mines in 2024. Jharia CBM block-I of BCCL encompasses an area of 26.55 km^2 and contains gas reserves estimated at 25,000 Mm^3[83].

The demand for coking coal in India is expected to rise substantially, driven by the growth of the steel and power industries. The coking coal demand is expected to increase from 67 MMT in fiscal 2025 to 104 MMT in fiscal 2030 at a CAGR of 9.2%[84]. With the increasing demand for coking coal and improving modernization of BCCL by implementing mass production technologies, opening of new mines through MDO route and increasing underground production, it places the company in a unique position to expand and cater to the coking coal market. By promoting self-sufficiency in coking coal production, India can minimize reliance on imports, strengthen its energy security, and foster a more robust and resilient steel sector.

4.2 Operational Highlights

As on 1st April 2024, BCCL holds total geological resources of 14,865 MMT out of which coking coal comprises of 7,910 MMT making BCCL one of the largest holders of coking coal resources in India. Jharia and Raniganj region hold the reserve of coking coal in India, making BCCL strategically important. BCCL's coking coal is one of the most

[83] *Annual Report of BCCL FY 2024*
[84] *Demand estimates by Crisil Intelligence*

indigenous metallurgical coal resources in India. Thus, such significant resource base strengthens BCCL's position as a major player in the Indian Coking Coal Industry making less vulnerable to resource depletion.

BCCL, being the market leader in the domestic coking coal segment, produced 38.9 MMT coking coal out of a total production of 66.5 MMT in fiscal 2025 capturing 58.50% of the market. The company also produced 1.6 MMT of non-coking coal aggregating to a total of 40.5 MMT in fiscal 2025. BCCL produced 25.9 MMT of coking coal in fiscal 2020 hence projecting a 50% growth to 38.9 MMT in fiscal 2025.

4.2.1 Key operational advantages of BCCL

The operational features and advantages of BCCL compared to other coal mining companies in the country include:

- Technology pioneering: BCCL is the first company in India to introduce Powered Support Longwall Technology at Moonidih underground coal mines in 1978.
- Coal Washing Legacy: BCCL is one of the oldest players in coal washing in India with several washeries operational since 1983.
- Introduction of Highwall Mining: In 2024, BCCL introduced highwall mining technology at ABOCP Mine, improving recovery rates in open-cast coal mines by accessing seams from the pit highwall. Another highwall project is set to be operational soon at Rajapur OCP.

BCCL produces coal through both departmental and (hired) contractual routes. The output per manshift (OMS) of the company is continuously increasing, indicating better productivity and utilization of assets. OMS has improved significantly from 3.8 tonnes in fiscal 2023 to 6.5 tonnes in fiscal 2025.

To extract coal from mines, the waste (rock) needs to be removed to access the mineral which is referred to as overburden (OB).

In fiscal 2024, BCCL surpassed its previous records of production to produce 39.1 MMT of raw coking coal, representing a growth of 16% compared to fiscal 2023. Further, in fiscal 2025, BCCL also recorded its highest overburden removal of 182.4 Mm^3 and the second highest off take of 38.26 MMT, reflecting its commitment to operational growth and efficiency.

BCCL produced 40.5 MMT of coal in fiscal 2025 out of which 31.8 MMT (78%) is through hired route. In fiscal 2025, 78% of the opencast (OC) production is through hired routes. BCCL removed 182.4 Mm^3 of overburden (OB) in fiscal 2025.

4.2.2 Market share in Indian end user market

The total raw coal supply in India in year 2025 was 1048 MMT from different sources with 5.1% increase from 997 MT in 2024. India produced 66.5 MMT of coking coal and 981.5 MMT of non-coking coal in fiscal 2025. BCCL is a major domestic player among the coal producing companies and it recorded a total production of 40.5 MMT of coal in fiscal 2025, with coking coal contributing to 96%.

BCCL has a market share of 4% in overall domestic coal production and a 58.50% market share in coking coal production in fiscal 2025.

Figure 4.1 BCCL overall market share in India and in coking coal segment in fiscal 2025

Source: Coal Directory of India

4.3 Peers for BCCL

4.3.1 Domestic market

In India, BCCL has only CCL as its main competitor in the coking coal segment as these are the major commercial players selling coking coal. Other producers like SAIL and Tata Steel do not sell coking coal commercially and consume it for captive purposes and are not considered as peers. However, CIL subsidiary, MCL, who is the largest non-coking coal producers can be considered as competition in non-coking coal segment.

4.3.2 International market

In 2023, 1040 MMT[85] of coking coal was produced globally out of which China is the biggest player producing 554 MMT (53%), followed by Australia 169 MMT (16%), Russia 107 MMT (10%), India 57 MMT (5%), USA 55 MMT (5%), Canada 27 MMT (3%) and others.

The table below outlines the major coal companies in the top five countries which export coking coal to India and hence can be considered as competition for BCCL in upcoming years.

Table 4.1 Revenue (Rs million) and production (MMT) of major global companies[86]

Country	Company	Total coal production	Coking coal production	Total revenue	% Revenue from coal mining	Revenue from coking coal
Australia	BMA (50:50 alliance of BHP and Mitsubishi)	37.7	22.3[87]	4,607,748	14%	479,584
	Anglo American	16.0	16.0	2,531,153	14%	342,943
	Glencore	113.6	7.5	**17,987,684**	8%	158,300
USA	Peabody Energy	121.7	7.0	378,029	100%	104,353
	Arch Resources	70.7	9.3	244,726	100%	118,104
	Alpha Metallurgical Resources	17.5	17.5	253,203	100%	253,203

[85] *Coal Directory of India, 2024; Global production numbers are for calendar years*
[86] *For Glencore, PJSC Raspadskaya, Anglo American, Alpha Metallurgical Resources and Warrior Met coal the fiscal year is from 1st January to 31st December; for BHP the fiscal year is from 1st July to 30th June. The financials and production for companies of USA and Canada i.e. Peabody Energy, Arch Resources, , Ramaco Resources, and Teck Resources have been adjusted according to fiscal year from 1st April to 31st March.*
[87] *22.3 MMT is BHP's share of production out of 44.6 MMT*

Country	Company	Total coal production	Coking coal production	Total revenue	% Revenue from coal mining	Revenue from coking coal
	Ramaco Resources	3.2	3.2	57,938	100%	57,938
	Warrior Met Coal	7.2	7.2	130,589	100%	130,589
Canada	Teck Resources	24.0	24.0	932,241	56%	932,241
Russia	PJSC Raspadskaya[88]	21.5	21.5	223,316	100%	223,316

Source: Annual Reports; For Glencore and Anglo American-2023 data; for BHP, Peabody Energy, Arch Resources, Alpha Metallurgical Resources, Ramaco Resources, Warrior Met Coal and Teck Resources -2024 data; for PJSC Raspadskaya- 2022 data

1. Peabody Energy, USA- It is the largest coal producer of USA generating Rs 378,029 million of revenue and produced 121.7 MMT of coal including 7 MMT of coking coal in fiscal 2024. The company generated 100% of its revenue from coal mining operations.
2. Arch resources- It is the second largest coal producer in USA generating Rs 244,726 million of revenue and produced 70.7 MMT of coal including 9.3 MMT of coking coal in fiscal 2024. The company generated 100% of its revenue from coal mining operations.
3. Alpha Metallurgical Resources- It is the largest metallurgical coal producer of USA generating Rs 253,203 million of revenue and produced 14.6 MMT of coking coal in fiscal 2024. The company generated 100% of its revenue from coking coal mining operations.
4. Ramaco Resources- It is a one of the major coking coal producers in USA generating Rs 57,938 million of revenue by producing 3.2 MMT of coking coal in fiscal 2024. The company generated 100% of its revenue from coking coal mining operations.
5. Warrior Met Coal- It is a one of the major coking coal producers in USA generating Rs 130,589 million of revenue by producing 7.5 MMT of coking coal in fiscal 2024. The company generated 100% of its revenue from coking coal mining operations.
6. Teck Resources, Canada- It is the largest coking coal producer in Canada generating Rs 932,241 million of revenue and produced 24 MMT of coking coal in fiscal 2024. It does not produce thermal coal and generates 56% of revenue from coal mining operations.
7. BHP, Australia- It is one of the largest mining companies in the world producing several minerals like coal, iron ore, copper, and others. It generated a cumulative revenue of Rs 4,607,748 million in fiscal 2024 out of which coal mining contributed 14% of the total revenue. The company has a 50:50 alliance with Mitsubishi called BMA (BHP- Mitsubishi Alliance) through which BHP's share was 22.3 MMT of coking coal in fiscal 2024.
8. Anglo American, Australia- It generated a cumulative revenue of Rs 2,531,153 million in 2023 out of which coking coal contributed 14% of the total revenue. It also operates in various other segments like iron ore, copper, manganese, nickel etc. It produced 16 MMT of coking coal in 2023.
9. Glencore, Australia- It is based out of Switzerland and one of the leading producers of coking coal in Australia with 113.6 MMT of coal production out of which coking coal contributed to 7.5 MMT in 2023. The company recorded a cumulative revenue of Rs 17,987,684 million with coal mining contributing to 8% of revenue in 2023.
10. PJSC Rajpadskaya- It is one of the leading coking coal producers in Russia with coking coal production of 21.5 MMT and recorded a revenue of Rs 223,316 million in 2022.

In order to undertake competition benchmarking, it is required to benchmark with listed companies of similar line of business and size in terms of revenue generation.After careful consideration and analysis, Alpha Metallurgical Resources and Warrior Met Coal have been considered as competition for BCCL for benchmarking in international

[88] *The production and revenue data are for 2022 as 2023 data is not available.*

market as other international companies like Peabody Energy, Arch Resources, Ramaco Resources, Teck Resources, BHP, Anglo American and Glencore are either too large in scale or have diverse minerals which is not a viable comparison. CCL and MCL although being a non- listed entities have been considered as these entities are involved in similar line of business catering to the coal mining industry.

4.4 Financial benchmarking

4.4.1 Revenue from operations

BCCL achieved revenue of operations[89] of Rs 139,984 million in fiscal 2025 which grew from Rs 132,967 million in fiscal 2023 at a CAGR of 2.60% during the period. Alpha Metallurgical Resources and Warrior Met Coal reported a CAGR of -13.65% and -4.75% respectively from fiscal 2022 to 2024. CCL recorded revenue from operations of Rs 163,792 million in fiscal 2023 which grew to Rs 165,657 million in fiscal 2024. MCL recorded revenue from operations of Rs 271,823 million in fiscal 2024.

Table 4.2 Revenue from operations (Rs million) and CAGR 2023-25

Company	2023	2024	2025	CAGR[90]
BCCL	132,967	140,453	139,984	2.60%
CCL	163,792	165,657	NA	1.14%
MCL	310,769	271,823	NA	-12.53%
International Peers	**2022**	**2023**	**2024**	**CAGR**
Alpha Metallurgical, USA	339,571	288,544	253,203	-13.65%
Warrior Met Coal, USA	143,950	139,361	130,589	-4.75%

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In case of listed International Peers the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December have been considered.

4.4.2 EBITDA

BCCL reported EBITDA[91] of Rs 23,561 million in fiscal 2025 which grew from Rs 8,913 million in fiscal 2023 at a CAGR of 62.58% during the period. CCL recorded EBITDA of Rs 53,821 million in fiscal 2023 which grew to Rs 55,662 million in fiscal 2024. MCL recorded EBITDA of Rs 166,369 million in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal reported a CAGR of -51.57% and -29.89% respectively from fiscal 2022 to 2024.

Table 4.3 EBITDA (Rs million) and CAGR 2023-25

Company	2023	2024	2025	CAGR[92]
BCCL	8,913	24,939	23,561	62.58%
CCL	53,821	55,662	NA	3.42%

[89] *Revenue from operations means the revenue from operations as appearing in the Financial Statements of the companies*
[90] *Revenue CAGR for BCCL, is calculated by dividing the Revenue from operations for fiscal 2025 by the Revenue from operations for fiscal 2023, raising it to the power of one divided by the number of compounding periods i.e. 2 years, and subtracting by one, while for CCL and MCL it is calculated by dividing the Revenue from operations for fiscal 2024 by the Revenue from operations for fiscal 2023, raising it to the power of one divided by the number of compounding periods i.e. 1 years, and subtracting by one. Revenue CAGR for Alpha Metallurgical and Warrior Met Coal is calculated by dividing the Revenue from operations for fiscal 2024 by the Revenue from operations for fiscal 2022, raising it to the power of one divided by the number of compounding periods i.e. 2 years, and subtracting by one*
[91] *Operating EBITDA is calculated as profit / (loss) for the period / year, plus finance costs, total taxes, and depreciation and amortization expense less other income*
[92] *EBITDA CAGR for BCCL, is calculated by dividing the EBITDA for fiscal 2025 by the EBITDA for fiscal 2023, raising it to the power of one divided by the number of compounding periods i.e. 2 years, and subtracting by one, while for CCL and MCL it is calculated by dividing the EBITDA for fiscal 2024 by the EBITDA for fiscal 2023, raising it to the power of one divided by the number of compounding periods i.e. 1 years, and subtracting by one. Revenue CAGR for Alpha Metallurgical and Warrior Met Coal is calculated by dividing the EBITDA for fiscal 2024 by the EBITDA for fiscal 2022, raising it to the power of one divided by the number of compounding periods i.e. 2 years, and subtracting by one*

Company	2023	2024	2025	CAGR[92]
MCL	194,978	166,369	NA	-14.67%
International Peers	2022	2023	2024	CAGR
Alpha Metallurgical, USA	139,433	82,227	32,698	-51.57%
Warrior Met Coal, USA	76,979	57,913	37,837	-29.89%

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered.

4.4.3 Profit After Tax (PAT)

BCCL reported PAT[93] of Rs 12,402 million in fiscal 2025 which grew from Rs 6,648 million in fiscal 2023 at a CAGR of 36.59% during the period. CCL recorded PAT of Rs 33,932 million in fiscal 2023 which grew to Rs 36,585 million in fiscal 2024. MCL recorded PAT of Rs 118,454 million in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal reported a CAGR of -63.40% and -36.43% respectively from fiscal 2022 to 2024.

Table 4.4 PAT (Rs million) and CAGR 2023-25

Company	2023	2024	2025	CAGR[94]
BCCL	6,648	15,645	12,402	36.59%
CCL	33,932	36,585	NA	7.82%
MCL	134,702	118,454	NA	-12.06%
International Peers	2022	2023	2024	CAGR
Alpha Metallurgical, USA	119,925	60,009	16,061	-63.40%
Warrior Met Coal, USA	53,093	39,784	21,457	-36.43%

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered.

4.4.4 PAT margin (% Total income)

BCCL reported a PAT margin[95] of 8.50% in fiscal 2025 which grew from 4.86% in fiscal 2023. CCL recorded a PAT margin of 19.62% in fiscal 2023 which grew to 20.72% in fiscal 2024. MCL recorded a PAT margin of 40.65% in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal reported a PAT margin of 6.30% and 16.08% respectively in fiscal 2024.

Table 4.5 PAT margin (% total income)

Company	2023	2024	2025
BCCL	4.86%	10.83%	8.50%
CCL	19.62%	20.72%	NA

[93] *Profit after tax (PAT) means profit / (loss) for the period/financial year as appearing in the Financial Information of the companies*
[94] *PAT CAGR for BCCL, is calculated by dividing the PAT for fiscal 2025 by the PAT for fiscal 2023, raising it to the power of one divided by the number of compounding periods i.e. 2 years, and subtracting by one, while for CCL and MCL it is calculated by dividing the PAT for fiscal 2024 by the PAT for fiscal 2023, raising it to the power of one divided by the number of compounding periods i.e. 1 years, and subtracting by one. PAT CAGR for Alpha Metallurgical and Warrior Met Coal is calculated by dividing the PAT for fiscal 2024 by the PAT for fiscal 2022, raising it to the power of one divided by the number of compounding periods i.e. 2 years, and subtracting by one*
[95] *PAT margin (%) is calculated as PAT divided by Total Income*

Company	2023	2024	2025
MCL	41.22%	40.65%	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	35.23%	20.73%	6.30%
Warrior Met Coal, USA	36.61%	27.87%	16.08%

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered.

4.4.5 Return on Networth

BCCL recorded return on net worth[96] of 19.22% in fiscal 2023, 34.21% in fiscal 2024 and 20.83% in fiscal 2025. CCL reported a return on net worth of 34.55% in fiscal 2023 and 29.69% in fiscal 2024. MCL recorded a return on networth of 80.15% in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal recorded return on networth of 11.48% and 12.82% respectively in fiscal 2024.

Table 4.6 Return on net worth

Company	2023	2024	2025
BCCL	19.22%	34.21%	20.83%
CCL	34.55%	29.69%	NA
MCL	124.34%	80.15%	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	200.92%	47.33%	11.48%
Warrior Met Coal, USA	88.61%	28.87%	12.82%

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered.

4.4.6 Return on capital employed (ROCE)

BCCL recorded ROCE[97] of 16.56% in fiscal 2023, 47.20% in fiscal 2024 and 30.13% in fiscal 2025. CCL reported a ROCE of 48.28% in fiscal 2023 and 39.14% in fiscal 2024. MCL recorded a ROCE of 106.48% in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal recorded ROCE of 13.44% and 13.67% respectively in fiscal 2024.

Table 4.7 Return on capital employed

Company	2023	2024	2025
BCCL	16.56%	47.20%	30.13%

[96] *Return on Net Worth is calculated as restated profit / (loss) for the period / year divided by average net worth. Net Worth is the total equity attributable to equity-holders of the company, as appearing in the Restated Financial Information less OCI - Re-measurement of Defined Benefits Plans (net of Tax) Reserve. Average net worth is the sum of opening and closing net worth divided by two.*
[97] *Return on average capital employed (ROCE) refers to the EBIT divided by average capital employed for the year/period. EBIT means restated profit / (loss) for the period / year, plus finance costs and total taxes. Capital employed is the total equity attributable to equity-holders of the company, as appearing in the Restated Financial Information plus non-current borrowings. Average capital employed is the sum of opening and closing capital employed divided by two.*

Company	2023	2024	2025
CCL	48.28%	39.14%	NA
MCL	172.55%	106.48%	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	218.85%	56.46%	13.44%
Warrior Met Coal, USA	93.08%	30.20%	13.67%

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered.

4.4.7 Capital expenditures (CAPEX)

BCCL recorded CAPEX[98] of Rs 9,865 million in fiscal 2023, Rs 12,375 million in fiscal 2024 and Rs 18,149 million in fiscal 2025. CCL reported CAPEX of Rs 27,114 million in fiscal 2023 and Rs 37,581 million in fiscal 2024. MCL recorded a CAPEX of Rs 39,388 million in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal employed CAPEX of Rs 17,025 million and Rs 39,147 million respectively in fiscal 2024.

Table 4.8 CAPEX (Rs million)

Company	2023	2024	2025
BCCL	9,865	12,375	18,149
CCL	27,114	37,581	NA
MCL	42,795	39,388	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	13,603	20,395	17,025
Warrior Met Coal, USA	16,992	40,868	39,147

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.4.8 Current ratio

BCCL recorded a current ratio[99] of 0.96 in fiscal 2023, 1.21 in fiscal 2024 and 1.19 in fiscal 2025. CCL reported a current ratio of 1.29 in fiscal 2023 and 1.41 in fiscal 2024. MCL recorded a current ratio of 2.02 in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal recorded the current ratio of 4.13 and 5.20 respectively in fiscal 2024.

Table 4.9 Current ratio

Company	2023	2024	2025
BCCL	0.96	1.21	1.19
CCL	1.29	1.41	NA
MCL	1.99	2.02	NA

[98] *Capex refers to the total Capital Expenditure for the respective financial years.*
[99] *Current ratio has been calculated as current assets divided by current liabilities as at the end of the financial year.*

Company	2023	2024	2025
International Peers	2022	2023	2024
Alpha Metallurgical, USA	2.53	3.38	4.13
Warrior Met Coal, USA	7.66	7.24	5.20

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.4.9 Net asset value per equity share (NAVPS)

BCCL recorded NAVPS[100] of Rs 8.14 in fiscal 2023, Rs 11.50 in fiscal 2024 and Rs 14.07 in fiscal 2025. CCL reported NAVPS of Rs 11.66 in fiscal 2023 and Rs 7.23 in fiscal 2024. MCL recorded NAVPS of Rs 12.17 in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal recorded NAVPS of Rs 11,182 and Rs 3,424 respectively in fiscal 2024.

Table 4.10 Net asset value per equity share (Rs)

Company	2023	2024	2025
BCCL	8.14	11.50	14.07
CCL	11.66	7.23	NA
MCL	20.10	12.17	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	6,825	9,513	11,182
Warrior Met Coal, USA	2,321	2,998	3,424

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.4.10 Earnings per share (EPS)

BCCL recorded EPS[101] of Rs 1.43 in fiscal 2023, Rs 3.36 in fiscal 2024 and Rs 2.66 in fiscal 2025. CCL reported EPS of Rs 3.61 in fiscal 2023 and Rs 3.89 in fiscal 2024. MCL recorded EPS of Rs 17.90 in fiscal 2024. Alpha Metallurgical Resources and Warrior Met Coal recorded EPS of Rs 1,234 and Rs 410 respectively in fiscal 2024.

Table 4.11 Earnings per share (Rs) (basic)

Company	2023	2024	2025
BCCL	1.43	3.36	2.66
CCL	18.07	19.47	NA
MCL	101.67	89.46	NA
International Peers	2022	2023	2024

[100] Net asset value (NAV) per equity share refers to Net worth as at the end of the year / period divided by number of equity shares outstanding at the end of the financial year. Net Worth is the total equity attributable to equity-holders of the company, as appearing in the Restated Financial Information less OCI - Re-measurement of Defined Benefits Plans (net of Tax) Reserve.
[101] Earnings per share (EPS) equals profit for the year attributable to the shareholders of the company divided by the Weighted average number of Equity Shares outstanding during the year. Since there is no dilutive capital, Basic and Diluted EPS would be same.

Company	2023	2024	2025
Alpha Metallurgical, USA	6,857	4,254	1,234
Warrior Met Coal, USA	1,028	765	410

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

Table 4.12 Earnings per share (Rs) (diluted)

Company	2023	2024	2025
BCCL	1.43	3.36	2.66
CCL	18.07	19.47	NA
MCL	101.67	89.46	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	6,581	4,098	1,223
Warrior Met Coal, USA	1,027	765	410

Source: Annual Reports of BCCL, CCL, MCL; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.5 Operational benchmarking

4.5.1 Production

BCCL produced 40.5 MMT of coal in fiscal 2025 out of which coking coal contributed to 38.9 MMT. The production of the company has increased from 36.2 MMT in fiscal 2023 to 40.5 MMT in fiscal 2025 i.e. at a CAGR of 5.8%. CCL produced 76.1 MMT in fiscal 2023 which improved to 87.5 MMT in fiscal 2025, however the share of coking coal was 20.6 MMT in fiscal 2023 and 20.5 MMT in fiscal 2025.

MCL produced 100% non-coking coal of 225.2 MMT in fiscal 2025. Alpha Metallurgical Resources and Warrior Met Coal produced 15.7 MMT and 7.5 MMT of coal respectively in fiscal 2024.

Table 4.13 Coking and non-coking coal production (MMT)

Company	2023	2024	2025
Coking coal			
BCCL	33.7	39.1	38.9
CCL	20.6	21.1	20.5
MCL	-	-	-
Non coking coal			
BCCL	**2.5**	**2.0**	1.6
CCL	**55.5**	**65.0**	67.0
MCL	**193.3**	**206.1**	225.2
Total coal			

Company	2023	2024	2025
		Coking coal	
BCCL	**36.2**	**41.1**	40.5
CCL	**76.1**	**86.1**	87.5
MCL	**193.3**	**206.1**	225.2
International Peers	2022	2023	2024
		Coking coal	
Alpha Metallurgical, USA	13.9	14.8	14.6
Warrior Met Coal, USA	5.7	6.9	7.5
		Non coking coal	
Alpha Metallurgical, USA	2.2	1.9	1.1
Warrior Met Coal, USA	**-**	**-**	-
		Total coal	
Alpha Metallurgical, USA	16.1	16.7	15.7
Warrior Met Coal, USA	5.7	6.9	7.5

Source: Coal Directory of India, 2024; Monthly Statistical Report- March 2025, Ministry of Coal; Annual report for Alpha Metallurgical Resources and Warrior Met Coal

Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.5.2 Production (type of mine)

BCCL produced 39.4 MMT (97.3%) of coal through open cast method out of 40.5 MMT of total production in fiscal 2025. CCL produced 86.8 MMT (99.2%) of coal through open cast method out of 87.5 MMT of total production while MCL produced 224.7 MMT (99.8%) of coal through open cast method out of 225.2 MMT in fiscal 2025.

Table 4.14 Opencast and underground coal production (MMT)

Company	2023	2024	2025
		Opencast	
BCCL	35.5	40.3	39.4
CCL	75.2	85.3	86.8
MCL	192.8	205.6	224.7
		Underground	
BCCL	0.7	0.8	1.1
CCL	0.9	0.8	0.7
MCL	0.5	0.5	0.5
		Total coal	
BCCL	**36.2**	**41.1**	40.5

Company	2023	2024	2025
CCL	**76.1**	**86.1**	87.5
MCL	**193.3**	**206.1**	225.2
International Peers	2022	2023	2024
		Opencast	
Alpha Metallurgical, USA	NA	NA	NA
Warrior Met Coal, USA	-	-	-
		Underground	
Alpha Metallurgical, USA	NA	NA	NA
Warrior Met Coal, USA	5.7	6.9	7.5
		Total coal	
Alpha Metallurgical, USA	16.1	16.7	15.7
Warrior Met Coal, USA	5.7	6.9	7.5

Source: Coal Directory of India, 2024; Monthly Statistical Report- March 2025, Ministry of Coal; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.5.3 Offtake

BCCL despatched 38.3 MMT of coal in fiscal 2025 which has increased from 35.5 MMT in fiscal 2023. Most of the coal is fed to the power plant, while others are fed to washery, steel plants, fertilizer etc. For CCL, the despatch has increased from 75.0 MMT in fiscal 2023 to 85.8 MMT in fiscal 2025.

Table 4.15 Coal despatch by different companies (MMT)

Company	2023	2024	2025
BCCL	35.5	39.2	38.3
CCL	75.0	82.9	85.8
MCL	**192.8**	**198.9**	212.0
International Peers	2022	2023	2024
Alpha Metallurgical, USA	16.4	17.1	17.1
Warrior Met Coal, USA	5.1	6.8	7.2

Source: Coal Directory of India, 2024; Monthly Statistical Report- March 2025, Ministry of Coal; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.5.4 Overburden removal

BCCL removed 182.4 Mm3 of overburden in fiscal 2025 which increased from 114.5 Mm3 in fiscal 2023. CCL and MCL removed 118.6 Mm^3 and 337.6 Mm3 of overburden in fiscal 2025.

Table 4.16 Overburden removal (Mm^3)

Company	2023	2024	2025
BCCL	114.5	149.3	182.4
CCL	106.6	121.3	118.8
MCL	229.5	276.5	337.6
International Peers	2022	2023	2024
Alpha Metallurgical, USA	NA	NA	NA
Warrior Met Coal, USA	NA	NA	NA

Source: Coal Directory of India, 2024; Monthly Statistical Report- March 2025, Ministry of Coal; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.5.5 Output per manshift (OMS)

BCCL produced 40.5 MMT of coal in fiscal 2025 at overall OMS (tonne) of 6.5 in fiscal 2025. CCL and MCL achieved OMS of 12.1 and 28.8 respectively in fiscal 2024.

BCCL's OMS is lower compared to its peers, primarily due to a higher strip ratio resulting from the deeper deposits of BCCL which requires a higher amount of overburden removal to extract the same amount of coal.

Table 4.17 Output per manshift

Company	2023	2024	2025
BCCL	3.8	5.9	6.5
CCL	10.2	12.1	NA
MCL	35.4	28.8	NA
International Peers	2022	2023	2024
Alpha Metallurgical, USA	NA	NA	NA
Warrior Met Coal, USA	NA	NA	NA

Source: Coal Directory of India, 2024; Monthly Statistical Report- March 2025, Ministry of Coal; Annual report for Alpha Metallurgical Resources and Warrior Met Coal
Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.5.6 Production of washed coking coal

BCCL is a market leader in coking coal washery capacity in India with a cumulative capacity of 37.4 MTPA (including upcoming washeries) and owned operational capacity of 13.65 MTPA, while CCL has a capacity of 9.4 MTPA in fiscal 2024. BCCL produced 1.65 MMT of washed coking coal in fiscal 2025 which increased from 1.43 MMT in fiscal 2023. CCL produced 0.77 MMT of washed coking coal in fiscal 2025. MCL does not produce washed coking coal

Table 4.18 Washed coking coal production

Company	2023	2024	2025
BCCL	1.43	1.46	1.65
CCL	0.72	0.80	0.77
MCL	-	-	-
International Peers	**2022**	**2023**	**2024**
Alpha Metallurgical, USA	NA	NA	NA
Warrior Met Coal, USA	NA	NA	NA

Source: Coal Directory of India, 2024; Monthly Statistical Report- March 2025, Ministry of Coal; Annual report for Alpha Metallurgical Resources and Warrior Met Coal

Note: In the case of listed international peers, the Financial Year begins on 1st January and ends on 31st December of that particular year. For comparison, the last three completed financial years 2022, 2023 and 2024 all ended on 31st December has been considered

4.6 Key observations

Bharat Coking Coal Limited (BCCL), stands out as the market leader in coking coal production in India, boasting a competitive advantage due to its high-volume coking coal production of 38.9 MMT in fiscal 2025 with a 58.50% domestic market share in coking coal and largest commercial coking coal washing capacity in the country. The company's financial health is robust, with growing revenue numbers and improving profit margins, positioning it for expansion and diversification into new domains.

BCCL has vast resources of coking coal and is the largest domestic producer of coking coal. In addition, the strategic location of BCCL mines in the Jharia coalfield, which is rich in prime coking coal, allows easy access to prime coking coal. The company has majority of coal resources within a radius of 40 km[102]. The majority reserves are primarily free from major geological disturbances. BCCL has a unique advantage of being the only source of prime coking coal in the country along with a favourable geographical location with good rail/road connectivity. In an industry where resource availability is a limiting factor, BCCL's possession of extensive reserves enables BCCL in long term planning and strategic development.

BCCL has also identified few underground mines for reopening through MDO mode on a revenue sharing basis, out of which six mines with a cumulative capacity of 8.4 MTPA have been awarded for operation.

As a debt-free company, it has limited liabilities, providing substantial growth prospects. Looking ahead, BCCL is focused on expansion, adding washery capacity and monetizing old assets to fuel future growth. However, one challenge the company faces is the low per-tonne realization of its coking coal, primarily due to the lower grades of coal produced. BCCL has demonstrated its ability to adapt and implement new technologies, increasing production while ensuring the safety of its personnel. It has also introduced highwall mining technology in fiscal 2024. BCCL uses its expertise in coal mining as a foundation to explore new opportunities in areas like Coal Bed Methane (CBM) and solar energy.

The rapidly growing economy and increasing demand for steel, is expected to push the demand for coking coal in upcoming years which presents an unexhaustive market to be catered by BCCL. According to National Steel Policy 2017, India aims to reach 300 MTPA of crude steel capacity by fiscal 2031 from current crude steel capacity of 180 MMT [103] in fiscal 2024. The production of prime coking coal shall reduce imports, promote Aatmanirbhar Bharat and help in saving foreign exchange.

[102] *Annual Report of BCCL 2024*
[103] *Source: Annual Report, Ministry of Mines*

Key threats and challenges

Although BCCL positions itself as a leader in the coking coal industry, there are certain threats and challenges to BCCL which pose a concern for its growth. BCCL produces lower grade of coking coal which belongs to the washery grade and is unable to be utilized in the steel plants. The reserves of BCCL are deep seated and located in the densely populated district of Jharkhand which is a challenge and causes hindrance in mining activities. The spontaneous heating of mines and continuous fire in the old underground working of Jharia poses a threat to the inhabitants and further lowers productivity. The lack of suitable technology to extract coal reserves from these areas is a major concern for BCCL, limiting its ability to tap into these valuable resources. The ongoing fires also result in significant economic losses and environmental degradation.

The company needs to address these threats and challenges and improve its efficiency to ramp-up production and contribute to the nation's growth.

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