

India Mines and Minerals Conclave 2026

KNOWLEDGE PARTNER – ICRA LIMITED

**Transforming India's Mining sector for
Global Competitiveness**





Table of Contents

01	Domestic mining industry: Historical PSU dominance and changing dynamics	06
02	Mining landscape of eastern and north-eastern India	13
03	Global mining & minerals transformation: Focus on critical minerals	16
04	Regulatory reforms shaping the future of mining in India	23
05	Foreign direct investment trends and mining sector dynamics in India	34
06	Key challenges in India's mining sector: Preparedness of the mining industry	36
07	Strategic reforms in coal sector to increase India's self-sufficiency	45
08	Sustainability in mining: Balancing growth with environmental stewardship	49
09	Conclusion	53

Foreword

Mr Sanjiv Ganeriwala

Chairman, ASSOCHAM Mining Council - East



Mining is indisputably one of India's core sectors and a critical enabler of the nation's economic ambitions – providing essential raw materials for infrastructure, power, steel, cement, and manufacturing. Indeed India's vast natural resource endowment, spanning 95 minerals from coal and iron ore to bauxite and rare earths, positions our country to become an important player in global mineral supply chains, particularly as the world pivots to cleaner energy and advanced technologies. Today, India's mining industry has reached a pivotal moment of transformation, driven by collective commitment to innovation, resilience, and self-reliance.

The last decade has seen a series of forward-looking policy reforms that are reshaping India's mining landscape. Landmark measures – from transitioning to transparent auction-based allocations in 2015 to the launch of commercial coal mining in 2020 – have increased fairness and competition in the sector. These steps, alongside further amendments to the Mines and Minerals (Development and Regulation) Act and supportive initiatives under the Government's Atmanirbhar Bharat mission, are enhancing policy clarity and encouraging greater private participation. One tangible outcome is improved investor confidence, as seen in the hundreds of mining blocks successfully auctioned to date, and a renewed interest in India's mineral potential. The coal sector is witnessing record domestic output, moving India closer to energy self-sufficiency and reducing thermal coal imports. Equally significant is the strategic focus on critical minerals – such as lithium, cobalt, and nickel – which are vital for renewable energy systems and electric mobility and key to India's future resilience amid the global energy transition.

Even as momentum builds, we recognise that realising the sector's full potential requires continued collaboration and decisive action across all stakeholders. There is an urgent need to accelerate on-ground execution, including streamlined regulatory clearances, faster land acquisition and environmental approvals, and timely development of mining infrastructure. Compared to international best practices – where mining permits often come through in mere months – mine development in India can still be protracted, sometimes taking 4–5 years for approvals. Industry and government must work together to shorten these timelines, enhance transportation and logistics networks, and upgrade exploration and mining technology to boost efficiency and productivity. The sector's long-term success rests on earning a social licence to operate through responsible mining – embracing ESG best practices, safeguarding the environment, and ensuring local communities tangibly benefit from mineral development.

With a shared vision and partnership between industry and government, India's mining sector can enter a new era of global competitiveness, resilience, and self-reliance. The prospects ahead – higher domestic output, improved ease of doing business, increased foreign investments, and integration into global critical mineral value chains – are truly promising. ASSOCHAM remains committed to facilitating dialogue and collaboration among policymakers, industry leaders, and investors to overcome challenges and realise this vision. We are confident that the insights captured in this report will help catalyse the concerted efforts needed to unlock India's vast mineral potential, secure our resource needs, and drive sustainable growth for decades to come.

Foreword

Mr Girishkumar Kadam

Senior Vice-President and Group Head

ICRA Limited



India's mining industry stands at an inflection point, moving from decades of public-sector dominance into a new era of private participation, innovation, and sustainable growth. Mining has long been the backbone of our country's core industries – powering the electricity sector, steel, cement, and others – yet its contribution to GDP remains modest at around 2–2.5%, markedly lower than peer resource economies. This underscores both the sector's untapped potential and the urgency of transformation.

Encouragingly, significant reforms and regulatory changes in recent years are beginning to unlock latent capacity and boost private investment. The Government of India's move to transparent auction-based mineral allocations and the opening of commercial coal mining in 2020 have started to dismantle historic structural constraints, inviting new domestic and foreign entrants. Public sector units (PSUs) still account for roughly three-quarters of India's mineral output, led by Coal India Limited's near-monopoly in coal; but private and captive miners are gradually expanding their footprint, particularly in coal following the auctions. Together with record-high coal production – surpassing one billion tonnes in the past year – this shift has improved energy self-sufficiency by containing thermal coal import dependence to near 20% of consumption. The report also highlights how India is proactively exploring non-traditional resources (e.g. lithium, nickel, cobalt) to reduce reliance on imported critical minerals, vital for the global energy transition and future economic resilience.

While the trajectory is positive, the sector continues to face formidable challenges that require urgent attention. Cumbersome mine approvals, protracted land acquisition and environmental clearances can still span four years or more, delaying projects and raising execution risks. Limited transport infrastructure and logistical bottlenecks – such as heavy dependence on costly road freight – hinder efficiency, keeping operating costs high and eroding competitiveness. These structural bottlenecks not only constrain output but can also affect the industry's risk profile and investor confidence. From a credit perspective, smoother regulatory processes, better infrastructure, and prudent risk management are essential to attract investment and improve the sector's financial robustness. Equally, sustainability has become integral, with policymakers and mining firms focusing on mining's environmental and social impact. Initiatives like star-rating mine standards and adoption of cleaner, low-carbon technologies signal a commitment to aligning growth with ESG principles for long-term viability.

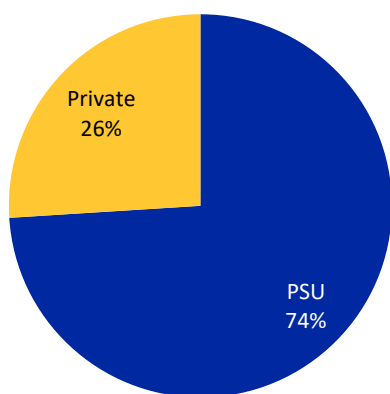
Looking ahead, India's mining sector is poised for greater global relevance and self-reliance. By addressing execution challenges and continuing reforms to capitalise on its vast mineral endowment, India can unlock high growth in mining – boosting its GDP contribution, supporting energy security, and solidifying its role in the evolving critical minerals landscape. As a result, the sector can emerge not only as a cornerstone of the nation's sustainable economic development but also as a creditworthy, future-ready pillar of India's industrial progress.

Domestic Mining Industry: Historical PSU dominance and changing dynamics

India's mining sector plays a critical role in supporting core industries such as power, steel, cement, fertilisers, and non ferrous metals. Structurally, the sector has been dominated by public sector enterprises, which account for roughly three quarters of the total value of mineral production. Coal India Limited occupies a near monopoly position in coal mining, while other public sector units (PSUs) play a significant role in iron ore, bauxite, aluminium, and copper. Private sector participation, though increasing, remains fragmented and concentrated

in select minerals and regions. These private miners face significant challenges – including limited access to financing, complex regulations, and inadequate transportation infrastructure – which constrain their growth and operational scale. There are signs of change, however, as captive mining (mines operated by companies for their own use) and private commercial coal mining in the coal sector expand, and are expected to boost private coal output in the future.

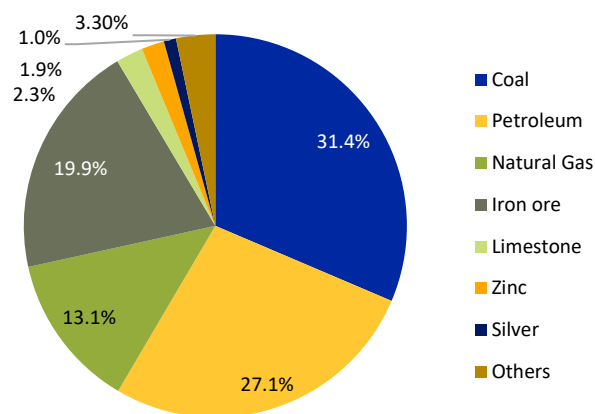
Exhibit 1: Value of mineral production – PSUs v/s private firms



Source: ICRA Research

Coal remains the single largest contributor to the value of mineral production, reflecting India's continued reliance on coal for electricity generation and industrial use. Iron ore, limestone, bauxite, and lignite together form the backbone of bulk mineral production, while non ferrous metals such as aluminium, zinc, and copper are increasingly important for manufacturing and infrastructure.

Exhibit 2: Mineral-wise value of production



Source: Ministry of Mines, ICRA Research; Figures for FY2025

These rankings establish India as a significant global producer of bulk and base minerals, though it has minimal presence in high-value energy transition minerals such as lithium, cobalt, and rare earth elements. India's reliance on imports for most critical minerals creates supply risks for its green energy targets.

Exhibit 3: India's share and rank in global production of major minerals

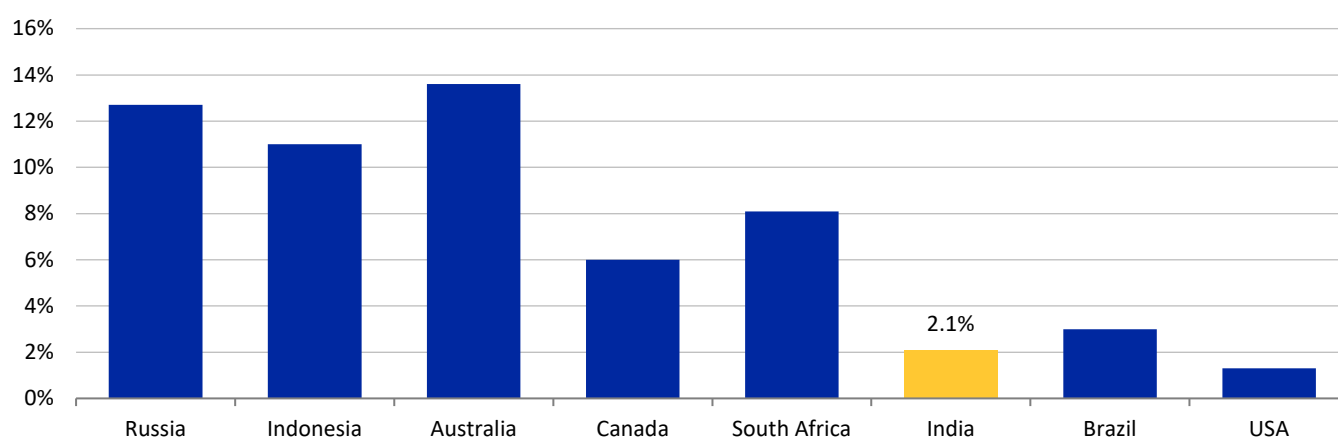
	Share of world production (%) (2023)	Global rank (2023)	Order of self-sufficiency (2025)
Bauxite	5.75%	6th	90.0%
Zinc	5.75%	3rd	94.0%
Iron ore	11.05%	3rd	100.0%
Copper	1.84%	10th	35.0%
Coal	11.13%	2nd	84.0%
Chromite	8.39%	3rd	92.0%

Source: Ministry of Mines, ICRA Research

The mining and quarrying sector's contribution to India's GDP remains relatively modest at approximately 2.2–2.5% as of fiscal year 2023, considerably lower than other major mining economies. For comparison, mining contributes 12% to the gross domestic product (GDP) in Russia, 11%

in Indonesia, 13.6% in Australia, 6% in Canada, 8.1% in South Africa, 3% in Brazil, and 1.3% in the US. This gap highlights the limited economic footprint of India's mining sector and its weak integration with global resource value chains.

Exhibit 4: Contribution of the mining industry to the GDP of various countries



Source: ICRA Research; India's data is for FY2023; data for other countries indicates latest available year

The economic contribution of mining to India's GDP has declined over the past decade, reflecting both cyclical factors and structural inefficiencies. Low exploration intensity, long approval timelines,

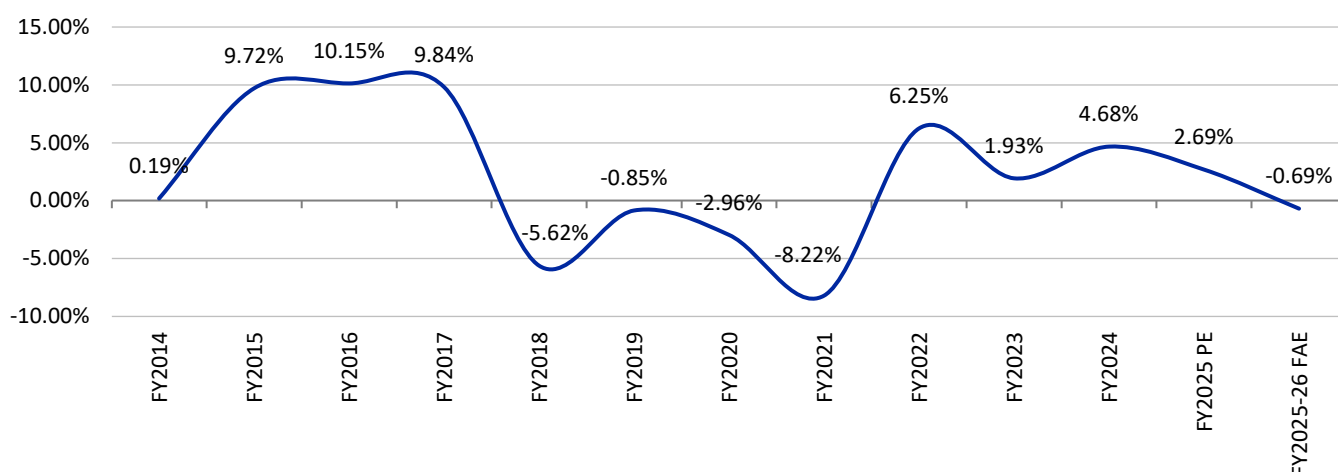
infrastructure constraints, and limited value addition have constrained output growth relative to the broader economy. Addressing these structural issues is central to unlocking the sector's full potential.

Mining sector's GVA growth

The mining sector's contribution to gross value added (GVA) has been on a gradual decline. During FY2015–FY2017, the sector demonstrated strong performance with year-on-year GVA growth reaching approximately **10%**. This momentum weakened subsequently, with contractions in FY2018 and FY2019 driven by macroeconomic challenges,

stagnant investment, regulatory obstacles, and weak commodity prices. The mining sector's share in India's GVA has fallen steadily — from around **3.2% in FY2012** to approximately **-0.7% by FY2026** (First Advance Estimate). This persistent decline, despite policy interventions, underscores the structural challenges the sector confronts.

Exhibit 5: Trend in India's mining sector YoY GVA growth



Source: Ministry of Statistics and Program Implementation (MoSPI); ICRA Research; FAE: First Advance Estimate

The Government's National Mineral Policy 2019 set an ambitious target of increasing domestic mineral production value and volume by 200% over seven years (targeting FY2026), implying a required compound annual growth rate (CAGR) of approximately 10.4%, substantially higher than the

historical performance. The Covid-19 pandemic further disrupted operations, causing consecutive contractions in FY2020 and FY2021. While FY2022 showed recovery, growth rates subsequently decelerated.

Opening of the coal mining sector for private sector participation likely to benefit the mining industry and raise its GDP share in coming decades

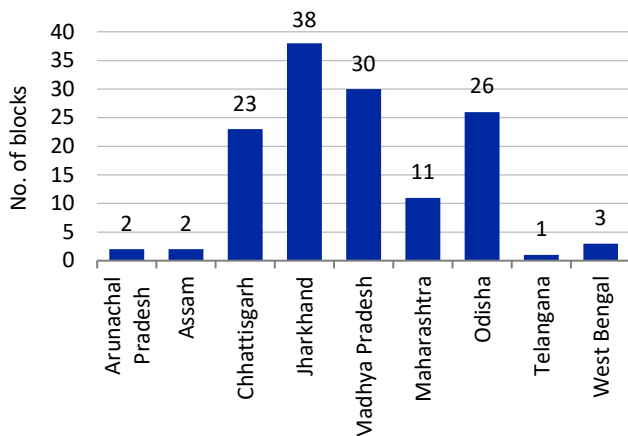
India's coal sector has transitioned from captive allocation to a competitive auction-based framework, enabling commercial mining in the country. Key reforms such as Mineral Laws (Amendment) Ordinance, 2020, removal of end-use restrictions

and introduction of revenue-sharing auctions linked to the National Coal Index have enabled market-driven participation. Since June 2020, about 136 coal blocks have been auctioned in the commercial coal mine route.

Private participation in coal block auctions has been moderate with an average bid success rate of 25%, reflecting selective bidding based on block quality and market conditions. However, the exploration profile of the auctioned mines remains supportive,

with nearly 62% classified as G1 category mines (explored) and around 26% as G2 category mines (partly explored), indicating stronger reserve visibility and relatively low development risks.

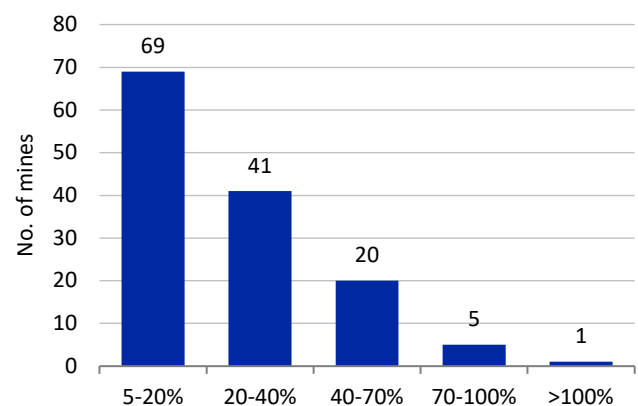
Exhibit 6: State-wise coal blocks auctioned



Source: Metal Scrap Trade Corporation Limited (MSTC), ICRA Research, Ministry of Coal

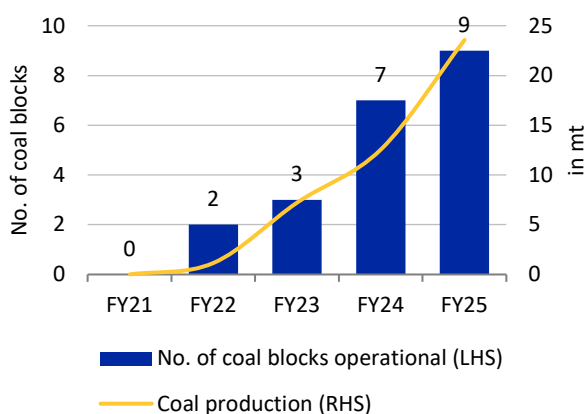
Of the 136 commercial coal mines auctioned so far, majority are located in mineral-rich states such as Chhattisgarh, Jharkhand, Odisha and Madhya Pradesh, which account for almost 78% of India's coal reserves. The state-wise distribution indicates that the auctions have largely focused on established coal-bearing regions with existing mining infrastructure

Exhibit 7: Revenue sharing (%) of auctioned mines



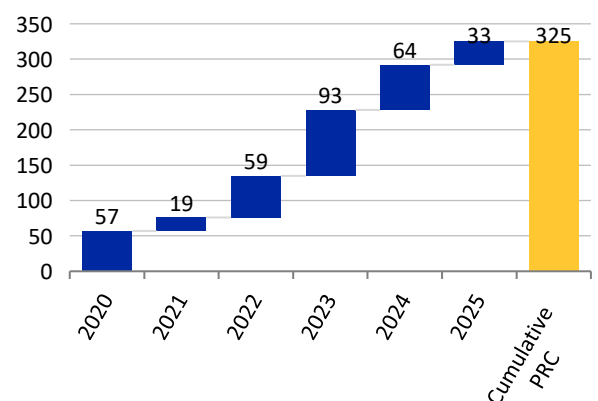
support. Bids for the commercial coal auctions have remained reasonable. Around 69 mines were bid at revenue sharing below 20%, and 41 mines between 20% and 40%. The overall bidding pattern suggests disciplined participation, with revenue sharing commitments aligned with project viability to a large extent.

Exhibit 8: Trend in operational coal blocks



Source: MSTC, ICRA Research; Coal Directory

Exhibit 9: Year-wise peak-rated capacity of mines auctioned (million MT)



Source: MSTC, ICRA Research; Coal Directory

Given the long coal mine development cycle of 4-5 years and challenges related to land acquisition and receipt of statutory approvals, production from the auctioned mines remains limited. However, the growth rate ramped up sharply during FY2024 and FY2025 as more mines became operational. Despite

the current low production levels, the cumulative peak-rated capacity of all auctioned mines is estimated at 325 million tonnes per annum. Once operationalised in phases over the next 3-4 years, this capacity is expected to contribute to India's domestic coal production.

Exhibit 10: Trend in miner-wise production growth (%)

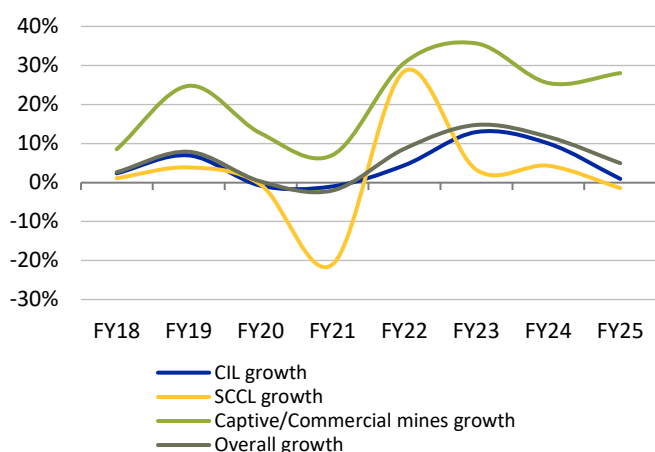
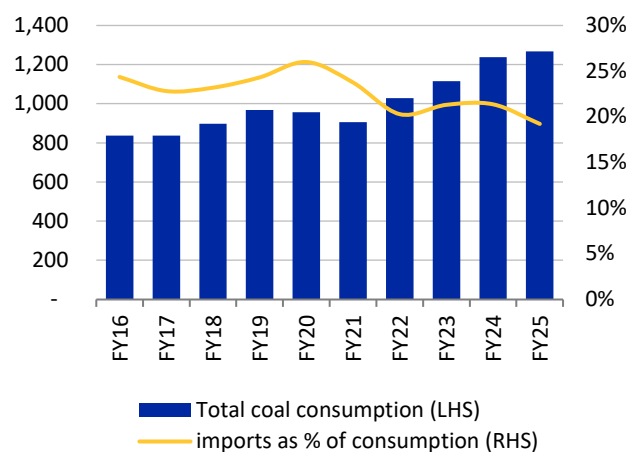


Exhibit 11: Trend in coal consumption and import dependency



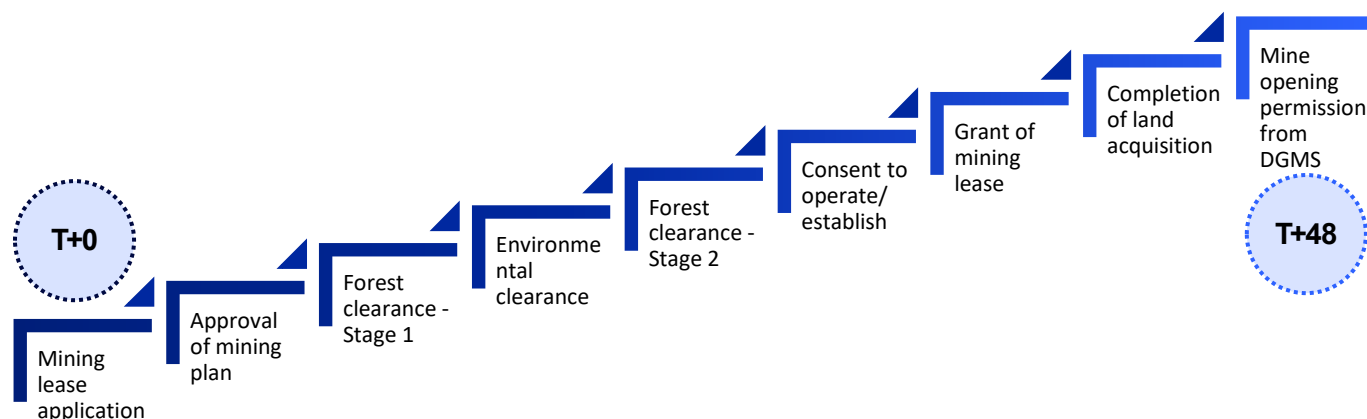
Source: Ministry of Coal, ICRA Research, MoSPI; CIL: Coal India Limited; SCCL: Singareni Collieries Company Limited

India's coal production is largely driven by three sources – Coal India Limited (CIL), Singareni Collieries Company Limited (SCCL) and captive/commercial miners. While CIL's production has grown at a modest pace of about 4% during FY2017-FY2025, captive/commercial mines have grown at a healthy CAGR of around 21%. With domestic coal consumption rising sharply – to almost 1,267 million tonnes in FY2025

from about 837 million tonnes in FY2016 – supported by higher demand from the power, steel and cement sectors, the strong coal output growth from captive and commercial mines has helped contain the rise in coal import dependence. In addition, with continued higher growth in commercial coal mining, the same is expected to further result in healthy domestic coal production and lower import requirements.

Timely regulatory clearances and land acquisition remain key for success of private commercial coal mining

Exhibit 12: Stages of regulatory approvals before starting coal mining operations

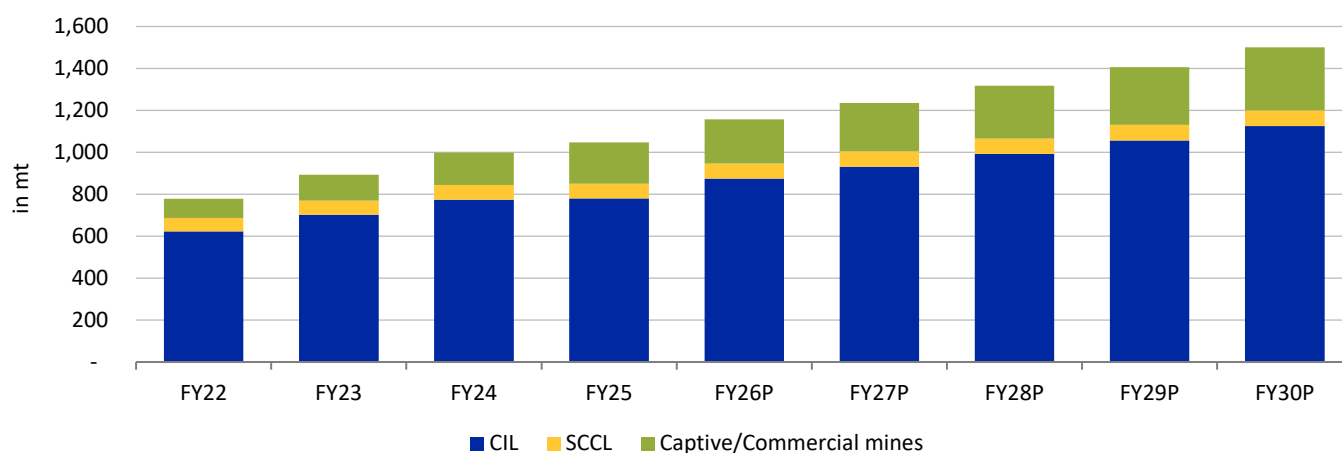


Source: ICRA Research

The typical time to secure regulatory clearances and land acquisition in a coal mining project in India stands at around 48 months, considerably higher than 6-12 months required in most other leading coal producing countries. This could increase further in case of coal projects with a high degree of surface constraints, such as proximity to reserve forests and densely populated villages/towns or overlapping areas with critical infrastructure assets like railway/power transmission lines. With a large greenfield

coal project requiring around 3-5 years to achieve its peak rated capacity, the gestation period for a coal project in India to realise its full potential stands at 7-9 years. Streamlining the mine approval process through greater coordination between the various Central and the state authorities, and facilitating land acquisition as per applicable laws, would remain a critical factor for the success of commercial coal mining in the country.

Exhibit 13: Projected trend in coal production for CIL and captive/commercial mining



Source: Ministry of Coal, ICRA Research

The Government of India (GoI) continues to expand the commercial coal mining pipeline through successive auction rounds, with the latest round (14th tranche) offering 41 mines across key coal-bearing states. The tranche includes around 5.3 billion tonnes of resources and about 35 MTPA of peak annual capacity (only from explored blocks), supporting incremental domestic coal supply over the medium term.

Nonetheless, commercial coal production is expected to grow, which is likely to drive incremental coal production, going forward. Of India's overall coal production, the captive and commercial coal mine segments are expected to see significant growth (CAGR of 9-10%) compared to the industry CAGR of about 6%, highlighting the increasing role of commercial coal mining in supporting India's incremental coal supply.

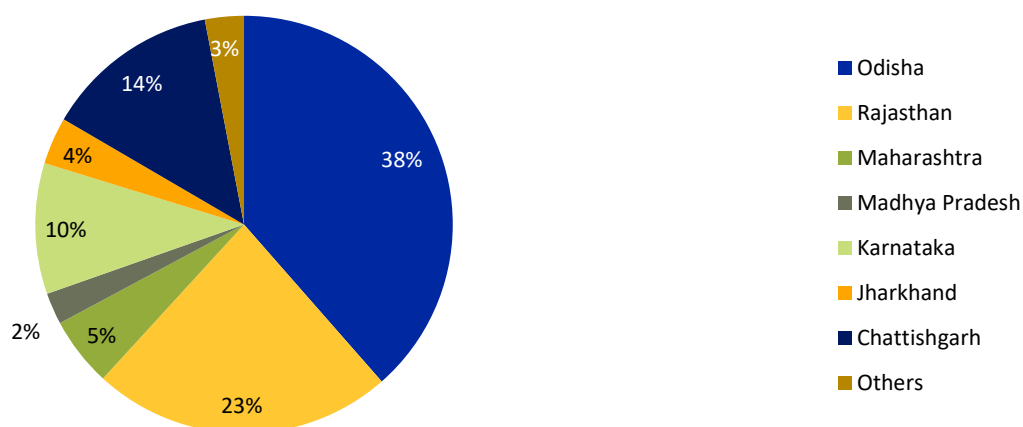


Mining landscape of eastern and northeastern India

As discussed above, amid the sharp regional divergence in mineral production in the country, eastern India emerges as the dominant mining powerhouse. Odisha, Jharkhand, Chhattisgarh, and West Bengal have played pivotal roles in shaping this trend, while northeastern states like Assam and

Arunachal Pradesh have been gradually stepping into focus. These regions together form the mineral-rich eastern belt of India, responsible for a lion's share of the country's coal, iron ore, bauxite, and chromite output.

Exhibit 14: State-wise share of mineral production value in FY2026 (excl. fuel, atomic & minor minerals)

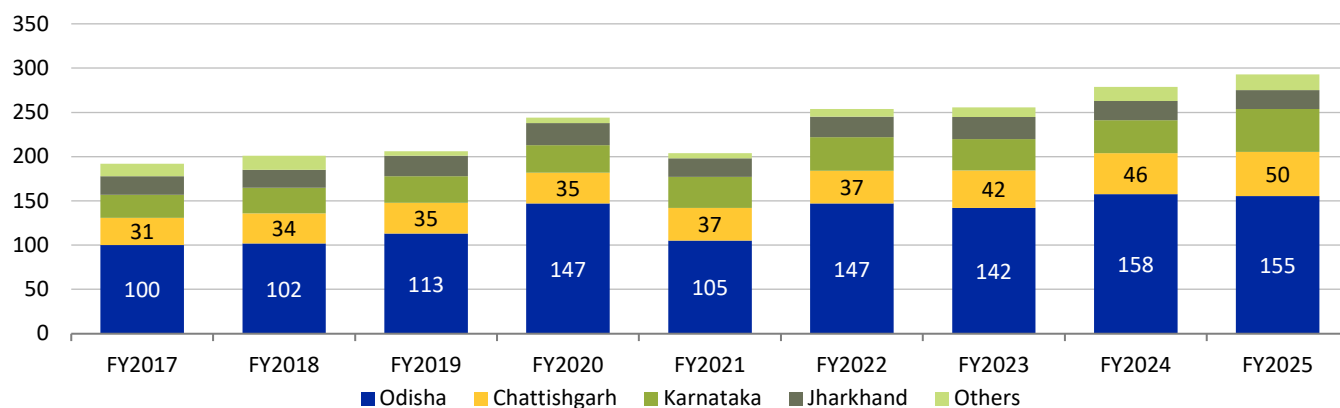


Source: Indian Bureau of Mines (IBM), ICRA Research

As per Ministry of Mines, Odisha alone contributed over 38% of the national mineral production value in FY2026 (excluding hydrocarbons, atomic minerals and fuel), followed by Chhattisgarh (13%) and Rajasthan (23%). Jharkhand contributes about 4% of the total value. Notably, Odisha has consistently maintained leadership due to its rich deposits of iron ore, bauxite, chromite, and coal. Jharkhand, meanwhile, holds

significant coal reserves and ranks among the top iron ore producers in the country, while Chhattisgarh is known for both coal and iron ore. These three states have not only shown consistency in output but also experienced accelerated production growth over the last few years, supported by proactive mineral policy reforms and faster auctioning of mineral blocks.

Exhibit 15: Trend in state-wise iron ore production in India (million MT)

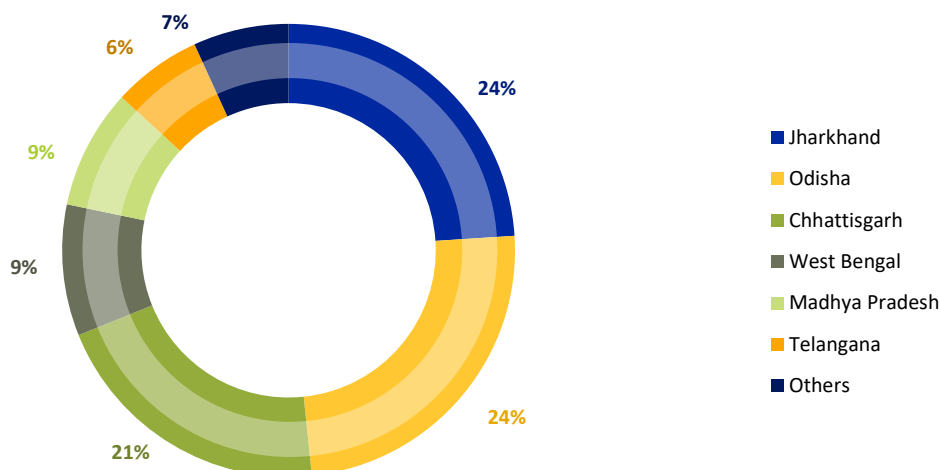


Source: Indian Bureau of Mines, ICRA Research

In **iron ore** production, eastern India continues to dominate the national landscape. Odisha, Jharkhand and Chhattisgarh collectively account for most of India's output, with Odisha alone generating over 53% in FY2025, producing approximately 155 million tonnes. Jharkhand and Chhattisgarh also maintain strong output, supported by vast reserves in the

Singhbhum and Bailadila regions, respectively. These states benefit from well-established rail corridors connecting mineral belts to industrial hubs and export ports, enabling efficient evacuation and logistics. Northeastern states, however, have limited iron ore resources and play a minimal role in this segment.

Exhibit 16: Share of leading states in India's coal resources

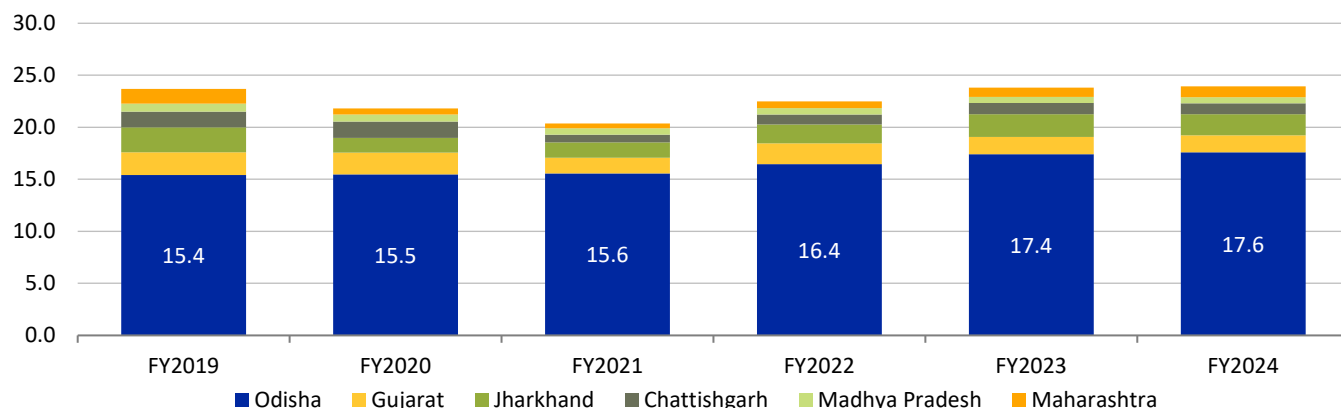


Source: IBM, ICRA Research; Coal reserves as on Apr 1, 2022

In the case of **coal**, eastern India again leads, with Jharkhand and Odisha occupying the top two positions nationally. In FY2024-FY2025, Odisha produced around 269 million tonnes of coal – roughly 26% of the national output of 1,047 MT. Jharkhand and Chhattisgarh closely follow with significant

coalfields and huge coal resources. Assam has begun modest contributions to coal mining in India, with key reserves in Ledo and Margherita. However, coal production in the North East remains constrained by ecological concerns and infrastructural challenges.

Exhibit 17: Trend in state-wise bauxite production in India (million MT)



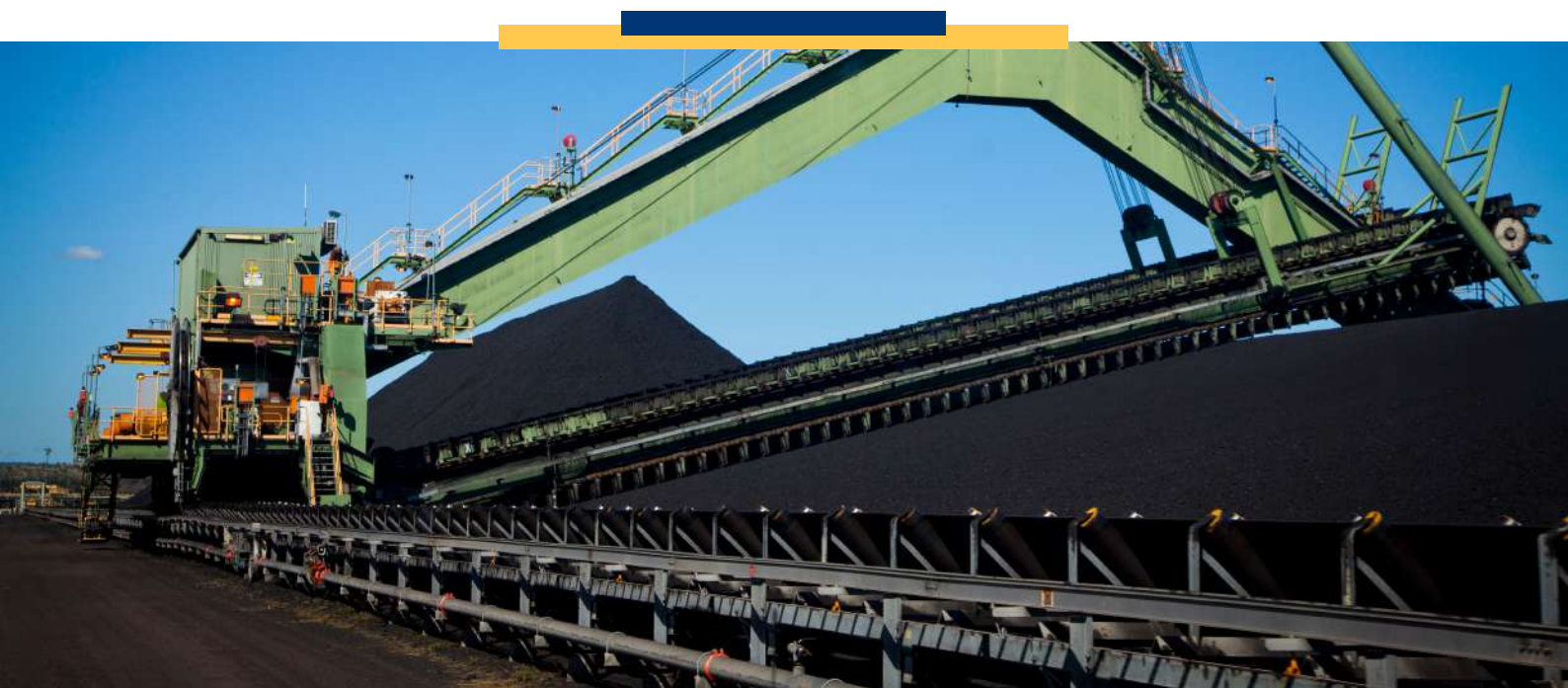
Source: Odisha Department of Steel & Mines, ICRA Research

In **bauxite**, Odisha again leads the country, producing 17.6 million tonnes in FY2024, which accounts for nearly 73% of India's total bauxite output. However, other eastern states like Chhattisgarh also possess substantial bauxite reserves and have witnessed rising production in recent years. These deposits are critical for supporting India's aluminium industry. Northeastern states have limited bauxite resources and are not significant contributors to this mineral.

Regarding **chromite**, eastern India – specifically Odisha – dominates entirely, holding 96% of India's chromite reserves and contributing 100% to its production. Most of this output comes from the Sukinda Valley, with production led by companies such as Odisha Mining Corporation (OMC) and Tata Steel Mining. Chromite resources in other eastern

and northeastern states are negligible, making Odisha the single critical node for this strategic mineral.

In contrast, the mining output from western and southern India is relatively modest and skewed towards non-ferrous minerals. Karnataka, for instance, is a major iron ore producer but has stricter mining regulations due to environmental sensitivities and judicial restrictions. Gujarat and Maharashtra contribute primarily to lignite and bauxite production, while Rajasthan dominates in non-metallic minerals such as limestone, potash, and rock phosphate. Northern India, barring pockets of coal-bearing zones in Uttar Pradesh, plays a limited role in mineral production.

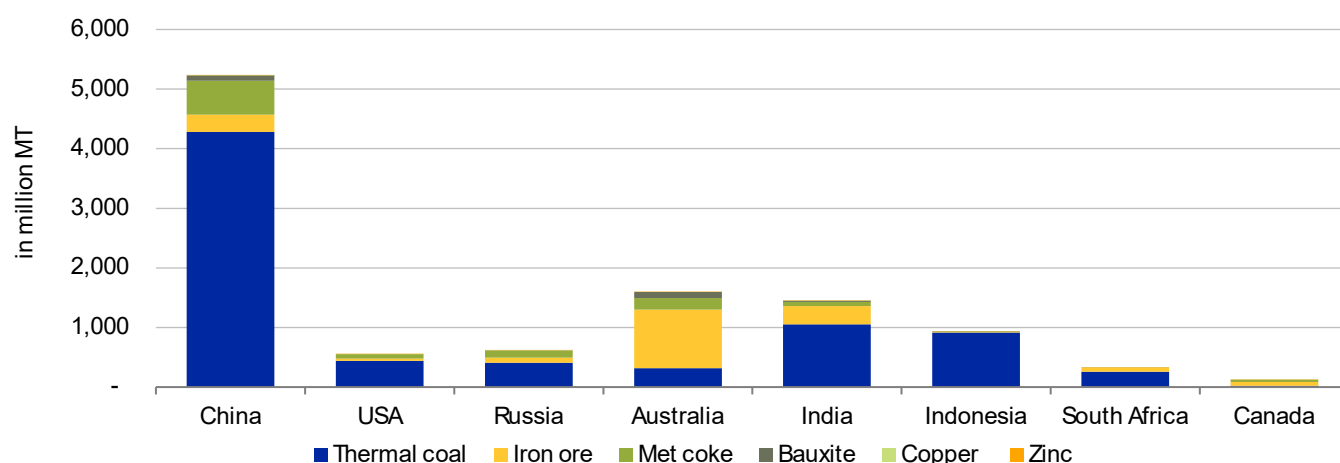


Global mining & minerals transformation: Focus on critical minerals

The global mining industry serves as the foundational supplier of raw materials for construction, manufacturing, energy, agriculture, and high-technology sectors. Over the past four decades, global mined output has more than doubled, rising from approximately 9.6 billion MT in 1985 to 20.0 billion MT in 2024, reflecting structural trends such as rapid industrialisation in emerging markets, sustained infrastructure development, and rising demand for mineral inputs across economies. This long-term expansion trajectory underscores the sector's resilience and its linkage to fundamental macroeconomic drivers.

The industry is, however, inherently cyclical, with profitability closely linked to commodity price movements, cost inflation, and capital discipline. Also, mineral production and processing are highly concentrated geographically, creating strategic vulnerabilities that are reshaping global supply chains. China is responsible for more than 50% of production of 18 minerals and has greater-than-10% concentration of reserves for a further 35 minerals.

Exhibit 18: Country-wise major mineral production in CY2024 (million MT)



Source: US Geological Survey, ICRA Research

From a global production standpoint, China remains the dominant supplier of thermal coal, with output estimated at approximately 4.3 billion tonnes in 2024, far surpassing any other producing nation. India, the second largest producer, mined around 1.05 billion tonnes during the year, while Indonesia

followed closely with production of about 0.91 billion tonnes. Together, these three countries underscore Asia's central role in the global coal market. More broadly, Asian economies such as India, Indonesia, and Russia are also major contributors to regional mining output across a wide range of commodities.

Outside Asia, North America and Oceania continue to be structurally important mining regions, characterised by diversified mineral portfolios and relatively mature regulatory and infrastructure frameworks. The US, Canada, and Australia collectively extract a broad spectrum of minerals spanning precious metals, base metals, and industrial minerals. Australia, in particular, is a cornerstone supplier in global bulk commodities, producing roughly 980 million tonnes of iron ore in 2024 and about 97 million tonnes of Bauxite.

South America represents another critical mining geography, with countries such as Chile, Peru, Brazil, and Argentina hosting substantial reserves and production capacity for strategically important

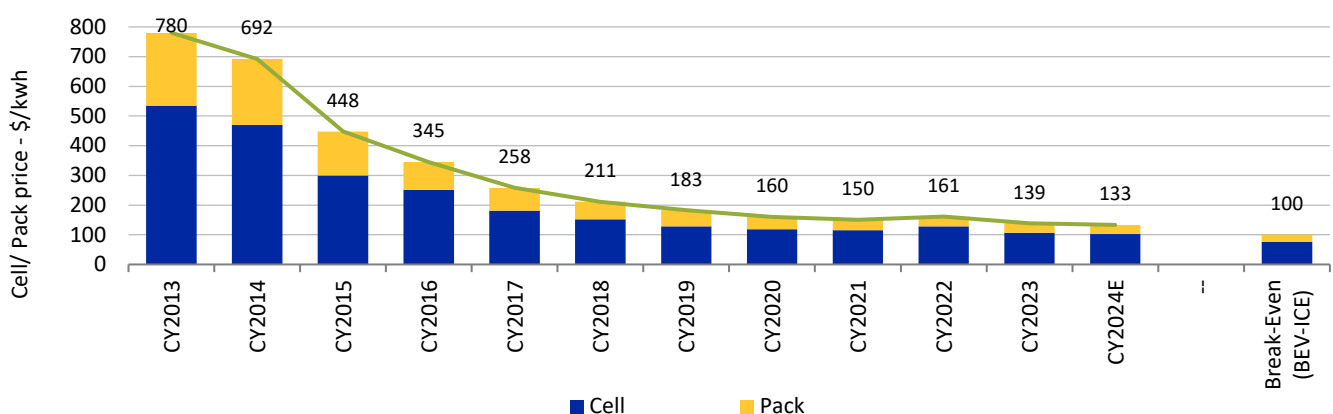
minerals, notably copper, lithium, and silver. These resources position the region as a key beneficiary of energy transition led demand growth. Africa, while contributing a comparatively smaller share of global mining volumes in aggregate, remains indispensable for specific high value and strategically sensitive minerals. The Democratic Republic of the Congo (DR Congo) supplies over 70% of global cobalt, making it central to battery supply chains, while South Africa is the world's leading source of platinum group metals. Taken together, these regional dynamics highlight the highly concentrated and specialised nature of global mineral markets, where a limited number of countries exert outsized influence over individual commodities – an important consideration from a supply security, pricing, and credit risk perspective.

Energy transition and structural demand shift

The global shift toward decarbonisation is driving extraordinary growth in demand for energy transition materials. Although these critical minerals currently represent only about 3.2% of global mined volume (as of 2022), demand for critical minerals experienced strong growth in 2023, with lithium demand rising by 30%, while demand for nickel, cobalt, graphite, and rare earth elements all saw 8–15% increases. Clean energy applications have become the main driver of demand growth for a range of critical minerals.

Technological advancements and economies of scale have played a pivotal role in driving down the costs of green energy technologies. Over the past decade, the cost of lithium-ion batteries (LIBs) has plummeted by more than 80%, decreasing from \$780/kWh in 2013 to an estimated \$133/kWh by 2024. This remarkable cost reduction, led predominantly by China's dominant role in battery manufacturing and supply chain optimisation, has been a critical factor in the rapid global adoption of renewable energy sources and electric vehicles (EVs).

Exhibit 19: Trend in lithium-ion battery (LIB) prices

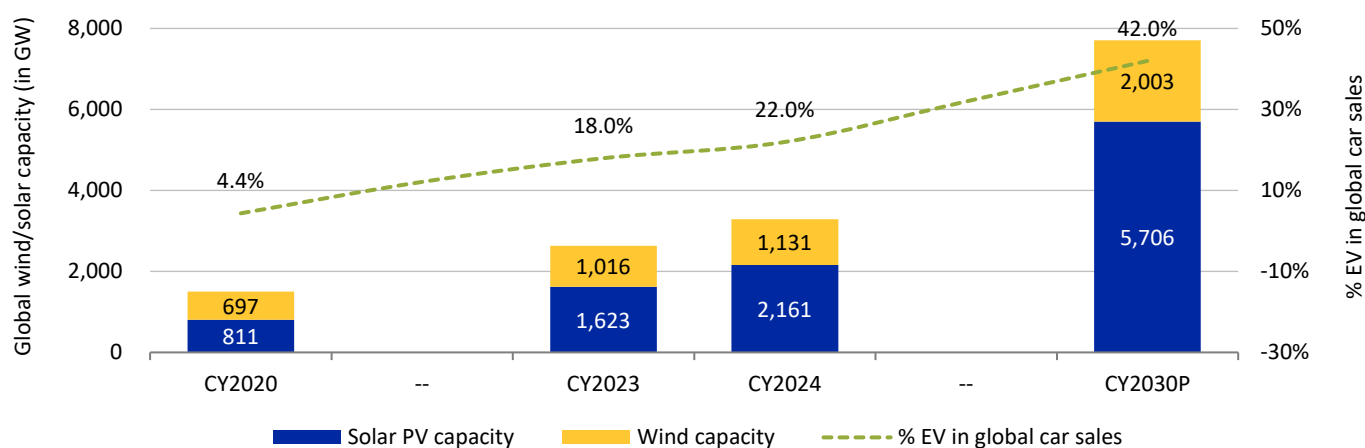


Source: Bloomberg New Energy Finance, ICRA Research; LIB price of \$100/kWh is widely considered to be the sweet spot when EVs reach cost-parity with ICE vehicles

The scale of this change is clear from the latest International Energy Agency (IEA) forecasts, which project that by 2030, global installed capacity for renewable energy (RE), including wind and solar,

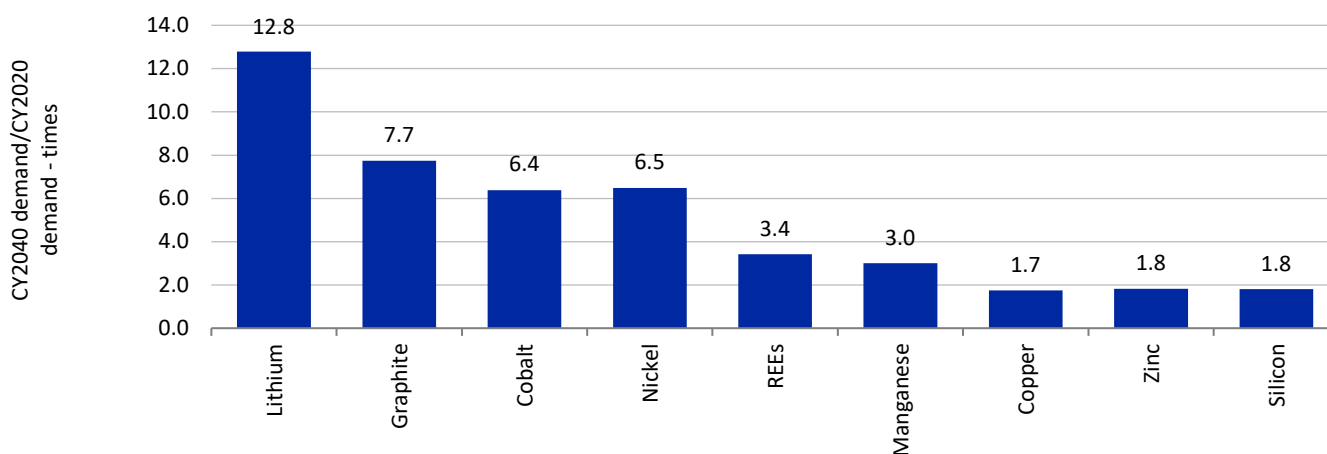
will reach 2.9 times the 2023 levels. At the same time, the share of EVs in global car sales has grown substantially, reaching 22% in 2024, with further growth expected to reach 42% by 2030.

Exhibit 20: Trend in adoption of renewable energy and EVs (IEA forecasts)



Source: International Energy Agency (IEA), ICRA Research

Exhibit 21: IEA's CY2040 demand of critical minerals (in STEPS) represented as number of times of CY2020 demand



Source: IEA, ICRA Research; STEPS: Stated Policy Scenario takes into account relevant policies and implementation measures adopted by countries as of the end of August 2023, together with relevant policy proposals

This shift towards green technologies is creating an unprecedented demand surge for critical minerals. As the energy transition accelerates, key minerals such as lithium, cobalt, nickel, copper, and rare earth

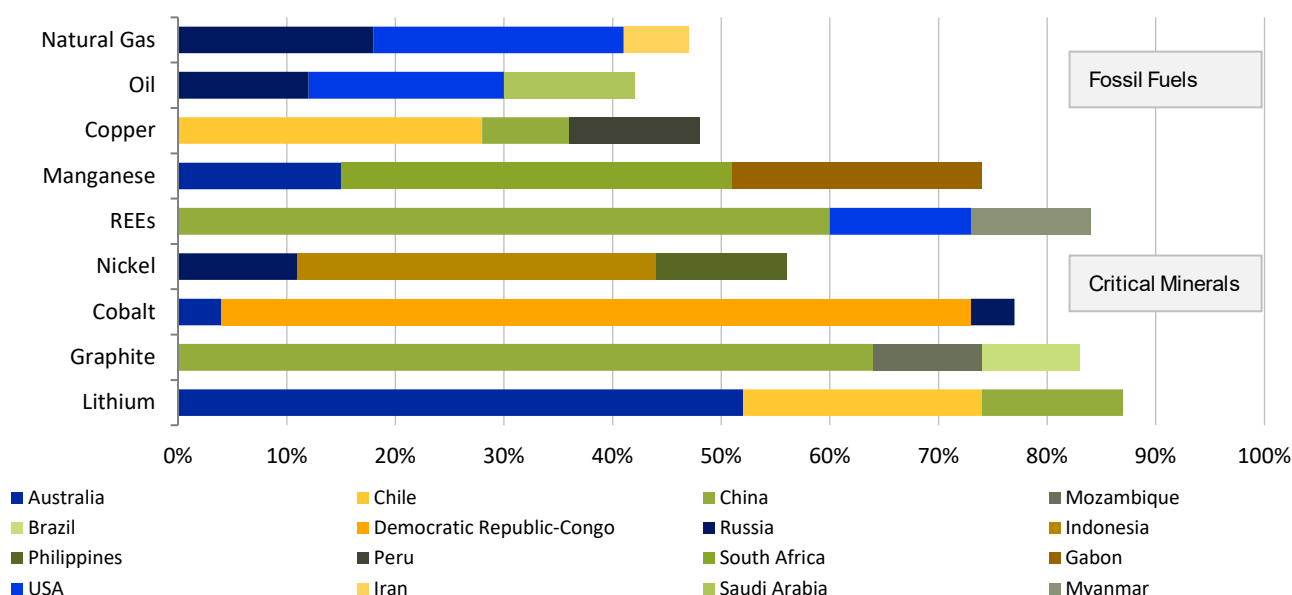
elements will see a sharp increase in consumption, driven by their essential roles in battery production, renewable energy infrastructure, and other low-carbon technologies.

Estimates suggest that demand for some of these critical minerals could multiply several times over current levels, placing immense pressure on supply chains and amplifying the strategic importance of securing reliable, diversified sources of these materials.

However, the production of key energy transition minerals exhibits a higher level of concentration compared to oil and natural gas. For lithium, cobalt, and rare earth elements, more than three-quarters of the global output is controlled by the top three producing nations, with some minerals seeing a single country contributing nearly half of

the global supply. In 2019, DR Congo accounted for approximately 70% of global cobalt production, while China was responsible for 60% of rare earth element output. The high degree of concentration, coupled with complex and interdependent supply chains, heightens the risk of disruptions from geopolitical tensions, trade restrictions, or regulatory changes in major producing regions. As the global energy transition accelerates, securing diversified and resilient supply chains will be critical in mitigating these risks and ensuring stable access to the minerals essential for sustainable energy technologies.

Exhibit 22: Share of top producing countries in extraction of selected minerals and fossil fuels, 2019



Source: IEA, ICRA Research; REE: Rare-Earth Elements

India's critical minerals scenario: Navigating the present

India's demand for critical minerals is increasing rapidly, driven by its targets for renewable energy expansion, electric vehicle adoption, and the overall growth of high-technology industries. However, India is heavily dependent on imports for most of its critical

minerals. Despite having some reserves of graphite, bauxite, and rare earth elements, the country relies on imports for key minerals like lithium, cobalt, and nickel, which are essential for battery production and clean energy technologies.

Most of India's lithium and cobalt imports come from Australia, Latin America, and Africa, while China dominates the supply of processed rare earth elements and graphite. This high dependency on imports exposes India to supply chain risks and price volatility in global markets, particularly as demand for these minerals intensifies worldwide.

As India scales up its clean energy plans, securing a stable supply of critical minerals through strategic partnerships, domestic exploration, and investment in mineral processing infrastructure will be essential to meeting future demand and reducing import dependency.

Exhibit 23: India's import dependence on key critical minerals

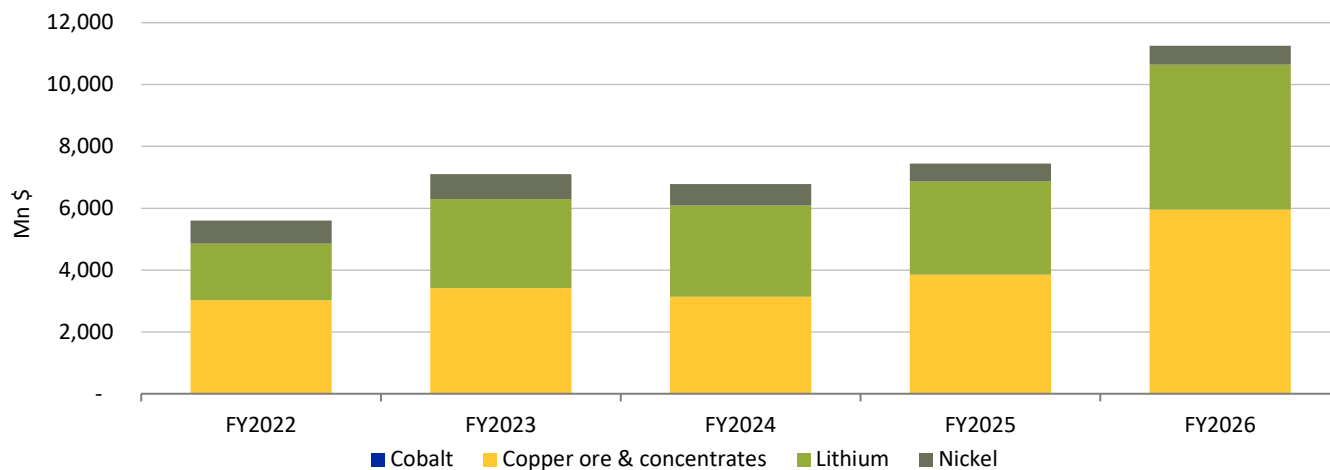
Sl. No.	Critical mineral	%age (2020)	Major import sources (2020)
1	Lithium	100%	Chile, Russia, China, Ireland, Belgium
2	Cobalt	100%	China, Belgium, Netherlands, USA, Japan
3	Nickel	100%	Sweden, China, Indonesia, Japan, Philippines
4	Vanadium	100%	Kuwait, Germany, S. Africa, Brazil, Thailand
5	Niobium	100%	Brazil, Australia, Canada, S. Africa, Indonesia
6	Germanium	100%	China, S. Africa, Australia, France, USA
7	Rhenium	100%	Russia, UK, Netherlands, S. Africa, China
8	Beryllium	100%	Russia, UK, Netherlands, S. Africa, China
9	Tantalum	100%	S. Africa, Australia, Indonesia, Malaysia, USA
10	Strontium	100%	China, USA, Russia, Estonia, Slovenia
11	Zirconium	80%	S. Africa, Australia, Indonesia, Malaysia, USA
12	Graphite	60%	China, Madagascar, Mozambique, Vietnam, Tanzania
13	Manganese	50%	S. Africa, Gabon, Australia, Brazil, China
14	Chromium	2.50%	S. Africa, Mozambique, Oman, Switzerland, Turkey
15	Silicon	<1%	China, Malaysia, Norway, Bhutan, Netherlands

Source: Ministry of Mines, ICRA Research

Of India's list of 30 identified critical minerals, most of the elements have been found to occur naturally, with the possibility of extracting copper ore as a by-product from the processing of copper concentrate. Therefore, copper is believed to be the glue connecting various critical minerals. However, India is mostly import-dependent on meeting its requirement of virgin copper ore and

concentrates, with domestic supplies meeting only 5% of the requirement. However, in the years to come, domestic non-ferrous metal manufacturing companies like Hindustan Copper, Vedanta, and Hindalco are expected to play an increasing role in ensuring the extraction of some of these critical minerals as a by-product of refined copper.

Exhibit 24: Trend in imports of key critical minerals by India



Source: Ministry of Commerce, ICRA Research

Apart from copper, India meets 100% of the requirement of battery materials like lithium, cobalt, and nickel through imports, as domestic supplies are yet to be activated. While the net-zero transition is in its initial days, India's import bill for these critical battery minerals stood at \$11.0 billion in FY2026 and \$7.5 billion in FY2025, and is poised to grow significantly in the coming decades as green technology adoption gathers momentum.

India's position in the global critical minerals landscape is marked by a growing demand, driven by its ambitions in renewable energy, electric mobility, and technological advancements, yet constrained by significant supply-side limitations. In comparison to global leaders like China, the US and Australia, India remains a major consumer but a minor producer of key critical minerals such as lithium, cobalt, nickel, and rare earth elements (REEs). China, with its dominant position in the processing and production of graphite and REEs, controls an overwhelming share of the global market, ensuring its leverage over global supply chains. Australia leads in the mining of

lithium, Indonesia for nickel (60% of global supply) and DR Congo supplies over 70% of the world's cobalt, making these countries pivotal players in the global supply matrix. Meanwhile, the US and the European Union (EU) have prioritised diversification of supply chains and are aggressively investing in securing resources through partnerships, domestic production, and recycling initiatives.

India, despite holding deposits of minerals like bauxite, graphite, and REEs, remains largely import-dependent for crucial minerals such as lithium and cobalt, both essential for battery production and electric vehicles. The country's limited domestic production capacity for these critical minerals exposes it to global supply chain vulnerabilities. While India has undertaken various strategic initiatives – such as the National Mineral Policy 2019 and the Atmanirbhar Bharat mission to promote self-reliance – its ability to match the scale and sophistication of global players is hindered by underdeveloped exploration efforts, inadequate processing technology, and a lack of advanced infrastructure.

Moreover, India's critical mineral beneficiation technologies lack global standards, making it difficult to refine its resources to the high purity levels required for industries like electric vehicles and renewable energy storage.

In response to these challenges, India has been actively negotiating Mineral Security Partnership (MSPs), with key resource-rich countries, including Argentina, Bolivia, and Australia, particularly for lithium and cobalt. While these agreements are a positive step, they highlight India's ongoing dependence on foreign supplies rather than addressing its internal production gaps. India's focus is shifting towards developing its own processing facilities and increasing domestic exploration, but progress in these areas remains nascent.

In terms of readiness to compete globally, India is not yet positioned to challenge major players in the critical minerals supply chain. The country's current reliance on imports, coupled with insufficient domestic production capabilities, places it at a disadvantage over more established global counterparts. For India to strengthen its global competitiveness, it must rapidly scale-up exploration, invest in cutting-edge beneficiation technology, and develop a robust domestic supply chain infrastructure. These steps are critical if India is to reduce its dependency on volatile international markets and position itself as a significant player in the global critical minerals landscape. Without decisive and immediate action, India's participation in the critical minerals race will remain constrained, limiting its ability to meet its ambitious clean energy and industrial goals.



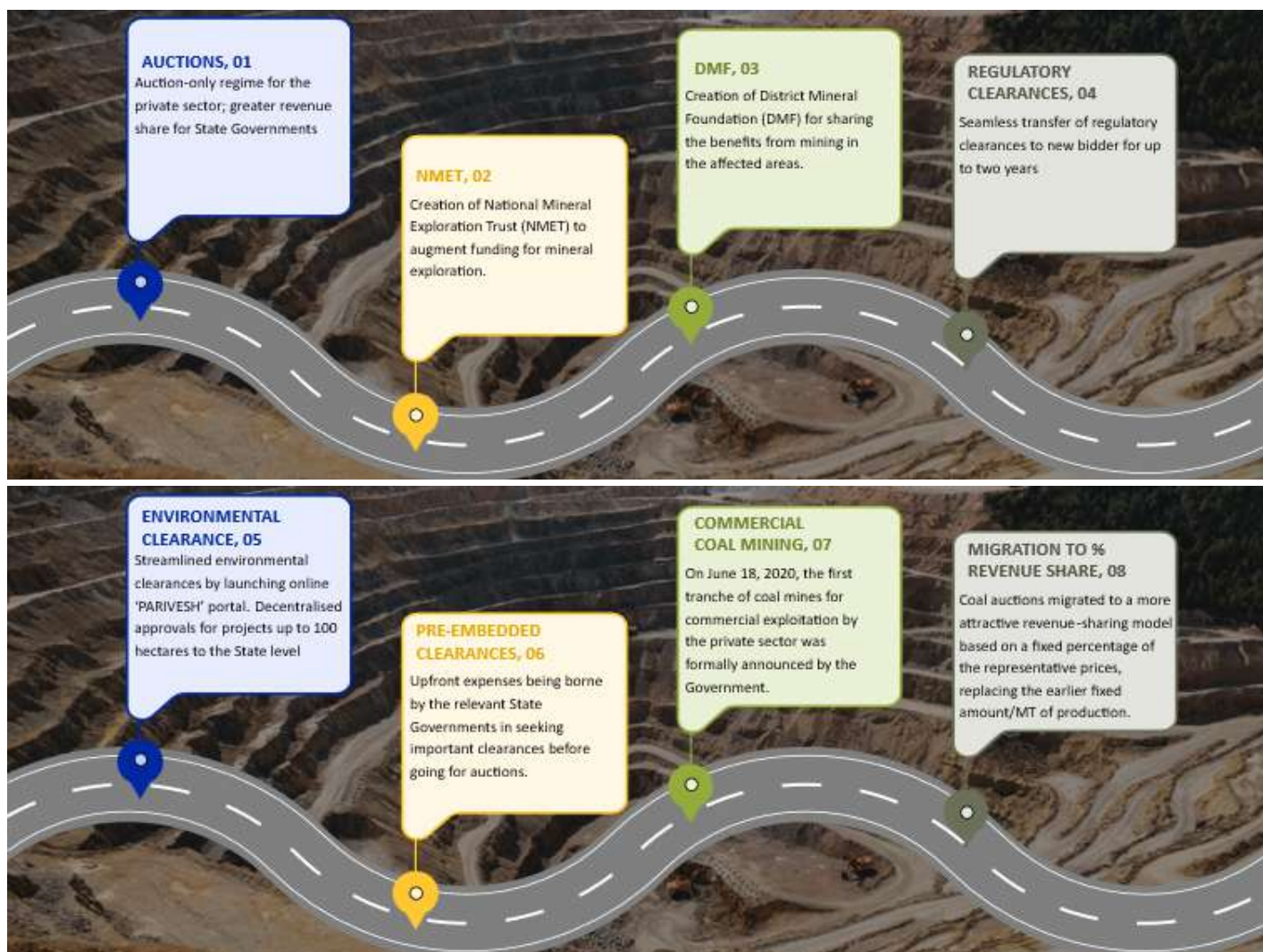
Regulatory reforms shaping the future of mining in India

Over the last decade, the Government of India has introduced several reforms to improve transparency, ease business operations, and make the domestic mining sector more attractive to investors. These changes have also created mechanisms to share mining benefits more effectively with state governments and communities in mining areas.

The Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), is the main

legislation that governs exploration, mining, and mineral management in India, excluding petroleum and atomic minerals. The Act has been amended multiple times to improve transparency, increase investment, and boost sector efficiency. This document provides an overview of the key changes to the MMDR Act and their impact on the Indian mining industry.

Exhibit 25: Key policy changes in the mining sector since January 2015



Source: Ministry of Mines, MMDR Acts, ICRA Research

Migration to the auction-only route: Following the Supreme Court's cancellation of 204 coal blocks in October 2014, the Government amended the MMDR Act on 12 January 2015. This amendment replaced the earlier discretionary system of granting mining leases with a transparent auction-based approach for awarding mineral concessions to private entities.

Increased funding and entry of private sector players in mineral exploration: The MMDR Amendment Act, 2015, introduced a levy of 2% of mining royalties to fund the National Mineral Exploration Trust (NMET), which aims to increase investment in India's underfunded mineral exploration sector. The NMET was set up to accelerate regional and detailed exploration activities. In March 2021, the Government further liberalised exploration by removing the requirement for non-exclusive

Creation of the District Mineral Foundation (DMF) for mining affected areas: The DMF was established under the MMDR Amendment Act, 2015, to share mining revenues with communities affected by mining operations. Mining companies contribute 30% of royalties for older leases and 10% for newer ones, creating a substantial fund to improve healthcare, education, infrastructure, and livelihoods in mining regions. DMF projects focus on building hospitals, schools, water facilities, and supporting skill development to promote economic resilience. Governance is managed by district authorities with

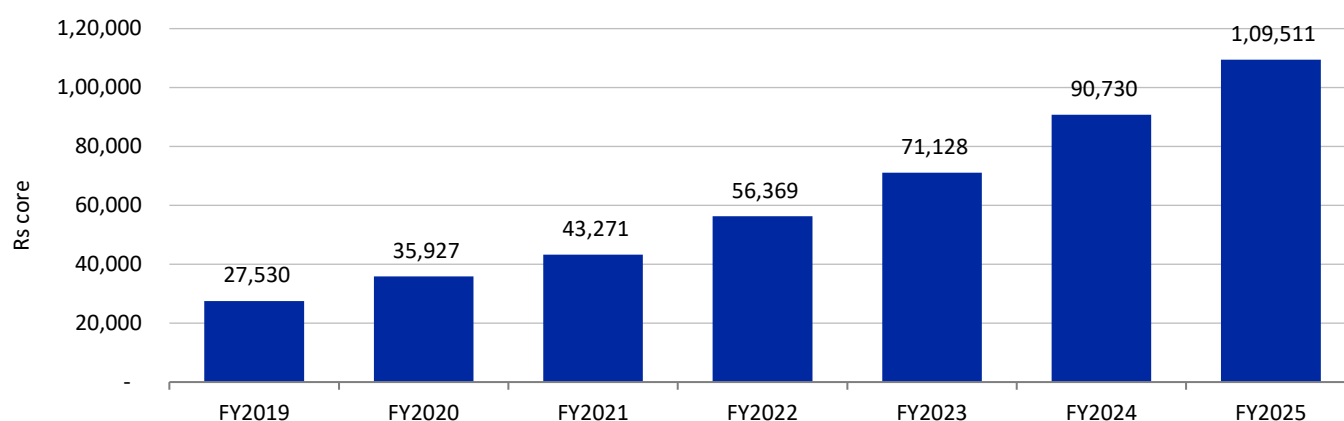
The move to auctions has improved transparency and increased revenue sharing with state governments. Since the introduction of this system, India has auctioned 425 non-coal mineral blocks (including iron ore, chromite, limestone, bauxite, and gold) and 163 coal blocks.

reconnaissance permits and allowing select private companies to conduct prospecting activities. These companies can also access NMET funds to support their exploration efforts. To date, 14 accredited private exploration firms have been notified. Between FY2018 and FY2023, NMET collections averaged Rs. 635 crore annually, providing critical resources to advance exploration, which is essential for building a strong mining ecosystem.

local representation to ensure that funds meet community needs.

Despite progress in states like Odisha and Jharkhand, challenges such as fund underutilisation and delays persist. Strengthening transparency, community involvement, and using technology for monitoring can enhance DMF's impact and drive sustainable development in mining areas. Cumulative DMF collections have grown significantly from Rs. 27,530 crore in FY2019 to Rs. 1,09,511 crore in FY2025.

Exhibit 26: Trend in cumulative DMF collections (Rs. crore)



Source: Ministry of Mines, ICRA Research

Seamless transfer of clearances: The MMDR Amendment Act, 2015, led to the expiry of several merchant mining leases on 31 March 2020. To address delays in obtaining fresh approvals by new bidders, the Government amended the Act in January 2020, allowing existing clearances to be transferred to the new lessee for a period of two years, providing time to secure renewed approvals. Due to continued

Transitioning to more balanced, risk-reward framework for revenue sharing with states in mine auctions: Initially, coal mine auctions followed a revenue-sharing model where states received a fixed amount per metric tonne of production. This structure favoured state revenues, even during market downturns when falling prices reduced miners' profit margins, thereby discouraging investor interest. To

Opening the coal sector to private players for commercial mining: India's coal sector was nationalised in 1973, but a shift towards privatisation began with the Coal Mines (Special Provisions) Ordinance, 2014, which allowed for future commercial mining by private players. Despite this, end-use restrictions persisted for another five years, limiting private sector participation. Initial enthusiasm for captive coal block auctions faded due to unsustainable premiums, leading to a drop in interest by FY2018-FY2019.

Removal of end-use restriction and distinction between captive and non-captive mines in auctions: On 28 March 2021, the Government amended the MMDR Act to remove 'end-use' restrictions in mineral auctions. Additionally, captive mines (other than atomic minerals) that had already been auctioned before 28 March 2021 were allowed to sell

Streamlining processes for environmental clearance: To promote transparency and real-time monitoring, the Ministry of Environment, Forest and Climate Change (MoEFCC) digitised the environmental

delays, a further amendment was introduced on 28 March 2021, removing the two-year limit. This change ensured that statutory clearances could be seamlessly transferred to new lessees and remain valid for the entire lease term. This policy shift has improved certainty in the auction process, enhanced price discovery, and ensured a stable supply of raw materials for downstream industries.

address this, in May 2020, the Government adopted a more balanced approach, linking revenue sharing to a fixed percentage of representative prices. This change ensures the states' share in both upside and downside risks, aligning incentives and encouraging greater participation by investors, even during industry downturns.

To revive private investment, the Government introduced reforms during 2019–2020, such as allowing 25% open market sales from captive mines, enabling 100% foreign direct investment (FDI) via the automatic route, and lifting end-use restrictions for certain mines. The sector was fully opened on 18 June 2020, with the announcement of the first tranche of coal blocks for commercial mining by private firms.

up to 50% of their annual production as merchant sales, subject to additional revenue sharing with the state government. This move to remove end-use restrictions was intended to support better price discovery in future auctions, incentivise mining companies, increase domestic mineral availability to end-use sectors, and reduce import dependence.

clearance (EC) application process through the online 'PARIVESH' web portal. Moreover, to further streamline decision-making for granting ECs, the MoEFCC decentralised the procedure to the state

level for lease areas measuring less than 100 hectares (increased from 50 hectares earlier). In addition, to fast-track EC approvals, in April 2015, the MoEFCC standardised the Terms of Reference (ToR) and EC conditions, helping project sponsors simultaneously

start preparing Environmental Impact Assessment Reports and Environmental Management Plans, even before applying for the ToR. At present, close to 20 major approvals are required before operationalising a coal mine.

Pre-embedded clearances in mineral auctions: To increase the ease of doing business in the mining sector, the Ministry of Mines issued guidelines on 3 June 2020 for the auction of mineral blocks with pre-embedded clearances. Though this requires upfront expenses to be borne by the relevant state governments in seeking important clearances before auctions, the mechanism can lead to better price discovery, aided by greater policy clarity and reduced project gestation periods.

Such pre-embedded clearances include: (a) approval of a mining plan by the Indian Bureau of Mines (IBM), with the winning bidder having the flexibility to enhance or reduce mine capacity by 25%; (b) Stage-1 forest clearance and EC from the MoEFCC; and (c) securing land acquisition for both Government and private land. The cost borne by the state government in obtaining these clearances would be recouped from the winning bidder.

Exhibit 27: Impact of MMDR Amendment Act, 2021



Source: MMDR Amendment Act, 2021, ICRA Research

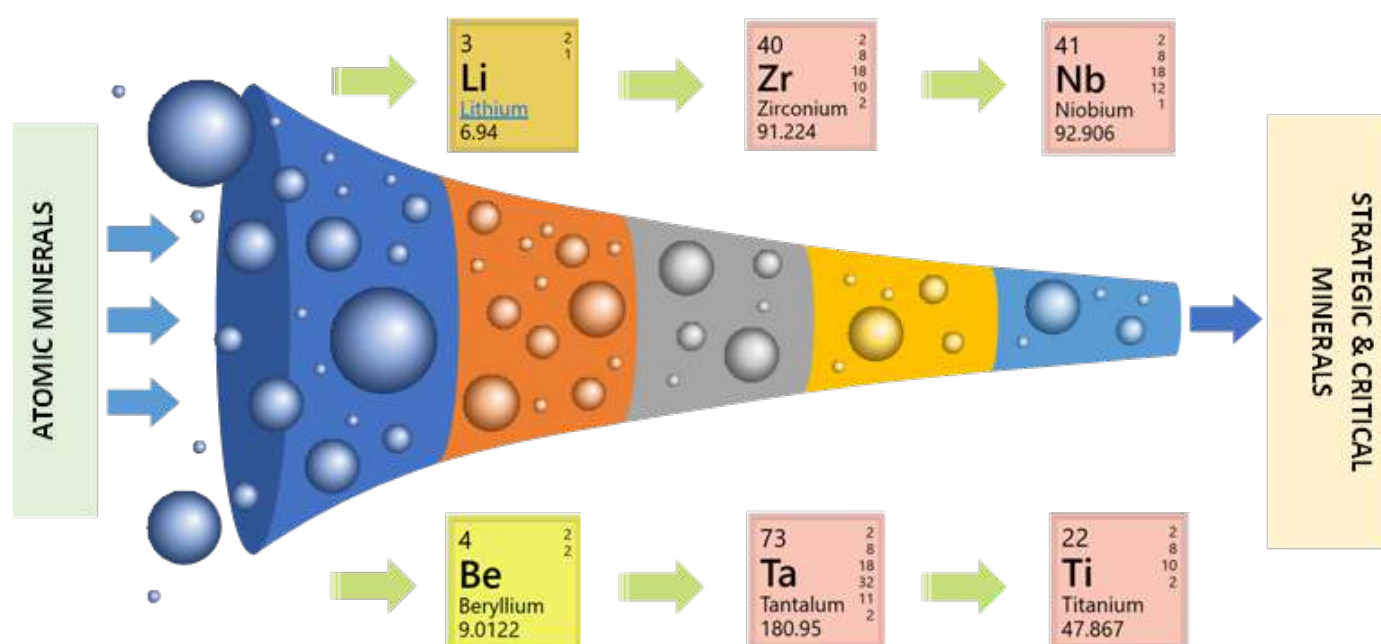
The MMDR Amendment Act, 2023, amended the MMDR Act, 1957, with the aim of strengthening the exploration and extraction of critical minerals.

In addition, the Government has taken several steps in improving the regulatory framework for critical minerals to make the effort to increase the availability of the critical minerals in India. India's approach to critical minerals is becoming increasingly strategic, with the Government actively pushing for enhanced domestic exploration, mining, and beneficiation through a range of policies and incentives. However, for India's critical mineral strategy to succeed, it is essential to establish a robust and integrated value chain that spans the initial mineral exploration stage to the recycling of metals. This entails developing capacity across all stages of the value chain, including

exploration to identify new deposits, efficient extraction methods, intermediate processing technologies, advanced manufacturing capabilities, and sustainable recycling infrastructure. By building expertise and infrastructure at every phase, India can not only ensure a reliable domestic supply of critical minerals but also reduce its dependence on imports, enhance value-added production, and close the loop in the lifecycle of these strategic resources. Such a comprehensive approach is vital for securing India's place in the global supply chain for critical minerals and aligning with international sustainability standards. India has already taken several steps to develop its critical minerals sector as detailed in Exhibit 28 below:

Regulatory change in critical minerals: Liberating lithium for private exploration

Exhibit 28: Reclassification of six atomic minerals as strategic and critical minerals, as per MMDR Amendment Act, 2023



Source: ICRA Research

Lithium was previously classified as an atomic mineral due to its role as a primary source of tritium in thermonuclear reactions and its use in cooling systems of nuclear power plants. Under The Atomic Minerals Concession Rules, 2016, any lithium-bearing orebody with concentrations exceeding 5,000 parts per million (ppm) in hard rock/clay deposits, and 200 ppm in brine deposits, could only be mined by Government companies. Deposits with lower concentrations of lithium were available for private sector mining.

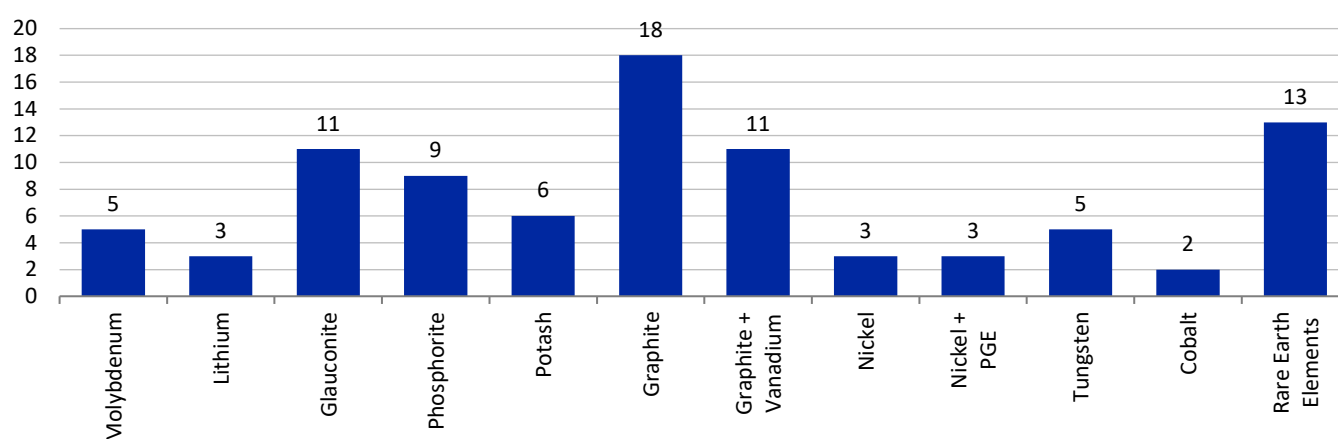
However, with the amendment to the MMDR Act in August 2023, lithium, along with five other minerals (including zirconium), was reclassified from an 'atomic mineral' to a 'critical and strategic mineral'. This change opened the exploration and mining of lithium, across all ore grades, to private sector participation, significantly broadening the scope for exploration and development in the critical minerals space.

Auction of critical mineral blocks: Strategic step forward, but challenges remain

India's recent critical mineral auction marked an important milestone in the country's efforts to develop its domestic supply of key minerals, such as lithium, cobalt, and nickel etc. On November 29, 2023, the Ministry of Mines started the first-ever round of auction (under tranche I) of 20 blocks of critical minerals, including lithium, graphite, nickel, copper, manganese, REEs, molybdenum, potash, glauconite, and phosphorite. Subsequently, on 29 February 2024, under tranche II, another 18 critical mineral blocks were put up for auction by the GoI. In addition to the minerals auctioned in tranche I, tranche II includes minerals like cobalt, the platinum

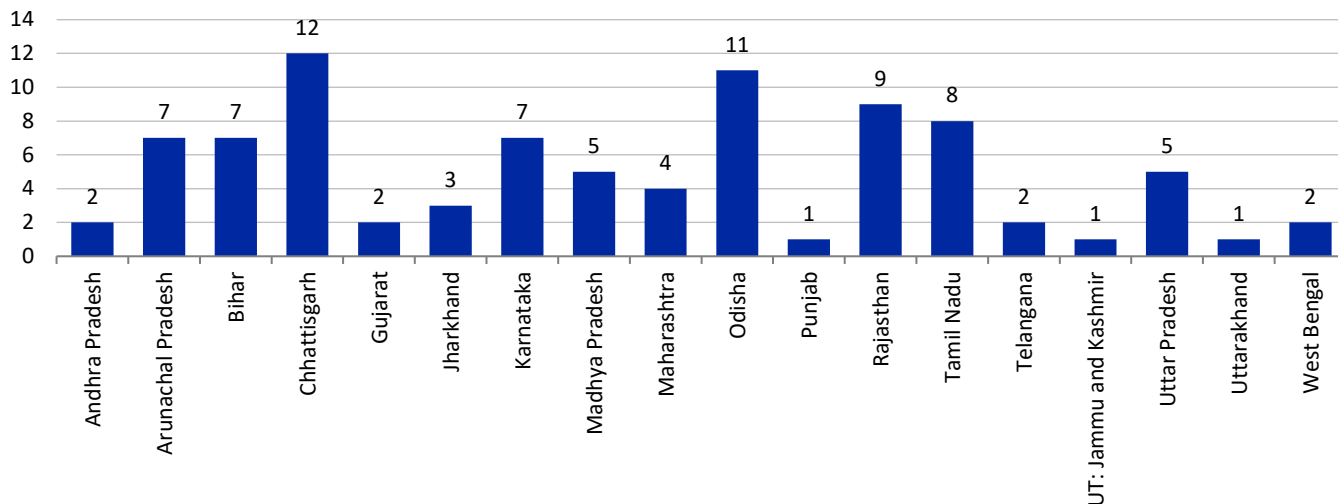
group of elements (PGE), tungsten, vanadium, and potash. On 14 March 2024, in tranche III, the GoI re-auctioned seven blocks that received less than three bids in tranche I. On 24 June 2024, in tranche IV, the GoI re-auctioned 11 blocks that had received less interest in earlier auctions and further added 10 more blocks for minerals, including graphite and REEs. Subsequently, there has been tranches V, VI and (the latest announced) VII. A total of 89 blocks spread across 18 states are on offer, of which Chhattisgarh has the maximum number of blocks (12), followed by Odisha (11) and Rajasthan (9).

Exhibit 29: Number of critical mineral blocks auctioned in tranches I-VII



Source: MSTC, ICRA Research; PGE: Platinum-Group Element

Exhibit 30: State-wise number of critical mineral blocks auctioned in tranches I-VII

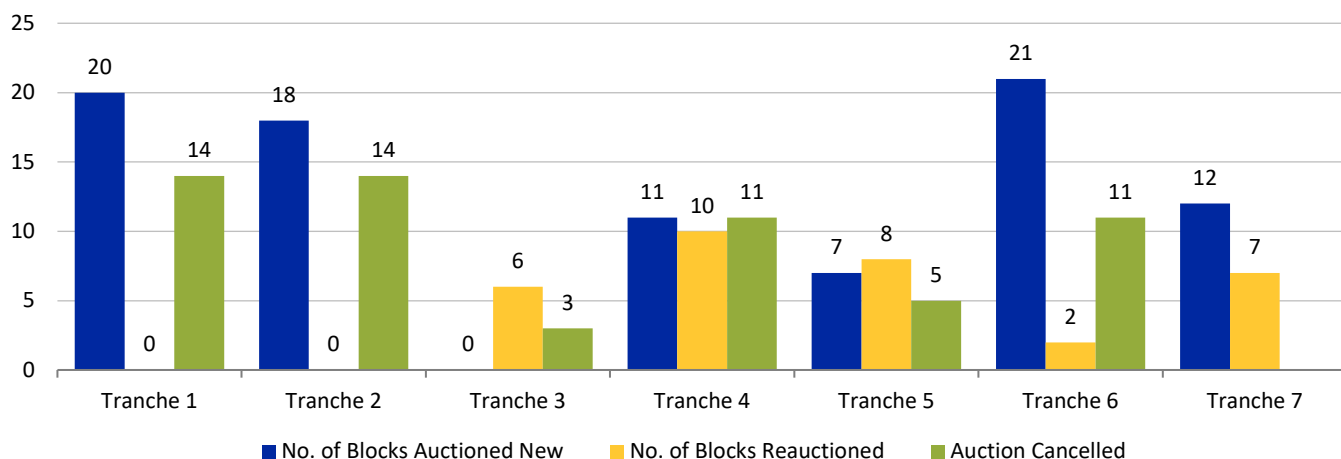


Source: MSTC, ICRA Research

Despite the importance of the auction, the response from the bidders was less enthusiastic than expected, which was demonstrated by the annulment of the

auctions announced in tranches I and II. The lacklustre response is largely attributed to the uncertainty surrounding the available data on potential reserves.

Exhibit 31: Number of critical minerals blocks auctioned and annulments (tranche-wise)



Source: MSTC, ICRA Research

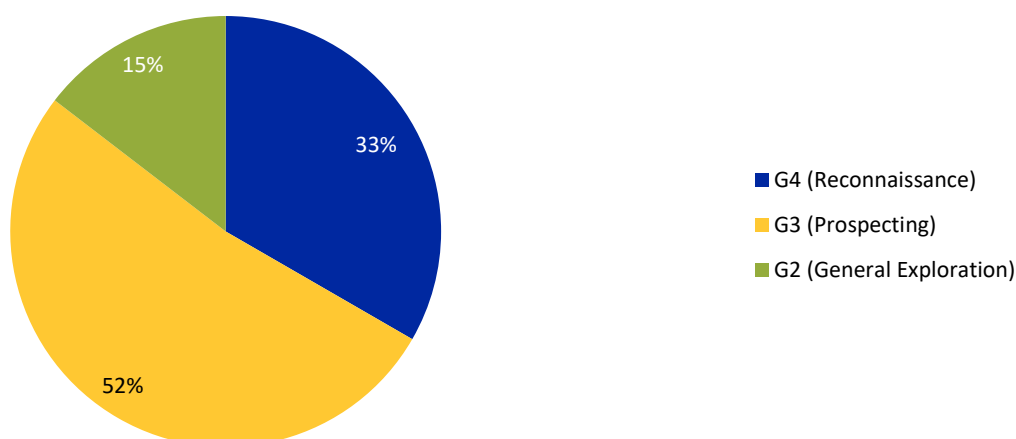
Also, if one looks at the timeframes for developing lithium assets in key-producing regions like Australia and South America, the average lead time from discovery to commercial production ranges at 4-7 years. For copper and nickel mines, the gestation period between discovery and production is even

longer, ranging at 13-20 years. Almost 84% of the blocks on offer in tranches I, II, III and IV are in the preliminary G3 and G4 stages of exploration. Only 16% of the blocks is in the G2 stage, while none is in the G1 stage of exploration.

Given the preliminary stage of exploration for most of these critical mineral blocks, commercialising these assets are unlikely in the current decade, and the benefits are mainly likely to accrue in the next

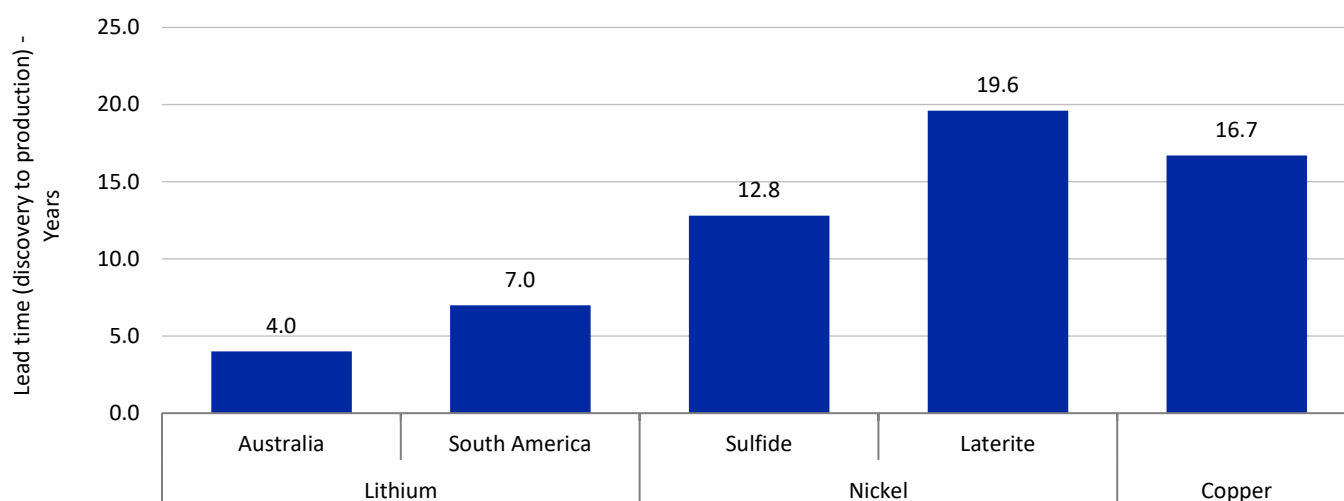
decade, during 2030-2040. Moreover, many of these mines, after more detailed exploration efforts, could even be found to be unviable.

Exhibit 32: Status of exploration of critical mineral blocks auctioned



Source: MSTC, ICRA Research

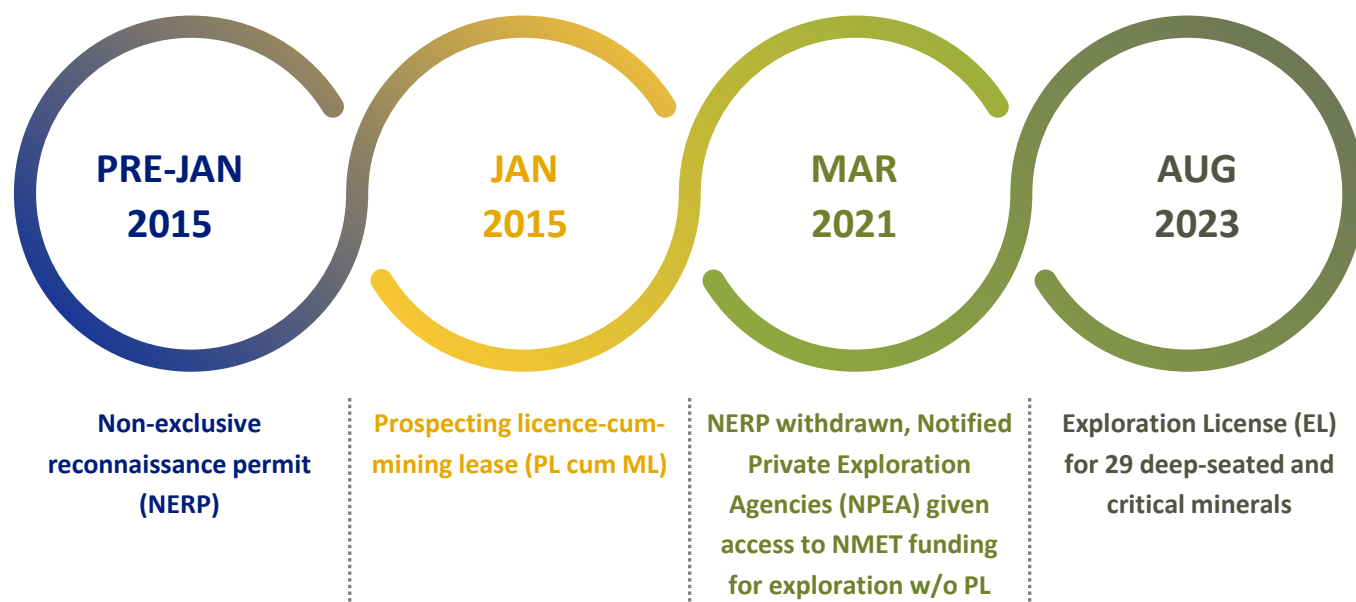
Exhibit 33: Average observed lead time for selected minerals (discovery to production)



Source: IEA, ICRA Research

Gol incentivises domestic exploration of deep-seated and critical minerals with exploration licences

Exhibit 34: Transition of mineral exploration regime in India



Source: ICRA Research

Even though 100% FDI is allowed in the mining sector through the automatic route, India's earlier non-exclusive reconnaissance permit and prospecting licence-cum-mining lease (PL-cum-ML) regimes failed to attract global mining majors to the country. Subsequently, in March 2021, even as privately-owned Notified Private Exploration Agencies (NPEA) were allowed to undertake exploration without a PL and get access to funding from the NMET, global mining majors/ junior mining companies remained on the sidelines.

To fast track the production of critical and deep-seated minerals, the MMDR Act was amended in August 2023 to empower the Central Government to conduct such auctions. Moreover, to enable a more attractive risk-return sharing for explored blocks, the Government introduced the auction

of 'Exploration Licences' for 29 deep-seated and critical minerals, which shall permit the licensee to undertake reconnaissance and prospecting activities. The preferred bidder for the exploration licence are to be selected through reverse bidding for a share of the auction premium paid by the mining lease holder. The bidder quoting the lowest percentage bid shall be preferred for the licence. This gives a higher upside to the exploration agency against the erstwhile NPEA regime.

In March 2024, Karnataka (for gold, copper and lithium) and Rajasthan (for rare earths and potash) became the first states to launch 'Exploration Licences' in the country. Andhra Pradesh, Chhattisgarh, Madhya Pradesh, and Maharashtra are in line to launch them next.

To encourage private exploration of critical and strategic minerals, the Ministry of Mines introduced a scheme offering partial reimbursement of exploration costs to licence holders. The Scheme for Partial Reimbursement of Exploration Expenses

for Holders of Exploration Licenses (EL), launched on 24 June 2024, provides a 50% reimbursement on exploration expenses, with a maximum limit of Rs. 20 crore.

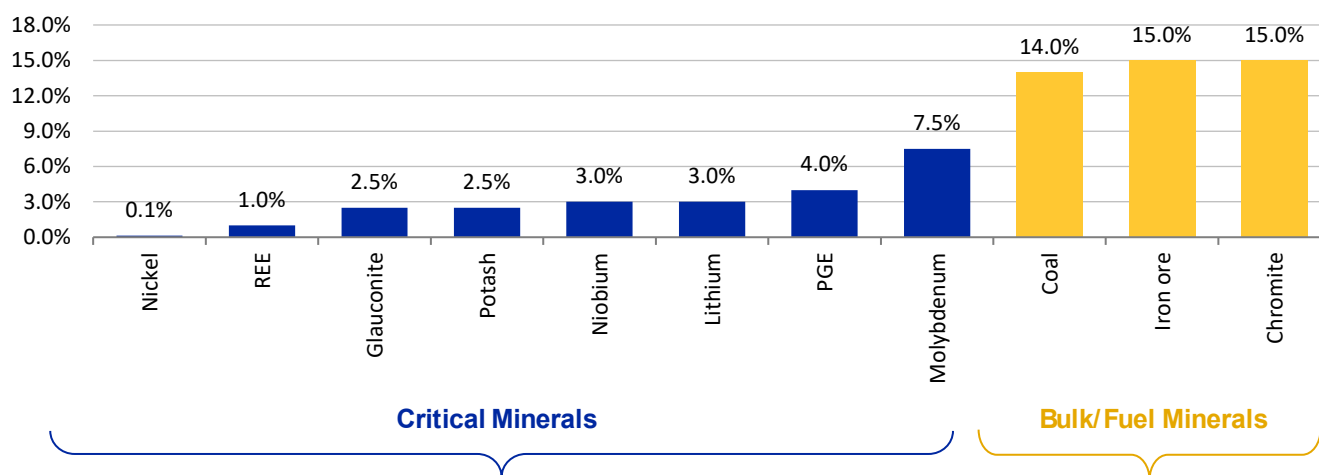
Attractive royalty rates for critical minerals to raise cost competitiveness and encourage fresh investments in mine development

The GoI has kept the mineral royalties for critical and strategic minerals significantly lower than bulk minerals like coal, iron ore, and chromite to incentivise accelerated pace of investments. The royalty rate on lithium has been kept at 3% of the London Metal Exchange (LME) price, significantly lower than the 14-15% royalty being levied on industrial/ fuel minerals like coal, iron ore, and chromite.

Apart from encouraging more private participation, over the last few years, the Geological Survey of

India (GSI) has increased its focus on the exploration of deep-seated and critical minerals, with the number of exploration projects jumping steeply from that in Field Season (FS) 2022. During the pre-Covid period of FS2016–FS2020, the GSI had undertaken an average of 60-65 exploration projects of critical minerals annually. Given the GoI's policy thrust on reducing export-dependence in critical minerals, the GSI's exploration activities jumped to 118 in FS2022, and further to 458 in the last FS2026.

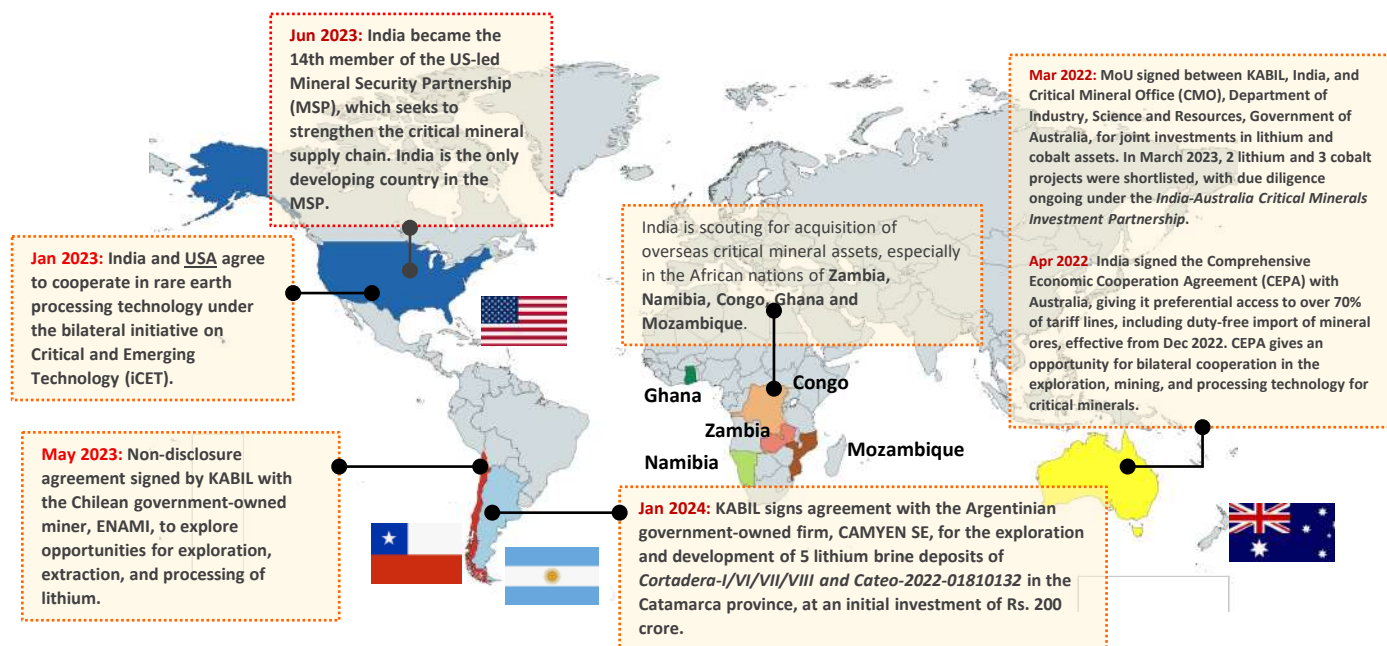
Exhibit 35: Royalties of key critical and bulk minerals



Source: Ministry of Mines, ICRA Research; Lithium and Nickel royalty rates charged over the prevailing LME prices

KABIL* recently became the first domestic player to acquire overseas lithium brine assets in Argentina

Exhibit 36: India's strategic alliances to secure supply of critical minerals



Source: Ministry of Mines; ICRA Research

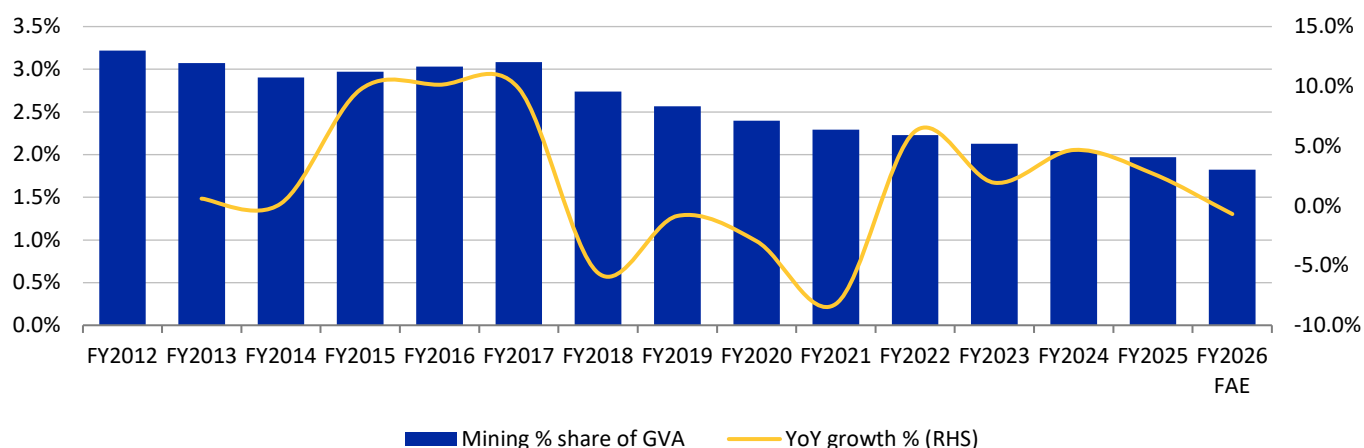


Foreign direct investment trends and mining sector dynamics in India

India's mining sector has seen significant changes in regulations and structure over the last 10 years. These changes were designed to increase transparency, improve operational performance, and build investor trust. The reforms included moving to an auction-based system for mineral allocation,

making changes to the MMDR Act, and creating new policy tools such as the DMF and NMET. However, despite these changes and the country's rich mineral resources, foreign direct investment (FDI) into India's mining sector has remained weak.

Exhibit 37: Trend in mining sector's share in India's overall GVA



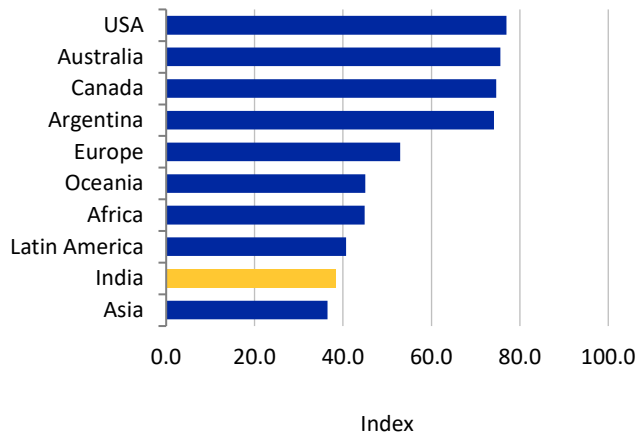
Source: MoSPI, ICRA Research

The mining sector's share in India's GVA has been falling steadily. From FY2012 to FY2018, mining generated around 3% to total GVA. This share fell to approximately 2.3% after FY2021, with the lowest point at 2% in FY2020, largely due to the impact of the Covid-19 pandemic. While FY2024 showed some improvement in production and sector growth, mining's contribution to national output remains below its potential.

In FY2023, India was ranked 69th out of 86 countries on the Fraser Institute's Mining Investment Attractiveness Index. More concerning is India's

81st position out of 86 countries on the Policy Perception Index. These rankings highlight ongoing structural and regulatory problems that discourage international capital. Major issues raised by global mining investors include high regulatory complexity, legal uncertainties, overlapping Government responsibilities, inconsistent policy implementation, and delays in land acquisition and project approvals. Survey data shows that 90% of respondents identified legal risks as a barrier, 83% pointed to inconsistent law enforcement, and 82% raised concerns about policy overlaps.

Exhibit 38: India's rank in Mining Investment Attractiveness Index

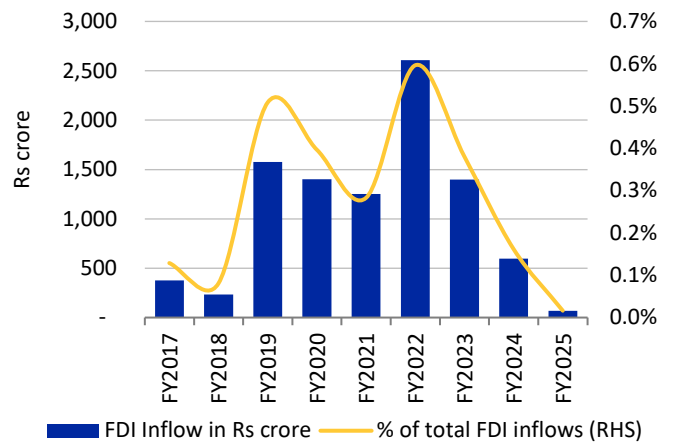


Source: Fraser Institute Annual Survey of Mining Companies (FY2023), ICRA Research

FDI data supports these concerns. In FY2025, mining attracted almost nil of India's total FDI inflows, showing the sector's limited appeal to international investors compared to more transparent and stable mining markets such as Australia, Canada, and Latin America. The instability in India's mining FDI is clear from trends over the past seven years. Although FDI increased during FY2021 and FY2022, inflows dropped sharply afterwards, indicating declining investor confidence due to regulatory challenges and market uncertainties. The mining sector's small share in India's overall FDI inflows clearly shows its inability to convert its geological potential into steady capital inflows.

Global investors are hesitant to commit long-term capital to India's mining sector due to systemic problems. These include long permit approval times,

Exhibit 39: Trend in FDI inflows to India's mining industry



Source: DIPI, ICRA Research

inconsistent environmental and forest clearance rules, frequent court interventions, and unpredictable tax and fiscal policies. Investors also cite poor infrastructure in mineral-rich regions, limited access to geological data, and unclear revenue-sharing arrangements as significant obstacles.

While India has made meaningful progress in reforming its mining regulations, these efforts have not yet resulted in significant foreign capital inflows. Unless there is improvement in regulatory certainty, institutional responsiveness, and policy predictability, the sector is likely to remain underfunded despite its resource potential. Focused reforms aimed at making it easier to conduct mining operations are essential for attracting FDI and supporting long-term growth in the sector.



Key challenges in India's mining sector: Preparedness of the mining industry

Regulatory approvals process not akin to global standards

The mining industry in India continues to face prolonged and complex regulatory approval timelines, which have emerged as one of its most significant barriers to investment, particularly in greenfield coal and mineral projects. While policy-level reforms have aimed to improve the ease

of doing business, the ground reality remains challenging. The process of securing approvals and clearances ranging from reconnaissance permits and mining leases to land acquisition and environmental and forest clearances is lengthy and involves multiple agencies, often resulting in significant project delays.

Exhibit 40: Stages of regulatory approvals before starting coal mining operations in India

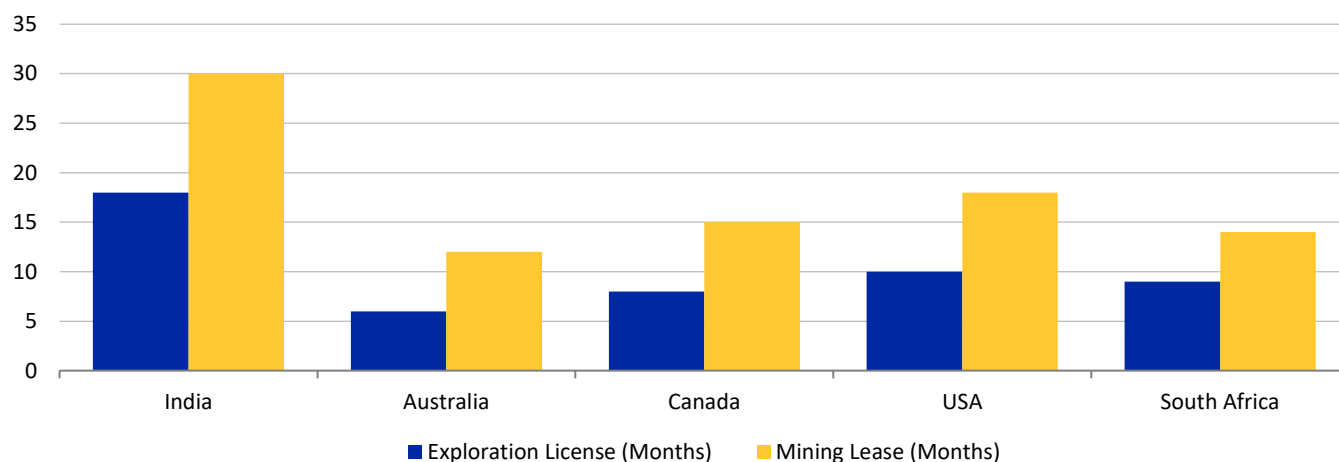


Source: Discussion paper on Auction of Coal Mines for Sale of Coal, Ministry of Coal, ICRA Research

For coal mining projects specifically, data from the Ministry of Coal indicates that it typically takes around 48-51 months to secure all necessary regulatory clearances and complete land acquisition in India. This stands in stark contrast to leading mineral producing jurisdictions such as Canada, Australia, and the US, where similar approvals can be secured within 6-12 months. For example, in Canada, most

provinces and territories grant mining permits within six months, while in parts of the US and Australia, the timeline is generally around 6-8 months. Sweden and other Nordic countries also exhibit a more investor-friendly timeline of under six months. These comparisons clearly highlight the extent of procedural delays faced by investors in India.

Exhibit 41: Comparative timelines for granting approvals

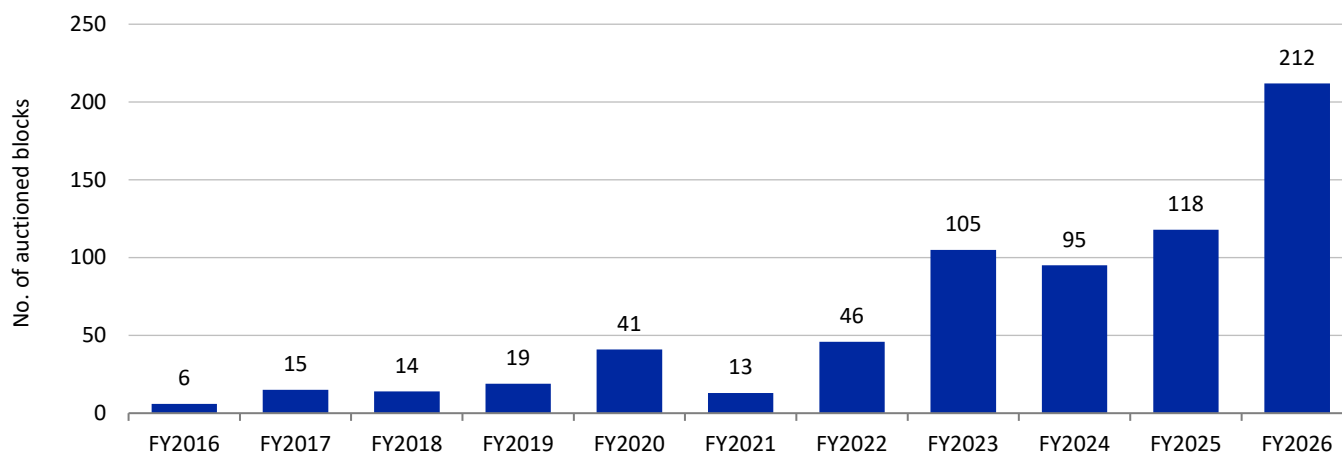


Source: Fraser Institute Annual Survey of Mining Companies (2023); Ministry of Coal, Government of India; ICRA Research

However, the mining ministry has taken actions to expedite operationalisation of mines by reducing the time taken at every stage – right from mining lease and approvals to operationalisation. Also, the

Government is in fast-track mode to increase the year-wise auction of mines, which has substantially grown in recent years.

Exhibit 42: Number of mining blocks auctioned over last decade

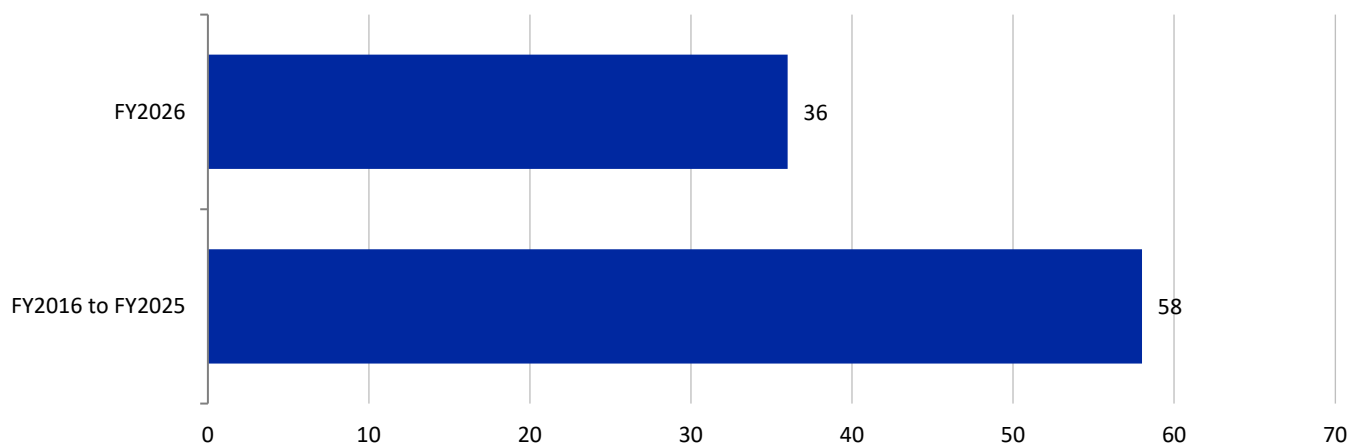


Source: Ministry of Mines; ICRA Research

As shown in Exhibit 42, there has been tremendous focus on new block auctions in the last four years, resulting in a yearly average of 132 blocks during FY2023-FY2026, compared to total block auctions of 154 during the earlier seven years. In addition, during FY2025-FY2026, a total of 36 mineral blocks,

including 28 greenfield and 8 brownfield blocks, have been operationalised over 58 blocks (20 greenfield and 38 brownfield blocks) becoming operational during the entire period of FY2015-FY2025. This shows the on-ground improvement in increasing the operationalisation status of auctioned mines.

Exhibit 43: Operational status of auctioned blocks in India



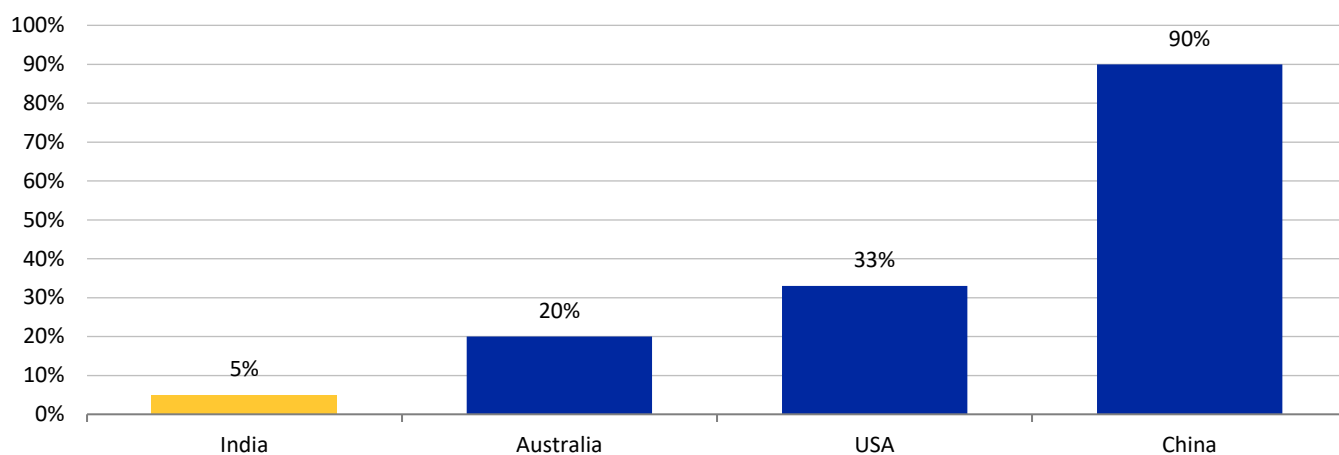
Source: Ministry of Mines; ICRA Research

Sub-optimal investment in technology

India's mining industry has made notable progress in extracting surface minerals such as iron ore, dolomite, and bauxite. However, the sector continues to underperform in the exploitation of deep-seated mineral resources that require advanced extraction techniques. This underutilisation of modern mining technology is particularly evident in coal, where India has overwhelmingly favoured open-cast mining

methods over underground operations due to lower capital costs and faster commissioning timelines. As a result, underground mining accounts for a mere 5% of India's total coal output, a stark contrast to major coal producing economies such as China (90%), the US (33%), and Australia (20%), where underground extraction is significantly more common.

Exhibit 44: Share of production from underground coal mines

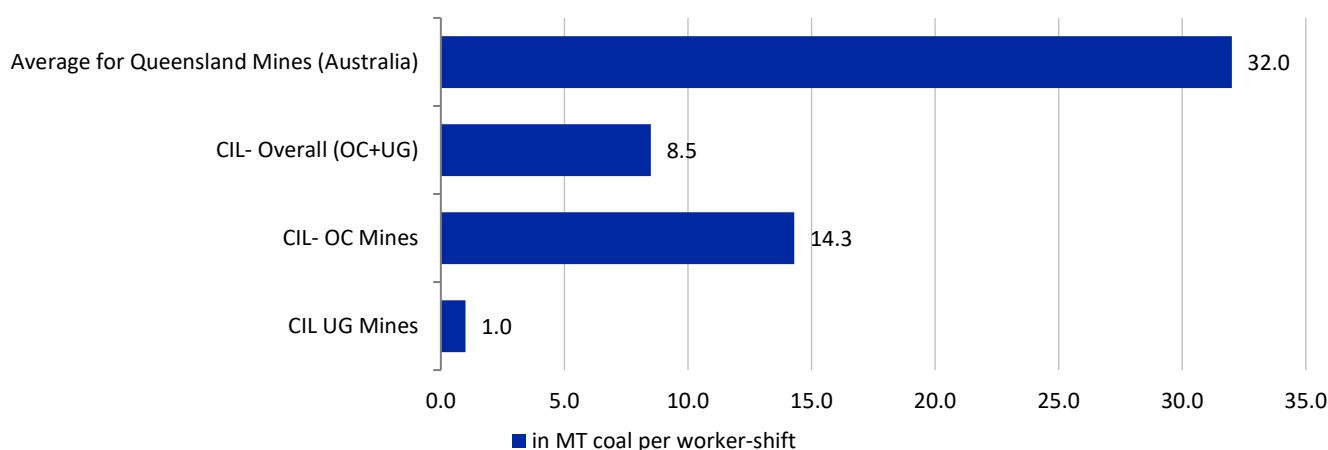


Source: CIL, Planning Commission Twelfth Five Year Plan (2012–2017), ICRA Research

The low adoption of underground mining techniques in India can be attributed to several interlinked factors, including high upfront investment requirements, insufficient indigenous technological capabilities, and inadequate access to automated and mechanised mining systems. Technologies such as longwall mining, continuous miners, high-capacity

surface miners, and real-time geospatial mapping tools have seen only limited deployment across Indian mines. In contrast, these technologies are well established in developed mining economies, which leverage them to boost safety, efficiency, and labour productivity.

Exhibit 45: Output per man shift (in tonnes) for CIL and Australian miners



Source: CIL, ICRA Research; OC: Opencast; UG: Underground

Exhibit 45 provides further insight into the productivity gap driven by technological disparity. Labour productivity in Australia's Queensland coal mines is nearly four times higher than that of CIL, reflecting the impact of automation, advanced equipment, and digital integration in mining operations. While open-cast mines in India achieve moderate output of about 14.3 tonnes per worker-shift, underground mines lag significantly at around 1 tonne per worker-shift, highlighting the severe underperformance of this segment and its inability to scale without urgent technological intervention.

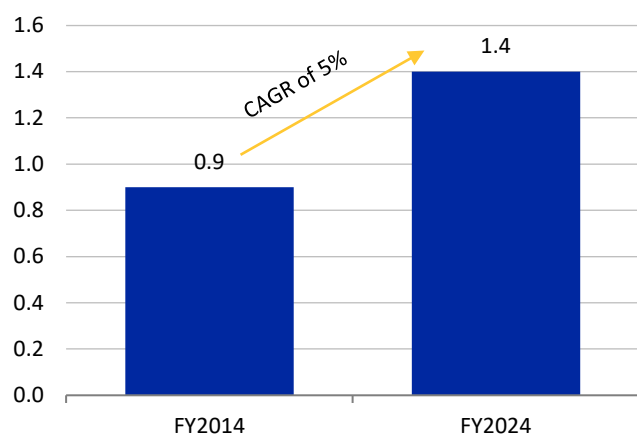
However, the industry is gradually moving towards creating the right ecosystem for the sustainable growth of the industry. The National Geoscience Data Repository (NGDR) is a flagship initiative

conceptualised by the Ministry of Mines as a part of the National Mineral Exploration Policy (NMEP), 2016, for hosting all exploration related geoscientific data for dissemination to all stakeholders to expedite, enhance and facilitate the exploration coverage of the country. Geological Survey of India (GSI) is the nodal agency for the implementation of NGDR. The legacy data of all stakeholders will be brought into the system through digitisation, while all exploration related data has already been standardised through the Mineral Exploration Reporting Template (MERT) and converted into Geographic Information System (GIS) compatible formats for the application of emerging technologies like artificial intelligence (AI) and machine learning (ML). lakh sq.km (from 0.3 lakh sq.km in FY2014 annually, it increased to 2.1 lakh sq.km in FY2024).

Geochemical data coverage is around 21.39 lakh sq.km (from 0.9 lakh sq.km in FY2014 annually, it

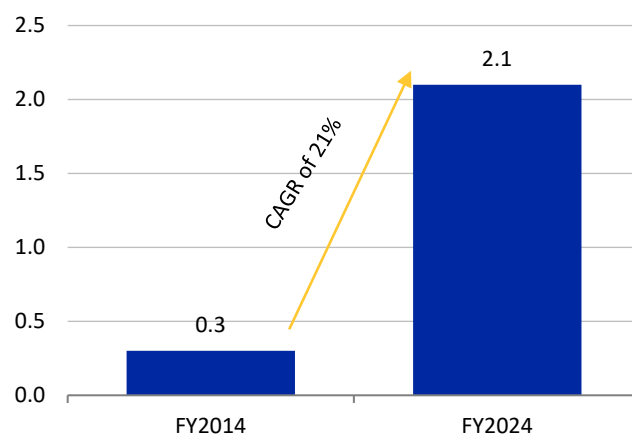
rose to 1.4 lakh sq.km in FY2024). Geophysical data coverage is around 14.06

Exhibit 46: Geochemical mapping (lakh sq.km)



Source: Ministry of Mines, ICRA Research

Exhibit 47: Geophysical mapping (lakh sq.km)

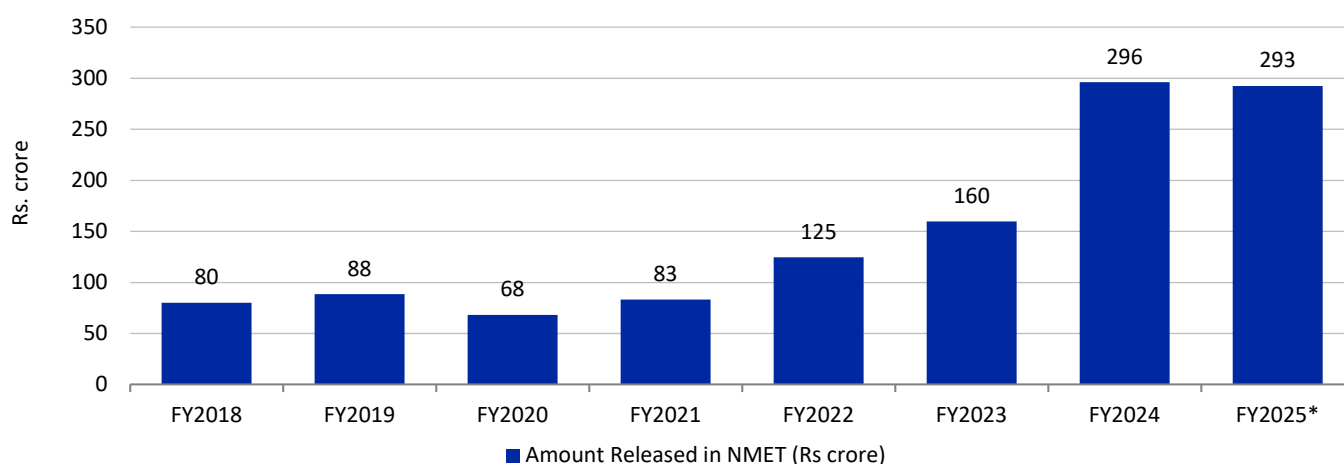


Source: Ministry of Mines, ICRA Research

In addition, there is significant thrust on mineral exploration activities as demonstrated by the increase in NMET's expenditure over the years from

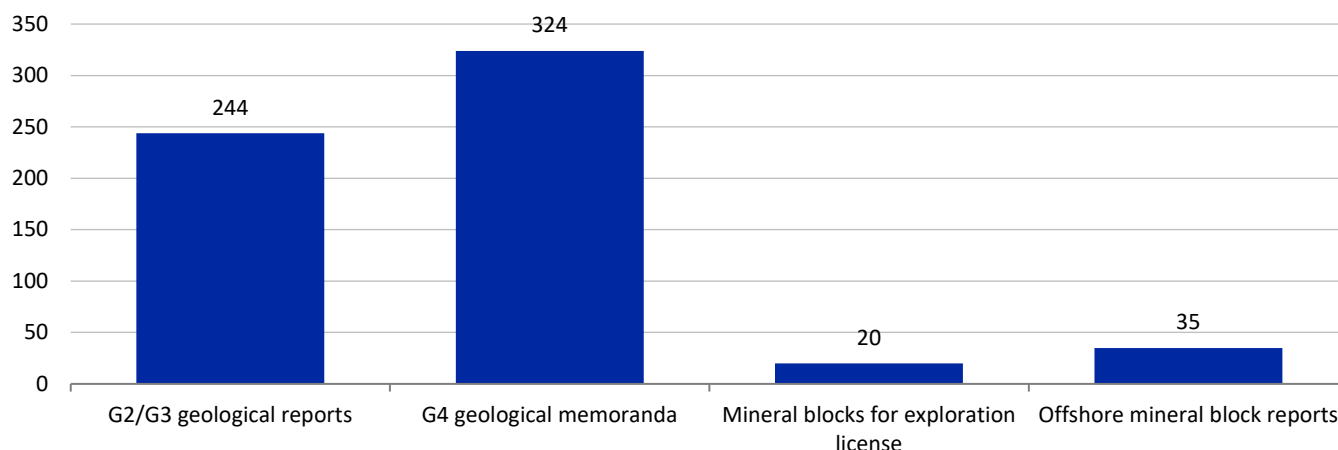
around Rs. 80 crore in FY2018 to around Rs. 300 crore in FY2024 and FY2025.

Exhibit 48: Trend in NMET's released amounts (Rs. crore)



Source: Ministry of Mines, ICRA Research; *Data till March 09, 2025

Exhibit 49: Number of exploration reports handed over



Source: Ministry of Mines, ICRA Research

Exhibit 49 reveals that India's exploration pipeline is heavily weighted toward early-stage findings. A large majority (324) of exploration outputs are G4 geological memoranda, compared to 244 G2/G3 geological reports and much smaller numbers of mineral blocks for exploration license (20) and offshore mineral block reports (35). This skew toward G4 (reconnaissance-level) reports – which reflect the broadest, least detailed exploration stage – indicates that most new mineral prospects being handed

over to state authorities are still in the preliminary reconnaissance phase.

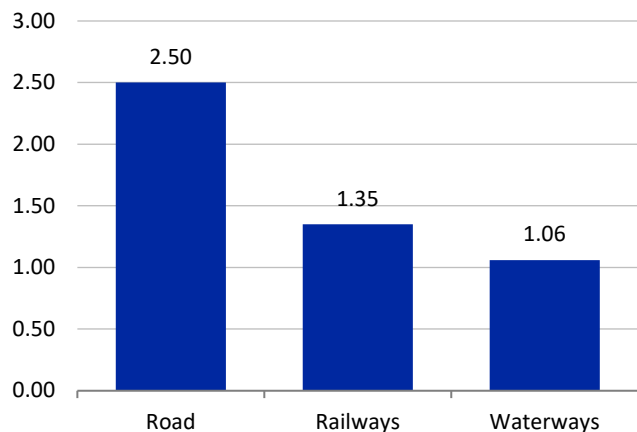
However, the current exploration landscape features a broad base of early-stage discoveries, which has shown significant pick-up in recent years, and which is expected to progress to more detailed exploration and preliminary resource estimates through further drilling and feasibility work to confirm reserves and viability.

Logistics bottlenecks

India's mining sector faces persistent structural issues in its transportation and logistics network, which directly affect cost structures and the competitive position of downstream industries including power generation, steel production, and cement manufacturing. Despite having significant reserves of bulk minerals such as coal, iron ore, and bauxite,

the country struggles with high evacuation costs and operational inefficiencies, primarily because of heavy dependence on road transport. Unlike the US and China, which have developed integrated multimodal logistics systems incorporating railways, waterways, and pipelines, India's mining logistics remains predominantly road-based.

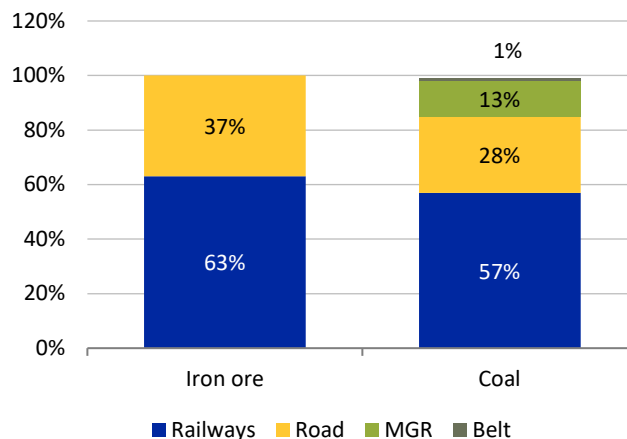
Exhibit 50: Freight cost comparison through various modes (Rs./tonne km)



Source: NITI Aayog; ICRA Research

According to the NITI Aayog, road freight costs in India are approximately Rs. 2.50 per tonne-km, substantially higher than railway transport at Rs. 1.35 per tonne-km and waterway transport at Rs. 1.06 per tonne-km. Despite this significant cost differential, around 28% of coal and almost 37% of iron ore

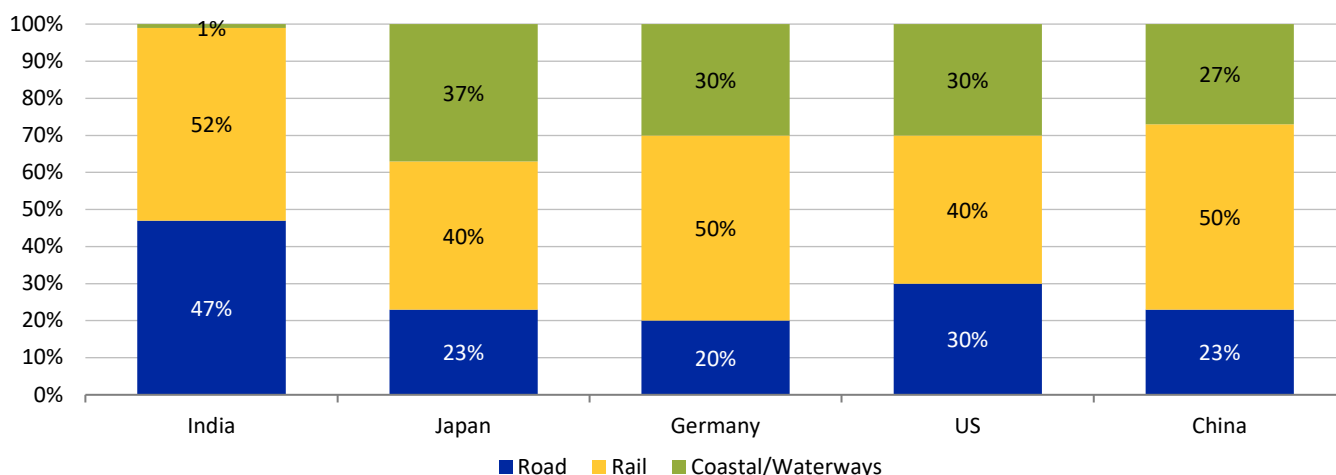
Exhibit 51: Mode of outward movement of coal and iron ore in India



Source: Ministry of Coal, Ministry of Railways, ICRA Research

production were transported by road in 2025. This reliance on road transport results in higher delivered costs for end-user industries, supply chain delays due to road congestion, and increased working capital needs arising from unpredictable delivery schedules.

Exhibit 52: Mode of transportation for steel industry



Source: Ministry of Steel, ICRA Research

When compared internationally, particularly in the steel sector, India's logistics inefficiency becomes more apparent. Nearly 47% of steel products in India move by road, compared to just 23% in China and 20% in Germany. Developed economies have invested substantially in rail and coastal shipping

infrastructure, which forms the foundation of their bulk logistics operations. In countries like Japan and Germany, railways and waterways provide cost and reliability advantages that enable smoother industrial operations and lower input costs.

On the logistics bottlenecks, the key aspect would be the inclusion of slurry pipelines for material movement in the coming decades to save on the

logistics cost and making mining more cost-effective. Select slurry pipeline projects under development have been shared in Exhibit 53:

Exhibit 53: Slurry pipeline projects under development by major primary steelmakers

Entity Name	Project Details
AMNS India	A flagship project moving beneficiated iron ore from Kirandul (Chhattisgarh) to Visakhapatnam (Andhra Pradesh) for AMNS's steel plant, offering cost-effective and green logistics.
Lloyds Metals	India's first iron ore slurry pipeline in Central India (Maharashtra), moving ore from Surjagarh mines to Konsari, noted for its fast execution.
AMNS India	AMNS also secured approval for another pipeline from Chhattisgarh to Andhra Pradesh, via Odisha, for its new integrated steel plant.
NMDC	Developing a similar system for iron ore mines, connecting Chhattisgarh to Vizag, reducing railway dependence.
JSW Steel Limited	A 312-km pipeline designed to transport iron ore slurry from a grinding and desliming plant near Joda (Keonjhar district, Odisha) to the proposed integrated steel plant at Paradeep (Odisha) .
Jindal Steel Limited	An iron ore slurry pipeline running from Barbil to Angul (Odisha), connecting JSPL's major captive mining operations to its integrated steel complex.
Steel Authority of India Limited (SAIL)	Metallurgical & Engineering Consultants (India) Limited (MECON) prepared Detailed Project Reports (DPRs) for three major grid networks: the BSL Grid (Barajamda to Bokaro Steel Plant with a return water pipeline), the RSP Grid (Barsua to Rourkela Steel Plant), and the BSP Grid (Rowghat to Dalli, extending to Bhilai Steel Plant).

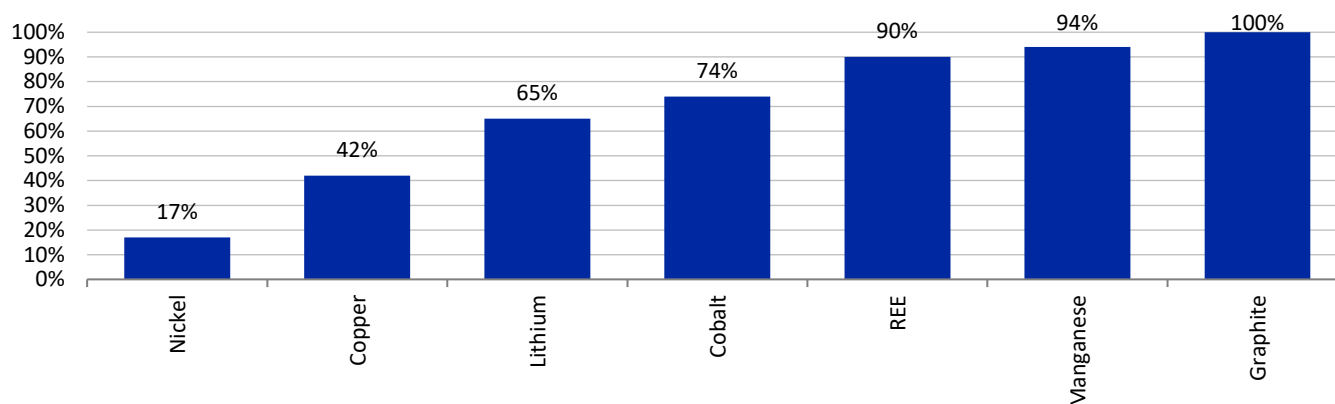
Source: Publications of steel companies, ICRA Research

Geopolitical realignments and their implications for global mining policies

The global mining landscape is undergoing a structural transformation, driven by rising geopolitical fragmentation and a push toward resource nationalism. The year 2023 marked a significant escalation in the impact of global conflicts and political realignments on mineral supply chains. The ongoing war in Ukraine, combined with growing strategic tensions between China and

Western economies, has disrupted traditional trade relationships and exposed vulnerabilities in mineral procurement systems. These developments have led to an accelerated shift toward self-reliance among nations, with governments revisiting their mineral security strategies and prioritising domestic resource development.

Exhibit 54: China's share in processing critical minerals



Source: IEA, Giant Metals, ICRA Research

A key concern emerging from this shift is the growing dominance of China in the refining and processing of critical minerals essential for the global energy transition. China currently controls a disproportionately high share of global processing capacity, up to 90% or more for minerals such as rare earths, graphite, and manganese. This concentration of market power raises concerns over supply security for economies dependent on clean energy technologies, which are highly reliant on a steady flow of processed critical minerals.

The broader implication of this realignment is a fundamental shift in global mining policy from efficiency-driven globalisation to risk-mitigated regionalism. Countries are now placing greater emphasis on safeguarding their mineral value chains through incentive-led investments, tighter export controls, and the establishment of domestic refining infrastructure. This trend is expected to intensify in the coming decades, as nations race to secure critical inputs for green technologies, including electric vehicles, battery storage, and renewable power systems.



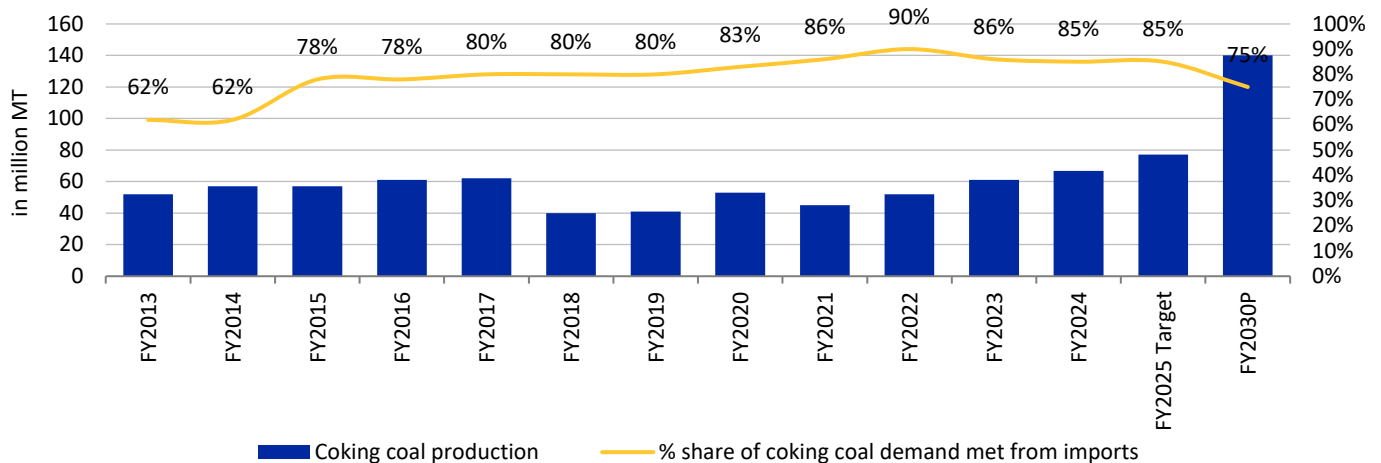
Strategic reforms in coal sector to increase India's self-sufficiency

Mission coking coal: India's push to cut steelmaking import dependency

India's steel sector, particularly through the Blast Furnace-Basic Oxygen Furnace (BF-BOF) route, remains heavily reliant on imported coking coal, a critical reductant used in the coke-making process. With the BF-BOF route accounting for nearly 45% of India's steel production, the country's demand for metallurgical coal is structurally high. Domestic coking coal production has remained relatively stagnant over the last decade, fluctuating in a narrow

range of 40-60 million tonnes per annum, largely sourced from Jharkhand. The persistent challenge lies in the high ash content of domestic coal, often ranging from 18% to 49%, which necessitates extensive washing to bring it down to usable levels below 18%. As of FY2024, domestic coking coal output was approximately 67 million tonnes, and the ash adjustment gap continues to limit its broader industrial applicability.

Exhibit 55: Trend in domestic coking coal production



Source: Ministry of Coal; ICRA Research

Consequently, India's dependence on seaborne coking coal imports has steadily increased, rising from around 62% in FY2013 to as high as 85% in recent years, making the steel sector vulnerable to international price volatility. Imports are primarily

sourced from Australia, followed by the US, Canada, and Mozambique. In FY2025, India is estimated to have imported 58 million tonnes of coking coal, driven by robust steel production and a lack of sufficient domestic washing capacity.

Recognising this strategic vulnerability, the Gol launched the ‘Mission Coking Coal’ initiative in August 2021, aiming to more than double domestic coking coal production to 140 million tonnes by FY2030. The initiative is also intended to reduce import dependency from the prevailing 85–90% to around 75%. ICRA’s analysis suggests that to meet

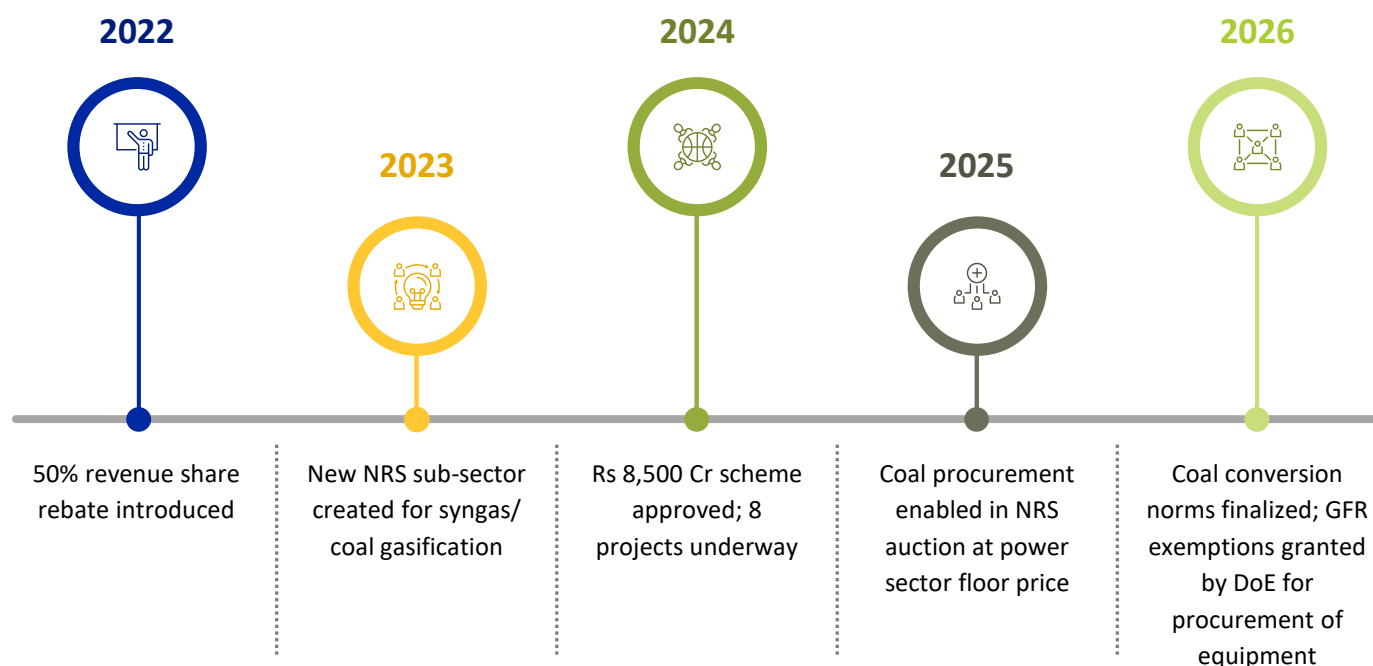
this target, India will not only need to raise raw coal production but also expand coal washing capacity significantly – from the current estimated 23 MTPA to nearly 78 MTPA. This would enable improved blending potential of domestic coal with imported high-grade coking coal, reducing both cost and import volumes over time.

Coal to chemicals: India’s strategic pivot towards a gasification-led future

As part of its long-term energy diversification and industrial self-reliance agenda, the Gol has placed a sharp focus on coal gasification as a transformative pathway to value-added coal utilisation. With an ambitious target to gasify 100 million tonnes of coal annually by FY2030, the Ministry of Coal has launched the National Coal Gasification Mission, which is expected to unlock an investment potential

exceeding Rs. 4 lakh crore across coal-bearing states. The mission is being implemented in three phases, with the final phase (FY2026–2030) targeting 90–100 MT of coal gasification per year. Financial incentives such as a 50% rebate in revenue share for coal blocks used for gasification – conditional upon using at least 10% of mined coal for gasification – are being extended to catalyse investment.

Exhibit 56: Journey so far in coal gasification projects



Source: Ministry of Coal, ICRA Research; NRS: non-regulated sector; GFR: General financial rules; DoE: Department of Expenditure

The technology centres around the generation of syngas – a mixture of carbon monoxide and hydrogen – which can be processed further to produce a variety of chemical and petrochemical products currently imported in significant volumes. These include synthetic natural gas (SNG), methanol, ethanol,

synthetic diesel, ammonia, and ammonium nitrate, among others. Coal gasification is also emerging as a critical bridge technology for substituting imported liquefied natural gas (LNG) in industrial sectors, and as a stepping stone towards green hydrogen adoption for cleaner steelmaking.

Exhibit 57: Planned domestic coal gasification projects

	Talcher Fertilizer	Coal India (ECL)	Coal India (MCL)	Coal India (SECL)	Coal India (WCL)	Neyveli Lignite	Jindal Steel & Power	New Era Cleantech Solution
Technology Partner	Wuhan Engineering Company	GAIL	BHEL	IOCL	-	Air Products, USA and EIL	Midrex Technologies, USA	-
Product	Urea	Synthetic Natural Gas	Ammonium Nitrate	Di-methyl ether	Ammonium Nitrate	Methanol	DRI	Methanol/ Urea
Capacity	1.27 mtpa	633.6 mio. m ³	0.66 mtpa	0.72 mtpa	0.66 mtpa	0.396 mtpa	1.8 mtpa	-
Coal/Lignite Gasified	2.5 mtpa	1.4 mtpa	1.3 mtpa	1.35 mtpa	0.8 mtpa	2.26 mtpa	2.4 mtpa	5 mtpa
Project Cost	Rs. 13,277 crore	Rs. 13,053 crore	Rs. 11,782 crore	-	-	Rs. 4,383 crore	-	~Rs. 20,000 crore (US\$ 2.5 billion)

Source: Company data

As of FY2025, several gasification projects were either under construction or in advanced planning stages. Among the most prominent was the Talcher Fertilizer Project in Odisha, a joint venture between CIL, GAIL India Limited (GAIL), Rashtriya Chemicals & Fertilizers Limited (RCF), and Fertilizer Corporation of India Limited (FCIL), which will be India's largest coal gasification-based urea complex with a capacity of 1.27 MTPA. The project is expected to be commissioned by December 2027. Jindal Steel & Power has already operationalised a coal gasification-based sponge iron plant at Angul, Odisha, while Neyveli Lignite Corporation and CIL have signed MoUs for five additional coal-to-chemical projects, including one focused on lignite gasification.

In addition to surface projects, underground coal gasification (UCG) has also gained policy traction, with pilot sites identified in West Bengal and Telangana. Furthermore, indigenous R&D is being supported through pilot-scale projects such as the 500 TPD coal-to-hydrogen demonstration unit, mandated by the Government and led by Bharat Heavy Electricals Limited (BHEL).

Looking ahead, coal gasification is poised to play a strategic role in India's efforts to reduce import dependency on chemicals and natural gas, monetise high-ash domestic coal, and decarbonise

hard-to-abate industrial sectors. However, timely execution, infrastructure for syngas handling, and the development of downstream market linkages will be essential for realising the full economic and environmental potential of these investments. If the Government's targets are met, coal gasification could emerge as the backbone of India's transition from thermal combustion to a coal-to-chemicals economy, signalling a paradigm shift in how coal is valued and utilised.

The Government has already launched a Rs. 8,500-crore incentive scheme and recently approved an additional Rs. 37,500-crore financial support package to accelerate coal gasification projects across the country. Coal gasification has the potential to significantly reduce the country's dependence on imported methanol, ammonia, fertilisers and other critical chemicals, thereby protecting farmers, industries and consumers from global trade shocks and price volatility.

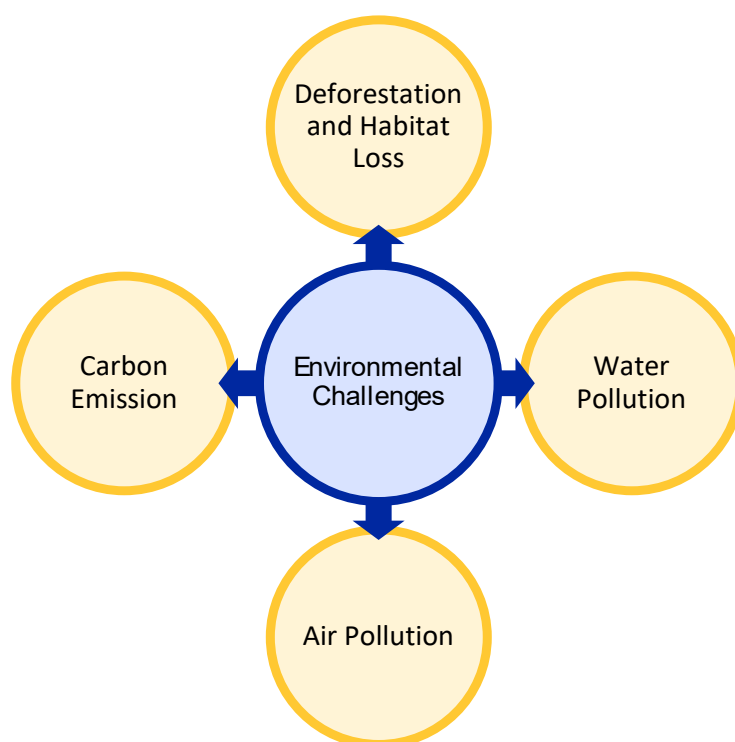


Sustainability in mining: Balancing growth with environmental stewardship

The mining industry in India is pivotal to the country's economic growth, supplying the raw materials essential for infrastructure, manufacturing, and energy sectors. However, mining activities also pose significant environmental and social challenges, such as habitat destruction, water pollution, air quality degradation, and community displacement. Recognising the need to balance economic benefits with environmental stewardship and social responsibility, Indian mining companies are increasingly adopting sustainable practices.

The focus is now on reducing the environmental footprint, enhancing resource efficiency, and improving community relations to ensure the long-term sustainability of the industry. Rule 35 (2) of the Mineral Conservation and Development Rules, 2017, mandatorily provides for 'Star Rating' of non-coal/lignite mining leases in the country based on sustainable mining practices. In June 2023, the Ministry of Coal announced the introduction of the 'Star Rating' system for domestic coal mines as well

Exhibit 58: Key environmental challenges in Indian mining

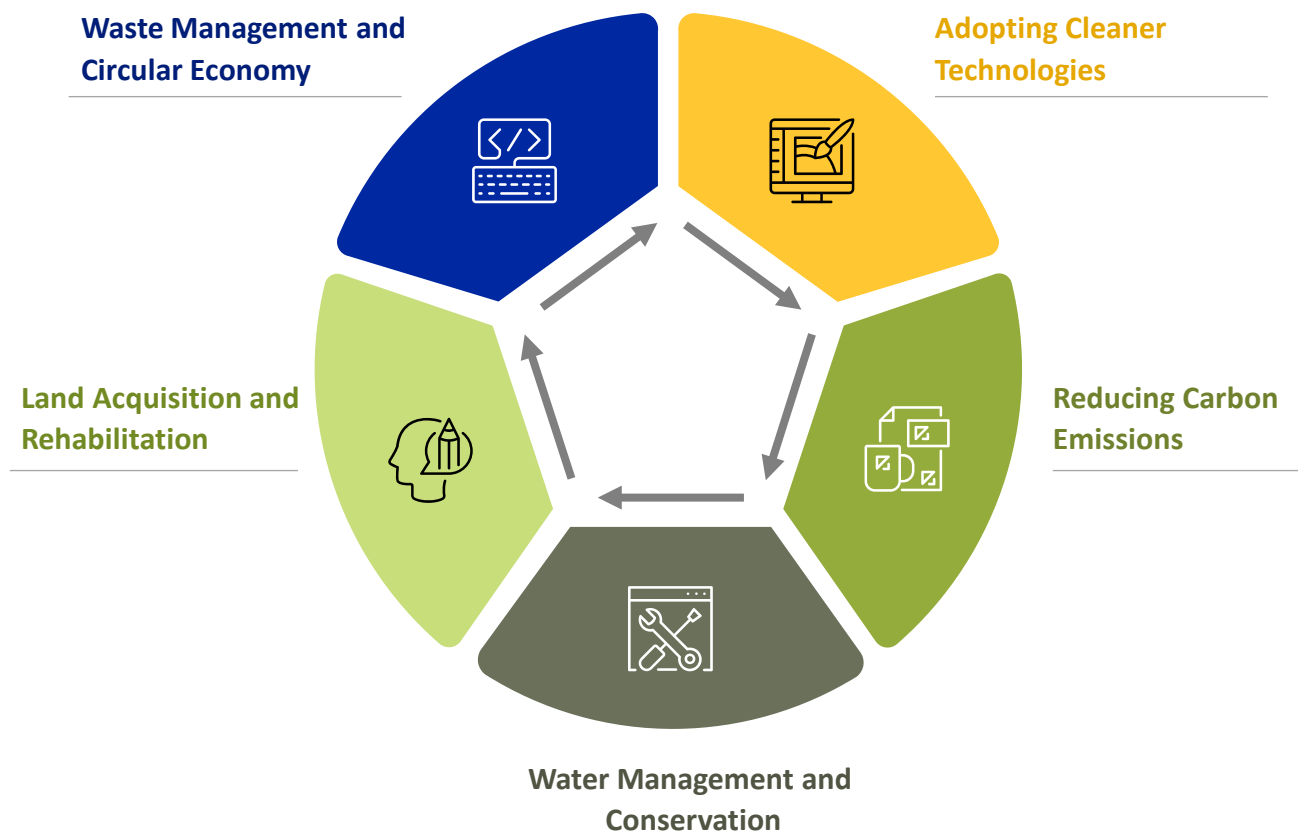


Source: ICRA Research

To reduce the environmental impact of mining activity, Indian mining companies are increasingly

adopting sustainable practices as outlined in Exhibit 59:

Exhibit 59: Five pillars of sustainable mining



Source: Industry reports, ICRA Research

Cleaner technology

Mining technology has evolved over the years, and today multiple options are available for companies to adopt mining techniques that reduce the extent of environmental impact. Indian mining companies

are increasingly adopting advanced technologies to enhance operational efficiency and minimise environmental impact.

Advanced mining technologies

- Surface miners:** These machines enable precise cutting of minerals, reducing the need for drilling and blasting, which in turn minimises dust and noise pollution. For instance, the National Aluminium Company Limited (NALCO) employs surface miners in its bauxite mines to enhance efficiency and reduce environmental disturbances.
- Continuous miners and longwall mining Systems:** These technologies are pivotal in underground coal mining, allowing for continuous extraction and helping reduce the environmental footprint.

Electric and hybrid machinery

- **Battery electric vehicles (BEVs):** Hindustan Zinc Limited (HZL) has pioneered the use of BEVs in its underground operations. In January 2023, the company introduced the Normet Agitator SmartDrive EV into its underground mining operations, marking a significant step toward reducing carbon emissions and promoting sustainable mining practices.
- **Hybrid excavators:** Tata Steel has incorporated hybrid hydraulic excavators in its mining operations. These machines combine diesel and electric power, leading to lower fuel consumption and reduced greenhouse gas (GHG) emissions.

Automation and remote operations

- **Automated drilling systems:** HZL has implemented automated drilling in its zinc mines, enhancing precision and safety while reducing energy consumption.
- **Remote monitoring and control:** JSW Steel utilises remote monitoring systems in its iron ore mines, allowing for real-time data analysis and operational adjustments. These steps significantly improve efficiency and reduce environmental impact.

Reducing carbon emissions

Indian mining companies are increasingly focused on reducing their carbon footprint by adopting renewable energy and energy-efficient technologies.

- Hindalco, a subsidiary of the Aditya Birla Group, has been making significant investments in solar energy to power its mining and manufacturing operations.
- JSW Steel has been a pioneer in adopting energy-efficient technologies to optimise power usage

This is in line with global sustainability goals and India's commitments to reducing GHG emissions.

across its iron ore mines and steel manufacturing facilities.

- HZL is leveraging IoT and automation technologies to optimise energy use in its underground mining operations.

Water management and conservation

Leading Indian mining companies like Vedanta and Tata Steel have implemented Zero Liquid Discharge (ZLD) systems, ensuring that all wastewater generated during their operations is treated, recycled, and

reused on-site, thereby preventing any discharge into local water bodies and protecting surrounding ecosystems.

For instance, Vedanta's Lanjigarh alumina refinery in Odisha and Tata Steel's Jamshedpur plant in Jharkhand have successfully integrated ZLD systems, significantly reducing their impact on local water

sources. These companies have also embraced rainwater harvesting and efficient water recycling systems to minimise their dependence on freshwater sources.

Waste management and circular economy

Indian mining and metals companies are increasingly focusing on waste management and circular

economy initiatives to reduce environmental impact and optimise resource utilisation.

- Tata Steel has been reusing slag generated from its steel production for road construction and as an additive in cement manufacturing, turning what was once considered waste into valuable inputs for infrastructure projects.
- Similarly, Vedanta has launched various waste-to-wealth initiatives, converting by-products from its aluminium and zinc operations into

commercially useful materials. Vedanta's red mud and fly ash recycling projects not only reduce waste but also supply materials for cement and brick production. By adopting these practices, companies are not only reducing landfill waste but also contributing to a more sustainable circular economy.

Land acquisition and rehabilitation

Mining activity and its associated degradation of soils, biomass, and local ecosystems make the land unsuitable for alternate use until initiatives for bio-reclamation of mined areas and reforestation have been undertaken. In this regard, to promote mine tourism, CIL and Steel Authority of India Limited (SAIL) have developed eco-parks/biodiversity parks on reclaimed land.

Internationally, mining companies like Alcoa, headquartered in Pittsburgh, USA, have gone a step ahead by implementing not only large-scale reforestation but also by restoring local species present at a mine site before mining operations began.



Conclusion

In conclusion, India's mining sector stands at an inflection point. After decades of public-sector dominance – with state-owned enterprises historically contributing roughly three-quarters of mineral output – the industry is undergoing significant transformation and opening to private and global players. Reforms introduced in recent years, notably the move to auction mineral blocks and the opening of commercial coal mining in 2020, have begun to catalyse greater private participation. These steps, along with eased restrictions on mining licenses and 100% FDI allowances, signal a commitment to harnessing India's vast resource base and building self-reliance in key minerals. The sector remains critical to India's power, steel, and manufacturing industries, and raising domestic output – especially of coal – will help curb import dependence and secure the nation's energy needs. At the same time, the Government's strategy to encourage exploration, diversify into new minerals (such as lithium and other critical transition metals), and streamline policies lays the groundwork for sustained growth.

Yet the sector's revival faces enduring challenges. India's mining industry still contributes only about 2–2.5% to GDP, far below global peers. This modest footprint reflects structural bottlenecks: long and complex approval processes, onerous land acquisition, fragmented logistics, and infrastructure constraints have historically impeded timely project development. These issues translate directly into heightened execution risk and capital inefficiencies. For example, securing clearances for a new coal mine can take four years or more, delaying production ramp-ups and investor returns. Likewise, inadequate

rail and pipeline networks force heavy reliance on road transport, raising costs and reducing competitiveness. FDI remains negligible, as global investors remain wary of regulatory uncertainty and slow processes, despite India's clear resource potential.

Encouragingly, industry and Government stakeholders are adopting mitigants to address these shortcomings. Authorities have begun expediting mine auctions and clearances, resulting in a sharp increase in new operational mines in recent years. Mining companies are investing in advanced technologies and greener practices – from surface miners and underground automation to battery-electric vehicles – boosting productivity and reducing environmental impact. Major initiatives to cut import reliance are underway – Mission Coking Coal targets doubling local output to reduce India's 85% reliance on imported metallurgical coal, and an ambitious coal gasification drive aims to create value-added products and replace imported fuels.

In parallel, Indian mining firms are embracing sustainability, with the launch of a star-rating system for sustainable mines and industry-wide emphasis on environmental stewardship, resource efficiency, and community engagement. These efforts – in logistics (e.g. slurry pipelines to move bulk ores cost-effectively), technological upgrades, and eco-friendly practices – demonstrate a growing resilience and proactive risk management across the sector. By balancing growth ambitions with environmental and social responsibilities, India's mining industry can emerge more globally competitive, financially robust, and sustainable.

The journey ahead is complex, but the progress so far provides a strong foundation for long-term resilience and self-reliance in this strategic sector.

About ASSOCHAM

ASSOCHAM initiated its endeavor of value creation for Indian industry in 1920. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem. With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy'. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

Vision

Be the knowledge architect for the Indian economy, with a focus on strengthening India's domestic ecosystem and enhancing global competitiveness.

Mission

Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development.

For more information, contact

Mr Ramit Sircar

Deputy Director and State Head – West Bengal

The Associated Chambers of Commerce and Industry of India

West Bengal State Office: C/o, Zioks, Room No. 118, 6th Floor, Tower II, Millenium City IT Park, DN 62,
Sector V, Salt Lake Kolkata 700091

website: www.assochem.com

About ICRA

ICRA Limited (formerly Investment Information and Credit Rating Agency of India Limited) was set up in 1991 by leading financial/investment institutions, commercial banks and financial services companies as an independent and professional investment Information and Credit Rating Agency. Today, ICRA and its subsidiaries together form the ICRA Group of Companies (Group ICRA). ICRA is a Public Limited Company, with its shares listed on the Bombay Stock Exchange and the National Stock Exchange.

ICRA details (Analytical)

Girishkumar Kadam	Senior Vice-President & Group Head	girishkumar@icraindia.com	022 – 6114 3408
Ankit Jain	Vice-President & Co-Group Head	Ankit.jain@icraindia.com	0124 – 4545 865
Sumit Jhunjunwala	Vice-President & Sector Head	Sumit.jhunjunwala@icraindia.com	033 – 6521 6814

Contacts



Business Contacts

L Shivakumar

Chief Business Officer
E-mail: shivakumar@icraindia.com
022-61693304

Sai Krishna

Head - Research Sales and Investor Connect
E-mail: sai.krishna1@icraindia.com
9840774883

Rohit Gupta

Head Business Development –
Infrastructure Sector
E-mail: rohitg@icraindia.com
0124-4545340

Vivek Bhalla

Head Business Development –
Financial Sector
E-mail: vivek.bhalla@icraindia.com
022-61693372

Vinita Baid

Head Business Development – East
E-mail: vinita.baid@icraindia.com
033-71501131

Shivam Bhatia

Head Business Development
Corporate Sector – North & South
E-mail: shivam.bhatia@icraindia.com
0124-4545803

Sanket Kulkarni

Head Business Development –
Corporate Sector – West
E-mail: sanket.kulkarni@icraindia.com
022-6169 3365

Media and Public Relations

Naznin Prodhani

Head - Group Corporate Communications & Media Relations
E-mail: communications@icraindia.com
0124-4545860

Registered Office

B-710, Statesman House 148,
Barakhamba Road
New Delhi-110001
Tel: +91 11 23357940-45

Corporate Office

Building No. 8, 2nd Floor,
Tower A, DLF Cyber City, Phase II,
Gurgaon - 122 002
Tel: +91-124-4545300

Ahmedabad

1809-1811, Shapath V,
Opp: Karnavati Club,
S.G.Highway, Ahmedabad - 380015
Tel: +91 79 4027 1500/501

Bengaluru 1

'The Millenia', Tower B Unit No. 1004,
10th Floor, 1 & 2 Murphy Road,
Bengaluru - 560 008
Tel: +91 80 4332 6400

Bengaluru 2

2nd Floor, Vayudooth Chamber
15-16, Trinity Circle, M.G. Road,
Bengaluru - 560 001
Tel: +91 80 4922 5500

Chennai

5th Floor, Karumuttu Centre
634, Anna Salai, Nandanam
Chennai - 600 035
Tel: +91 44 4596 4300

Hyderabad

Unit No 1006, 10th Floor, Gowra Fountain
Head, Patrika Nagar, Madhapur,
High-Tech City, Hyderabad,
Telangana – 500081
Tel: +91 040-69396464

Kolkata

Siddha Esplanade, 3rd floor,
6 Jawaharlal Nehru Road,
Esplanade, Kolkata,
West Bengal -700 013
Tel: +91 33 6521 6800

Mumbai

3rd Floor, Electric Mansion
Appasaheb Marathe Marg,
Prabhadevi,
Mumbai - 400 025
Tel: +91 22 6169 3300

Pune

5A, 5th Floor, Symphony, S. No. 210
CTS 3202 Range Hills Road, Shivajinagar,
Pune - 411 020
Tel: +91 20 2556 1194

Email: Info@icraindia.com

Helpdesk: 9354738909

Website: www.icra.in/ www.lcraresearch.in