

# Mining for self-reliance and progress



**ARUN MISRA**



**INDIA'S MINING SECTOR** has undergone a remarkable transformation—from a traditional excavation-driven industry to a sustainability-focused, technology-powered force.

Today, the sector is a key contributor to the economy, accounting for over 2% of the national Gross Value Added (GVA) and serving as a multiplier for industrial growth. Notably, a 1% increase in mining activity can spur a 1.3% rise in industrial production and a 0.3% boost in GDP, an indication of its far-reaching influence.

India's mineral wealth has long been the backbone of its industrial growth. In the last decade, this sector has seen a massive change due to new technologies and policy shifts. The amendments made in 2015 to the Mines and Minerals (Development and Regulation) Act introduced a transparent auctioning process, which, combined with increased lease length, has improved operational continuity. Other reforms in 2023, including the auctioning of 24 essential and strategic minerals and the establishment of Exploration Licenses, have fortified India's position in international mining. These

developments have turned the landscape brimming with potential and an industry poised to meet the demands of infrastructure development and energy transition.

Iron ore, a cornerstone of India's industrial framework, exemplifies this evolution. Production surged from 152 million tonnes in FY14 to 274 million tonnes in FY24, positioning India as the world's fourth-largest producer. The numbers, while impressive, tell only part of the story. The mining industry is increasingly adopting new technologies to improve efficiency and sustainability.

Leveraging IoT, AI, and ML, mining operations have become smarter and more efficient. These innovations facilitate predictive maintenance, real-time monitoring, and data-driven decision-making, leading to greater productivity and safer,

more sustainable operations. With advanced analytics, companies can now foresee equipment failures and streamline production processes, minimising downtime and staying competitive in a fluctuating market.

Sustainability, once a peripheral concern, has now become a keyboardroom agenda. The sector has adopted practices aimed

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at zero waste mining, maximising resource efficiency, and minimising environmental impact. Companies are integrating renewable energy sources into their

operations, with ambitious targets of a 30-40% reduction in mining-related carbon footprints by 2030. India's journey towards becoming a critical player in the global energy transition is evident in its production of non-ferrous metals like aluminium, zinc, and copper. Bauxite and manganese, crucial for downstream industries, have seen robust growth. From FY 2014 to FY 2024, the production of bauxite increased from 14.6 million tonnes to 21 million tonnes, while manganese output increased from 2.6 million tonnes to 3.4 million tonnes. These minerals are integral to producing materials that drive renewable energy systems, EVs, and digital infra, aligning the sector with future technological and environmental demands.

Infrastructure development has acted as a powerful catalyst for the mining sector. Ambitious initiatives like PM Gati Shakti, Housing for All, and the National

Infrastructure Pipeline have significantly boosted the demand for minerals. Over the next 15 years, an estimated \$1 trillion in investments will be crucial to drive the global energy transition and achieve carbon emission targets, with India poised to attract a substantial share of this capital. This capital influx will further drive innovations in mining technologies and practices, ensuring the sector's alignment with national and global priorities.

The evolving regulatory environment has also played a pivotal role in driving the industry forward. Policies like the National Mineral Policy 2019 aim to foster transparency, attract private investment, and encourage sustainable mining practices. The introduction of offshore mining rights and mechanisms to explore critical and deep-seated minerals are steps in the right direction. These reforms pave the way for enhanced exploration capabilities and increased domestic production, reducing dependency on imports and strengthening supply chain resilience.

Yet, challenges persist. The need for significant investments in mineral beneficiation and extraction technologies is urgent. Encouraging collaboration between mining companies, national laboratories, and academic institutions could unlock breakthroughs in this area. Additionally, increasing the size of mineral blocks and optimising auction processes are crucial to ensuring the sector's sustainable growth.

As India marches toward its vision of becoming a \$30 trillion economy by 2047, mining will remain a crucial driver. The ability of the sector to create 25 additional million jobs during this period makes it an important socio-economic decision as well. However, the next chapter of this journey promises to be as transformative as the last, only when driven by the twin engines of innovation and sustainability.

*(The writer is CEO & Whole time Director, Hindustan Zinc & Executive Director, Vedanta)*