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India's new green revolution: Powering the future with energy transition metals

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India is on the brink of something no major nation has done before—becoming prosperous while going green.

In India, the energy transition is not seen as a cost, but an engine for jobs, innovation, self-reliance, and national pride. We've already shown the world what ambition backed by action can do. India achieved a 50% share of renewable energy in its power mix five years ahead of its 2030 target. EV adoption is consistently accelerating; over 20% of three-wheelers and 6% of two-wheelers sold in 2025 were fully-electric. We are the

third-largest renewable energy market and the largest EV market outside China. These achievements point to something bigger: India is building its own model of green growth that is inclusive, scalable, and uniquely Indian.

This new green revolution, however, has an industrial foundation. Every electric vehicle, solar panel, and wind turbine is built on the foundation of energy transition metals—copper, zinc, silver, lithium, cobalt, graphite, and rare earths.

Take copper, often called the metal of electrification. Electric vehicles need nearly 2.5x more copper than conventional cars. Offshore wind farms require almost 8x more copper per megawatt than gas plants. Zinc, one of India's strongest industrial assets, plays a vital role in protecting infrastructure, enhancing battery life, and supporting the circular economy through recycling and corrosion control. Silver, once viewed primarily as a precious metal, is indispensable to solar panels, EV components, and next-generation electronics. The recent global rally in silver prices not only recognises this shift but also crystallises strategic importance in the green energy value chain.

The International Energy Agency projects that global demand for these minerals will rise sixfold by 2040. The world is rushing to secure them. And this is where India’s unique advantage lies.

Our geology mirrors that of mineral-rich nations like Australia and South Africa. Yet, we have explored only around 20% of our potential. That means four-fifths of what lies beneath remains untapped. Unlocking this potential could reshape our economy. Today, nearly half of India's $400 billion annual imports are natural resources. Imagine the possibilities if we could meet even a fraction of that demand domestically, not just in mining, but in refining and downstream value addition. It would make ‘Make in India’ truly meaningful.

Across the world, nations are moving swiftly to secure their mineral supply chains. Every country is protecting its natural endowments as strategic assets. For India, this is both a challenge and an opportunity. We must move quickly, responsibly, and at scale.

The recent auction of 38 critical and strategic mineral blocks across 14 states marks a powerful beginning. It recognises that critical minerals are not just commodities but strategic infrastructure, just as vital to our future as energy or technology. The nature of mining itself is changing. The old perceptions of mining are no longer true. With advanced sensing, automation, and AI, modern mining is becoming more efficient and a fully restorative effort over its life cycle. If we unlock our mineral wealth responsibly, the impact will extend far beyond industry.

Delivering energy transition is not only about ambition but also execution. The resources sector already ranks among India's largest employment generators, second only to construction. With the right partnerships and innovation, it can create millions of jobs, ranging from geology and engineering to data science and community development. We have the world's largest pool of engineers and one of the most

dynamic technology ecosystems. If we can marry geology with innovation, India can become a global benchmark for sustainable resource development.

The new green revolution isn’t just about producing metals; it’s about producing hope, in mining towns, manufacturing hubs, and classrooms where young Indians dream of building a vibrant future.

I often think of India's journey as one of rediscovering what already lies within us, in our soil, our spirit, and our will to build. The last decade belonged to India's digital revolution. The next will be defined by its green industrial revolution. Because when India grows green, the world grows better.

(The author is non-executive director, Vedanta Limited, and chairperson, Hindustan Zinc Limited. Views are personal.)