



# CRITICAL MINERALS

All the Right Elements Behind  
The Star of Electrochemistry  
(Part IV): The Deep Dive

India's first-ever offshore critical mineral auctions positions the nation alongside China, Japan, the USA, Belgium, and Norway in the race to unlock valuable sea-based deposits

JANUARY 2025



## 1 Critical Mineral Auctions – The One-Year Status Report



## 2 Opening up Offshore Minerals for Private Exploration



## 3 The Missing Link to Commercialise India's Offshore Mineral Blocks



## 4 The Laws of Deep-Sea Mining in International Waters



## 5 The Way Forward







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*India has been a late starter in the exploration of domestic land-based critical mineral resources compared to other large economies. However, the Ministry of Mines has now swiftly gone a step ahead by inviting bids for mining offshore critical minerals in the country's territorial waters and exclusive economic zones. This helps position India amongst a select few nations alongside China, Japan, the USA, Belgium, and Norway which is actively looking to develop offshore critical mineral deposits*



- The Government of India (GoI) has so far conducted four tranches of land-based critical mineral block auctions. However, of the 48 blocks offered so far, only 50% of the blocks (24 blocks) have managed to find a buyer. This suggests that the risk-reward tradeoffs remain unattractive and the path to commercialisation remains uncertain in half of the blocks being auctioned.



- Most leading domestic miners remained on the sidelines at the auctions, given the high risk of exploring deep-seated and critical minerals, where the probability of discovering and commercialising a good reserve remains low. The Vedanta Group, Coal India and the Rungta Group are the only notable domestic names figuring on the list of winning bidders.



- Global mining majors as well as the smaller entities with technological know-how in the niche area of critical mineral mining gave the auctions a miss even as 100% FDI is allowed in the mining sector through the automatic route. This suggests that the right domestic ecosystem is not yet there for facilitating a wider industry participation.



- While the discovery of a world-class domestic land-based resource for critical minerals remains elusive, the Government has now stepped up deep-sea exploration activities. Of the 13 blocks that have been lined up for India's maiden offshore mineral auctions, three blocks are for construction sand (having end-use in construction), three are for lime-mud (with end-use in cement) and seven are for polymetallic nodules (containing battery minerals like nickel and cobalt).



- The technological entry barriers and risks of developing offshore construction sand and lime-mud blocks are much less compared to the polymetallic nodule blocks, as the deposits for the latter are located at depths of 550-1,600 metres. In ICRA's view, unlocking the potential of polymetallic nodules and crusts without foreign expertise would remain a challenge.



- Apart from conducting offshore mineral auctions in territorial waters & exclusive economic zones, India is parallelly conducting deep-sea mineral exploration programmes in international waters. The International Seabed Authority (ISA) has awarded one polymetallic nodule and another polymetallic sulphide contract to India, both in the Central Indian Ocean. India's latest deep-sea mineral exploration mission to one of the two ISA-allotted block was in October 2024.



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