

FutureBridge

What is?

Critical Minerals Shortage: Are Seabed Nodules the Sustainable Answer?

Critical minerals like lithium, cobalt, and nickel are vital building blocks for many green technologies.

As per IEA, by 2040, total mineral demand from clean energy technologies could double or even quadruple.

Depleting land-based mineral reserves drive the demand for seabed nodules mining.

Seabed nodules, rich in manganese, nickel, copper, and cobalt, present a potential solution to meet growing resource demands for renewable energy.

31

exploration contracts for polymetallic seabed nodules mining were awarded up till 2023

\$16.2

Trillion

Projected market value of deep-sea mineral deposits

polymetallic nodules can contain up to

10x

metal concentration of terrestrial ores for nickel, cobalt, and copper

The Clarion-Clipperton Zone in the Pacific Ocean holds an estimated

21 Bn tons

polymetallic mineral deposits

What if?

Harnessing Ocean Riches: Is Deep-Sea Nodule Mining the Answer?

The Metals Company (TMC) has exploration contracts within the Clarion-Clipperton Zone (CCZ) in the Pacific Ocean. Their pilot projects aim to extract and process polymetallic nodules

Blue Nodules Project: This EU-funded initiative focuses on developing technology to improve the sustainability of seabed mining, including robotics and monitoring systems

Its Started ...

The Clarion-Clipperton Zone between Hawaii and Mexico is hot bed for seabed nodules fields exploration. Japan had also launched pilot deep-sea mining projects, with one pilot extraction yielding 16 tons of mineral ores, including zinc, copper, and lead.

What now?

The BIG questions

If the turnover of rare earth minerals sourced from the seabed nodules mining potentially reaches US\$15 Bn by 2030, then

- Who will lead the charge in offering next-gen deep-sea mining equipment?
- Which regions will emerge as hotspots for sustainable nodule extraction?
- How will evolving regulations redefine the future of deep-sea mining?
- What innovations must equipment manufacturers embrace to stay ahead in this transformative era?

By 2030

~6 Mn Tons

Of copper would be sourced from seabed nodules mining

Global deep-sea mining market is forecasted to reach

\$15 Bn

by 2030

About FutureBridge

FutureBridge is a techno-commercial consulting and advisory company. We track and advise on the future of industries from a 1-to-25-year perspective to keep you ahead of the technology curve, propel your growth, identify new opportunities, markets and business models, answer your unknowns, and facilitate best-fit solutions and partnerships using our platforms, programs, and access to global ecosystems and players.