

As companies and countries withdraw their support for **seabed mining**, the about-face is raising broader questions about how metals used in battery production are sourced and the sale of the associated environmental costs. The sourcing of [nickel](#) particularly has been in the spotlight.

Last week, **A.P. Moller-Maersk** became the latest company to drop its investment in The Metals Company, a prospective seabed miner based in Vancouver, British Columbia. Lockheed Martin and Norway's Storebrand also have recently sold their interests in deep-sea mining companies. Others including German luxury carmaker BMW have said that, given environmental concerns, they won't use battery metals sourced from the deep sea. More than a dozen countries are concerned about the [environmental impact](#) of the practice and are calling for a moratorium on seabed mining.

Exponential growth in the sale of [electric vehicles](#) and an expected further rise in the demand for them, however, are fueling a global race to find and mine metals such as nickel and cobalt. Companies are looking to secure supplies in ways that minimize environmental and humanitarian concerns, but are finding it to be a challenge.

For instance, **Ford Motor and Volkswagen** have both announced multibillion-dollar investments in Indonesia's nickel supply chain, which is dominated by Chinese companies such as Contemporary Amperex Technology, or CATL. Ford said the investment provides a low-cost source of nickel that they can directly control to ensure it is mined in line with their sustainability targets.

Indonesia is the world's biggest source of nickel. About half the global total—an estimated 1.6 million metric tons—was mined there in 2022, according to the U.S. Geological Survey. But the World Wildlife Fund, or WWF, has labeled nickel from the Southeast Asian country a concern because of the high levels of deforestation needed to extract the minerals. The nation has the highest forest loss in mining areas worldwide, according to an April report by the international conservation organization.

**Indonesian** nickel exists largely in low concentration deposits underneath lush rainforests. To extract the nickel, the mined ore is crushed, converted to a slurry and then treated with acid under high pressure. The process of recovering the mineral in a commercially viable way often requires huge operations and causes significant environmental damage.

Proponents of deep-sea mining say the nascent practice is a less harmful way to extract nickel than how the mineral is currently sourced in Indonesia. "At the moment the growth in nickel supply is coming from equatorial rainforests," said Gerard Barron, chairman and chief executive of The Metals Company. "So for us the target mineral is nickel."

TMC aims to harvest nodules from sites in the middle of the Pacific Ocean using a specially

designed machine to scrape rocks from the ocean floor that is attached to a ship at the water surface.

In March, battery consulting firm Benchmark Mineral Intelligence published a life-cycle assessment of the impact of deep-sea mining, and found that nickel production via nodule collection by TMC had an environmental impact that was 80% lower than existing sources, largely because the marine method didn't use acid in production.

Despite that report, many companies and countries continue to be concerned about the environmental consequences of mining the seabed. A total of 14 countries, including France and Germany, are calling for a global ban on the practice. Campaigners against deep-sea mining, including the WWF, say the practice disrupts marine environments in part because the rocks, or so-called nodules, harvested from the seabed are starter ecosystems.

The Environmental Justice Foundation, a climate-focused nonprofit, said the Casper Octopus is one species which lays its eggs on the rocks. The wastewater produced during deep-sea mining can contain heavy metals that would harm marine food chains, according to the Deep Sea Mining Campaign, an association of nongovernmental organizations and citizens.

Other nickel sources do exist, but these also aren't free of concern. **Russia** was the third-largest global source of nickel but western automakers have been trying to avoid buying from the country since it invaded Ukraine. New Caledonia, an overseas French territory some 750 miles northwest of Australia, is also a source of nickel but environmentalists say mining on the islands threatens some native species such as the New Caledonian crow. Major miners, including Glencore, are investing in developing nickel recycling; however, different battery chemistries and high startup costs are barriers. Given most electric-vehicle batteries aren't expected to be recycled until after 10 years of use, primary supply remains the key concern.

Environmental groups such as Greenpeace also question the need for fresh mining as new battery chemistries are being developed to avoid using nickel, cobalt and manganese. For example, China's biggest electric-vehicle maker BYD is opting for lithium iron phosphate batteries only.

"There's lots of changing innovation in battery technologies from producers downstream because of environmental and human rights issues," said Louisa Casson, global project leader for Greenpeace's Stop Deep Sea Mining campaign.

A similar trend evolved with [cobalt](#), another mineral that can be extracted from the ocean. Roughly 70% of the blue metal is supplied from the **Congo**, where organizations have called out human-rights violation and environmental destruction that have been committed in efforts to produce it. Such concerns led many battery makers and car manufacturers to

## Can Nickel, Cobalt and Other Battery Metals Be Sourced Sustainably?

adjust their battery chemistry to minimize or completely avoid using cobalt in their batteries. Deep-sea miners have also recently shifted their focus from cobalt to [nickel](#) amid waning demand.

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