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Weekly Brief

Critical Minerals Belong on CEOs' Agendas

Shortages of critical minerals are already disrupting some supply chains, and a broader gap is coming. A BCG proprietary model projects demand for key inputs, including rare earths, copper, and lithium, at roughly 120% to 250% of forecast supply through 2040, driven by electrification, the AI build-out, and defense spending.

The potential for shortages isn't news, and many companies have a plan in place to manage the risks. But most are still underestimating how exposed their companies are—and missing out on a chance to turn risk into advantage.

CEOs tend to leave critical minerals to procurement, which judges the risk of shortages by how much the company pays for each material, what its direct suppliers report, and where the minerals are mined.

A [new report](#) from my BCG colleagues identifies three blind spots that come from relying on those metrics:

- **Overemphasizing Dollars Spent.** Ranking materials by cost leads to a focus on minerals such as copper and lithium—and a tendency to overlook what may matter more. “Mosquito minerals” are too small by traded value to reach a risk register, but they can stop a production line when supply runs short. For example, arsenic’s upstream market is only about \$50 million a year in size, and one Japanese producer supplies roughly 60% of the ultra-high-purity grade that defense electronics require.

- **Stopping at Tier One.** By looking only at the components that direct suppliers sell them, companies lose sight of the minerals embedded within those components—for example, inside motors, magnets, lasers, and sensors. They may also overlook the minerals within the tools and processes needed to create those components.
- **Focusing Solely on Production.** Companies link their exposure to where minerals are mined, but for many minerals the bottleneck is processing, not production. For example, China processes roughly 90% of rare earths, which should be factored into companies' risk calculus. Ownership also matters: a mine or refinery in one country may be owned by companies based in another, so switching to a supplier elsewhere might not solve the problem.

The Strategic Miss

These blind spots lead to miscalculations of risk, but they also deprive companies of opportunities to tap into public capital. Public finance commitments to critical minerals in advanced economies reached around \$65 billion in 2025, according to the International Energy Agency. The money carries conditions and covers about one-tenth of the capital needed through 2040. As of September, flagship funding vehicles in the US, Canada, Italy, and Australia had disclosed limited transactions.

These vehicles seek private partners, and offtake agreements—long-term commitments to buy a project's output—are usually the main eligibility condition. A company that does not know its exposure cannot commit credibly.

Some companies are moving already. Siemens Gamesa, a wind-turbine manufacturer, signed a five-year contract to buy neodymium and praseodymium from Arafura Rare Earths. The contract met Germany's condition for considering an export-credit guarantee of up to \$600 million for Arafura's mine. Mitsui, a trading and investment conglomerate, secured rights to 40% of the copper concentrate from Argentina's Josemaria deposit through a Japanese government tender.

In both cases, the CEO and executive team led the work and treated critical minerals as a source of competitive advantage.

The lesson for CEOs is to bring critical minerals onto the executive agenda. A full view of exposure, all the way to the mine, shows where diversifying suppliers is enough and where a company needs to redesign products or secure supply directly.

Every industrial company is exposed to the coming shortage. Those that measure and manage their exposure well can shape the market in a way that creates strategic advantage for them and requires their competitors to adapt.

Until next time,



Christoph Schweizer
Chief Executive Officer

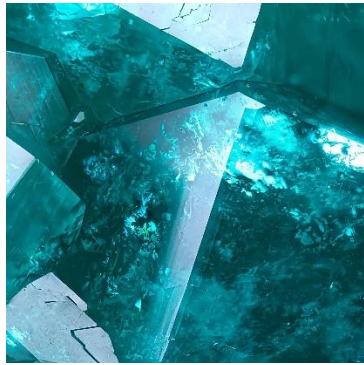
Further Insights



Why Critical Mineral Shortages Are a CEO Issue

Most industrial companies think they understand their exposure to supply chain disruptions. But they may need to take a closer look at their true vulnerability.

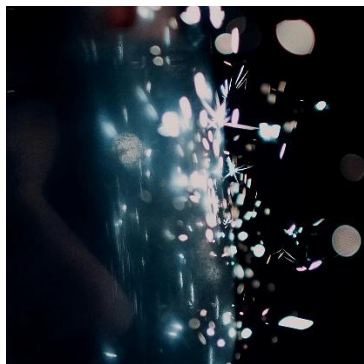
TURN RISK INTO ADVANTAGE



Ecosystems Are the Missing Link in Critical Minerals Supply Chains

Global demand for critical minerals is surging. Buyers and sellers need a coordinated approach to creating supply chain resilience.

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Boston Consulting Group
200 Pier Four Boulevard
Boston, Massachusetts 02210, USA



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