FINANCING THE NEXT CRITICAL MINERALS FRONTIER: AI AND INNOVATION

REPORT OUT
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AI Infrastructure Will Drive Surging Demand for Critical Minerals

The rapid expansion of artificial intelligence is dramatically increasing demand for advanced chips, semiconductor manufacturing equipment, energy, and the critical minerals that underpin these technologies. Key materials include rare earth elements used in high-performance magnets that support cooling and precision systems in data center infrastructure; copper required for power grids and electrical systems; and minerals such as tungsten and graphite used in semiconductor manufacturing equipment and thermal management applications. As AI deployment accelerates, ensuring secure and diversified supply chains for these minerals across extraction, processing, and manufacturing will be essential to sustaining both AI infrastructure and broader industrial capacity. At the same time, recycling and reprocessing critical minerals from decommissioned electronics and data center equipment will become increasingly important. Expanding domestic recycling capacity can reduce dependence on foreign supply while strengthening the resilience of U.S. critical mineral supply chains needed to support future AI growth.

Closing the "Micro-Valleys of Death" in Critical Mineral Technologies

A key takeaway from the discussion is that financing innovative critical mineral technologies remains one of the central challenges in building resilient supply chains. While early-stage technologies can often raise venture capital for research, development, and pilot projects, scaling from pilot to commercial deployment is far more difficult. Rather than a single "valley of death," many companies encounter multiple micro-valleys of death where innovative technologies struggle to reach a minimum sufficient scale due to gaps in financing, permitting, and market certainty. Debt financing for first-of-a-kind (FOAK) facilities that produce commodities with prices manipulated by an adversarial state is nearly impossible to secure, particularly difficult to secure, and private equity and project finance traditional capital typically enter only once technologies are proven at commercial scale. To overcome these barriers, investors need stable, long-term demand signals or performance risk support for a FOAK facility that justifies committing capital to early infrastructure-intensive projects that have yet to benefit from Wright's Law (e.g., learning curves). Government-backed initiatives such as Project Vault, the Department of Energy's Innovation Program, or the Department of Commerce's Investment Accelerator can help create durable demand signals and provide cross-administration stability. Ultimately, the most successful model combines public and private capabilities, where government financing helps balance risk that the private sector struggles to absorb because it cannot capture the public good externalities, aggregate demand, and crowd in private capital to scale critical mineral technologies.

Reshaping Allied Critical Mineral Supply Chains from Just-in-Time to Just-in-Case

Strategic and coordinated approaches, such as State Department initiatives like the Forum on Resource Geostrategic Engagement (FORGE) and Pax Silica, are becoming essential to securing critical mineral and AI supply chains. As industries move from "just-in-time" to "just-in-case" supply chains, governments and companies are increasingly prioritizing coordinated tools such as stockpiling, demand aggregation, project financing, and international partnerships to ensure reliable access to critical minerals. This shift reflects a broader evolution in allied critical mineral policies, moving beyond domestic incentives toward deeper global supply chain coordination. Alongside financing, stockpiles, and project development, the United States is working with trusted partners to build a plurilateral system that can help reshape global mineral markets, reduce dependence on predatory or distorted supply, and strengthen resilient supply chains. More broadly, the intersection of AI development and critical minerals highlights the need for strategic industrial coordination and international cooperation, including through the Department of Commerce's AI Export Program. Securing these supply chains will require system-level policy thinking that goes beyond siloed sector approaches, with collaboration across government, industry, and allied partners to share best practices, mobilize investment, and ensure stable and resilient supply. [Recommend commissioning a study to evaluate tax credits and other financial mechanisms to offset the marginal cost of carry for consumers of critical minerals to hold larger privately-owned inventories of critical minerals.]

Trade Policy as a Tool to Stabilize Critical Mineral Prices

Trade policy is increasingly being used as a tool to de-risk private investment in Western critical mineral supply chains. Protecting mining and processing investments in the United States and allied countries from price suppression, volatility, and market distortions is becoming a growing focus of trade strategy. One emerging approach is the development of coordinated price floor mechanisms for critical minerals, designed to provide greater market certainty for investors. Through potential plurilateral trade arrangements, the United States and its partners are exploring ways to implement adjusted import prices at the border to counter artificially low-priced minerals entering global markets, particularly from China, as the recent critical minerals 232 investigation outlined. Such measures could help establish a minimum, market-consistent price across participating economies, supporting the economic viability of new mining and processing projects while strengthening resilient supply chains.

Permitting Bottlenecks Stand in the Way of AI and Innovation

Expanding domestic mining, smelting, and processing capacity is essential to supporting the rapid growth of AI infrastructure and the advanced technologies that depend on critical minerals. However, the development of these projects is often constrained by lengthy permitting timelines, regulatory fragmentation, and the capital intensity required to build new facilities. Early-stage projects and pilot technologies frequently face overlapping federal and state requirements that can stall progress even after successful technological development. As demand for minerals tied to AI, advanced manufacturing, and next-generation innovation continues to rise, streamlining permitting processes will be critical to accelerating domestic production. Policies that improve federal-state coordination, reduce duplicative regulatory requirements, and empower decision-makers to move projects forward can help ensure that promising technologies and mineral projects are able to scale. Addressing permitting bottlenecks will be key to enabling integrated mineral value chains in the United States and allied countries, supporting both innovation and the infrastructure needed to power the AI economy. Harness AI to streamline permitting review workflows.