

GAO Highlights

Highlights of [GAO-22-104824](#), a report to the Ranking Member, Subcommittee on Interior, Environment, and Related Agencies, Senate Committee on Appropriations

Why GAO Did This Study

The U.S. is heavily reliant on imports of many minerals, such as cobalt and lithium, which are essential for manufacturing advanced technologies (see figure). Supply chains for many of these minerals are also vulnerable to various risks, such as foreign government actions. In 2018, Interior designated 35 minerals and mineral groups whose supply chains are vulnerable to disruption as essential to our nation's economic and national security. GAO was asked to review federal efforts to advance critical minerals recovery and substitution.

This report (1) identifies key challenges affecting efforts to advance critical minerals recovery and substitution in the U.S., and (2) examines the extent to which federal agencies have taken actions to advance recovery and substitution. GAO reviewed laws and agency documents and interviewed officials and staff on the CMS, including the Departments of Commerce, Defense, Energy, and the Interior, EPA, the National Economic Council, and OSTP. GAO also interviewed a nongeneralizable sample of seven nonfederal stakeholders such as academic researchers and industry, selected for their relevant expertise.

What GAO Recommends

GAO recommends that DOE, Interior, and OSTP work together to update the national strategy to address recent developments and more fully incorporate characteristics of effective national strategies. DOE concurred with the recommendation, OSTP took no position, and Interior thought it should be directed to OSTP. GAO maintains the recommendation is warranted as outlined in the report.

View [GAO-22-104824](#). For more information, contact J. Alfredo Gómez at (202) 512-3841 or gomezj@gao.gov.

June 2022






CRITICAL MINERALS

Building on Federal Efforts to Advance Recovery and Substitution Could Help Address Supply Risks

What GAO Found

Based on GAO's analysis of the views of six federal agencies and seven nonfederal stakeholders, five cross-cutting challenges constrain efforts to advance critical minerals recovery (i.e., recycling and use of nontraditional sources) and substitution (i.e., developing alternatives) in the U.S. These challenges include (1) limited data and analytical tools to support decision-making, (2) limited research and development, (3) limited domestic infrastructure and capacity, (4) potential adverse effects on the environment and worker safety, and (5) limited economic viability of recovery and substitution methods. Federal agencies have taken some steps that may help address these challenges. For example, the Environmental Protection Agency (EPA) issued guidance for protecting worker safety during electronic waste recycling.

Examples of Critical Minerals Used in Advanced Technologies

Solar panels – Arsenic, Germanium, Indium, Tellurium	Battery storage – Cobalt, Graphite, Lithium, Manganese	Wind turbines – Aluminum, Rare Earth Elements	National defense – Chromium, Gallium, Scandium	Aviation – Niobium, Tantalum, Vanadium
				

Source: GAO analysis of agency documents; Photos: Stockadrik/tongpatong/Rawf8/swisshippo/muratart/stock.adobe.com. | GAO-22-104824

In 2019, the Department of Commerce, in coordination with the Critical Minerals Subcommittee (CMS)—an interagency group co-chaired by the Departments of Energy (DOE) and the Interior and the Office of Science and Technology Policy (OSTP)—issued a national strategy for ensuring secure and reliable supplies of critical minerals. Federal agencies have taken specific actions recommended by the strategy. For example, DOE is developing a research and development roadmap to guide federal efforts to advance critical minerals recovery and substitution.

However, the national strategy does not incorporate certain characteristics of effective national strategies identified in prior GAO work. Specifically, the strategy does not fully address (1) what the strategy intends to achieve, how results will be achieved, or performance measures to gauge results; (2) what the strategy will cost; and (3) how federal agencies will implement it. For example, the strategy does not identify how agencies will implement the activities necessary to complete the roadmap or how they will integrate these activities into existing programs. Furthermore, the strategy does not address newly enacted statutory requirements or recent agency efforts, such as recommendations from a 2021 White House report that assessed risks to critical mineral supply chains. Updating the strategy to address recent developments and better incorporate characteristics of effective national strategies would provide greater assurance of the strategy's usefulness to congressional and agency decision makers. Such an update would also better ensure accountability for the strategy's implementation.