Critical Minerals

Critical minerals are those that are essential to the economy and whose supply may be disrupted. Critical minerals also tend to be those on which a country is heavily import-reliant, so the minerals that are deemed critical will vary from country to country. Demand for many of these minerals has skyrocketed in recent years with the spread of high-tech devices that use a wide variety of materials.

Basics

Critical minerals are mineral resources that are essential to the economy and whose supply may be disrupted. The ‘criticality’ of a mineral changes with time as supply and society's needs shift. Table salt, for example, was once a critical mineral. Today, many critical minerals are metals that are central to high-tech sectors. They include the rare earth elements and other metals such as lithium, indium, tellurium, gallium, and platinum group elements. 

Frequently Asked Questions
Which mineral commodities used in the United States need to be imported?
American Geosciences Institute

How do we use rare earth elements?
U.S. Geological Survey

What are critical minerals, and why are they important?
U.S. Geological Survey

What are rare earth elements, and why are they important?
U.S. Geological Survey

Are rare earth elements the only critical mineral resources?
U.S. Geological Survey

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Industrial Minerals
Industrial minerals are non-metals including crushed rock, sand, and gravel. They are essential for construction of buildings and highways, and are used in many household products and industrial processes.

Metals
Metals are found in many different places around the world. Many natural Earth processes affect their distribution and abundance. Metals are essential to our economy and lifestyle, and the global demand for metals continues to rise.

Mineral Resources
Global demand is rising for mineral resources of all kinds, including metals, industrial minerals, and solid fuels like coal. Mineral resources are unequally distributed around the globe, reflecting the vast differences in geology of different parts of the Earth. Geoscientists play an essential role in locating mineral resources and designing processes for their safe extraction.
Mining

Mining is essential to meet rising global demand for minerals. Geoscientists locate mineral resources and figure out how to extract them economically while minimizing health and environmental impacts. The method of mining, as well as potential environmental impacts, depends on the type of resource being mined.

Latest News

Senate committee discusses U.S. foreign dependence on critical minerals
(2018-08-09)
July 19, 2018 On July 19, the Senate Committee on Energy and Natural Resources convened a hearing on critical minerals—the fifth hearing on the subject in almost as many years, according to Chairwoman Lisa Murkowski (R-AK). The hearing was held to review the Department of the Interior’s (DOI)...

Department of the Interior finalizes list of critical minerals
(2018-06-08)
May 18, 2018 On May 18, the Department of the Interior (DOI) released the final version of the Critical Minerals List (83 FR 23295) in accordance with Executive Order (EO) 13817. Among other directives, the EO directed the Secretary of the Interior, in coordination with the Secretary of Defense...

House Natural Resources Committee advances bill to streamline domestic critical mineral production
(2018-04-03)
March 7, 2018 On March 7, the full House Committee on Natural Resources marked up the National Strategic and Critical Minerals Production Act (H.R.520), following a hearing to consider the bill last month. The Act, introduced by Representative Mark Amodei (R-NV-2) on January 13, aims to support...
President Trump and Secretary Zinke sign orders to advance domestic production of critical minerals (2018-01-04)

December 21, 2017 On Wednesday, December 20, President Donald Trump signed an executive order to reduce America's dependence on foreign sources of critical minerals. The order requires the Departments of the Interior, Agriculture, Defense, and Energy to submit a report that includes a strategy to...

House Natural Resources hearing revisits U.S. dependence on foreign minerals (2018-01-04)

December 12, 2017 The electronics and defense industries, among other key industries in the United States, rely upon the supply and availability of minerals – many of which are imported to the U.S. from other countries. Not only are these elements integral to the production of high-end electronics...

Senate hearing examines U.S. reliance on foreign sources of minerals (2017-04-10)

March 28, 2017 Industry and agency experts examined the United States’ increasing dependence on foreign sources of minerals on March 28. The Senate Committee on Energy and Natural Resources held a hearing to explore opportunities to rebuild and improve the supply of critical minerals in the United...

Domestic supply of critical materials would be boosted by new bill (2017-04-10)

March 7, 2017 Representative Duncan Hunter (R-CA-50) introduced the "Materials Essential to American Leadership and Security (METALS) Act" (H.R.1407) to ensure the U.S. has access to a sustainable and secure supply of materials to safeguard our national security on March 7. H.R.1407 would use one...

GAO Report on Critical Raw Materials Published (2016-10-05)

The Government Accountability Office (GAO) published the report, "Strengthened Federal Approach Needed to Help Identify and Mitigate Supply Risks for Critical Raw Materials" (GAO-16-699). The 79 page report identified that federal agencies are primarily focused on two areas of activity related to...
SME Releases 2016 Minerals Baby
(2016-09-07)
The Minerals Education Coalition, of the Society for Mining and Metallurgy and Exploration, Inc. (SME), has released an updated 2016 version of their iconic "Minerals Baby" which depicts how many minerals a human will use throughout their lifetime. The 2016 updated estimates an increase of more...

SME: Why Should the Government Care about Reinvestment in Mining and Engineering Schools
(2016-09-01)
The Society for Mining and Metallurgy Exploration, Inc. (SME) has posted a new Technical Briefing Paper on the website regarding Federal Support for U.S. Mining Schools. In it they provide background on the issue, outline reasons investment in these programs is valuable to the American public and...

Maps & Visualizations

Visualization of the mineral resources in everyday objects
U.S. Geological Survey
The U.S. Geological Survey has produced a visualization entitled, "Mineral Resources...out of the ground...into our daily lives", which details the mineral resources used to produce everyday items that we use in our homes, on our person, and out in the world. This visualization gives the major...
Recycling as a source of mineral commodities

Why Recycle? Recycling saves energy, money, materials, and natural resources, while reducing landfill use. It supplements the national supply of essential materials, reducing dependence on imports. As more minerals and materials become critically important - particularly in advanced technologies -.

Mining remediation in the Sudbury region of Ontario

The Sudbury region of Ontario is rich in metallic ores. Underground mining operations at the 15 active mines of Inco Ltd. and Falconbridge Ltd. in Sudbury currently produce 51,000 tons of ore per day [note: these figures are from the late 1990s], and five other mines within 500 km of Sudbury...

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Webinars & Forums

Tracking the Global Supply of Critical Materials

2018-01-26
This webinar focuses on U.S. and European Union (EU) efforts to gather information and develop tools that can be used to ensure a secure national and global supply of mineral resources; identify and quantify vulnerabilities in this supply; and stimulate national and international co-operation,...
Underpinning Innovation: The Science and Supply of America's Critical Minerals and Materials

This webinar is based on a Congressional briefing organized by AGI on behalf of the Mineral Science & Information Coalition (3 March 2016). The webinar addresses the efforts being taken at the federal level to ensure a steady supply of critical minerals and materials.

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GOLI Online Courses

Tracking the Global Supply of Critical Materials
Course Type: GOLI Online Course
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No country in the world produces all of the mineral resources necessary for modern society. International trade plays a critical role in providing these raw materials, forming a global network of production, export, import, and use. This network must continuously adapt to national and...

Best Practices in Mineral Resource Estimation and Reporting
Course Type: GOLI Online Course
View course
Construction of a computerized model to estimate mineral resources is a common practice in mineral exploration projects and mining operations. Many times a technical report is done as per international reporting standards such as NI-43-101 or JORC to meet the requirement of certain stock...

Search all GOLI courses

Geological Surveys Database Publications
A preliminary report on the geology and ore deposits of the eastern part of the Yellow Pine District, Idaho
1935, Idaho Geological Survey

Commercial minerals of California
1942, California Geological Survey

Florida mineral industry with summaries of production for 1940 and 1941
1943, Florida Geological Survey
The antimony and fluorspar deposits near Meyers Cove, Lemhi County, Idaho
1943, Idaho Geological Survey

The Board of Natural Resources and Conservation of the Department of Registration and Education
1944, Illinois State Geological Survey

The Illinois State Geological Survey in war mineral research
1944, Illinois State Geological Survey
Consolidated index of publications of the Division of Mines and predecessor State Mining Bureau, 1880-1943 inclusive
1945, California Geological Survey

Geologic description of the manganese deposits of California
1950, California Geological Survey

Mineral resource research and activities of the State Geological Survey, 1950-1951
1951, Illinois State Geological Survey
Geology of Lower Lake Quadrangle, California
1953, California Geological Survey