

# THE 35 MINERALS CRITICAL TO U.S. NATIONAL SECURITY

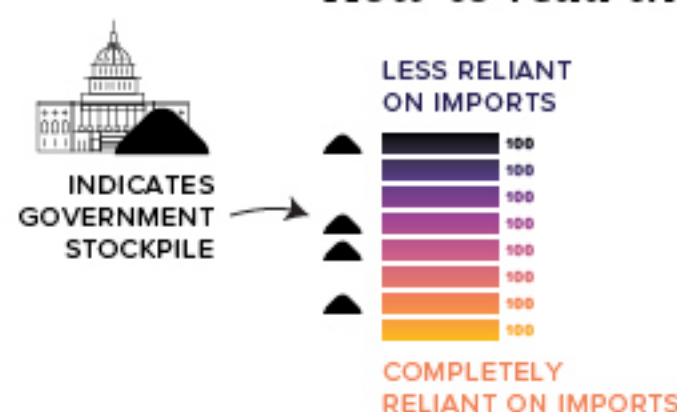
This draft list of minerals deemed essential to the economic and national security was released Feb 16, 2018



“...our nation's mission [is] to reduce our vulnerability to disruptions in the supply of critical minerals. Any shortage of these resources constitutes a strategic vulnerability for the security and prosperity of the United States.”

—Dr. Tim Petty, Assistant Secretary of the Interior for Water and Science

## How to read this



### Critical Minerals List

Mineral	Net Import Reliance	Example Uses
HAFNIUM	E	Nuclear control rods, alloys, ceramics
HELIUM	E	MRIs, lifting agent, research
BERYLLIUM	14%	Alloying agent in aerospace and defense industries
MAGNESIUM	47%	Furnace linings for manufacturing steel and ceramics
GERMANIUM	50%*	Fiber optics, night vision applications
LITHIUM	50%*	Batteries
TUNGSTEN	50%*	Used in wear-resistant metals
ZIRCONIUM	50%*	High-temperature ceramics production
ALUMINUM	61%	Used in almost all sectors of the economy
PLATINUM-GROUP METALS	68%†	Catalytic agents
CHROMIUM	69%	Stainless steel, other alloys
COBALT	72%	Rechargeable batteries, superalloys
TIN	75%	Coatings and alloys for steel
BARITE	75%*	Cement and petroleum industries
TELLURIUM	75%*	Steelmaking, solar cells
RHENIUM	80%	Lead-free gasoline, superalloys
ANTIMONY	85%	Batteries, flame retardants
TITANIUM	91%	White pigment, metal alloys
POTASH	92%	Fertilizer
BISMUTH	96%	Used in medical and atomic research
VANADIUM	100%	Used for titanium alloys
CESIUM	100%	Used in research and development
FLUORSPAR	100%	Aluminum manufacturing, gasoline, uranium fuel
GALLIUM	100%	Integrated circuits, optical devices (e.g. LEDs)
GRAPHITE	100%	Lubricants, batteries, fuel cells
INDIUM	100%	LCD screens
MANGANESE	100%	Steelmaking
NIObIUM	100%	Steel alloys
RARE EARTHS	100%	Batteries, electronics
RUBIDIUM	100%	Research and development in electronics
SCANDIUM	100%	Alloys, fuel cells
STRONTIUM	100%	Pyrotechnics, ceramic magnets
TANTALUM	100%	Electronic components (e.g. capacitors)
ARSENIC	100%	Lumber preservatives, pesticides, semi-conductors
URANIUM	?**	Nuclear fuel

### HELIUM

The Federal Helium Reserve is the world's only sizable long-term storage facility for crude helium. In recent years, the U.S. has become the world's major source of helium as global demand has risen sharply.

In the summer of 2017, an embargo of products from Qatar caused a temporary shortage of Helium.

### ALUMINUM

U.S. production of primary aluminum decreased for the fifth consecutive year and is now at its lowest level since 1951.

### PGMs

The price of platinum was down slightly due to a decrease in demand for diesel automobiles, in which platinum is used in catalytic converters.

Conversely, the other metals in the group saw significant average price increases in 2017:

- Iridium Up 55%
- Rhodium Up 51%
- Palladium Up 39%
- Ruthenium Up 45%

### COBALT

About 45% of the cobalt consumed in the United States was used in superalloys, mainly in aircraft gas turbine engines. As well, cobalt is a key component in many lithium-ion batteries.

Congo (Kinshasa) continued to be the world's leading source of mined cobalt, supplying more than one-half of world cobalt mine production.

### VANADIUM

Increased environmental inspections in China have continued to temporarily, or in some cases permanently, close some vanadium producers. As a result, ferrovanadium prices reached their highest point since November 2008.

### RARE EARTHS

Rare earth compounds and metals are widely used in batteries and electronics. China is the source of nearly 80% of U.S. imports.

### URANIUM

About 11% of the uranium delivered to U.S. reactors in 2017 was produced in the United States and 89% came from other countries.

“Today's extreme dependence is not a matter of foreign competition legitimately underpricing domestic production. It is the result of certain foreign state-subsidy policies that undermine U.S. companies who could otherwise compete fairly on a global basis.”

—Energy Fuels and Ur-Energy Petition

