Fact Sheet

Critical Mineral Deep Dive: Lithium

Lithium is a U.S. Geological Survey-designated critical mineral. It is used in high-performance batteries for electric vehicles, grid storage systems, and consumer electronics, as well as in the production of metals, ceramics, and pharmaceuticals. It is classified by the U.S. Department of Energy as "highly critical" in the medium term (through 2035) due to its importance for energy applications and exposure to supply chain risks.

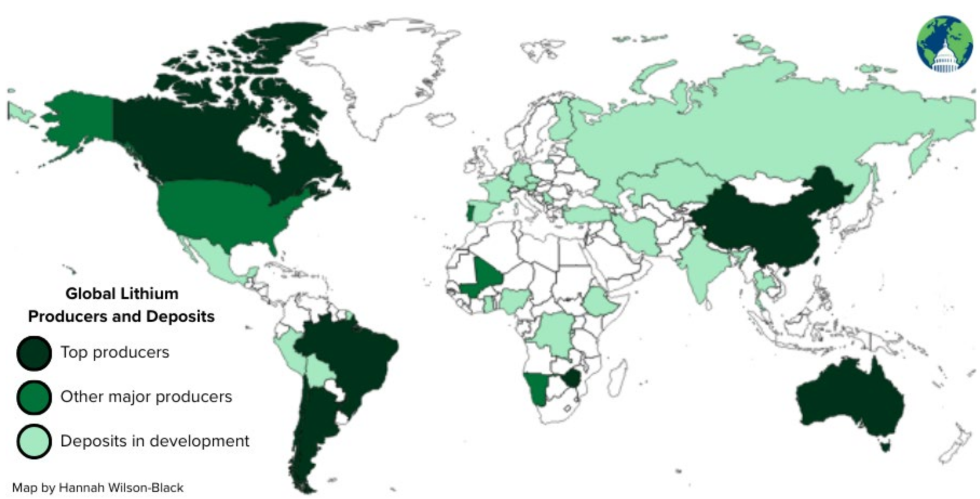
Clean Energy Applications

Lithium's unique properties make it optimal for the performance and longevity of batteries in electric vehicles and for energy storage on the electric grid. Compared to other metals and minerals, it is a strong conductor of electricity, lightweight (important for portability in electronics and mileage range in electric vehicles), and highly reactive (meaning it gives up electrons quickly, translating to higher battery voltages). Lithium ions are also small enough to cycle through batteries repeatedly without damaging them, which allows these batteries to be recharged hundreds of times. In 2025, about 90% of global lithium demand was for electric vehicle batteries and battery storage, with electric vehicle batteries accounting for the vast majority of that demand. This figure is expected to rise to 97% by 2035.

Availability and Supply Chain

Lithium deposits are abundant worldwide. However, deposits that exist in a high enough concentration to make extraction economically and technologically viable are far more limited, existing in just a few countries. Argentina, Bolivia, and Chile comprise South America's "lithium triangle," which produces 35% of the lithium in the global market but hosts an estimated 60% of the world's supply in vast brine (saltwater) deposits. Australia, meanwhile, leads global production of hard rock lithium, producing 37% of global supply.

In 2025, the United States relied on imports—primarily from Chile, followed by Argentina—for more than 50% of its lithium consumption. While the United States has hard rock and brine deposits of lithium, a Nevada brine facility was the only domestic producer in 2025. Other particularly lithium-rich regions of the country include the Paradox Basin, which comprises parts of Arizona, Colorado, New Mexico, and Utah; California's Salton Sea; the Smackover Formation in the Gulf region; the Carolinas; and northern New England.



Lithium brine is typically processed near where it is extracted; accordingly, China, Chile, and Argentina lead lithium brine refining. China also processes 95% of the world's hard rock lithium. In the United States, processing occurs at the Kings Mountain facility in North Carolina, and new processing facilities are in development on the Texas-Arkansas border and in Chester County, South Carolina.

Extraction ⬇	Lithium can be mined from hard rock ore (naturally occurring material that contains a mineral) in the form of lithium spodumene. It can also be extracted as an ion from briny water. The latter process involves pumping brine into large, shallow pools, from which water evaporates naturally over months or years, leaving behind high concentrations of lithium carbonate.
Processing ⬇	Lithium spodumene is ground and crushed to separate the lithium from its ore. Acid and solvent are applied to leach out the ore, leaving behind pure lithium. Similarly, in the case of brine water, once the water evaporates, the remaining material is leached to remove impurities and isolate the lithium.
Manufacturing ⬇	Globally, 88% of refined lithium is manufactured into batteries for electric vehicles, grid storage systems, and electronic devices. The other 12% is used to make glass and ceramics, medicines, and other products.
Recycling ♲	Lithium largely lacks recycling pathways. This is in part attributed to limited feedstocks of lithium-containing products available for recycling due to low collection rates. Additionally, lithium-ion batteries for electric vehicles are not expected to reach end-of-life in sufficient numbers for cost-effective recovery until after 2030. Problems with lithium reactivity during recycling processes also constrain its capacity for reuse. Lithium-ion battery recycling is the most common form of lithium recycling. These batteries, or products containing them, are collected, evaluated for repair or reuse, and shredded. Battery shredding leaves behind "black mass," the lithium-bearing material that can be reprocessed for reuse. Effective recycling could reduce the need for new lithium mines by 25% by 2050.

Externalities of Lithium Development

Lithium extraction and production frequently occur in water-stressed regions. In Chile's Salar de Atacama region, one of the driest in the world, lithium and copper production consumed more than 65% of local water supplies. Plans to extract lithium brine in Utah would draw freshwater from the Green River, a tributary to the water-stressed Colorado River, and a proposed lithium mine in Nevada's northwest would consume billions of gallons of groundwater.

Meanwhile, the processing of both brine- and hard rock-sourced lithium requires inputs of chemicals that can contaminate nearby freshwater sources, rendering them unusable for drinking and agriculture and decimating wildlife populations. In Argentina and Chile, toxic waste from brine evaporation pools have contaminated the water sources of nearby Indigenous communities, and a lithium mine in Tibet caused years of mass fish and livestock death. In Nevada, researchers linked impairments to fish populations to lithium processing operations 150 miles upstream.

Lithium extraction disproportionately impacts Indigenous communities around the world. In the United States, 79% of lithium reserves and resources are located within 35 miles of Native American reservations. Lithium recycling can help mitigate the harmful environmental and public health impacts of mining, conserve raw lithium supplies, promote a circular economy, protect against supply chain disruptions, and bolster national security.

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This fact sheet is available at www.eesi.org/papers.

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