



## Where are Critical Minerals going to come from to meet our Future Energy Needs?

**The future of America's energy transition is completely dependent upon the availability of critical minerals for modernizing electricity generation, transmission, and distribution. U.S. decision makers need to have the information necessary to ensure our nation develops policies for an adequate and ethical supply of these minerals.**

### US Mining of Critical Minerals

- Supply chains are essential to all global economic activity, and supply chains start with extracting the mineral resources required for building the infrastructure for future low- carbon energy goals.
- Transition to low-carbon energy technologies requires numerous critical and other minerals.
- The energy sector will become the leading consumer of these minerals as clean energy technologies require more minerals than their fossil fuel counterparts.
  - The shift to a clean energy system is set to drive a huge increase in the requirements for minerals and the energy sector is emerging as a major force in mineral markets. Until the mid-2010s, the energy sector represented a small part of total demand for most minerals. Clean energy technologies are becoming the fastest-growing segment of mineral demand and are expected to increase by a factor of four by 2040.<sup>1</sup>
  - The annual pace of grid expansion needs to more than double by 2040 to meet the world's goals to address the Paris Agreement, improve air quality and provide access to modern energy.<sup>2</sup>
  - Around 50% of the increase in transmission lines and 35% of the increase in distribution network lines are attributable to an increase in renewable technologies.<sup>3</sup>
  - Existing electricity generation and transmission will require updating and new infrastructure must be constructed to assist in this energy transition.
  - Copper and aluminum are the two main minerals used in wires and cables for the electricity grid. Future demand, based on current usage, essentially doubles the amounts used in 2020: from 5 million tons (Mt) to 10 Mt of copper and from 9Mt to 16 Mt for aluminum by 2040<sup>4</sup>.

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- Ninety percent (up to 351 million) of cars on the road need to be electric vehicles by 2050<sup>5</sup>. EVs require critical minerals such as lithium, cobalt, nickel, copper, and more, which are all readily available in the U.S. To achieve low-carbon emissions by 2050, production of these key minerals will need to expand by six times the current levels<sup>6</sup>.
- This rapid increase in demand for critical minerals raises concerns of availability and reliability of supply, which would lead to time lags and price volatility. This is exemplified by the USA's dependence on imports for copper and rare earths going from <5% to 37% and <5% to 95% from 1995 to 2020, respectively.<sup>7</sup>
- The USA is endowed with large copper and critical mineral deposits which can be the solution to our mineral supply needs. However, the USA faces many unnecessary and lengthy time constraints to permitting and developing our mineral endowment as compared to other advanced nations. These constraints include the time to permit and begin mining a new deposit.
- The USA should consider certain key recommendations of the International Energy Agency and develop policies to address mineral security<sup>8</sup>:
  - Adequate investment in diversified sources of new mineral supplies
  - Promote technology innovation
  - Enhance supply chain resilience and market transparency
  - Strengthen international collaboration between producers and consumers
- The US mining industry has strong and globally respected labor and environmental regulations, and the industry is prepared to help meet the demands of low-carbon electrification.
- The USA must take advantage of its many universities and corporations working on technological advancements in mineral extraction, materials processing, carbon capture, electricity generation, the electric transmission and distribution grid and transportation electrification. New and advanced techniques for environmental protection, as well as grid modernization technologies, are also part of the advances being incorporated in these industries.

### **About WMC**

WMC's mission is to advocate for today's modern domestic mining industry which is essential to our Nation. WMC is a grassroots organization with members nationwide who work in all sectors of the mining industry including hardrock and industrial minerals, coal, energy generation, manufacturing, transportation, and service industries. WMC engages with members of Congress and their staff, federal land management and regulatory agencies, and state governments to discuss issues of importance to both the hardrock, coal, and industrial mining sectors.

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<sup>3</sup>[https://www.nature.com/articles/s41558-020-00921-7.epdf?sharing\\_token=8yol2CGBN5lepSZpmJw7nNRgN0jAjWeI9jnR3ZoTv0MwZgD9OhVz9I1pdqn5uP1k1CpCf4fg7znFhbBxuv-brtlgxyaT2o8LowjdXblgi-wRB0Ui-abMCgWsYRe4h0L3uRhskiXYmyKBib\\_4YKj6hq8m\\_TaQOs9OJ7O7YKft0\\_vOowCA95oKye2LSrGAl7tqwfcYTd\\_BOdwSVCh0KEowOU9vPIQoaPjTpK02LinKhtM%3D&tracking\\_referrer=www.nytimes.com](https://www.nature.com/articles/s41558-020-00921-7.epdf?sharing_token=8yol2CGBN5lepSZpmJw7nNRgN0jAjWeI9jnR3ZoTv0MwZgD9OhVz9I1pdqn5uP1k1CpCf4fg7znFhbBxuv-brtlgxyaT2o8LowjdXblgi-wRB0Ui-abMCgWsYRe4h0L3uRhskiXYmyKBib_4YKj6hq8m_TaQOs9OJ7O7YKft0_vOowCA95oKye2LSrGAl7tqwfcYTd_BOdwSVCh0KEowOU9vPIQoaPjTpK02LinKhtM%3D&tracking_referrer=www.nytimes.com)

<sup>6</sup><https://www.carbonbrief.org/iea-mineral-supplies-for-electric-cars-must-increase-30-fold-to-meet-climate-goals>

<sup>7</sup>U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries 2021

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