



**Testimony
for the
Record**

**United States
House of
Representatives
Committee on Natural Resources**

“Unleashing America’s Energy and Mineral Potential”

February 8, 2023

America’s mining industry supplies the essential materials necessary for nearly every sector of our economy – from technology and healthcare to energy, transportation, infrastructure and national security. The NMA is the only national trade organization that serves as the voice of the U.S. mining industry and the hundreds of thousands of American workers it employs before Congress, the federal agencies, the judiciary and the media, advocating for public policies that will help America fully and responsibly utilize its vast natural resources. We work to ensure America has secure and reliable supply chains, abundant and affordable energy, and the American-sourced materials necessary for U.S. manufacturing, national security and economic security, all delivered under world-leading environmental, safety and labor standards. The NMA has a membership of more than 275 companies and organizations involved in every aspect of mining, from producers and equipment manufacturers to service providers. Thank you for the opportunity to offer testimony on behalf of the mineral and hardrock mining companies in the NMA.

Ever-increasing Demand for Minerals

There is widespread recognition that we are entering the most mineral and metal intensive era in human history.¹ Consequently, the right policies to secure new domestic mineral production and our supply chains are more important than ever.

The international competition for minerals will be fierce. The European Union (EU) recently unveiled its “REPowerEU Plan” to scale-up and speed up renewable energy in the next decade.² Late last year, the United Kingdom (UK) released its

¹ Google results for the term “critical minerals” return nearly 24,000 responses (7,000 news specific) for the last month alone.

² Communication from the Commission to the European Parliament, The European Council, The Council, The European Economic and Social Committee and the Committee of the Regions: REPowerEU Plan, {SWD(2022)

“Resilience for the future: The UK’s critical minerals strategy.”³ In December, Canada released its “Canadian Critical Minerals Strategy,” a generational “plan to position Canada as the global supplier of choice for critical minerals and the clean technologies they enable.”⁴ Of course, China, with its much longer planning horizon, moved earlier and more quickly to address the risks to its mineral supply chains. In 1999, the Chinese government announced its aggressive “go global” campaign to secure raw materials. The policy, which was fully implemented around 2002-2003, articulated three main objectives: (1) to support national exports and expand into international markets; (2) to push domestic firms to internationalize their activities as a means of acquiring advanced technologies; and (3) to invest in the acquisition of strategic resources.⁵

Many public analyses evaluate the demand for minerals for new technologies but especially energy generation. Last year the International Energy Agency (IEA) issued a cautionary report about risks related to the mineral supply chains required for energy generation transitions.⁶ IEA estimates and others show that demand for some minerals could grow by more than 40 times by 2040. According to IEA:

- Lithium demand is anticipated to grow by more than 40 times by 2040, followed by graphite, cobalt and nickel at around 20-25 times;
- Copper demand for grid infrastructure and electrification more than doubles by 2040
- Demand for cobalt is expected to be anywhere from 6 to 30 times higher than today’s levels; and
- Rare earth elements may see three to seven times higher demand in 2040 than today.⁷

230 final}, May 18, 2022. https://eur-lex.europa.eu/resource.html?uri=cellar:fc930f14-d7ae-11ec-a95f-01aa75ed71a1.0001.02/DOC_1&format=PDF.

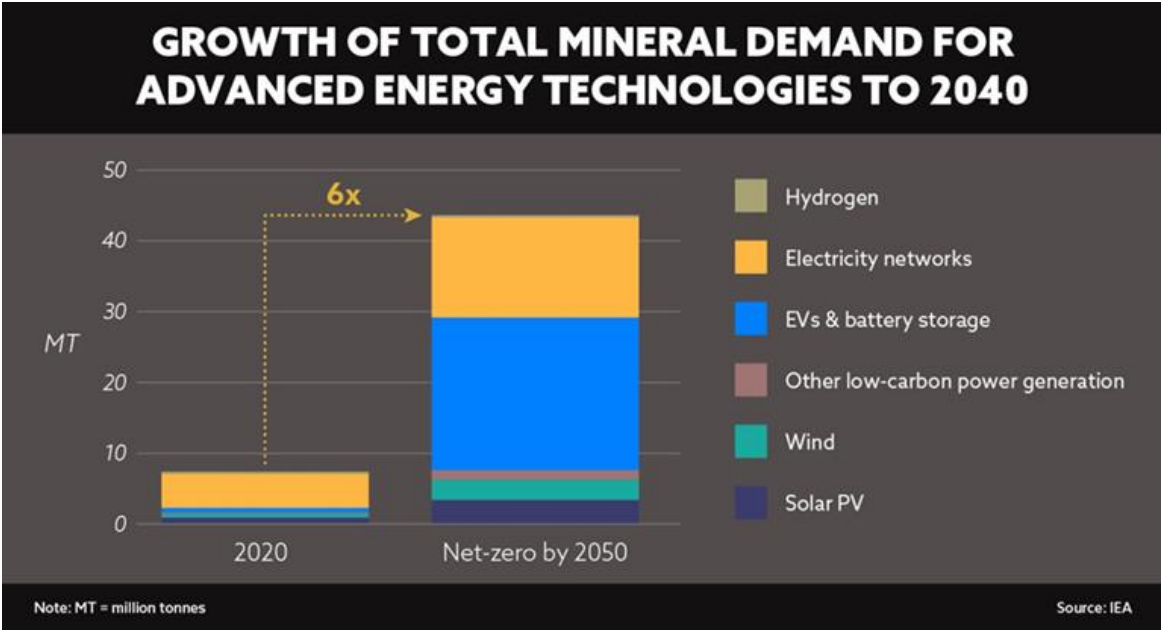
³ Department for Business, Energy and Industrial Strategy, “Resilience for the future: The UK’s critical minerals strategy, 22 July 2022. <https://www.gov.uk/government/publications/uk-critical-mineral-strategy/resilience-for-the-future-the-uks-critical-minerals-strategy>

⁴ Natural Resources Canada News Release, “Countries Commit to the Sustainable Development and Sourcing of Critical Minerals,” Dec. 12, 2022. <https://www.canada.ca/en/natural-resources-canada/news/2022/12/countries-commit-to-the-sustainable-development-and-sourcing-of-critical-minerals.html>

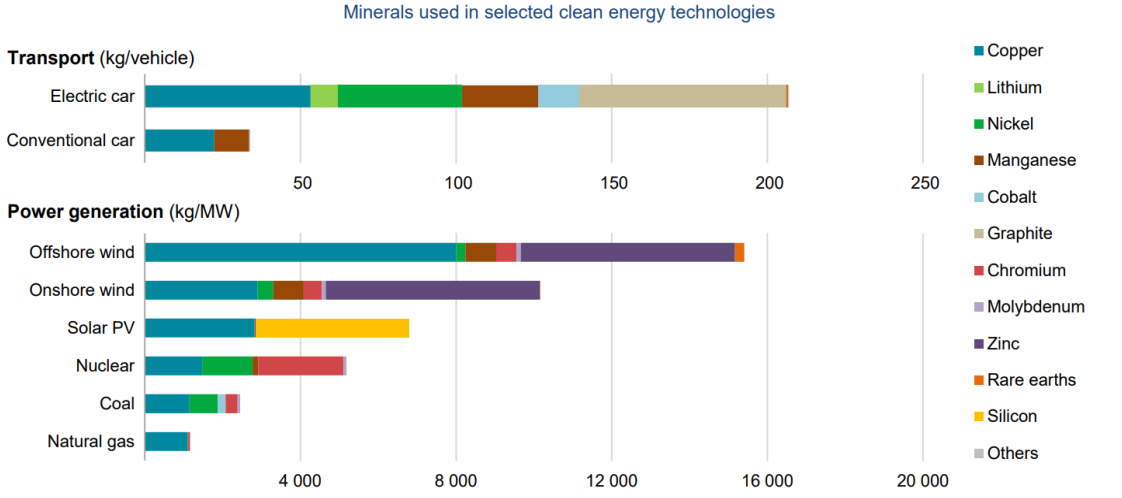
⁵ CRS, “China’s Mineral Industry and U.S. Access to Strategic and Critical Minerals: Issues for Congress,” R43864, March 20, 2015, p. 2. <https://crsreports.congress.gov/product/pdf/R/R43864/6>

⁶ International Energy Agency, “The Role of Critical World Energy Outlook Special Report Minerals in Clean Energy Transitions,” May 2021.

⁷ Id at pp.8-10



The rapid deployment of clean energy technologies as part of energy transitions implies a significant increase in demand for minerals



IEA. All rights reserved.

Notes: kg = kilogramme; MW = megawatt. Steel and aluminium not included. See Chapter 1 and Annex for details on the assumptions and methodologies.

Other major reports echo the findings of the IEA. Wood Mackenzie, the World Bank,⁸ the Wilson Center⁹ and others outline staggering demand

⁸ World Bank Group, “Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition,” 2020. <https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf>

⁹ D. Wood, A. Helfgott, M. D’Amico, and E. Romanin, Woodrow Wilson International Center for Scholars, “The Mosaic Approach: a Multidimensional Strategy for Strengthening America’s Critical Minerals Supply Chain,” Oct. 12, 2021, https://www.wilsoncenter.org/sites/default/files/media/uploads/documents/critical_minerals_supply_report.pdf.

increases that are likely to outpace the available minerals supply. According to Wood Mackenzie:

- Demand for copper and aluminum is anticipated to increase by a third by 2040,
- Nickel demand grows by two-thirds and cobalt and lithium by 200 percent and 600 percent, respectively.¹⁰

Matching the speed and scale of this rising demand requires a permitting regime that enables the mining sector to respond to market signals. Current U.S. permitting timelines do not.

As the IEA recently concluded in a July 2022 battery supply chain report:

Electrifying road transport requires a wide range of raw materials. While all stages of the supply chain must scale up, extraction and processing are particularly critical due to long lead times. Governments must leverage private investment in sustainable mining and ensure clear and rapid permitting procedures to avoid potential supply bottlenecks.¹¹

Impacts Down the Supply Chain

End users of minerals have awoken to the challenge of securing mineral supply chains, a development perhaps most pronounced by the automotive sector as it advertises a transition to electric vehicles (EVs). Over the last few years, many of the major U.S. car makers have made ambitious announcements about their EV plans. As examples, General Motors has announced it will invest \$35 billion in electric and autonomous vehicle product development until 2025 and that it will phase out petrol and diesel cars by 2035; Volkswagen wants half of its vehicle sales to be electric by 2030 and nearly 100 percent electric sales by 2040; and Audi will launch fully electric models only from 2026 and aims for all car sales to be electric by 2030.¹²

At the same time, automakers are warning with ever greater frequency that the coming battery material shortfall could stop the EV revolution in its tracks. As recently noted by RJ Scaringe, CEO of EV start-up Rivian, the auto industry's current semiconductor problems "are a small appetizer to what we are about to feel on battery cells over the next two decades."¹³ No wonder, as the battery supply chain is already facing the pinch of rising material prices as the gap between demand and supply widens. Battery pack costs – which had been on a

¹⁰ Gavin Montgomery, Wood Mackenzie, "COP26: Why battery raw materials are a highly-charged topic:- Aggressive EV uptake is needed to meet a 2° C target, but metals supply will struggle to meet demand." 13 October 2021, <https://www.woodmac.com/news/opinion/cop26-why-battery-raw-materials-are-a-highly-charged-topic/>

¹¹ IEA, "Global Supply Chains of EV Batteries," July 2022. <https://www.iea.org/reports/global-supply-chains-of-ev-batteries>.

¹² van Halm, I. and Mullan, C., Feb. 14, 2022, "Booming EV sales challenge critical mineral supply chains," *Energy Monitor* <https://www.energymonitor.ai/sectors/transport/booming-ev-sales-challenge-mineral-supply-chains>

¹³ Wall Street Journal, "Rivian CEO Warns of Looming Electric-Vehicle Battery Shortage," April 2022. <https://www.wsj.com/articles/rivian-ceo-warns-of-looming-electric-vehicle-battery-shortage-11650276000>

long downward trend – are now rising. Metals accounted for 40 percent of battery costs in 2015. Today, they account for 80 percent. Where the price of these metals goes, so does the cost of batteries and EVs. According to EV automaker Stellantis CEO Carlos Tavares, there will be a shortage of EV batteries by 2024-2025, followed by a lack of raw materials for the vehicles that will slow availability and adoption of EVs by 2027-2028 as the global automotive industry pivots to EVs to meet an expected increase in consumer demand and government regulations. He recently cautioned that the “speed at which we are trying to move all together for the right reason, which is fixing the global warming issue, is so high that the supply chain and the production capacities have no time to adjust.”¹⁴

Automakers have been seeking solutions, including inking deals directly with mining companies. For example, last year Tesla addressed its concern about obtaining the nickel for its EVs by entering into an agreement with BHP to obtain nickel from Australia and more recently with Talon Metals to buy quantities of nickel directly from a mine the company is building in Minnesota. Ioneer has signed a binding offtake agreement with the Ford Motor Company to supply lithium from its Rhyolite Ridge lithium-boron project in Nevada.¹⁵ Only last week, General Motors announced it was investing \$650 million in Lithium Americas to secure access to production from its Nevada operations, which General Motors estimates will contribute to one million EVs annually.¹⁶ For this deal, General Motors was one of more than 50 automakers and companies seeking a secure supply of minerals from Lithium Americas.¹⁷

At the same time, automakers are urging the ramp up of domestic mining. Last year, the Alliance for Automotive Innovation wrote President Biden expressing concerns that “neither the current trajectory of consumer adoption of EVs, nor existing levels of federal support for supply- and demand-side policies, is sufficient to meet our goal of a net-zero carbon transportation future.”¹⁸ One of the specific policy recommendations offered by the Alliance is to promote national security and economic security enhancements through the development of U.S.-based supplies of critical minerals (extraction, processing and recycling), battery and fuel cell manufacturing, and other critical components, including semiconductors.¹⁹ And as succinctly stated recently by Jim Farley, President and CEO of Ford Motor Co.:

¹⁴ Media interview, May 24, 2022, <https://www.cnbc.com/2022/05/24/stellantis-ceo-warns-of-ev-battery-shortage-lack-of-raw-materials.html>

¹⁵ [PR Newswire](#), “Ioneer Signs Binding Lithium Offtake Agreement with Ford,” July 21, 2022

¹⁶ Lithium Americas General Motors Transaction Announcement, January 31, 2023, <https://www.lithiumamericas.com/news/lithium-americas-provides-general-motors-transaction-details-and-update-on-construction-plan-for-thacker-pass>. Cecilia Jamasmie, January 31, 2023, “GM invests \$650m in Lithium Americas to develop Thacker Pass mine” www.mining.com, <https://www.mining.com/gm-lithium-americas-to-jointly-develop-thacker-pass-mine-in-nevada/>

¹⁷ The Electric, “The New ‘Elephants’—GM Grabs the Biggest Lithium Deposit in the U.S.,” Feb. 2, 2023. <https://subscriptions.theinformation.com/newsletters/the-electric/archive/the-electric-the-new-elephants-gm-grabs-the-biggest-lithium-deposit-in-the-u-s>

¹⁸ Alliance for Automotive Innovation letter to President Biden, March 29, 2021. <https://www.autosinnovate.org/posts/communications/Auto%20Industry%20EV%20Policy%20Letter%20to%20President%20Biden%20March%2029%202021.pdf>

¹⁹ Id. at 4.

We have to bring battery production here, but the supply chain has to go all the way to the mines. . . So are we going to import lithium and pull cobalt from nation-states that have child labor and all sorts of corruption or all we going to get serious about mining?" . . . We have to solve these things and we don't have much time."²⁰

We have our work cut out for us to build our domestic mineral supply chains quickly. As recently reported by *The New York Times*, how automakers will obtain enough materials for an all-electric lineup remains unclear. Just last month, Farley told analysts that only 50 percent of the raw materials needed to meet the auto industry's announced EV targets were actually available.²¹

Demand Cannot Be Met Without New Mining

The automakers are just one stakeholder group that acknowledges the role of domestic mining in securing our supply chains. Certainly, the federal government has repeatedly noted that boosting sustainable domestic mining must be part of the solution. For example, in May 2021, the White House rebutted reporting from *Reuters* claiming that President Biden will primarily rely on ally countries to supply the bulk of the metals needed to build EVs. In its clarification, the White House noted that the reporting incorrectly characterizes the Biden-Harris administration's approach:

President Biden is focused on seizing the electric vehicle (EV) market, sourcing and manufacturing the supply chain here in America, and creating good-paying, union jobs. Building American-made EVs and shipping them around the world will include leveraging American-made parts and resources. This includes responsibly pursuing, developing, and mining critical minerals and materials used for EV batteries. As we strengthen our supply chains, we will pursue strong environmental standards and broad, rigorous consultations with local and indigenous communities to support a responsible, fair, and sustainable EV industry."²²

Working with our allies, like Canada, to build these supply chains is smart. But that must complement the essential work of standing up production and these supply chains at home. It cannot come in place of it.

Recent withdrawal decisions this month locking up more than 225,000 acres in federal Forest Service lands from mining for two decades after also withdrawing federal leases nearly sixty years old from projects in the same areas known for some of the nation's largest reserves of nickel, cobalt, copper, platinum, and

²⁰ Jim Farley remarks, Detroit Homecoming VIII, Live-streamed interview with Mary Kramer (director of the annual event). Sept. 25, 2021. <https://detroithomecoming.com/livestream-events/>

²¹ Boudette, Neal E. 2022. "California E.V. Mandate Finds a Receptive Auto Industry." *The New York Times*, August 25, 2022, sec. Business. <https://www.nytimes.com/2022/08/25/business/energy-environment/electric-vehicles-automakers.html>.

²²Statement from Ali Zaidi, Deputy National Climate Advisor, Reuters, Epoch Times etc.: https://www.theepochtimes.com/white-house-denies-report-that-biden-looks-overseas-for-electric-vehicle-metals_3832373.html?welcomeuser=1

palladium could only be described at best as short sighted and at worst self-sabotage.²³

Current Permitting Process Discourages Investment in U.S. Mining

With over \$6 trillion worth of mineral resources here in the United States, a highly trained and highly compensated workforce, and world-class environmental and safety standards, the U.S. mining industry is essential to helping the nation meet ever-increasing demand for minerals for electrification, infrastructure and manufacturing needs.

However, there is real room for improvement. To improve supply chain security, we must also have a robust domestic mineral supply chain. That includes more smelting, processing and refining capabilities in the U.S. necessary to claw back these essential processes from geopolitical adversaries like China, which controls more than 80 percent of global rare earth element production, nearly 90 percent of global mineral processing capabilities as well as the market prices for rare earth elements at each step of the process.

Permitting delays have been, and continue to be, one of the most significant risks to meeting domestic mineral production goals. As the permitting process for important projects across the U.S. drags on, geopolitical rivals are taking advantage of our bureaucratic inertia. Opening or expanding a mine in the U.S. typically involves multiple agencies and the navigation of tens or even hundreds of permitting processes at the local, state and federal levels, with little transparency into status, delays arising from duplication among federal and state agencies, an absence of firm timelines for completing environmental assessments, and failures in coordination of responsibilities between various agencies. Necessary government authorizations now take an average of seven to 10 years to secure – one of the longest permitting processes in the world for mining projects – a time period that is completely out of step with the dramatic increases in minerals production that will be needed in the coming decades to keep up new technologies, infrastructure, manufacturing and even with the administration’s goals.

In the U.S., necessary government authorizations place the U.S. at a competitive disadvantage in attracting investment for mineral development. By comparison, permitting in Australia and Canada, which have similar environmental standards and practices as the U.S., take between two and three years. The NMA believes that valid concerns about environmental protection should be fully considered and addressed but permitting processes should not serve as an excuse to trap mining projects in a limbo of duplicative, unpredictable, endless and costly review without a decision point. Moreover, there is little evidence that such delays yield commensurate environmental benefits. The length of the permit process should not be confused with the rigor of review. Ironically, it takes about two years to

²³ Wall Street Journal, “Biden’s Green-Energy Mineral Lockup. The feds block mining that is essential for making EV batteries” January 29, 2023, <https://www.wsj.com/articles/biden-administration-mining-duluth-complex-minnesota-superior-national-forest-deb-haaland-electric-vehicles-11674860178>.

build a new battery gigafactory, but it takes at least eight years (sometimes more than 10 years) to build a new lithium mine.²⁴

Nearly two decades ago, the U.S. attracted almost 20 percent of the world’s total mining investment. Unfortunately, in the time since, there has been a sharp decline in U.S. exploration investment. This is not due to lack of resources, but rather a lack of confidence in the U.S. as a viable mining jurisdiction in which to invest hundreds of millions of dollars in upfront costs due to duplicative, inefficient and costly permitting timeframes, making the U.S. more dependent on other countries for metals.



Current Permitting Process Encourages Foreign Dependence

The U.S. is increasingly vulnerable to supply chain disruptions and retaliation from geopolitical adversaries due to our ever-increasing reliance on imports for these essential resources. Less than half of the mineral needs of U.S. manufacturing are met by domestically produced minerals, which leaves our economy and national security at a strategic disadvantage. The U.S. Geological Survey’s annual commodity summary released only last week makes some key findings:

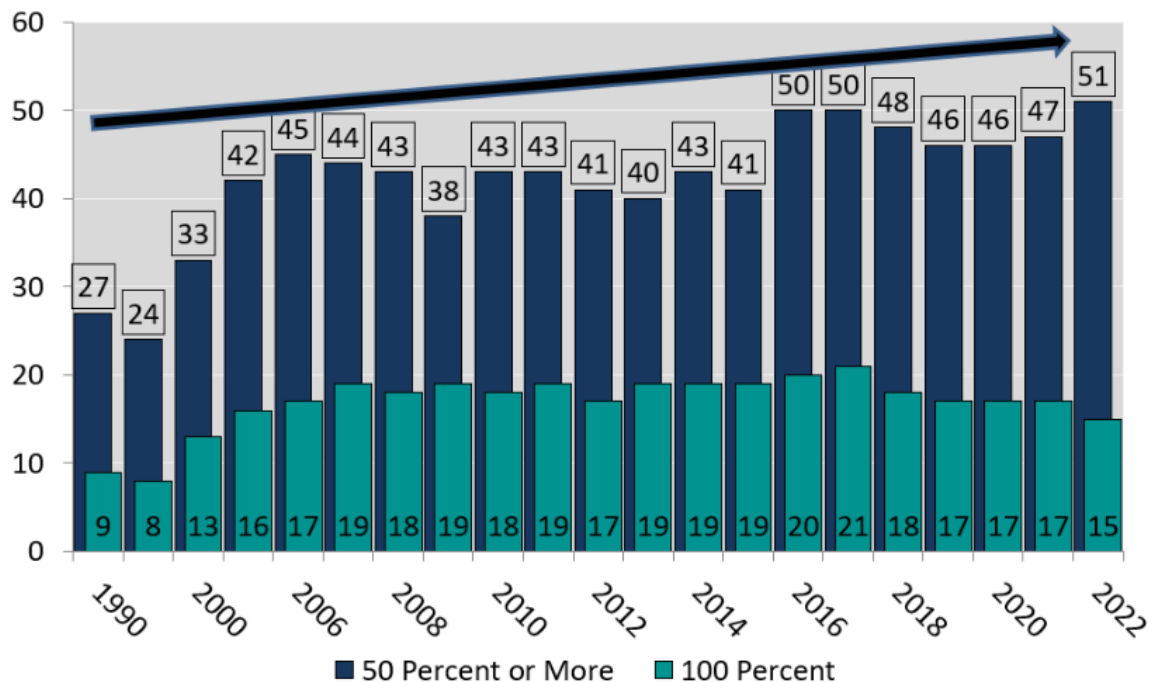
- Last year, imports made up more than one-half of the U.S. apparent consumption for 51 nonfuel mineral commodities, and the United States was 100 percent net import reliant for 15 of those.
- Of the 50 mineral commodities identified in the “2022 Final List of Critical Minerals,” the United States was 100 percent net import reliant for 12, and an additional 31 critical mineral commodities (including 14 lanthanides,

²⁴ Comments of Dr. Qichao Hu, founder and CEO of Massachusetts-based battery maker SES, in an interview with Charged.

which are listed under rare earths) had a net import reliance greater than 50 percent of apparent consumption.

- Underscoring the vulnerability of U.S. mineral supply chains, China was the leading source of mineral commodities with a greater than 50 percent import reliance providing 26, with significant imports of other essential commodities also coming from Russia.
- The estimated value of U.S. metal mine production in 2022 was \$34.7 billion, six percent lower than the revised value in 2021. In 2022, the capacity utilization for the metals mining industry was 61 percent, less than the 63 percent capacity utilization in 2021.²⁵

U.S. Mineral Import Reliance



Source: USGS Mineral Commodity Summaries 1990-2023 editions

While alarming, these findings are the latest in a 20-year trend of net imports that cost our country roughly \$90 billion last year alone. Though the warning signs about our import reliance have been highlighted by a few key legislators for years, overall political concern about minerals supply chains has waxed and waned – with periods of frenzy following unexpected shortages, especially for military

²⁵ U.S. Geological Survey, 2023 Commodity Summary, <https://pubs.er.usgs.gov/publication/mcs2023>

applications such as China’s exercise of its dominance over the rare earths’ minerals supply chain – followed by periods of complacency.²⁶

Before the more recent exposure of supply chain vulnerabilities from the pandemic and geopolitical developments of the last few years, the most recent panic occurred in 2010, when China threatened global rare earth supplies. As the Congressional Research Service (CRS) explained:

Chinese export quotas on a type of critical minerals referred to as rare earth elements (REEs) and China’s curtailment of rare earth shipments to Japan over a maritime dispute in 2010 *represented a wakeup call* for the United States on China’s near-monopoly control over global REE supply. The actions of the Chinese led to record high prices for REEs and, as a result, *began to shine a light on the potential supply risks and supply chain vulnerability for rare earths and other raw materials and metals needed for national defense, energy technologies, and the electronics industry*, among other end uses. U.S. legislators have introduced and deliberated on bills that would address the potential supply risk and vulnerability with respect to rare earth supply and bills that would promote domestic rare earth mine development.²⁷ (Emphasis added.)

Unfortunately, none of these past efforts or policies have reversed the U.S. overreliance on foreign sources of minerals despite widespread acknowledgement that this overreliance weakens our economy and endangers our national security. China’s mineral dominance remains a major threat. Currently, China is the leading producer and/or supplier of 66 percent of mineral commodities listed as essential to U.S. economic and national security including lithium, rare earths and other battery metals.²⁸ According to USGS, production concentration has increased markedly over the past few decades for many mineral commodities with the most notable global shift has being the increasing production of mineral commodities in China.²⁹ As illustrated by the following USGS data, China’s share of global mineral production and processing has grown markedly since 1990 for many mineral commodities, including aluminum, bismuth, refined cobalt, gallium, lead, magnesite, magnesium metal, mercury, REEs, silicon, steel (raw), titanium, vanadium and zinc.

²⁶ See e.g., The Domestic Minerals Program Extension Act of 1953; the Mining and Mineral Policy of 1970; the Federal Land Policy and Management Act; the National Materials and Minerals Policy, Research and Development Act of 1980; and the 1984 National Critical Materials Act.

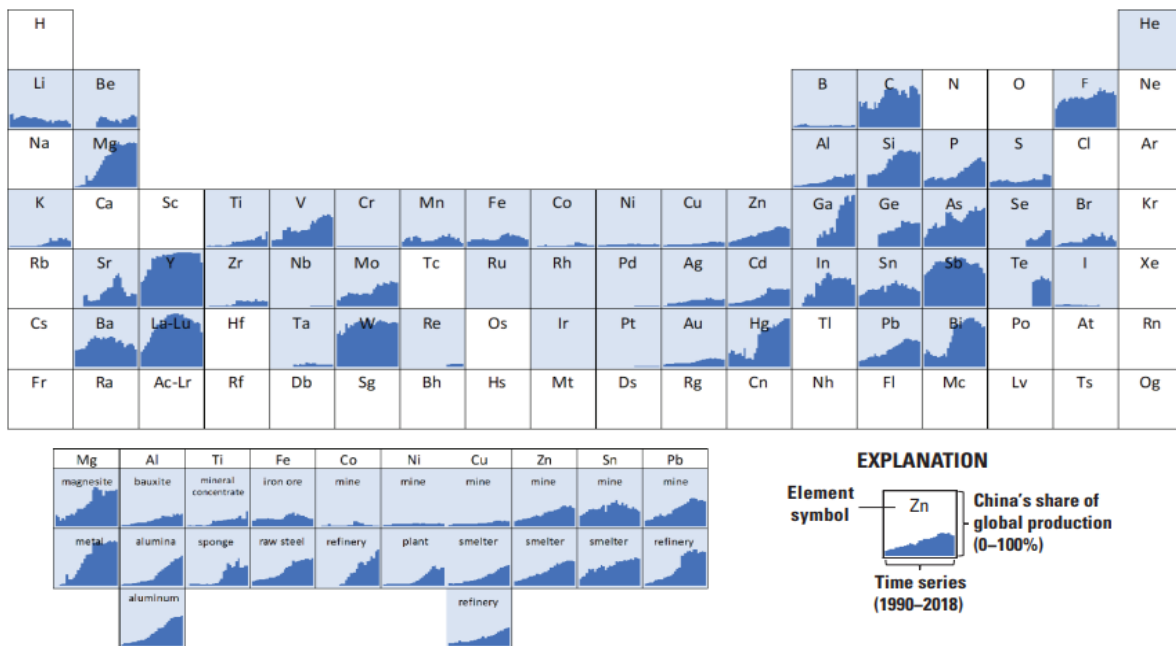
²⁷ Humphries, Marc. Congressional Research Service, “Critical Minerals and U.S. Public Policy.” R45810, June 28, 2019, p. 5.

https://www.everycrsreport.com/files/20190628_R45810_b3112ce909b130b5d525d2265a62ce8236464664.pdf

²⁸ Notably this reliance comes despite existing U.S. resources. In the 2022 Mineral Commodity Summaries, the USGS indicated the U.S. had an estimated 48 million metric tons (mt) of copper that can be mined and processed economically, 69 million mt of cobalt, 340 million mt of nickel and 750 million mt of lithium. Regardless, in 2021, the U.S. imported 48 percent of U.S. consumption of nickel, 76 percent of cobalt, 45percent of copper, and more than 25 percent of lithium.

²⁹ Nassar, N.T., Alonso, E., and Brainard, J.L., 2020, Investigation of U.S. Foreign Reliance on Critical Minerals—U.S. Geological Survey Technical Input Document in Response to Executive Order No. 13953 Signed September 30, 2020 (Ver. 1.1, December 7, 2020): U.S. Geological Survey Open-File Report 2020–1127, p. 4. <https://pubs.usgs.gov/of/2020/1127/ofr20201127.pdf>

China's share of global primary mineral commodity production over time³⁰



China's strong supply chain position stems, in large part, from state investment in processing and manufacturing, rather than an inherent advantage in reserves for most materials. China's "go global" strategy included \$390 billion in outbound direct investments in the mining sector.³¹ For example, as discussed in a recent White House report on supply chains:

- China is the primary global supplier of cobalt for batteries, despite having very limited reserves, through its aggressive investment in processing capacity coupled with foreign direct investment for ores and concentrates.
- China has a dominant position over the Democratic Republic of Congo cobalt reserves, which constitute half of the known global cobalt reserves.
- China has billions invested in nickel projects in Indonesia, home to one-quarter of overall global reserves.
- Mexican-based Sonora clay lithium deposit, operated by China-based Gangfeng Lithium, is currently under development, and would increase total lithium production by roughly half of today's production.³²

³⁰ For selected elements of the periodic table, the figure displays a time series of China's estimated share of global production for various associated mineral commodities for the years 1990–2018. In the periodic table, production refers to primary production or mine production. In the subfigure below the periodic table, multiple supply chain stages or forms are displayed for each mineral commodity. Elements not assessed are white. For a few mineral commodities (gallium, germanium, indium, selenium, silicon, strontium, and tellurium), data are not available for all years in the time series.

³¹ Humphries, Marc. Congressional Research Service, "China's Mineral Industry and U.S. Access to Strategic and Critical Minerals: Issues for Congress," March 20, 2015. <http://fas.org/sgp/crs/row/R43864.pdf>.

³² White House, "Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-based Growth, 100-Day Reviews under Executive Order 14017," June 2021, p. 94.

- Chinese firms have also made multiple and large investments in mining operations around the world to ensure their supply of critical materials like cobalt, nickel and lithium.³³ Just last month, China based CATL, the world's largest EV battery manufacturer, beat out U.S. and Russian companies to develop the world's largest lithium deposit in Bolivia.³⁴

As a result of these tactics, China controls significant portions of the global mineral supply chain. The IEA reported in May 2021 that China was responsible for 60 percent of global rare earth elements production and nearly 90 percent of global processing for rare earth elements in 2019.³⁵ And this threat is not limited to rare earths. As noted in USGS criticality methodology, "of the 54 mineral commodities evaluated, China was the leading producer of at least one stage of the supply chain for 35 commodities."³⁶

It did not used to be this way and it does not have to be our future. At every turn, our import dependence is both outsized and unnecessary. As explained in a recent opinion piece published in *The Hill*:

In the 1980s, the U.S. was the mineral capital of the world. Since then, China has developed a juggernaut battery supply chain industry. The industry is centered around chemical processing of battery materials, backed by substantial government funding and coordination. These subsidies led to a wave of outsourcing by American companies across industries from semiconductors to steel. In addition, China has spent the last two decades investing in the mining industry abroad, including major investments and mineral rights in Australia, Africa, Asia and South America. This has led to an overreliance on China — and in turn vulnerable supply chains and a lost economic opportunity at home.³⁷

³³ See also, USGS 2020 Investigation of U.S. Foreign Reliance on Critical Minerals (There are instances where the mineral deposit or mining and mineral processing operation of a commodity is partially or completely owned and (or) controlled by foreign companies with strong ties to their governments. For example, Chinese firms have purchased equity stake in lithium deposits and operations in Australia and Chile, niobium operations in Brazil, a rare earth deposit in Greenland, and cobalt operations in the D.R. Congo, Papua New Guinea, and Zambia (S&P Global Market Intelligence, 2020). Investigating China's investment in cobalt assets worldwide, Gulley and others (2019) found that when taking into account Chinese companies' ownership in foreign assets on an equity-share basis, China's share of global cobalt production increases from 2 to 14 percent for cobalt mine materials and from 11 to 33 percent for cobalt intermediate materials (figure 6). Furthermore, if the Chinese companies' equity shares of the production from these assets are assumed to be as secure as its domestic production, then these acquisitions have the effect of reducing China's NIR from 97 percent to an adjusted 68 percent, thereby reducing China's exposure to supply disruptions (Gulley and others, 2019).) p. 8.

³⁴ Reuters, "Bolivia taps Chinese battery giant CATL to help develop lithium riches," Jan. 20, 2023. <https://www.reuters.com/technology/bolivia-taps-chinese-battery-giant-catl-help-develop-lithium-riches-2023-01-20/>

³⁵ International Energy Agency. "The Role of Critical Minerals in Clean Energy Transitions," 2021. <https://iea.blob.core.windows.net/assets/24d5dfbb-a77a-4647-abcc-667867207f74/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf>

³⁶ 2021 Methodology, p. 7.

³⁷ Ellen Hughes-Cromwick, Ph D. 2022. "How the US.. Can Secure a Resilient Electric Vehicle Battery Supply Chain." *The Hill*. June 8, 2022. <https://thehill.com/opinion/energy-environment/3516265-how-the-us-can-secure-a-resilient-electric-vehicle-battery-supply-chain/>.

Our mineral import dependence will be our next Achilles’s heel. The U.S. must focus on supplying these metals at home as part of the solution “to diversify supply chains away from adversarial nations and sources with unacceptable environmental and labor standards.”³⁸

In order to support new domestic production, a robust domestic supply chain that includes minerals and metals sourced, refined, processed and smelted within our borders, we need to build on the important work done by this committee.

The following data from the mining program at the University of Missouri of Science and Technology is an important snapshot which allows us to better understand the domestic supply chain issues impacting production and refining and processing for simply one widely used metal.



United States – Copper Mining, Smelting and Refining

• 1995

- 40 mines produce copper
 - 1.9 million tons production
- 7 primary smelters
- 4 secondary smelters
- 7 electrolytic refineries
- 15 electrowinning facilities
 - 2.3 million tons refined copper

• 2020

- 25 mines produce copper
 - 1.2 million tons production
- 3 primary smelters
- 0 secondary smelters
- 3 electrolytic refineries
- 14 electrowinning facilities
 - 0.9 million tons refined copper

China – Copper Mining, Smelting and Refining

• 1995

- 0.4 million tons mine production
- 0.7 million tons refined copper

• 2020

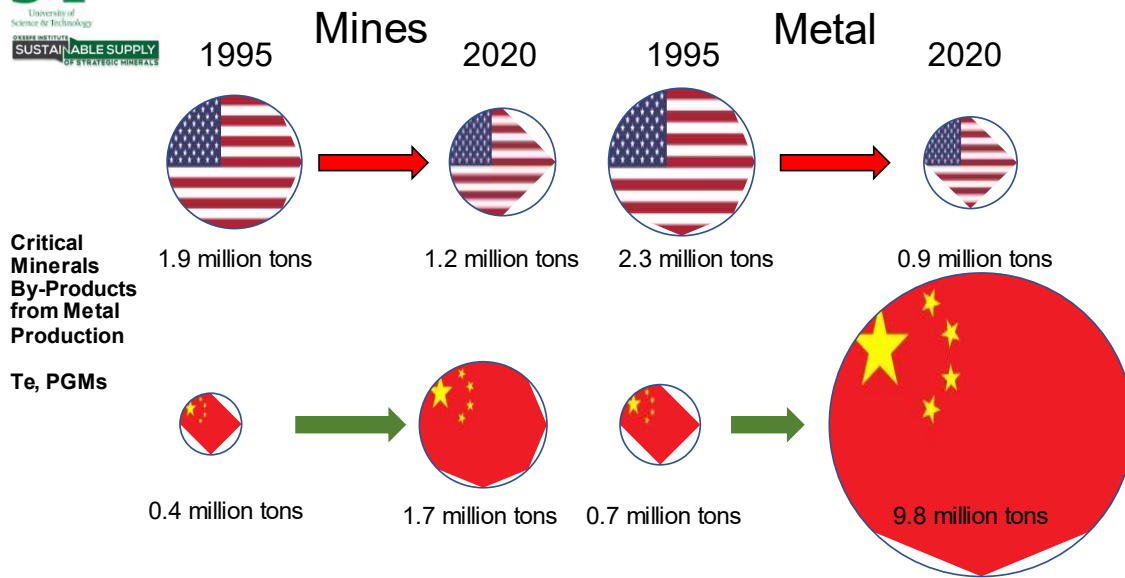
- 1.7 million tons mine production
- 9.8 million tons refined copper

All information from USGS National Minerals Information Center’s Mineral Commodity Summaries or Yearbook
All tons are metric tons

This next graphic further illustrates the enormity of the supply chain issues that the U.S. and our allies continue to face if we do not take the necessary steps to support regulatory policies that encourage private investment rather than attempting to control it.

³⁸ “FACT SHEET: Biden-Harris Administration Announces Supply Chain Disruptions Task Force to Address Short-Term Supply Chain Discontinuities.” 2021. The White House. June 8, 2021.
<https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/08/fact-sheet-biden-harris-administration-announces-supply-chain-disruptions-task-force-to-address-short-term-supply-chain-discontinuities/>.

Changes in Copper Supply Chain



What are the Solutions?

Chairman Westerman's and Subcommittee Chairman Stabuer's legislation with Chairwoman Cathy McMorris Rodgers *Securing American Mineral Supply Chains Act* contains key steps to support a robust domestic mineral supply chain that prioritizes responsible resource development through policies that provide certainty to all mining operations and manufacturers; sets lead agencies and improves the timeliness of the permitting process with timelines; maintains access to mineralized federal lands unless specifically withdrawn by Congress and unless the U.S. Geological Survey can assure that a withdrawal does not threaten supply chains; supports research, development and demonstration funding at the USGS and Department of Energy; new workforce development and training opportunities; and unlocks innovation by not supporting prescriptive mineral policies.

These policy recommendations are commonsense changes that would provide regulatory certainty to investors that the U.S. seeks to once again compete on a global scale in the mineral supply chain. Instead of only seeking to secure mineral supplies from foreign sources or exporting domestically extracted materials for further refinement, processing and smelting, these improvements in the permitting process would signal that the U.S. intends to secure the entirety of its supply chain, lessening vulnerabilities from outside sources, including geopolitical impacts.

Conclusion

The U.S. is at a mining crossroads. Mineral demand is soaring, but our policies are lagging. We must encourage more domestic mining and processing to meet future

demand and ensure that the materials required for everything from infrastructure to electrification are readily available. The NMA appreciates the prioritization of these issues by the House Natural Resources Committee and is eager to help craft important policy solutions for the future.