



To: House Committee on Natural Resources Republican Members
From: Subcommittee on Energy and Mineral Resources Republican Staff; Ashley Nichols (Ashley.Nichols@mail.house.gov) (251-656-8498) and Rebecca Konolige (Rebecca.Konolige@mail.house.gov) (914-217-8728)
Date: May 14, 2021
Subject: Republican Forum titled “Critical Minerals: Addressing Supply Chain Challenges and Rising Demand”

On **Tuesday, May 18, 2021, at 2:00 p.m. (EDT)**, the Committee on Natural Resources Republicans will host a forum titled “Critical Minerals: Addressing Supply Chain Challenges and Rising Demand.” This forum will address the necessity of securing domestic supply chains for critical minerals and the many challenges in achieving that goal.

All Members are encouraged to participate. This is a virtual forum, but Members may participate virtually from Cannon House Office Building 401 if they choose, using their own devices and headphones. Committee Republican Staff will be present in Cannon 401 to assist during the forum.

I. KEY MESSAGES

- A subset of non-fuel resources often called “hardrock” minerals, critical minerals are integral to our modern way of life. They are used in almost all high-tech devices, including smart phones, satellites, and missile defense systems. They are essential for the function of renewable energy technologies, electric vehicles, and battery storage.
- Rapid growth in renewable energy technologies is expected to drive mineral demand up by several orders of magnitude, exacerbated by the national goals recently pledged by the Biden Administration. If a massive scale-up in renewables is going to keep pace with stated demands, it is imperative that our nation accepts the reality of the massive amounts of mineral development necessary to meet those goals.
- Demand for critical minerals will be met somehow – either from countries with responsible mining and refining practices, or from suppliers that permit unacceptable labor conditions and have minimal concern for environmental impact.

This document has not been officially adopted by the Committee on Natural Resources and therefore may not necessarily reflect the views of its Members.

- Committee Republicans believe it is in the best interest of the United States to maximize production and development domestically or in conjunction with our allies, so that we can ensure minerals will be sourced in a safe, sustainable manner for decades to come.

I. INVITED WITNESSES

- **Dan McGroarty**, Principal, Carmot Strategic Group, Inc.
- **Laurel Sayer**, President and CEO, Perpetua Resources
- **Reed Blakemore**, Deputy Director, Global Energy Center, Atlantic Council
- **Dr. Michael Moats**, Professor of Metallurgical Engineering and Director of the O'Keefe Institute, Missouri University of Science and Technology
- **Abigail Wulf**, Director of our Center for Critical Minerals Strategy, Securing America's Future Energy
- **Tim Gould**, Head of Division for Energy Supply Outlooks and Investment, International Energy Agency
- **Steve Trussell**, Executive Director, Arizona Mining Association
- **Professor Ian Lange**, Colorado School of Mines

II. BACKGROUND

The United States has a concerning dependence on foreign nations for critical minerals, as highlighted recently by the Biden Administration's Executive Order on America's supply chains.¹ While recycling can provide a certain amount of minerals for reuse, today's recycling technologies cannot supply the massive volume of resources we will need in the near future. Demand for many of these minerals is predicted to grow exponentially, driven in part by a strong national and global push to increase renewable energy. For example, President Biden has made commitments to reach net-zero emissions by 2050, which would necessitate a massive scale-up of renewables in the next few decades.² Given the amount of minerals needed to build these technologies, a substantial increase in mineral extraction would be required to achieve this scale-up.

¹ Executive Order 14017 (March 1, 2021).

² FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies. April 22, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>

To illustrate, the World Bank predicts that demand will drive production of commodities like graphite, lithium, and cobalt up by almost 500% by the year 2050.³ A recent International Energy Agency (IEA) report titled, “The Role of Critical Minerals in Clean Energy Transitions,” found that achieving net-zero emissions globally by 2050 would require a sixfold increase of critical minerals by 2040.⁴

Further, this surge in demand is not limited to just minerals officially listed as “critical” by the Department of the Interior. For example, copper, which is not officially listed as a critical mineral currently, will be vital to the future energy sector due to its ability to conduct electricity. Electric vehicles require about four times as much copper as internal-combustion engine powered vehicles, and IEA predicts that copper demand for power lines will more than double over the next twenty years.⁵ In fact, Goldman Sachs declared that “copper is the new oil” in a report published in April 2021.⁶

Meeting this steep demand will be a global challenge. The first obstacle is that critical minerals are difficult to find in economically viable quantities. Unlike resources such as coal, which occur in large “seams,” hardrock minerals are sparsely scattered across a large area.⁷ It regularly takes hundreds of millions of dollars in upfront capital costs for exploration prior to production, and in the United States, exploration is followed by almost a decade of permitting due to environmental review requirements under the National Environmental Policy Act (42 U.S.C 4321 et seq.) and other laws, before production can even begin.⁸ It routinely takes over ten years and \$1 billion in start-up capital before a company produces any product in the U.S.⁹

But exploration and mining are just the beginning of the supply chain. Most minerals do not come out of the ground in a useable state and therefore must undergo a lengthy and expensive refining process. Many of the rarest critical minerals are produced as byproducts of other minerals during the refining or smelting process. For example, tellurium is a necessary component of solar panels and is produced almost exclusively as a part of the copper refining process. Unfortunately, aside from a few exceptions, the United States no longer has the refining capacity for the majority of our resources.¹⁰ In most cases, domestically-mined ore is shipped overseas to be refined and processed before the product is ready for sale. In addition to the extra time and expense, this also

³ World Bank Group. News release. “Mineral Production to Soar as Demand for Clean Energy Increases.” May 11, 2020.

⁴ Marshall, James. “Insufficient minerals threaten energy transition — report.” E&E News. May 5, 2021. <https://www.eenews.net/greenwire/stories/1063731805>

⁵ Id.

⁶ Id.

⁷ Briefing from the National Mining Association. March 2019.

⁸ Id.

⁹ Id.

¹⁰ U.S. Geological Survey. “Draft Critical Mineral List—Summary of Methodology and Background Information—U.S. Geological Survey Technical Input Document in Response to Secretarial Order No. 3359.” 2018. <https://pubs.usgs.gov/of/2018/1021/ofr20181021.pdf>

adds another layer of strategic uncertainty, as most the world's critical mineral refining capacity is now controlled by China.¹¹

China is unquestionably the biggest player in the global minerals market, controlling much of the global extraction and refinement capacity for many of the most important commodities. If the raw materials are not being mined in China, then they are being produced in Chinese-owned mines in Africa or other continents. China also has an absolute stranglehold on global refining capacity, as mentioned previously. The dominance of one country in this sector is not only an immense economic concern, but also an issue of national security. As demonstrated, critical minerals play a central role in everything from laptops to medical equipment to advanced military gear and relying on a one nation for the sustainment of those products has clear defense implications.

Committee Republicans believe that the best place for mineral development is in the United States, where we employ world-class scientific advancements and regulate mineral production under some of the world's most rigorous standards. One step towards allowing better access and investments in recycling technologies is the American Critical Mineral Independence Act, introduced by Congressman Waltz and Congressman Gosar on April 16, 2021. However, given the scale of the challenge, much more work remains to be done to ensure a stable supply of critical minerals to meet our national demand. Global mineral supply chains present several distinct, complex challenges. This forum presents an opportunity to have honest conversations about the scope of the problem, so that we may continue our work to solve it.

¹¹ Scheyder, Ernest. "China set to control rare earth supply for years due to processing dominance." Reuters. May 29, 2019. <https://www.reuters.com/article/us-china-usa-rareearth-refining/china-set-to-control-rare-earth-supply-for-years-due-to-processing-dominance-idUSKCN1T004J>