Testimony
U.S. House of Representatives
Committee on Natural Resources
Subcommittee on Energy and Mineral Resources
submitted by
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Chairman Stauber, Ranking Member Ocasio-Cortez, and Members of the Committee thank you for this opportunity to express my support for H.R. 8446.

My name is Misael Cabrera, and I am the Director of the School of Mining & Mineral Resources at the University of Arizona. After over 130 years of preparing students for mining careers, the School was formed to support departments and programs across campus in delivering interdisciplinary innovation in mining and sustainable minerals.

Before this appointment, I served as Director of the Arizona Department of Environmental Quality (ADEQ). During my tenure, the ADEQ team dramatically increased environmental outcomes and was recognized 28 times by local and national organizations. Previously, I held various environmental leadership roles in three international engineering firms.

Today, I am not speaking on behalf of the University. My comments are based primarily on nearly 30 years of experience as an environmental professional. With my hands, I have collected hundreds of environmental samples and designed treatment systems that have removed hundreds of thousands of pounds of pollution from soil and groundwater. I have overseen the drafting of state rules to protect air, water, and soil and advocated for the passage of historic state legislation to protect the environment. This career-long commitment to the environment has led me to understand the absolute urgency of having sustainable, abundant, and economical minerals and materials for our planet.

This urgency validates the need for both the United States Geologic Survey (USGS) critical minerals designation and the Department of Energy (DOE) critical materials designation.

The difference between the two designations can be effectively summarized in four materials: copper, electrical steel, silicon, and silicon carbide.[1] Copper is essential for generating, transmitting, and storing electricity.[2] Electric steel, an iron alloy, is necessary to operate nearly every electric motor efficiently. Silicon is essential for solar panels, semiconductors, and many alloys, including electric steel. Silicon carbide is a high-performance semiconductor used in electric vehicles, data centers, solar inverters, and health monitoring systems. In short, these materials are fundamental for modern life, our planet's growing population, and the Biden Administration's climate agenda.

The distinction between the USGS and DOE criticality assessments is crucial to understanding the value of both designations and the need for H.R. 8446. The DOE designation is forward-looking, incorporating global demand trajectories based on growth scenarios for various energy technologies.[3] On the other hand, the USGS calculated supply risk as a function of economic vulnerability based on actual – i.e., past but quantitative – production data, the most recent of which was in 2018.[4] Both methodologies have merit, as they are transparent and reproducible, just from different vantage points. The more important but perilous matter is that our nation is precariously reliant on foreign sources of minerals and materials, and our reliance continues to grow.

The 2024 USGS Mineral Commodities Report shows that the United States was at least 50% import reliant for 41 out of 50 critical minerals. The Mineral Commodities Report also shows that China was *the* leading critical-mineral-producing nation, supplying 29 of 43 critical minerals for which data was available.[5] Not surprisingly, China increased its CO_2 emissions by over 90% from 2005 to 2022, making it the world's largest emitter. The US reduced its emissions by 17% during the same period.[6] In sum, our lack of investment in critical minerals and materials over

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[1] The Energy Act of 2020, Section 7002 defines Critical Materials as those determined by the Secretary of Energy using certain criteria *or* a Critical Mineral. In 2023, DOE established 18 critical materials, 14 of which are on the USGS Critical Minerals List.

[2] Cathles, L. M., & Simon, A. C. (2024, May 15). Copper Mining and Vehicle Electrification. International Energy Forum.

[3] Federal Register. (2023, August 4). Notice of Final Determination on 2023 DOE Critical Materials List, Vol. 88(149)., August 4, 2023.

[4] Nassar, N. T., & Fortier, S. M. (2021). Methodology and technical input for the 2021 review and revision of the U.S. Critical Minerals List. U.S. Geological Survey Open-File Report 2021–1045

[5] U.S. Geological Survey, 2024, Mineral commodity summaries 2024: U.S. Geological Survey, 212 p., https://doi.org/10.3133/mcs2024

[6] Annual total emissions of carbon dioxide (CO_2), excluding land-use change, measured in tonnes, Our World in Data. https://ourworldindata.org/co2-emissions. Accessed on 6/1/2024.

the last few decades has led to security concerns, economic insult, and environmental injury for the planet.

While investment in critical minerals has been welcome, disparity still exists with critical materials. That is unfortunate, given that China is the world's largest producer of silicon, accounting for approximately 70% of the world's production.[7] It is also unfortunate, given that The International Energy Forum recently published a report estimating that the planet will need six new copper mines annually to meet the net zero goals by 2050.[2]

I support H.R. 8446 because it recognizes that critical minerals and materials designations are complementary in nature and that federal funding should flow to support research, development, and deployment efforts across both domains. By doing so, the United States can strengthen its resilience to supply disruptions and continue to lead in energy innovation and environmental stewardship.

[7] Newtop Silicone. (n.d.). Silicone Manufacturing in China: A Winning Combination of Cost, Quality, and Expertise. https://www.newtopsilicone.com/silicone-manufacturing-in-china-a-winning-combination-of-cost-quality-and-expertise. Accessed on 6/1/2024