THE U.S. CRITICAL MINERALS LIST: BETWEEN A ROCK AND A HARD PLACE

Wesley Peebles[*]

ABSTRACT

Critical minerals are minerals found essential to economic and national security and vulnerable to supply chain disruptions. Congress and presidents from both political parties have actively promoted critical mineral production, offering up billions of dollars to secure mineral supply chains. The federal government has invested to increase domestic mineral production, grow global partnerships, and reinvigorate U.S. industry in an attempt to reduce the risk of supply disruptions for these valuable minerals. To identify which minerals are critical to the United States, Congress tasked the Secretary of the Interior, acting through the U.S. Geological Survey (USGS), to evaluate and identify a list of critical minerals in the Energy Act of 2020. The list of critical minerals, updated by USGS at least every three years, employs scientific analysis to measure criticality and recommends minerals found most critical for designation on the final list. The list and its underlying evaluation are the primary mechanism by which the U.S. government evaluates the risk of disruption for these valuable mineral commodities. Maintenance of a robust, objective evaluation of minerals is

[*] Research Associate, Wallace Stegner Center Fellow, S.J. Quinney College of Law, University of Utah. I would like to thank members of the Law and Policy Program—John Ruple, Jamie Pleune, and Thomas Mitchell—who helped to incubate the ideas contained in this Article. Funding to support this research was provided by the ESRR Endowment for the Wallace Stegner Center for Land, Resources & the Environment and by the Wilburforce Foundation. Consistent with Stegner Center policies, funders play no role in project development, analysis, article preparation, or otherwise exercise any editorial control. The views expressed herein do not necessarily represent those of the state of Utah, University of Utah, or project funders.

necessary to inform and organize the federal government's response to supply risk. Recent action from the second Trump administration, including issuance of Executive Orders (EO) 14,154, 14,241, and 14,261, complicate the critical minerals list's function, risking politicizing the list and confusing which minerals qualify as "critical minerals." These complications threaten inefficient or unresponsive investments and policies that subsidize preferred minerals over those most likely to cause major disruption to economic or national security.

This Article considers the U.S. critical minerals list in its historical and legal context, examining past and present efforts to identify risk for mineral commodities. In doing so, this Article finds the critical minerals list is important to assessing risk for mineral commodities, informing the government and public, coordinating government-wide action on minerals, and prioritizing the most at-risk minerals for action. Confusion regarding the purpose of the list and competing political priorities threaten to diminish use of the critical minerals list. Thus, this Article recommends clear communication on the use and intent of the list, separation from other mineral and material priority lists, and adherence to the legal and scientific frameworks. Doing so produces a critical minerals list that more accurately measures criticality and provides information valuable in the effort to secure mineral supply chains.

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INTRODUCTION

Though most are likely unaware, critical minerals are indispensable to daily life. Raw minerals, such as lithium and cobalt, are foundational components used in a wide range of products—from everyday items like cell phones to specialized goods such as satellites, military weapons, and solar panels. Supply and demand challenges for critical minerals directly influence bipartisan natural resource policy and guide millions of dollars in federal investments. As a result, over the course of the past two decades, critical minerals have traveled from obscurity to headline-making news.[1]

1. *See, e.g.*, Edward Wong, *How Trump and Biden's Focus on Minerals Became Core to U.S. Foreign Policy*, N.Y. TIMES (Feb. 26, 2025), https://www.nytimes.com/2025/02/26/us/politics/trump-biden-minerals-ukraine.html; Constant Méheut, *Trump Urges Trading Ukraine's Critical Minerals for More U.S. Aid*, N.Y. TIMES (Feb. 5, 2025), https://www.nytimes.com/2025/02/03/world/europe/trump-ukraine-rare-earth-minerals.html; Don Nico Forbes, *Could a Global Minerals Trust Help Speed up the Energy Transition?*, WALL ST. J. (Aug. 6, 2025), https://www.wsj.com/articles/could-a-global-minerals-trust-help-speed-up-the-energy-transition; Julie Steinberg & David Uberti, *Why Kamala Harris Wants to Stockpile Minerals You've Probably Never Heard of*, WALL ST. J. (Sept.

The importance of critical minerals reflects their outsized importance to the economy. Take, for example, the shortage of semiconductors using lithium and cobalt caused by the COVID-19 pandemic. Work restrictions during the pandemic led to a slowdown in manufacturing, creating semiconductor scarcity in the United States. Unable to quickly source minerals and manufacture its own semiconductors during the pandemic, and without critical components for auto electronics, the U.S. automobile industry was unable to manufacture new cars. Thus, disruption in the supply of a small component led to a larger disruption for automobile manufacturing.[2] Market scarcity of new cars in the United States foisted higher prices and limited choice on U.S. consumers with lasting impacts to the broader economy.

Scarcity caused by COVID-19 demonstrates how failure to build security in U.S. mineral supply chains exposes the United States to preventable harm. Proactive planning can alleviate the negative impacts of a disruption, for example, by building domestic production and processing capacity or by entering agreements with a more diverse group of suppliers. Given the global scope and technical nature of the issue, however, it is difficult to know where to begin. In the United States, creating the critical minerals list is the first step to order the federal government's response to address mineral supply risk. By assessing market and production data to evaluate mineral commodities for risk, the U.S. Geological Survey (USGS) determines which minerals are critical. This information is then used by federal officials to plan for present and future exigencies.

Understanding what the critical minerals list does requires understanding what makes a mineral "critical" in the first place. At base, criticality is a unit of measurement capturing the risk facing the United States in the event of a supply disruption. The greater the

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29, 2024), https://www.wsj.com/politics/policy/why-kamala-harris-wants-to-stockpile-minerals-youve-probably-never-heard-of; David J. Lynch, *U.S. Races to Develop Alternatives to China's Rare Earth Materials*, WASH. POST (Jun. 22, 2025), https://www.washingtonpost.com/business/2025/06/22/us-rare-earth-neodymium-magnets-china/.

2. *Critical Mineral Shortages Could Disrupt Global Supply Chains*, U.S. GOV'T ACCOUNTABILITY OFF. (Jun. 21, 2022), https://www.gao.gov/blog/critical-mineral-shortages-could-disrupt-global-supply-chains.

high-value uses of a mineral and more vulnerabilities along a mineral's supply chain, the greater the risk disruption poses. In other words, the more essential or vulnerable a mineral is, the greater that mineral's criticality.

Because critical minerals are defined largely by social factors, not physical or geologic characteristics, they are a diverse group. However, by evaluating dimensions of mineral criticality—essentiality and vulnerability—USGS can determine which minerals pose the greatest risk and should be included on the critical minerals list.

First, essentiality. Critical minerals perform specialized functions in important technologies, often without practical substitutes. For example, indium, in the form of indium tin oxide, creates a clear, conductive film on smartphones, enabling touch screen functionality.[3] Additionally, end products themselves, not just critical mineral components, also perform specialized functions. For example, the jet engines of aircraft used in military operations use a highly heat-resistant alloy containing tantalum.[4] Without these mineral components, the technology would not function properly, leading to important social needs going unmet.

Second, vulnerability. Realities of mineral production and globalized trade expose minerals to risk of supply disruptions. As one commentator noted,

> When Mother Nature laid down the foundations of the earth, it seems that she did not feel impelled to take into consideration the unbalanced ideas of those over-

3. Visual Capitalist Elements, *A Breakdown of the Critical Minerals in a Smartphone*, MINING.COM (Aug. 25, 2021), https://www.mining.com/web/a-breakdown-of-the-critical-metals-in-a-smartphone/; *Critical Minerals Powering Your Smartphone*, SFA OXFORD, https://www.sfa-oxford.com/knowledge-and-insights/critical-minerals-in-low-carbon-and-future-technologies/critical-minerals-in-electronics/critical-minerals-in-smartphones/.

4. *Materials of Interest*, DEF. LOGISTICS AGENCY, https://www.dla.mil/Strategic-Materials/Materials/ (last visited Aug. 1, 2025) [hereinafter *Materials of Interest*]; *Critical Materials Are in High Demand. What Is DOD Doing to Secure the Supply Chain and Stockpile These Resources?*, U.S. GOV'T ACCOUNTABILITY OFF. (Sept. 12, 2024), https://www.gao.gov/blog/critical-materials-are-high-demand.-what-dod-doing-secure-supply-chain-and-stockpile-these-resources.

> nationalized individuals who were destinated to come along a few million years later, but placed the origins of the future ore deposits wherever her fancy dictated, and we today must make the best of the situation; and since *every* nation lacks *some* of the minerals necessary in modern industry, each is dependent on others for certain essential raw materials.[5]

Access is not the only hurdle to securing minerals. Technological limitations, infrastructure availability, environmental and social standards, and market dynamics all affect critical minerals production. Even if production runs smoothly, events such as natural disasters, labor disputes, and trade disputes between nations can still disrupt supply.

The Energy Act of 2020 guides USGS's evaluation and maintenance of the critical minerals list. This Act confines the scope of how criticality is measured, defining essentiality and vulnerability in law.[6] USGS informs critical mineral designation by using scientific evaluation to determine which minerals meet statutory criteria. As the mechanism for the U.S. government to identify critical minerals, the critical minerals list serves as the keystone of critical minerals policy, providing an understanding of mineral supply risk for the nation and facilitating government coordination to address that risk.

Accurately determining criticality has high stakes. Many important needs depend on effective mineral policy. Take, for instance, adapting to the realities of climate change through the clean energy transition.[7] Countries and companies throughout the world are employing clean energy technology to generate electricity and reduce greenhouse gas emissions. These clean energy technologies use far more mineral components than "traditional" energy technologies.

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5. G.A. ROUSH, STRATEGIC MINERAL SUPPLIES 2 (1939).

6. *See* 30 U.S.C. § 1606(c)(4)(A) (delimiting measurement of essentiality to "essential to economic or national security of the United States," serving "an essential function in the manufacturing of a product," and vulnerability to whether "the supply chain . . . is vulnerable to disruption").

7. *See* INT'L ENERGY AGENCY, THE ROLE OF CRITICAL MINERALS IN CLEAN ENERGY TRANSITIONS 5 (2022), https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions [hereinafter *IEA, ROLE IN CLEAN ENERGY*].

The International Energy Agency (IEA) estimates that a "typical electric car requires six times the mineral inputs of a conventional [gas-powered] car, and an onshore wind plant requires nine times more mineral resources than a gas-fired power plant."[8] Meeting Paris Climate Agreement goals to stabilize climate warming "well below 2ºC global temperature rise" requires quadrupling mineral output by 2040 for clean energy technologies alone.[9] These demands make many minerals far more essential while also straining markets to meet demand, increasing vulnerability. Even if the federal government is not prioritizing this transition, the United States will still face increased risk in a global market.

U.S. policy must also account for the geopolitical jockeying that uses critical minerals as a tool of influence, particularly from China. U.S. security concerns over mineral supply chain stability have increased as China has expanded its influence over global mineral markets.[10] Many modern military technologies, including fighter jets and radar systems, depend on rare earth elements,[11] over which China has been particularly bullish in exercising control.[12] But China exerts influence over more than just rare earth elements.[13] In a 2021 report, the IEA estimated that China's share of global refining was high for many minerals, including 35% for nickel, 50–70% for lithium and cobalt, and nearly 90% for the more often-mentioned rare earth

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8. *Id.*

9. *Id.* at 8. Even more ambitious goals, such as reaching net-zero emissions globally by 2050, require an even greater six-times increase in mineral inputs. *Id.*

10. *See* Pascale Massot, *The China Challenge in Critical Minerals: The Case for Asymmetric Resilience*, THE DIPLOMAT (Jun. 6, 2025), https://thediplomat.com/2025/06/the-china-challenge-in-critical-minerals-the-case-for-asymmetric-resilience/.

11. Gracelin Baskaran & Meredith Schwartz, *The Consequences of China's Rare Earth Export Restrictions*, CTR. FOR STRATEGIC & INT'L STUDS. (Apr. 14, 2025), https://www.csis.org/analysis/consequences-chinas-new-rare-earths-export-restrictions.

12. *See* Keith Bradsher, *China Tightens Its Hold on Minerals Needed to Make Computer Chips*, N.Y. TIMES (Oct. 28, 2024), https://www.nytimes.com/2024/10/26/business/china-critical-minerals-semiconductors.html.

13. *See* Shobhan Dhir et al., *Growing Geopolitical Tensions Underscore the Need for Stronger Action on Critical Minerals Security*, INT'L ENERGY AGENCY (Feb. 9, 2025), https://www.iea.org/commentaries/growing-geopolitical-tensions-underscore-the-need-for-stronger-action-on-critical-minerals-security.

elements.[14] In 2025 the IEA estimated that China controlled production of 95% of battery-grade graphite and rare earths, 70% of lithium chemicals, and 40% of copper by geography and ownership.[15] When production at multiple stages of the supply chain is limited to one or a few countries, supply risk for those minerals increases. Should China restrict supplies of necessary critical minerals to the U.S., it may leave the U.S. government scrambling to secure supplies, including by diverting these minerals and their components from civilian markets.[16]

Developing policy to secure mineral supply chains thus requires diagnosing threats and bold action to mitigate those threats. As the only nationwide mechanism for determining mineral criticality, the critical minerals list must be maintained with both scientific and legal integrity. Threatening the list's integrity risks identifying the wrong priorities, causing adoption of less effective policies as a result.

Threats to the list, including distorting the meaning of the term "critical mineral," politicizing creation of the critical minerals list, and seeking to advance alternative lists, all jeopardize U.S. efforts to secure critical mineral supply chains. By working to contain these threats and safeguard the functionality of the critical minerals list, the United States better positions itself to prevent future supply disruptions. Ultimately, the list should serve to measure risk posed by critical minerals, not be leveraged to subsidize industry partners.

This Article provides clarity to what the critical minerals list is, how it came to be, and what the government hopes to accomplish by maintaining it. By exploring the list's scientific, historical, and legal dimensions, this Article demystifies critical minerals and their designation. Appreciating the role of the critical minerals list is pivotal to engaging with U.S. policy on critical minerals, including investing millions of dollars in mineral production and the evolving role of diplomacy and international coordination on minerals.

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14. IEA, ROLE IN CLEAN ENERGY, *supra* note 7, at 12.

15. Geography considers which territory is under Chinese control, while ownership considers Chinese interests in projects located in other nations. INT'L ENERGY AGENCY, GLOBAL CRITICAL MINERALS OUTLOOK 2025, at 30 (2025), https://www.iea.org/reports/global-critical-minerals-outlook-2025 [hereinafter *IEA, OUTLOOK 2025*].

16. *See generally* Defense Production Act, 50 U.S.C. §§ 4501 *et seq.* (providing authority for the president to mobilize civilian resources in an emergency).

This Article also argues for adhering to the law and maintaining scientific rigor to develop and update the critical minerals list. Using scientific evaluation to compile the list enables decisionmakers to trust that they are receiving an accurate understanding of the supply risk of minerals to the United States. Departure from the letter and spirit of the Energy Act of 2020 threatens to undermine the usefulness of the critical minerals list by substituting scientific evaluation for political decision-making. Should the list lose rigorous evaluation or be coopted by political decision-making, its value as an informational tool to comprehend risk diminishes. Such hobbles the United States's ability to address economic and national security risks, diverting attention from critical minerals to subsidizing political favorites.

Part I distills a contemporary definition of critical minerals, looking to the broader mineral commodities field and the law. Part II traces the history of minerals policy in the United States, highlighting key periods in the development of the critical minerals list. Part III examines the legal requirements and scientific process for developing the list. Part IV provides a comparative analysis of other mineral-related priority lists, both domestic and foreign. Part V discusses how decisionmakers, largely in the federal government, use the list and the effects of listing a mineral as critical. Part VI identifies some political and policy concerns surrounding the critical minerals list, offering recommendations about how to reduce those concerns. The Article concludes with notes on the stakes of maintaining the list's integrity.

I. UNDERSTANDING DEFINITIONS: WHAT ARE CRITICAL MINERALS?

Generally, critical minerals are a class of non-fuel minerals identified as essential to the U.S. economy or national defense that have supply chain vulnerabilities.[17] Critical minerals include rare

17. *See* Jorge Valverde, *What Are Critical Minerals, and Why Are They So Important?*, UNU-MERIT (May 2, 2024), https://unu.edu/merit/news/what-are-critical-minerals-and-why-are-they-so-important; NAT'L RSCH. COUNCIL, MINERALS, CRITICAL MINERALS, AND THE U.S. ECONOMY 30–33 (2008),

minerals, such as thulium, a rare earth element not often found in significant ore concentrations,[18] and minerals uneconomic to produce, such as tellurium, a byproduct of copper mining.[19] These minerals are often necessary components in manufacturing high-tech products across a variety of fields, including aerospace, transportation, healthcare, energy, defense, and consumer electronics.[20] As discussed further below, without the ability to supply necessary mineral components used in important products, many social needs would go unmet.

While critical mineral uses vary, the energy, consumer technology, and defense sectors attract special attention. Clean energy generation is a growing driver of mineral demand.[21] A variety of clean energy technologies require specific mineral components to function, including cadmium in solar panels, samarium in wind turbines, and cobalt in batteries of electric vehicles.[22] The digital electronics market also feeds critical mineral demand. Ubiquitous consumer

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https://nap.nationalacademies.org/catalog/12034/minerals-critical-minerals-and-the-us-economy.

18. *See* Bradley S. Van Gosen et al., *Rare Earth Elements*, *in* CRITICAL MINERAL RESOURCES OF THE UNITED STATES—ECONOMIC AND ENVIRONMENTAL GEOLOGY AND PROSPECTS FOR FUTURE SUPPLY, Professional Paper 1802–A, U.S. GEOLOGICAL SURV. O1 (2017), https://pubs.usgs.gov/pp/1802/a/pp1802a.pdf.

19. U.S. GEOLOGICAL SURV., MINERAL COMMODITY SUMMARIES 2025, at 29, 178 (2025), https://pubs.usgs.gov/periodicals/mcs2025/mcs2025.pdf [hereinafter *USGS, SUMMARIES 2025*].

20. Off. of Fossil Energy & Carbon Mgmt., *Developing a Domestic Supply of Critical Minerals and Materials*, U.S. DEP'T OF ENERGY (Feb. 6, 2024), https://www.energy.gov/fecm/articles/developing-domestic-supply-critical-minerals-and-materials ("Critical minerals and materials are vital for a wide range of industries, including aerospace, health care, and defense. They are also key inputs to many clean energy technologies, including solar panels, wind turbines, electric vehicle batteries, and energy storage technologies."). *See also* Klaus J. Schulz et al., *Critical Mineral Resources of the United States—An Introduction*, *in* CRITICAL MINERAL RESOURCES OF THE UNITED STATES—ECONOMIC AND ENVIRONMENTAL GEOLOGY AND PROSPECTS FOR FUTURE SUPPLY, Professional Paper 1802–A, U.S. GEOLOGICAL SURV. A7 (2017), https://pubs.usgs.gov/pp/1802/a/pp1802a.pdf.

21. *See New Frontier for Global Energy Security: Critical Minerals*, INT'L ENERGY AGENCY, https://www.iea.org/topics/critical-minerals (last visited Apr. 11, 2025).

22. *See* USGS, SUMMARIES 2025, *supra* note 19, at 52, 63; Van Gosen et al., *supra* note 18, at O3.

products, like the modern smartphone, require many mineral components in manufacturing.[23] Finally, defense technologies such as radar, guidance systems, and night-vision goggles require critical minerals to function.[24] While defense uses do not drive a large share of mineral market demand, high-priority uses of these products make mineral supply a policy priority.[25]

The term "critical minerals" may refer to either a scientific or legal concept. Both require "essentiality" and "vulnerability" of minerals as dimensions of criticality. This Part provides an overview of the concept of critical minerals in science broadly, before discussing the Energy Act of 2020's narrower legal definition, which codifies U.S.-specific dimensions of the scientific concept into law. Understanding what criticality measures is key to fully understanding and appreciating the critical minerals list's function and the risk it addresses.

A. CRITICAL MINERALS ARE ESSENTIAL, VULNERABLE, AND DEFINED BY CONTEXT

A critical mineral is an essential and vulnerable mineral commodity.[26] This brief definition highlights the two dimensions of criticality—essentiality, which measures vital uses, and vulnerability, which measures potential for supply disruption.[27] Criticality is a

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23. *See* Bruno Venditti, *Visualizing the Critical Materials in a Smartphone*, VISUAL CAPITALIST (Aug. 24, 2021), https://elements.visualcapitalist.com/critical-metals-in-a-smartphone/.

24. U.S. GOV'T ACCOUNTABILITY OFF., GAO-24-107176, CRITICAL MATERIALS: ACTION NEEDED TO IMPLEMENT REQUIREMENTS THAT REDUCE SUPPLY CHAIN RISKS 3 (2016), https://www.gao.gov/assets/gao-24-107176.pdf.

25. *See* U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 2 ("DOD's ability to influence the market for critical materials is limited. DOD's demand is relatively low compared to the broader global commercial market for these goods.").

26. *See generally* NAT'L RSCH. COUNCIL, *supra* note 17, at 31 (defining critical minerals on the basis of "importance in use" and "availability"). Or, as the National Research Council described them in 2008, critical minerals are those that are highly important in use but have constraints on availability.

27. For example, U.S. criteria for listing a mineral commodity as a critical mineral require finding two elements of importance, both "to the economic or national security" of the nation and by "serv[ing] an essential function in the manufacturing of a product . . . ." It requires a measure of vulnerability by a finding

measurement of both dimensions, with greater criticality indicating greater risk. Criticality is also contextual, as essentiality and vulnerability of a mineral vary across time, location, and perspective of the group or nation that measures them.[28]

1. Essentiality: Critical Minerals Are Crucial to Supporting Social Needs

Essentiality is the first dimension of criticality. Essentiality transcends mineral demand to reflect the "economic, social, and other consequences if essential functions cannot be delivered."[29] To be essential, then, a mineral must be more than important; it must be vital to society, usually through important economic or national defense uses.[30] Many critical minerals are necessary components of high-tech electronics and equipment. These minerals often have highly specialized applications and lack effective substitutes,[31] making them vital for newer, high-value technologies, such as in touch screens (indium), wind turbines (rare earth elements such as praseodymium), electric vehicles (cobalt), and high-performance batteries (lithium).[32] Thus, essentiality also considers how shortfalls

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requirement of "a supply chain that is vulnerable to disruption . . . ." *See* 30 U.S.C. § 1606(c)(4)(A).

28. Valverde, *supra* note 17; *see also* LINDA R. ROWAN, CONG. RSCH. SERV., R47982, CRITICAL MINERAL RESOURCES: NATIONAL POLICY AND CRITICAL MINERALS LIST 3–4 (2025) (noting that criticality changes over time).

29. NAT'L RSCH. COUNCIL, *supra* note 17, at 31.

30. *Id.*

31. Schulz et al., *supra* note 20, at A7.

32. *See, e.g.*, USGS, SUMMARIES 2025, *supra* note 19, at 18, 91, 110 (discussing cobalt, lithium, and indium); *A New Frontier for Global Energy Security: Critical Minerals*, INT'L ENERGY AGENCY, https://www.iea.org/topics/critical-minerals (last visited Apr. 4, 2025) ("Critical minerals such as copper, lithium, nickel, cobalt and rare earth elements are essential components of many of today's rapidly growing energy technologies – from wind turbines and electricity networks to electric vehicles."); WHITE HOUSE, BUILDING RESILIENT SUPPLY CHAINS, REVITALIZING AMERICAN MANUFACTURING, AND FOSTERING BROAD-BASED GROWTH: 100-DAY REVIEWS UNDER EXECUTIVE ORDER 14017, at 171 (2021), https://bidenwhitehouse.archives.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf?utm_source=sfmc%E2%80%8B&utm_medium=email%E2%80%8B&utm_campaign=20210610_Global_Manufacturing_Economic_Update_June_Members (describing clean energy uses of critical minerals such as rare earth elements, cobalt, and lithium).

in mineral supply impact more than mineral production and can have cascading effects throughout the supply chain. For example, shortages of rare earth elements may disrupt permanent magnet production,[33] preventing wind turbine manufacturing, installation of wind energy utilities, and energy generation.[34] The more essential a mineral, the more critical that mineral.

2. Vulnerability: Critical Minerals Have Constraints Along Their Supply Chains

Vulnerability, the second dimension of criticality, measures mineral supply chain constraints and pressures producing supply risk.[35] Though many minerals are essential, some are easier to supply. Therefore, a significant level of risk along the supply chain must threaten supply for the mineral to be designated as critical. For example, while copper has many essential functions in the energy sector, it was previously found insufficiently vulnerable to supply chain disruptions to be listed as a critical mineral, in part due to existing domestic production.[36] Vulnerability may result from a variety of factors including rarity, concentration of orebodies, uneconomic production, low levels of refining capacity, lack of knowledge or technical capacity, or location in nations unable or unwilling to supply them.[37] As with essentiality, the greater the

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33. Permanent magnets are those that maintain their magnetism for a long period of time.

34. *See generally* U.S. DEP'T OF ENERGY, RARE EARTH PERMANENT MAGNETS: SUPPLY CHAIN DEEP DIVE ASSESSMENT (2022), https://www.energy.gov/sites/default/files/2024-12/Neodymium%2520Magnets%2520Supply%2520Chain%2520Report%2520-%2520Final%5B1%5D.pdf.

35. Mineral Res. Program, *What Are Critical Minerals?*, U.S. GEOLOGICAL SURV. (Nov. 1, 2024), https://www.usgs.gov/programs/mineral-resources-program/science/what-are-critical-minerals-0.

36. *See* Draft List of Critical Minerals, 83 Fed. Reg. 7065, 7066 (Feb. 16, 2018); 2021 Draft list of Critical Minerals, 86 Fed. Reg. 62199, 62202 (Nov. 9, 2021).

37. *See* NAT'L RSCH. COUNCIL, *supra* note 17, at 31 (outlining considerations that affect mineral availability). *See generally* U.S. DEP'T OF COM., A FEDERAL STRATEGY TO ENSURE SECURE AND RELIABLE SUPPLIES OF CRITICAL MINERALS (2019), https://www.commerce.gov/sites/default/files/2020-01/Critical_Minerals_Strategy_Final.pdf (pinpointing supply risks for critical minerals and outlining strategy to address them).

vulnerability, the greater the criticality, with more vulnerable minerals posing greater risk.

3. Contextuality: Essentiality and Vulnerability Vary Across Time, Space, and Actor

Criticality is dynamic; changes to either essentiality or vulnerability may alter whether a mineral is critical. Accordingly, mineral criticality varies across time, space, and perspective of party creating the list, making the context of criticality evaluation important.[38] For example, dysprosium, while critical today for its specialized uses in permanent magnets, had very low demand until the 1980s.[39] As use of dysprosium in technology became more important, its criticality increased. In another example, the U.S. does not produce large quantities of niobium, leading to high import levels.[40] Brazil, however, dominates worldwide niobium production.[41] Comparatively speaking, vulnerability for niobium is lesser in Brazil than in the United States, meaning niobium may not be critical in Brazil despite its criticality to the United States. Keeping contextuality in mind is important when comparing past and present mineral policy (including between updates to the critical mineral list) and the lists of different governments.

B. THE UNITED STATES DEFINITION OF CRITICAL MINERALS

For the United States to achieve its desired outcomes, whether building independence from China, supplying the military for national defense, or accelerating the clean energy transition, it must effectively define the scope of the problem, beginning with defining "critical mineral." If the definition fails to capture what makes a

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38. *See* Valverde, *supra* note 17; *FAQs Regarding 2022 List of Critical Minerals*, NSTC CRITICAL MINERALS SUBCOMMITTEE, https://www.criticalminerals.gov/pages/faq (last visited Mar. 26, 2025).

39. *See* Sander Hoenderdaal et al., *Can a Dysprosium Shortage Threaten Green Energy Technologies?*, 49 ENERGY 344, 345 (2013), https://doi.org/10.1016/j.energy.2012.10.043.

40. USGS, SUMMARIES 2025, *supra* note 19, at 126 (showing a net import reliance for the United States of 100% from 2020 to 2024).

41. *Id.* at 127 (noting Brazil produces 92% of the world's niobium).

mineral critical to the United States, no list produced based on that definition will capture minerals with the greatest risk.

To ensure the critical mineral list captures scientific principles of criticality from a U.S. context, Congress codified a definition of critical minerals in Section 7002 of the Energy Act of 2020.[42] Under the Act, a critical mineral (1) is "essential to the economic or national security of the United States," (2) has a "supply chain . . . vulnerable to disruption," and (3) serves "an essential function in the manufacturing of a product, . . . the absence of which would have significant consequences for the economic and national security of the United States . . . ."[43] The Energy Act of 2020 excludes fuel minerals; water, ice, or snow; or "common varieties" of minerals such as sand, gravel, stone, pumice, cinders, and clay from designation as critical.[44]

The Energy Act definition encapsulates dimensions of criticality in a U.S. context. The first element considers essentiality using a broad economic focus. Criticality is contextual under this definition by evaluating the *entire* United States economy, not limited to a particular sector. This element also highlights national security, which, though important to the U.S. government, does not make up a large share of economic output. The third element requires the mineral's use in manufacturing to have an outsized impact. This element sets essentiality as a measurement of what the United States *needs*, irrespective of whether it can produce the mineral in sizable quantities itself. This contextually reflects the nation's main economic concerns as a consumer for many minerals. Finally, the second element, which captures vulnerability, is also contextual. The definition requires risk be considered along the entire supply chain. Focus is not limited to supply shortages in one phase (e.g., extraction or processing), but any potential shortage that may occur, from mining to end use.

The context built into the legal definition of critical minerals demonstrates Congress's intent to capture a specific set of minerals. These minerals should not just be important, but vital to any sector

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42. The Energy Act itself was encompassed within Division Z of the Consolidated Appropriations Act, 2021. Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, div. Z, 134 Stat. 1182, 2418 (2020).

43. 30 U.S.C. § 1606(a)(3)(A), (c)(4)(A).

44. *Id.* § 1606(a)(3)(B).

essential to economic security, not solely energy or defense. Congress was also concerned with identifying all types of minerals, not just those the U.S. could easily produce itself.

II. HISTORY OF THE U.S. CRITICAL MINERALS LIST

Minerals have always been important to human society; however, the types and applications of minerals constantly evolve, creating new logistical questions regarding supply. Answering these questions has required planning and analysis to develop effective responses. The critical minerals list is the newest tool for this age-old problem.

The United States has undergone three industrial revolutions and is in the midst of a fourth.[45] Throughout each industrial revolution, U.S. mineral consumption changed, leading to high demand for previously insignificant minerals or reducing demand for previously important minerals. For example, coal drove early industrial revolutions in the United States, but social and technological changes shifted demand to a broader array of minerals to supply energy.[46] Between 1940 and 1980, changing sources of energy generation led to a decline in the proportion of coal-fueled power from 49.7% to 19.8%.[47] Shifts in industrial production, including developments in defense, clean energy, and digital technologies, created new uses for non-fuel minerals. These new uses have increased mineral demand, particularly for non-fuel minerals.

Responding to developments in consumption, the United States has created commodity priority lists to identify and address mineral supply concerns throughout its history. While these lists were prolific and diverse, federal policy responding to the lists were often subject to a cycle seesawing between proactive planning and a hands-off approach. As described by the Government Accountability Office, this cycle involved:

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45. *See* Jianfeng Yang et al., *Evolution of Energy and Metal Demand Driven by Industrial Revolutions and Its Trend Analysis*, 19 CHINESE J. POPULATION, RES. & ENVT. 44, 45 (2021).

46. *See id.* at 46–48.

47. *Id.* at 48.

> a recognition of the necessity to obtain certain materials for a war effort [or other emergency response]; soon followed by spot shortages or tight supplies of those materials; which is followed by contingency planning after the war [or other emergency] to prevent (or at least effectively deal with) a recurrence of similar situations in the future. Once the shortages are no longer visible, this effort has usually been followed by inattention born of the assumption that "the market will take care of things."[48]

That cycle produces uncoordinated, ad hoc action from the federal government, forcing the U.S. government to later address the stressors the free market cannot handle.

While mindful that all policy tools are limited by practical and political limitations of the time, the history of mineral policy demonstrates that effective use of the critical minerals list must avoid falling prey to the above cycle. If the U.S. is unable to learn from its history, the critical minerals list and critical minerals policy broadly may result in the U.S. sacrificing a proactive response to emergency management, costing millions of dollars.

This Part traces the history of mineral policy to understand how the critical minerals list and U.S. mineral policy framework developed. Section A begins with the origins of material priority lists in 1917, tracing development of minerals policy into the 2010s. Section B examines the current critical minerals list. These two periods are treated separately to demonstrate the distinctness of the current critical minerals list, acknowledging its interconnection with earlier policy. The U.S. critical minerals list does not exist in isolation, but adds to existing mineral policy to address current challenges.

48. U.S. GOV'T ACCOUNTABILITY OFF., EMD-79-30, LEARNING TO LOOK AHEAD: THE NEED FOR A NATIONAL MATERIALS POLICY AND PLANNING PROCESS 5 (1979).

A. A U.S. MINERALS POLICY HISTORY AND THE ORIGINS OF THE CRITICAL MINERALS LIST

1. Origins of the Critical Minerals List in World War I

The first material priority lists in the United States resembling today's critical minerals list arose following the outbreak of World War I.[49] During WWI, the United States faced difficulties accessing reliable supplies of raw materials, including minerals. Notwithstanding isolationist pressures from lawmakers advocating for American self-sufficiency, WWI made it clear that the United States would be unable to supply its own needs from a solely domestic resource pool.[50] U.S. entry into WWI further heightened the threat of shortages, as the U.S. confronted wartime supply pressures and prioritized valuable "war minerals."[51]

In 1917, Charles Kenneth Leith, then serving as mineral advisor to the War Industries Board, published the first list of priority minerals.[52] Though developed unofficially and with an industrial focus, Leith's list responded to mineral supply concerns caused by war.[53] The Leith list kicked off a series of list-making, both official and unofficial. Between 1917 and 1939, fifteen official and unofficial material lists were compiled.[54] These lists are predecessors of today's critical minerals list, identifying risk and organizing consensus.

The first official material priority list, drafted and published by the Supply Division of the Army General Staff in 1921, established the precedent for identifying key materials prior to crisis.[55] This list,

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49. *See* A.F. Britt & K. Czarnota, *A Review of Critical Mineral Resources in Australia*, 71 AUSTL. J. EARTH SCI. 1016, 1017 (2024), https://doi.org/10.1080/08120099.2024.2430279.

50. ROUSH, *supra* note 5.

51. *See* EUGENE N. CAMERON, AT THE CROSSROADS: THE MINERAL PROBLEMS OF THE UNITED STATES 254 (1986); Elmer W. Pehrson, *What Are Strategic and Critical Materials?*, 25 MINING & METALLURGY 329, 339 (1944).

52. Though Leith developed the list while serving on the War Industries Board, the list was produced in an unofficial capacity. ROUSH, *supra* note 5, at 10.

53. *Id.* Submarine warfare, for example, served to limit supplies of raw materials regardless of their industrial or military character. Pierre Chancerel, *Raw Materials*, INT'L ENCYC. OF THE FIRST WORLD WAR (Jul. 16, 2015), https://encyclopedia.1914-1918-online.net/article/raw-materials/.

54. *See* ROUSH, *supra* note 5, at 6–10.

55. Pehrson, *supra* note 51, at 339.

known as the Harbord list, identified "strategic materials," or "raw materials essential to the prosecution of a war, which cannot be procured in sufficient quantities from domestic sources, and for which no satisfactory domestic substitute has been found."[56] The strategic materials term encompassed minerals but included more, covering all difficult-to-procure commodities essential to war.

Over time, as policymakers targeted supply constraints outside of military contexts, the term "strategic materials" became more loosely applied, diluting its association with the national defense.[57] Compilers nominally linked materials and national defense, determining that a war effort would implicate all of society to provide for the national defense.[58] Linkages between the essential use of the materials and prosecuting a war became less direct.

To combat the deteriorating definition of "strategic," in 1932 the Army and Navy Munitions Board created a new category of commodities known as "critical materials" to complement "strategic materials."[59] The Munitions Board defined critical materials as:

> those essential to national defense, the procurement problems of which in war would be less difficult than those of strategic materials either because they have a lesser degree of essentiality or are obtainable in more adequate quantities from domestic sources; and for which some degree of conservation and distribution control will be necessary.[60]

This was the first definition using the term "critical." The meaning of the term would evolve but later serve as a template for Congress's definition of "critical mineral."

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56. *Id.*

57. ROUSH, *supra* note 5, at 2–4.

58. *See id.* at 2–4; NAT'L RSCH. COUNCIL, *supra* note 17, at 28–31; Schulz et al., *supra* note 20, at A11.

59. Pehrson, *supra* note 51, at 339.

60. The Munitions Board's definition of strategic materials remained largely the same as before, including "those essential to national defense, for the supply of which in war dependence must be placed in whole, or in substantial part, on sources outside the continental limits of the United States; and for which strict conservation and distribution control measures will be necessary." *Id.*

Following WWI, Congress was slow to enact a program to insulate the nation from the risk of supply disruption, despite a flurry of list creation from the military departments.[61] Not until just prior to World War II did Congress pass the Strategic and Critical Materials Stock Piling Act of 1939 (1939 Stock Piling Act).[62] The 1939 Stock Piling Act established a directive "to supply the industrial, military, and naval needs of the country for common defense," creating the national stockpile.[63] Congress instituted material stockpiling to ensure sufficient U.S. acquisition of materials to supply itself and reduce dependence on foreign sources in an emergency. While the 1939 Stock Piling Act came too late to avoid material shortfalls during WWII, it codified the term "critical material" into law.[64] In 1944, the Munitions Board approved a new definition of "strategic and critical materials" to carry out the 1939 Stock Piling Act's policy.[65]

Mineral stockpiling became a cornerstone of federal mineral policy and a way to insulate the United States from supply chain vulnerabilities. Following WWII, Congress reckoned with the shortcomings in the law by amending the 1939 Stock Piling Act in 1946.[66] Stockpiling took off during the Truman and Eisenhower administrations, creating a useful tool for the government to use in materials policy.[67] Today, this legal foundation as amended continues

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61. CAMERON, *supra* note 51, at 254–55.

62. Strategic and Critical Materials Stock Piling Act of 1939, Pub. L. No. 76-117, 53 Stat. 811 (1939).

63. *Id.* at 811.

64. Schulz et al., *supra* note 20, at A11.

65. The Munitions Board defined strategic and critical minerals as "those materials required for essential uses in a war emergency, the procurement of which in adequate quantities, quality, and time is sufficiently uncertain for any reason to require prior provision for the supply thereof." *Id.*

66. Strategic and Critical Materials Stock Piling Act of 1946, Pub. L. No. 79-520, 60 Stat. 596. The law has since been amended further, in both 1979 and 1987. *See* Strategic and Critical Materials Stock Piling Revision Act of 1979, Pub. L. No. 96-41, 93 Stat. 319; National Defense Stockpile Amendments of 1987, Pub. L. No. 100-180, 101 Stat. 1245.

67. NAT'L RSCH. COUNCIL, MANAGING MATERIALS FOR A TWENTY-FIRST CENTURY MILITARY 135–37 (2008). For more on the stockpiling practices of the time, *see* GLENN H. SNYDER, STOCKPILING STRATEGIC MATERIALS: POLITICS AND NATIONAL DEFENSE (1966).

to provide stockpiling authority to the President and Department of Defense (DOD).[68]

2. The Movement of Materials Policy Beyond Defense Concerns

By the time the United States entered the Korean War, the country once again found it necessary to strengthen its materials supply.[69] In 1951, President Truman established the President's Materials Policy Commission (known as the Paley Commission) "to study the broader and longer range aspects of the nation's materials problem as distinct from the immediate defense needs."[70] The resulting product, *Resources for Freedom: A Report to the President*, noted that changing conditions in materials consumption had led the United States to become a net importer of many materials, including minerals, for which it had previously been a net exporter.[71] The opening chapter of *Resources for Freedom*'s first volume sounds similar to contemporary discussion, noting:

> [s]ecurity and economic growth for the United States and the rest of the free world must be the essential aim of any policy worth the name. Materials strength is a prime ingredient of general economic strength and growth, which in turn is the foundation of rising living standards in peace and of military strength in war. This Commission is convinced that if the United States and other free nations are to have such strength they must coordinate their

68. *See About Strategic Materials*, DEF. LOGISTICS AGENCY, https://www.dla.mil/Strategic-Materials/About/ (discussing modern stockpiling program); *see also* 50 U.S.C. §§ 98 *et seq.* (providing stockpiling authority).

69. CAMERON, *supra* note 51, at 255. One of the touchstone laws for modern critical minerals policy, the Defense Production Act (DPA), was born during the Korean War. Title III of the DPA gives the President the authority to expand mineral supplies through expansion of mining and processing. *Id.*; John Ruple & Wesley Peebles, *Failure of U.S. Critical Mineral Policy: Why Aren't Miners Producing What America Needs?*, 16 WAKE FOREST J. L. & POL'Y (forthcoming 2026).

70. PRESIDENT'S MATERIALS POL'Y COMM'N, 1 RESOURCES FOR FREEDOM: A REPORT TO THE PRESIDENT vii (1952).

71. *Id.* at 1–3.

> resources to the ends of common growth, common safety, and common welfare.[72]

The Paley Commission went on to note that self-sufficiency in acquiring necessary materials would, in effect, only be "a self-imposed blockade" to achieving national goals of economic prosperity.[73] The Commission recommended that while sourcing minerals and other materials domestically would be advantageous to ensuring security of material supplies, so too would be cost-effective sourcing "wherever secure supplies may be found."[74]

Though the Paley Commission placed great importance on the free economy's ability to develop mineral reserves, it noted that exploration activity could be supported through federal policy.[75] In the report, the Commission also noted that "no comprehensive program, Government or private, [existed] for collecting and analyzing the facts on reserves, costs and rates of exploration and development, and other facts pertinent to showing the situation in reasonable detail and outlining the prospects for different minerals."[76] To rectify this, the Commission recommended the Department of the Interior (DOI) "intensify its fact-gathering and analytical activities" to develop a national outlook and appraisal of the United States' mineral situation.[77]

Presciently, the Paley Commission also called for "a mechanism for looking at a problem as a whole, for keeping track of changing situations and the interrelation of policies and programs."[78] This call was echoed again a decade later, even after legislative action from

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72. *Id.* at 3.

73. *Id.*

74. *Id.* at 3, 25 ("Whatever progress is made in developing greater imports of minerals and in reducing requirements for some through advances in technology—and great progress is possible along both lines—large increases in supplies from domestic sources will still be needed.").

75. *Id.* at 26.

76. *Id.*

77. *Id.*

78. PRESIDENT'S MATERIALS POL'Y COMM'N, TOWARD A NATIONAL MATERIALS POLICY: A REPORT ON A PROPOSED COMMISSION ON NATIONAL MATERIALS POLICY, S. REP. NO. 30-508, at 2 (91st Cong., 1st Sess., 1969) (quoting Paley Commission).

Congress.[79] The critical minerals list eventually filled this gap, assessing minerals' criticality and providing a foundation for government coordination on minerals.

In 1970, Congress passed the Mining and Minerals Policy Act (MMPA), setting the first national minerals and materials policy and reaffirming the role of private enterprise in minerals development.[80] The MMPA enacted two provisions important to critical mineral policymaking. First, it directed the Secretary of the Interior to include "a report on the state of the domestic mining, minerals, and mineral reclamation industries,"[81] recommitting USGS to assess domestic mineral resources.[82] Second, the MMPA promoted developing "all minerals and mineral fuels including oil, gas, coal, oil shale and uranium,"[83] setting broad policy not limited to energy or non-fuel minerals.[84]

Despite the MMPA, comprehensive action to address key supply needs was slow to follow. In 1973, USGS published *United States Mineral Resources* to provide the public with an assessment of domestic mineral resources.[85] *United States Mineral Resources* added

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79. *See* U.S. GOV'T ACCOUNTABILITY OFF., GAO/RCED-84-63, IMPLEMENTATION OF THE NATIONAL MINERALS AND MATERIALS POLICY NEEDS BETTER COORDINATION AND FOCUS v–viii (1984).

80. Mining and Minerals Policy Act of 1970, Pub. L. No. 91-631, 84 Stat. 1876, (codified at 30 U.S.C. § 21a); U.S. GOV'T ACCOUNTABILITY OFF., RED-76-86, NEED TO DEVELOP A NON-FUEL-MINERAL POLICY 2 (1976). The MMPA also stressed the importance of environmental regulation in conducting mining activity but left regulation and enforcement to other provisions codified in law. *See* GOV'T ACCOUNTABILITY OFF., RED-76-86, NEED TO DEVELOP A NON-FUEL-MINERAL POLICY 2 (1976); John Richard Shrock, *Congress Approves the Mining and Minerals Act*, EBSCO (2023), https://www.ebsco.com/research-starters/history/congress-approves-mining-and-minerals-act.

81. Mining and Minerals Policy Act of 1970 § 2.

82. *See Laws and Regulations Governing USGS Activities*, U.S. GEOLOGICAL SURV., https://www.usgs.gov/foia/laws-and-regulations-governing-usgs-activities. (last visited Oct. 8, 2025).

83. Mining and Minerals Policy Act of 1970 § 2.

84. Including uranium amongst examples in the definition of "mineral fuels" would later inform USGS's determination not to evaluate uranium for the critical minerals list. *See* 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62199, 62200 (Nov. 9, 2021).

85. U.S. GEOLOGICAL SURV., UNITED STATES MINERAL RESOURCES vii–viii, 1 (1973), https://pubs.usgs.gov/publication/pp820.

to concerns about U.S. mineral supply chains, as domestic mineral production had increased but not kept pace with demand.[86] At the same time, global mineral consumption had increased rapidly, heightening resource competition.[87]

3. Establishing a True National Minerals Policy for the United States

It soon became clear that the MMPA did little to prevent ad hoc decision-making and failed to solve U.S. mineral supply risks.[88] DOI viewed the MMPA as a restatement of preexisting priorities, asserting that the MMPA did not provide new authority or appropriations.[89] Meanwhile, U.S. concerns grew as mineral markets were impacted by the 1970s Arab Oil Embargo.[90]

In 1979, the U.S. General Accounting Office (now the Government Accountability Office, or GAO) identified "a lack of reliable, quantitative indicators which could demonstrate the importance of materials to the American economy."[91] GAO found that despite recurring supply risks and government response, there was no system to organize policy addressing short-term problems and long-term trends.[92] Further, GAO noted the United States' *laissez-faire* market approach exposed the nation to greater mineral supply risk in light of

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86. *See generally id.* at 1–8.

87. *See, e.g.*, CAMERON, *supra* note 51, at 149–161 (discussing mineral growth trends, specifically from 1964 to 1984); U.S. GOV'T ACCOUNTABILITY OFF., EMD-79-30, LEARNING TO LOOK AHEAD: THE NEED FOR A NATIONAL MATERIALS POLICY AND PLANNING PROCESS 26–27 (1979) (noting increasing international competition for materials).

88. *See* U.S. GOV'T ACCOUNTABILITY OFF., RED-76-86, NEED TO DEVELOP A NON-FUEL-MINERAL POLICY i–iv (1976); *see also* Shrock, *supra* note 80 ("The volatile international energy market of the 1970s played havoc with any policies that lacked provisions for implementation.").

89. U.S. GOV'T ACCOUNTABILITY OFF., RED-76-86, NEED TO DEVELOP A NON-FUEL-MINERAL POLICY 6 (1976) ("Interior's approach has been to regard the act of 1970 as a restatement of departmental traditional responsibilities for such functions as research and development, information gathering, and geologic investigations.").

90. *Id.* at 6–7; CAMERON, *supra* note 51, at 258–59.

91. U.S. GOV'T ACCOUNTABILITY OFF., EMD-79-30, LEARNING TO LOOK AHEAD: THE NEED FOR A NATIONAL MATERIALS POLICY AND PLANNING PROCESS 3 (1979).

92. *Id.* at 5.

growing subsidization of mineral production by foreign governments, increasing U.S. dependence on foreign sources, and evolving material uses following technological developments.[93]

To establish coherence in national minerals policy, Congress passed the National Materials and Minerals Policy, Research, and Development Act of 1980 ("Minerals Policy Act").[94] Section 2(b) of the Minerals Policy Act codified a definition of "materials," as "substances, including minerals, of current or potential use that will be needed to supply the industrial, military, and essential civilian needs of the United States . . . ."[95] The definition excluded "food and . . . energy fuels used as such."[96] The Minerals Policy Act also set policy promoting sufficient mineral supply that would support national security, the economy, and industrial production.[97] The policy extended beyond national security, confirming federal focus on non-defense uses. Among the Minerals Policy Act's promoted actions were long-term assessments of materials and increased research and development.[98]

Robust implementation of the Minerals Policy Act's vision was stymied during the Reagan administration. In 1984, GAO reported that the administration did not fully implement Minerals Policy Act

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93. *Id.* at 8–10, 22–28, 36

94. National Materials and Minerals Policy, Research and Development Act, Pub. L. No. 96-479, 94 Stat. 2305 (1980) (codified at 30 U.S.C. §§ 1601-05) ("[T]he United States does not have a coherent national materials and minerals policy.").

95. The Act continues its definition of "materials" with the qualification that these materials are used

> . . . in the production of goods or services, including those which are primarily imported or for which there is a prospect of shortages or uncertain supply, or which present opportunities in terms of new physical properties, use, recycling, disposal or substitution, with the exclusion of food and of energy fuels used as such.

Id. § 2(b), 94 Stat. at 2305.

96. *Id.*

97. *Id.* § 3, 94 Stat. at 2305-06 (codified at 30 U.S.C. § 1602).

98. *Id.* § 4, 94 Stat. at 2306-07 (codified at 30 U.S.C. § 1603).

requirements.[99] While the Reagan administration prepared a plan responsive to national security, they left mineral needs supporting economic well-being and industrial production to the free market.[100] The plan also lacked a method to determine which minerals or materials were most essential or vulnerable to supply disruption, a problem later addressed by the critical minerals list.[101]

Subsequent acts of Congress made express reference to the term "critical material," building government concern for supplying minerals outside a defense context. In 1984, the National Critical Materials Act created a National Critical Materials Council tasked with developing a national materials policy and implementing research programs.[102] While the National Critical Materials Act defined "materials," it did not define "critical."[103] Though a definition of "critical" was not codified,[104] the term "critical" had far broader connotations than "strategic," which remained descriptive of national security.[105]

4. Lax Federal Coordination Leads to Renewed Focus on Mineral Security

Vigorous government involvement in mineral supply policy cooled in the 1980s as the Cold War ended.[106] Nations began to favor (or at least acquiesce to) the inevitability of a globalized minerals market. This, however, left preexisting concerns unaddressed, including risks of relying on foreign sources for minerals and the gradual decline of mineral processing capacity domestically.[107]

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99. U.S. GOV'T ACCOUNTABILITY OFF., GAO/RCED-84-63, IMPLEMENTATION OF THE NATIONAL MINERALS AND MATERIALS POLICY NEEDS BETTER COORDINATION AND FOCUS v–viii (1984).

100. *Id.* at 30.

101. *Id.* at 20–24.

102. National Critical Materials Act, Pub. L. No. 98-373, tit. II, § 203, 98 Stat. 1242, 1250 (1984) (codified at 30 U.S.C. § 1802).

103. *Id.* § 212 (referencing the National Materials and Minerals Policy, Research and Development Act of 1980 § 2(b) definition of "materials").

104. Schulz et al., *supra* note 20, at A12.

105. NAT'L RSCH. COUNCIL, *supra* note 17, at 30.

106. *See* David Humphreys, *Whatever Happened to Security of Supply? Minerals Policy in the Post-Cold War World*, 21 RES. POL'Y 91 (1995).

107. *See* CAMERON, *supra* note 51, at 164–74 (noting these concurrent trends in the mid-1980s).

In the new millennium, reports clarified what it meant for a mineral to be "critical." In 2008, the National Research Council (NRC) published a report titled *Minerals, Critical Minerals, and the U.S. Economy*.[108] The NRC report contained a "criticality matrix," evaluating a mineral's criticality based on supply risk and the impact of supply restriction.[109] That matrix provided the skeleton for later mineral commodity assessments.[110] In 2010, the Department of Energy (DOE) published its first *Critical Materials Strategy* following increasing federal attention to clean energy.[111] The *Strategy* focused on materials, including minerals, necessary to advance the clean energy transition.[112] While DOE's *Strategy* evaluated applications only in energy technologies, it was one of the first department-wide applications of the criticality matrix identifying priority materials.[113]

In 2016, the National Science and Technology Council (NSTC) completed its *Assessment of Critical Minerals*, updating the methodology for calculating mineral criticality and examining minerals utilized in the U.S.[114] That methodology created a quantitative metric, screening commodities according to a two-step process and providing an early warning on potential supply chain

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108. *See* NAT'L RSCH. COUNCIL, *supra* note 17.

109. *Id.* at 4, 31–34.

110. Schulz et al., *supra* note 20, at A12.

111. U.S. DEP'T OF ENERGY, CRITICAL MATERIALS STRATEGY (2010), https://www.energy.gov/sites/prod/files/edg/news/documents/criticalmaterialsstrategy.pdf [hereinafter *U.S. DEP'T OF ENERGY, CRITICAL MATERIALS STRATEGY*]. The 2010 Assessment is also the first in a line of assessments later produced in 2011, 2019, and most recently in 2023. *See* U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT x (2023), https://www.energy.gov/sites/default/files/2023-07/doe-critical-material-assessment_07312023.pdf [hereinafter *U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT*].

112. U.S. DEP'T OF ENERGY, CRITICAL MATERIALS STRATEGY, *supra* note 111, at 10–11.

113. *See id.* at 95–99.

114. NAT'L SCI. & TECH. COUNCIL, ASSESSMENT OF CRITICAL MINERALS: SCREENING METHODOLOGY AND INITIAL APPLICATION ix (2016), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/csmsc_assessment_of_critical_minerals_report_2016-03-16_final.pdf [hereinafter *NSTC, SCREENING TOOL*]. The report cited the National Materials and Minerals Policy, Research and Development Act of 1980 for developing the screening methodology and publishing results. *See id.* at 6.

risks.[115] That NSTC screening tool served as a foundation for analysis used to create the first critical minerals list in 2018.[116]

B. CONTEMPORARY MINERAL POLICY AND CRITICAL MINERALS LIST

In 2017, President Trump signed Executive Order (EO) 13,817, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*,[117] kicking off the current era of critical mineral policy. EO 13,817 initiated a whole-of-government approach, leveraging policy to identify new sources of critical minerals, bolster activity along critical mineral supply chains, provide producers with access to data, and streamline leasing and permitting processes.[118] To coordinate these actions, the EO established the first federal definition of "critical mineral" as:

> a mineral identified by the Secretary of the Interior pursuant to [the critical minerals listing process] to be (i) a non-fuel mineral or mineral material essential to the economic and national security of the United States, (ii) the supply chain of which is vulnerable to disruption, and (iii) that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for our economy or our national security.[119]

Using the new definition, EO 13,817 required the Secretary of the Interior to produce a list of critical minerals, coordinating with the Secretary of Defense and consulting with appropriate executive department heads.[120] The Secretary of the Interior instructed the

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115. *See id.* at 6–12 (describing methodology).

116. *See* STEVEN M. FORTIER ET AL., DRAFT CRITICAL MINERAL LIST—SUMMARY OF METHODOLOGY AND BACKGROUND INFORMATION—U.S. GEOLOGICAL SURV. TECHNICAL INPUT DOCUMENT IN RESPONSE TO SECRETARIAL ORDER NO. 3359, OPEN-FILE REPORT 2018–1021, U.S. GEOLOGICAL SURV. 9 (2018), https://pubs.usgs.gov/publication/ofr20181021 [hereinafter *FORTIER ET AL., 2018 METHODOLOGY*].

117. Exec. Order No. 13817, 82 Fed. Reg. 60835 (Dec. 26, 2017).

118. *Id.* § 1, 82 Fed. Reg. at 60835.

119. *Id.* § 2(a).

120. *Id.* § 2(b).

USGS Director, in coordination with the Bureau of Land Management, to provide technical input for the draft list.[121] USGS published its first draft critical mineral list in February 2018[122] and the first final list in May 2018.[123] The 2018 list contained thirty-five minerals and mineral groups.[124]

EO 13,817 established several new responsibilities for other executive departments as part of its whole-of-government response. Of note, EO 13,817 directed the Department of Commerce to prepare a report on federal minerals policy, published in 2019.[125] That report presented calls to action, goals, and recommendations on the federal government's critical minerals initiatives.[126] One recommendation called for periodic review and update of the critical minerals list (preferably every two years) to keep abreast of changing risk and to ensure federal coordination using best available information.[127]

In September 2020, President Trump signed EO 13,953, which sought to upend the "Nation's undue reliance on critical minerals, in processed or unprocessed form, from foreign adversaries," by declaring a national emergency and directing executive departments to expand and strengthen domestic mining and processing capacity.[128] EO 13,953 also implemented the Department of Commerce recommendation to require periodic updates of the critical minerals list.[129]

Congress built on the work of the first Trump administration by passing the Energy Act of 2020.[130] The Energy Act of 2020 was a massive effort to modernize energy policy.[131] As part of this

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121. *See* Final List of Critical Minerals 2018, 83 Fed. Reg. at 23295.

122. Draft List of Critical Minerals, 83 Fed. Reg. at 7065.

123. Final List of Critical Minerals 2018, 83 Fed. Reg. at 23295.

124. *Id.*

125. *See* U.S. DEP'T OF COM., *supra* note 37.

126. *Id.* at 4.

127. *Id.* at 33.

128. Exec. Order No. 13953, 85 Fed. Reg. 62539, 62540 (Oct. 5, 2020).

129. *Id.* § 7, 85 Fed. Reg. at 62543 ("This list shall be updated periodically, following the same process, to reflect current data on supply, demand, and concentration of production, as well as current policy priorities.").

130. Energy Act of 2020, Pub. L. No. 116-260, div. Z, 134 Stat. 1182.

131. The Act addressed energy efficiency (Title I); advanced nuclear energy (Title II); technological research and development in clean energy (Title III, Subtitle A), energy storage and development (Title III, Subtitle C), and industry

modernization, Title VII, containing mineral security provisions, updated mineral policy established by the Minerals Policy Act of 1980. Section 7002 of the Energy Act of 2020 codified a definition of "critical minerals" and the requirement to create and update the critical minerals list.[132]

Following President Trump's first term, the Biden administration continued to develop critical minerals policy. Responding, in part, to the ongoing COVID-19 pandemic, in February 2021 President Biden signed EO 14,017, *America's Supply Chains*.[133] EO 14,017 directed the heads of various executive departments to evaluate and report on supply chains important to the welfare of the United States, directing the Secretary of Defense to update and evaluate work identifying critical mineral supply chain risks.[134] The final report by DOD incorporated critical minerals supply chains into its assessment, furthering understanding of existing supply chain vulnerabilities.[135]

Congress also continued to support U.S. critical minerals security through investments and programs in legislation, including the Infrastructure Investment and Jobs Act (IIJA),[136] Inflation Reduction Act (IRA) of 2022,[137] and CHIPS and Science Act (CHIPS Act).[138] Each of those acts contained massive allocations for critical minerals security all along the value chain. The IIJA appropriated nearly $7.9 billion specifically for battery manufacturing, recycling, and critical minerals, with DOE allocating $4.82 billion to projects in 2024

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and manufacturing (Title VI); carbon management and removal (Titles IV, V); and established a Department of Energy Innovation (Title IX). *See generally id.*

132. *Id.* § 7002, 134 Stat. at 2562-77.

133. Exec. Order No. 14017, 86 Fed. Reg. 11849 (Feb. 24, 2021).

134. *Id.* § 3(b)(iii), 86 Fed. Reg. at 11850.

135. BUILDING RESILIENT SUPPLY CHAINS, REVITALIZING AMERICAN MANUFACTURING, AND FOSTERING BROAD-BASED GROWTH: 100-DAY REVIEWS UNDER EXEC. ORDER 14017, WHITE HOUSE 151–204 (2021), https://bidenwhitehouse.archives.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf?utm_source=sfmc%E2%80%8B&utm_medium=email%E2%80%8B&utm_campaign=20210610_Global_Manufacturing_Economic_Update_June_Members.

136. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

137. Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818.

138. CHIPS and Science Act, Pub. L. No. 117-167, 136 Stat. 1366 (2022).

alone.[139] The IRA authorized $391 billion in funding related to critical minerals, including for domestic renewable energy production and tax incentives.[140] That included an appropriated $11.7 billion to support DOE's Loan Programs Office,[141] which completed two loan transactions totaling over $5 billion in fiscal year 2023.[142] By December 2024, the Department of Commerce announced that preliminary agreements had been made for forty semiconductor manufacturing projects, representing awards of $34 billion of the available $39 billion in CHIPS and Science Act funding and an additional $29 billion in loans.[143]

USGS began its first update to the critical minerals list under the Energy Act of 2020 in 2021, publishing a draft list of critical minerals that November.[144] USGS published the final list in February 2022.[145] USGS conducted its second update as required in 2025, publishing a draft list and revised methodology in August 2025[146] and final list in November 2025.[147]

Despite U.S. efforts to respond to critical mineral supply concerns, the United States remains at risk of repeating the seesawing cycle that plagued previous national policies. Remaining faithful to addressing mineral risk requires adherence to the law and a commitment to scientific integrity. Recent history indicates some cause for hope, but it will require sustained and deliberate investment into the established system to build security before crisis.

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139. BRENT D. YACOBUCCI ET AL., CONG. RSCH. SERV., RL47034, ENERGY AND MINERALS PROVISIONS IN THE INFRASTRUCTURE INVESTMENT AND JOBS ACT (P.L. 117-58) (2023).

140. USGS, SUMMARIES 2025, *supra* note 19, at 18.

141. Loan Programs Off., *Inflation Reduction Act of 2022*, U.S. DEP'T OF ENERGY (Sept. 22, 2023), https://www.energy.gov/lpo/inflation-reduction-act-2022.

142. USGS, SUMMARIES 2025, *supra* note 19, at 18.

143. *Id.* at 19.

144. 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62199 (Nov. 9, 2021).

145. 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381 (Feb. 24, 2022).

146. 2025 Draft List of Critical Minerals, 90 Fed. Reg. 41591 (Aug. 26, 2025).

147. Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494 (Nov. 7, 2025).

III. CREATING AND UPDATING THE U.S. CRITICAL MINERAL LIST

Designating critical minerals is the legacy of the many lessons learned throughout the history of U.S. mineral and materials policy. As it exists today, the critical minerals list involves a detailed scientific process and legal procedure for classifying minerals. While technical, creating and updating the critical minerals list is perhaps the single greatest factor in determining how the U.S. proceeds in its efforts to secure mineral supply chains. Though the U.S. government is not prohibited from incentivizing mineral development broadly, only minerals listed by USGS are considered "critical," thus subject to risk that requires more immediate attention.

This Part provides clarity to policymakers and the public about how the U.S. government has created and updated the critical minerals list by describing legal and scientific considerations. Section A explains the Energy Act of 2020's process in plain terms. Section B then breaks down various methodologies used to compile the critical minerals list.

A. THE U.S. CRITICAL MINERALS LIST

The United States includes minerals on the critical minerals list via one of two pathways. In the first, USGS, on behalf of the Secretary of the Interior, creates a list of critical minerals identified primarily by quantitative analysis in a methodology to determine risk.[148] This remains the most public-facing method for compiling the list, with a majority of candidates designated as critical through this process. The second pathway allows the Secretary of the Interior to designate minerals determined "strategic and critical to the defense or national security of the United States" by another executive department.[149] The second pathway has only been used on one occasion, in 2025, to list a total of five recommended minerals.[150]

148. *See* MINERAL RES. PROGRAM, *supra* note 35; 30 U.S.C. § 1606(c).

149. 30 U.S.C. § 1606(c)(4)(B).

150. Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494, 50495 (Nov. 7, 2025)

Listing via USGS analysis occurs in five steps. In the first step, USGS develops a methodology to assess mineral criticality.[151] The methodology utilizes quantitative analysis supplemented by a qualitative evaluation when insufficient data is available or a single point of failure in the supply chain exists.[152] This reflects the Energy Act of 2020 requirement to use quantitative analysis when possible.[153] While USGS may maintain the previous methodology, the agency is free to revise the methodology and has expressed that doing so helps the agency to reflect the best available science.[154] USGS must, however, comply with the requirements in the Energy Act, including using quantitative analysis when possible, publishing a description of the methodology in the *Federal Register*, and ensuring the methodology captures statutory criteria.

In the second step, USGS gathers multiple streams of data to analyze mineral commodities. Methodologies and analysis must comply with USGS's scientific integrity policy and the Information Quality Act, which require peer review and reduce political manipulation.[155] This also reflects DOI's responsibility to follow EO 14,303's commitment to science that is reproducible, transparent, and subject to unbiased peer review.[156] Discussed in greater detail in Part III.B below, USGS methodologies analyzed minerals using best

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151. 30 U.S.C. §1606(c) (outlining legal requirements for USGS methodology).

152. *See* NEDAL T. NASSAR ET AL., METHODOLOGY AND TECHNICAL INPUT FOR THE 2025 U.S. LIST OF CRITICAL MINERALS—ASSESSING THE POTENTIAL EFFECTS OF MINERAL COMMODITY SUPPLY CHAIN DISRUPTIONS ON THE U.S. ECONOMY, OPEN-FILE REPORT 2025-1047, U.S. GEOLOGICAL SURV. 2 (2025), https://pubs.usgs.gov/publication/ofr20251047 [hereinafter *NASSAR ET AL., 2025 METHODOLOGY*]; NEDAL T. NASSAR & STEVEN M. FORTIER, METHODOLOGY AND TECHNICAL INPUT FOR THE 2021 REVIEW AND REVISION OF THE U.S. CRITICAL MINERAL LIST, OPEN-FILE REPORT 2021-1045, U.S. GEOLOGICAL SURV. 1 (2021), https://pubs.usgs.gov/publication/ofr20211045 [hereinafter *NASSAR & FORTIER, 2021 METHODOLOGY*].

153. 30 U.S.C. § 1606(c)(2).

154. *Id.* § 1606(c)(5)(B); *see also* NASSAR ET AL., 2025 METHODOLOGY, *supra* note 152, at 1–2, 30 (noting methodology revision); NASSAR & FORTIER, *supra* note 152, at 2–3 (noting enhancement from previous methodology).

155. *See* U.S. GEOLOGICAL SURV., SURVEY MANUAL, NO. 500.25, SCIENTIFIC INTEGRITY, https://www.usgs.gov/survey-manual/50025-scientific-integrity (last visited Nov. 13, 2025).

156. Exec. Order No. 14303, § 3, 90 Fed. Reg. 22601, 22602 (May 29, 2025); 2025 Draft List of Critical Minerals, 90 Fed. Reg. 41591, 41593 (Aug. 26, 2025).

available data and considering dimensions of essentiality and criticality required by law.[157] Each methodology evaluated large numbers of mineral commodities, with some ultimately found non-critical.[158] After analysis, USGS compiles a draft list of critical minerals.

For the third step, the Energy Act of 2020 requires the Secretary of the Interior to consult with the Secretaries of Defense, Commerce, Agriculture, Health and Human Services, and Energy and the U.S. Trade Representative on the draft critical mineral list.[159] Consultation reviews both methodology and the resulting draft list.[160] This step provides opportunity for other executive departments to weigh in on criticality determinations. Importantly, consultation is required in both pathways for listing.[161]

The fourth step requires USGS to publish the draft list in the *Federal Register* and invite public comment. The Energy Act of 2020 requires a description of the methodology used to make determinations, a list of critical minerals, and a list of critical minerals produced as "byproducts" as well as their host minerals.[162] In practice, draft list publication has included a very short description of the methodology and combined the list of critical minerals and byproducts, noting which minerals are produced as byproducts.[163] USGS has furnished detailed descriptions of its methodology in

157. *See, e.g.*, Final List of Critical Minerals 2018, 83 Fed. Reg. 23295, 23295 (May 18, 2018) ("The tool is a quantitative methodology for identifying and ranking mineral commodities based on widely accepted criteria published in the mineral commodity literature."); 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62199, 62201 (Nov. 9, 2021) ("The quantitative evaluation is an enhancement of the NSTC methodology published in 2018 [] and used to develop the 2018 list of critical minerals.").

158. Criticality is a measurement of risk, with some risk existing for *all* minerals. Therefore, a mineral's criticality is best understood as existing on a continuum, rather than as an "either or" question. That is, all minerals are critical to some extent, but not all minerals are critical enough to be listed. NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 12.

159. 30 U.S.C. § 1606(c)(4)(C).

160. *Id.* § 1606(c)(5)(A).

161. *Id.* § 1606(c)(4)(C).

162. *Id.* § 1606(c)(1).

163. *See* 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62199, 62201–02, tbl. 1 (Nov. 9, 2021); 2025 Draft List of Critical Minerals, 90 Fed. Reg. 41591, 41592 (Aug. 26, 2025).

reports incorporated by reference.[164] After draft publication, USGS accepts public comment on both the methodology and draft list.[165]

The fifth and final step involves USGS review of comments and publication of the final critical mineral list. USGS updates the list or the methodology according to public comment as appropriate.[166] No later than forty-five days after close of public comment, the Secretary of the Interior must publish a description of the final methodology, a final list of critical minerals, and a final list of critical minerals produced as byproducts.[167] As with draft list publication, the final list of critical minerals and list of byproducts have been published together as a single list.[168]

The main purpose of a rigorous methodological process for developing the critical minerals list is to ensure that the list reflects empirical observations, not political designations. Prior to the critical minerals list, no federal mechanism appeared able to identify and quantify supply risk to the nation as a whole. Limitations of earlier mineral policy, such as the initial response to the National Mineral Policy Act outlined by GAO,[169] demonstrate that political priorities can easily erode development of a robust, responsive national minerals and materials policy. The approach taken by the Energy Act of 2020 and USGS regarding the critical minerals list reflect a desire to correct past limitations, with a rigorous methodology serving as foundation for national policy grounded in empirical observation.

The second pathway provides an alternative to listing, allowing the Secretary of the Interior to incorporate feedback from required

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164. *See* 2021 Draft List of Critical Minerals, 86 Fed. Reg at 62200; 2025 Draft List of Critical Minerals, 90 Fed. Reg. at 41593.

165. 30 U.S.C. § 1606(c)(1) ("The Secretary, acting through the Director of the United States Geological Survey [] shall publish in the Federal Register for public comment . . . .").

166. *Id.* §1606(c)(3).

167. *Id.*

168. *See* Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494, 50496–97 (Nov. 7, 2025); 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381, 10382 (Feb. 24, 2022).

169. *See generally* U.S. GEN. ACCOUNTING OFF., GAO/RCED-84-63, IMPLEMENTATION OF THE NATIONAL MINERALS AND MATERIALS POLICY NEEDS BETTER COORDINATION AND FOCUS (1984) (describing deficiencies in developing a national materials policy).

consultation with other executive department heads.[170] Listing without a finding of criticality by USGS methodology may occur where another federal agency has determined a mineral is "strategic and critical."[171] Even if another agency finds such, the Secretary of the Interior maintains discretion whether to designate that mineral as a *critical* mineral.[172] Consultation is not public, but reasoning for designating a mineral as critical via this pathway has been published with the final critical minerals list in the *Federal Register*.[173] "Strategic and critical" are not defined under the Energy Act of 2020, which may expand the scope of critical minerals beyond the primary criteria that govern designation of minerals by methodology.[174]

B. METHODOLOGY USED TO DEVELOP THE CRITICAL MINERALS LIST

While flexibility to adapt the methodology enables USGS to maintain scientific rigor and capture evolving criticality, each methodology contains the same mission—measuring essentiality and vulnerability as outlined in statute.[175] Methodologies may change, but the focus remains on providing useful analysis for the Secretary of the Interior to make critical mineral designations. This Section traces updates to USGS methodology, demonstrating how scientific evaluation contributes to developing the critical minerals list. Because methodological evaluation by USGS is the main path to designation, understanding analysis is invaluable to understanding mineral criticality.

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170. 30 U.S.C. § 1606(c)(4)(B)–(C).

171. *See id.* § 1606(c)(4)(B).

172. *See id.* ("Notwithstanding the criteria . . . the Secretary *may* designate and include . . .") (emphasis added).

173. Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494, 50495–96 (Nov. 7, 2025) (explaining reasoning for designating minerals after consultation include national security (arsenic, tellurium); steel production, energy, and defense (metallurgical coal, uranium); and food security (phosphate)).

174. *See id.* at 50495 ("Section 7002(c)(4)(B) of the Energy Act allows the Secretary to designate a critical mineral determined by another Federal agency to be strategic and critical . . . , *notwithstanding the Energy Act's criteria for designating a critical mineral.*" (emphasis added)). While the Energy Act of 2020 does not define the term "strategic and critical," it may refer to the definition in the Strategic and Critical Materials Stock Piling Act at 50 U.S.C. § 98h-3(1).

175. *See* 30 U.S.C. § 1606(c)(4)(A).

1. Foundation for Later Methodologies: The NSTC Mineral Criticality Screening Tool

The USGS methodology has foundations in the NSTC's Mineral Criticality Screening Tool.[176] The NSTC Screening Tool is the first of a two-step evaluation.[177] The initial screening uses a quantitative methodology, providing an early-warning mechanism that identifies minerals most at risk of supply disruption.[178] Minerals flagged during this stage are "potentially critical" and undergo further evaluation.[179] In the second stage, use of various customized, mineral-specific analyses determine vulnerabilities unique to a mineral.[180]

To create a list of critical minerals, the initial stage screens three factors: supply risk; production growth; and market dynamics.[181] Supply risk measures relative risk of supply disruption by quantifying mineral production concentration globally.[182] Production growth measures market trends based on changes in mineral production.[183] Market dynamics quantify price volatility, measuring how a mineral holds up to sudden market changes.[184] Using data including world production statistics, annual average prices, and country governance ratings, the three indicators are given values from 0 to 1, with greater scores indicating more concern.[185] Evaluators take the geometric mean of the three factors to provide a criticality score.[186]

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176. NSTC, SCREENING TOOL, *supra* note 114.

177. *Id.* at 6.

178. *See generally id.* at 6–12 (describing methodology).

179. The ultimate conclusion on criticality occurs after conducting in-depth analysis in the second stage. Until then, minerals flagged during the screening remain on a "watch list." *See id.* at 5.

180. *See id.* at 6–7.

181. The NSTC explains that these three factors are simple metrics but capture features of criticality through broader "umbrella" metrics, including "substitutability, recycling, and byproduct dependency." *Id.* at 8. USGS would change this tool for creation of the 2018 critical mineral list to account for its lack of "regional or country-specific demand or import dependencies." *Compare id. with* FORTIER ET AL., 2018 METHODOLOGY, *supra* note 116, at 2, 9.

182. *See* NSTC, SCREENING TOOL, *supra* note 114, at 8.

183. *Id.* at 10.

184. *Id.* at 11.

185. *See id.* at 7–8; FORTIER ET AL. 2018 METHODOLOGY, *supra* note 116, at 9.

186. *See* NSTC, SCREENING TOOL, *supra* note 114, at 8.

2. The 2018 USGS Methodology

USGS largely maintained the structure of the NSTC Screening Tool in the 2018 methodology, with a few minor changes.[187] First, because the Screening Tool was global in scope, USGS adapted the Screening Tool to evaluate a U.S.-specific outlook per EO 13,817's definition of "critical mineral."[188] USGS also adapted the methodology by including two principal metrics and a qualitative assessment of importance.[189] First, USGS measured production concentration using the Herfindahl-Hirschman Index (HHI). The HHI allows researchers to identify highly concentrated minerals markets, providing a metric of potential supply risk.[190] The more concentrated the market, the greater the criticality, or risk. Second, USGS used annual net import reliance figures to provide a measure of dependency on foreign mineral supply.[191] Similar to mineral concentration, greater net import reliance represented greater criticality.

3. Revised 2021 USGS Methodology

The revised 2021 methodology included updates reflecting codified requirements in the Energy Act of 2020. Updates included calibration to measure the Energy Act criteria for critical minerals as well as adopting a preference for quantitative analysis where sufficient data exist.[192] The revised methodology maintained net import reliance as an indicator but modified assessment of production concentration and importance. For production concentration, the new methodology focused on concentration outside of the United States and weighted this factor according to the foreign source's ability or

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187. *See*

188. *Id.* at 1–2.

189. NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3.

190. HHI is calculated as the sum of the squares of each producing nation's global production share of a commodity in a given year. It is measured on a scale from 0 to 10,000 with a threshold of 2,500 indicating a highly concentrated market. FORTIER ET AL., 2018 METHODOLOGY, *supra* note 116, at 9.

191. "[N]et import reliance is calculated as the amount of imported material (including changes in stockpiles) minus exports and changes in government and industry stocks and is expressed as a percentage of domestic consumption." *Id.*

192. *See* NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152; 30 U.S.C. § 1606(c)(2), (4).

willingness to continue supplying the United States.[193] Mineral importance was converted into a quantitative assessment of economic vulnerability for U.S. manufacturing.[194]

The methodology used three types of evaluation, based on the level of data available. For minerals with sufficient data, USGS used a purely quantitative analysis.[195] USGS determined criticality based on established thresholds, with scores weighing input from more recent years more heavily.[196] Next, if a mineral supply chain contained a single point of failure, USGS conducted a semi-quantitative analysis.[197] Commodities with a single point of failure had an additional layer of qualitative assessment after quantitative evaluation. Finally, for minerals without sufficient data (e.g., some rare earth elements), USGS used a qualitative assessment.[198]

In quantitative analysis, USGS calculated supply risk, a stand-in for criticality, as the geometric mean of three components ranging from 0 (low) to 1 (high).[199] Those three components were disruption potential, trade exposure, and economic vulnerability.[200] First, USGS calculated disruption potential as a measure of each producing country's share of global production (excluding the U.S.). USGS weighted these figures by an ability to supply index (ASI) and willingness to supply index (WSI), which looked to factors affecting governance and "trade, ideological, and defense ties" with the U.S. of the producing country, respectively.[201] Second, USGS used net import reliance to calculate trade exposure, measuring U.S.

193. NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3.

194. *Id. See also* 30 U.S.C. § 1606(c)(4)(A)(iii).

195. NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3–5.

196. *Id.* at 5.

197. *Id.* at 6.

198. *Id.* at 5.

199. *Id.* at 3.

200. These metrics *roughly* correspond with the NSTC methodology's measures of supply risk, production growth, and market dynamics, respectively. *See supra* Part III.B.1.

201. Specifically, ASI assesses "political stability, security, availability of labor, adequacy of infrastructure, trade barriers, regulations, taxation, uncertainties regarding protected areas and disputed land claims, and other factors . . . ." NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3. Both ASI and WSI incorporate the Energy Act of 2020 criterion at 30 U.S.C. § 1606(c)(4)(A)(ii).

dependence on foreign mineral sources.[202] Third, USGS assessed how a mineral added value to the economy in manufacturing to determine economic vulnerability, considering the price of the mineral and the profit it produces.[203]

4. The Revised 2025 USGS Methodology

USGS departed from previous methodologies to generate the 2025 draft critical minerals list. Moving away from the use of normalized indicators,[204] USGS adopted an economic effects assessment to determine criticality.[205] The 2025 methodology used two criteria for recommending minerals as critical. The first "criterion assessed the potential economic effects of foreign trade disruptions on the U.S. economy."[206] USGS evaluated economic effects through three stages: scenario quantification, equilibrium displacement modeling, and economic impacts modeling.[207] If a mineral did not qualify under the first criterion, in the second criterion, USGS assessed mineral data to determine if a single point of failure existed within the mineral's domestic supply chain.[208]

In the first stage of the economic effects assessment, USGS defined disruption scenarios. Scenarios evaluated the impact on U.S. net imports caused by complete restrictions of mineral exports by a trading partner.[209] In the second stage, USGS used equilibrium displacement modeling, which determined the impact of these simulated export restrictions on the U.S. on the global market for each mineral.[210] Finally, the third stage used economic impacts

202. NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3–4.
203. *Id.* at 4.
204. Normalized indicators are units that adjust disparate measurements to a common basis. For example, the score for economic vulnerability in USGS's 2021 methodology is a normalized indicator that converts various inputs into a comparable score.
205. FORTIER ET AL., 2025 METHODOLOGY, *supra* note 152, at 2.
206. *Id.*
207. *Id.*
208. *Id.*
209. *Id.* at 2–3.
210. *Id.* at 3–4.

modeling to determine the probability-weighted net decrease in U.S. gross domestic product by industry for each mineral.[211]

While departing in approach from previous methodologies, USGS tailored the 2025 methodology to continue to determine criticality, or risk, according to Energy Act of 2020 criteria. Economic impacts modeling weighted the impact of disruption probabilistically, considering the likelihood a nation would impose export restrictions, in line with consideration of whether a mineral "supply chain . . . is vulnerable to disruption[.]"[212] The methodology considered essentiality through overall economic impacts assessment and by evaluating which industries the mineral would greatly impact.[213]

IV. OTHER EFFORTS TO CLASSIFY AND EXAMINE MINERAL COMMODITIES

Other priority lists identify risk and establish priorities beyond the U.S. critical minerals list. The goals of these lists often overlap with the critical minerals list, making it important to understand how other priority lists operate. Doing so helps identify how the priority lists can work synergistically. Further, because superficial similarities between lists causes confusion, it is useful to differentiate other priority lists from the critical minerals list.

Section A discusses the legal basis and basic characteristics of two other priority lists created in the United States—DOE's critical materials list and DOD's strategic materials list—before turning to what this Article labels "priority minerals" designated by executive order. Section A also illustrates how these lists operate independently within the broader umbrella of U.S. minerals and materials policy. Section B then describes priority lists developed by other governments, examining how national context influences criticality determination. Comparison demonstrates how other nations approach criticality differently while also underscoring the importance of a critical minerals policy that considers international influences.

211. *Id.* at 4–7.
212. 30 U.S.C. § 1606(c)(4)(A)(ii).
213. *Id.* § 1606(c)(4)(A)(i), (iii).

A. OTHER U.S. MATERIAL PRIORITY LISTS

1. DOE's Critical Materials List

To secure energy technology supply chains, the Energy Act of 2020 authorizes DOE to designate a list of critical *materials*. Critical materials are any non-fuel minerals, elements, substances, or materials that the Secretary of Energy determines have a high risk of supply chain disruption and serve an essential function in energy technology, or a USGS-designated critical mineral.[214] Critical materials are thus focused on the energy sector. Designating critical materials supports DOE's program of materials research, development, and commercialization of energy technologies, for which the Energy Act of 2020 delegated further responsibility.[215] DOE's program prioritizes critical materials for de-risking activities that include reducing demand, finding substitutions, and increasing materials efficiency.[216] DOE finalized a list of eighteen critical materials in 2023,[217] adding metallurgical coal in 2025.[218]

DOE's critical materials list shares common, but not identical, goals with the USGS critical minerals list. Definitions of "critical material" and "critical mineral" both account for material and mineral supply concerns in energy technologies.[219] The law creates key differences in the scope and manner of analysis between DOE and USGS. USGS is limited to importance within a U.S. context in evaluating minerals; the definition of "critical mineral" requires the mineral to be essential to manufacturing and economic security "of

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214. *Id.* § 1606(a)(2).

215. *See id.* § 1606(g)–(i); U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT, *supra* note 111, at i (noting establishment of a "Critical Materials Research, Development, Demonstration, and Commercialization Application (RDD&CA) Program").

216. *See generally* U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT, *supra* note 111, at 1–2, 110–11 (describing use of critical materials assessment).

217. Notice of Final Determination on 2023 DOE Critical Materials List, 88 Fed. Reg. 51792 (Aug. 4, 2023).

218. *See* Critical Material List; Addition of Metallurgical Coal Used for Steelmaking, 90 Fed. Reg. 22711 (May 29, 2025).

219. *Compare* 30 U.S.C. § 1606(a)(2)(A)(ii) (requiring critical material to serve essential function in "1 or more energy technologies) *with* 30 U.S.C. § 1606(c)(4)(A)(iii) (extending scope of critical mineral concern to serving "essential function in the manufacturing of a product" to include in energy technology).

the United States."[220] No such limitations exist in the definition of "critical material,"[221] allowing DOE to consider global material use in energy technologies.[222] This produces differences in how DOE and USGS methodologies measure factors influencing criticality, including DOE's more liberal use of modeling to project future material criticality.[223] Finally, the Energy Act of 2020 does not require DOE to employ a preference for quantitative analysis, unlike for USGS.[224] Thus, DOE's *2023 Critical Materials Assessment* is more flexibly "based on qualitative assessments informed by quantitative analyses."[225]

2. DOD's Strategic Materials List

To lessen dependence on foreign sources and markets with supply vulnerabilities during a national emergency, the Strategic and Critical Materials Stock Piling Act (Stock Piling Act) tasks the President, acting through DOD, to identify *strategic materials* necessary for the national defense.[226] Strategic materials, or "strategic and critical materials," are "materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency,[227] and (B) are not found or produced in the United States in sufficient quantities to meet such need."[228] The Stock Piling Act provides "for the acquisition and retention of stocks and certain strategic and critical minerals" to conserve and develop important sources of materials in the event of a national emergency.[229] Designation of strategic materials thus precedes a

220. *See id.* § 1606(c)(4)(A).

221. *See id.* § 1606(a)(2).

222. U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT, *supra* note 111, at 2.

223. *See id.* at 2, 100–09 (describing methodology and use of projections).

224. *See* 30 U.S.C. § 1606.

225. U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT, *supra* note 111, at 102.

226. *See* 50 U.S.C. §§ 98a, 98b; *see also* DEF. LOGISTICS AGENCY, *supra* note 68.

227. A national emergency under the Stock Piling Act "means a general declaration of emergency with respect to the national defense made by the President or by the Congress." 50 U.S.C. § 98h-3(2).

228. *Id.* § 98h-3(1).

229. *Id.* § 98a(b).

stockpiling and management process.[230] Currently, DOD publicly highlights sixty-six materials monitored as strategic materials of interest.[231] While strategic materials are often essential for more than military uses, the sole purpose for stockpiling these materials is to support "the needs of the United States for national defense."[232]

Both DOD strategic materials and USGS critical minerals are designations used by government agencies to facilitate materials or minerals availability and establish alternatives and contingencies in the event of supply disruptions.[233] The two lists, however, have a clear difference in focus, with USGS's list of critical minerals capturing economic importance in addition to national security. Additionally, DOD's strategic materials support stockpiling,[234] whereas USGS has no similar acquisition program.

3. Minerals Prioritized by Executive Order

To "facilitate domestic mineral production to the maximum possible extent," in April 2025, President Trump issued EO 14,241, *Immediate Measures to Increase American Mineral Production* (Mineral Order).[235] The Mineral Order sought to "create jobs, fuel prosperity, and significantly reduce [U.S. mineral] reliance on foreign nations."[236] To carry out these goals, the Mineral Order required several measures to increase production, including designating mining as a priority use on federal public lands, opening new lines of financial support for mineral projects, and expediting

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230. *See* Strategic and Critical Materials Stock Piling Act, 50 U.S.C. §§ 98 *et seq.*; DEF. LOGISTICS AGENCY, *supra* note 68.

231. These materials include alloys, metals, non-metals, rare earths, ores and compounds, and precious metals. *See Materials of Interest*, *supra* note 4.

232. *See* 50 U.S.C. § 98a(c). This modern program is the legacy of earlier stockpiling efforts beginning during WWII. Clifton G. Chappell & Roderick Gainer, *America's Stockpile: An Organizational History*, DEF. NAT'L STOCKPILE CTR. 7–19 (Kristin Guss ed.), https://www.dla.mil/Portals/104/Documents/Strategic%20Materials/DNSC%20History.pdf.

233. *See* LINDA R. ROWAN, CONG. RSCH. SERV., CRITICAL MINERAL RESOURCES: NATIONAL POLICY AND CRITICAL MINERALS LIST, R47982 (2025); CAMERON M. KEYS, CONG. RSCH. SERV., EMERGENCY ACCESS TO STRATEGIC AND CRITICAL MATERIALS: THE NATIONAL DEFENSE STOCKPILE, R47833 (2023).

234. *See* 50 U.S.C. § 98a.

235. Exec. Order No. 14241, 90 Fed. Reg. 13673 (Mar. 25, 2025).

236. *Id.* § 1, 90 Fed. Reg. at 13673.

permitting for qualifying projects.[237] The Mineral Order defined a "mineral" as including "critical minerals" (as defined by the Energy Act of 2020), as well as uranium, copper, potash, gold, and any other mineral or material as designated by the Chair of the National Energy Dominance Council (NEDC).[238] Qualifying projects are present all across the value chain, from the extraction of raw materials to the manufacturing of final products including those minerals.[239]

While the Mineral Order did not classify "minerals" as "critical minerals," other executive orders directed the Secretary of the Interior to consider listing potential for uranium and metallurgical coal.[240] Uranium, copper, potash, gold, or other minerals under the Mineral Order were still required to be formally designated under the Energy Act of 2020 to be listed as critical.[241] The Mineral Order did, however, designate those listed "minerals" (regardless of critical status) for priority actions to bolster production. This Article thus discusses "minerals" defined in the Mineral Order as "priority minerals" to differentiate them from other designations.

B. MINERAL PRIORITY LISTS PRODUCED BY OTHER GOVERNMENTS

This Section examines foreign priority lists to compare them with the U.S. critical minerals list. This comparison provides two valuable insights. First, examining how foreign governments define criticality illustrates the role of context in determining what is critical. Conceptually speaking, unique circumstances facing each government influence their measurement of risk, producing differences in how each defines criticality. Second, introducing these lists makes explicit opportunities and challenges for the U.S. Inability to meet all mineral supply needs domestically requires creative diplomacy and partnerships with other governments. Surveying other

237. *Id.* §§ 3-6, 90 Fed. Reg. at 13673–76.

238. *Id.* § 2(a), 90 Fed. Reg. at 13673.

239. *Id.* § 2(b)–(d), 90 Fed. Reg. 13673.

240. *See* Exec. Order No. 14154, 90 Fed. Reg. 8353, 8358 (Jan. 29, 2025) (requesting consideration of uranium as critical mineral); Exec. Order No. 14261, 90 Fed. Reg. 15517, 15519 (Apr. 14, 2025) (requesting consideration of metallurgical coal as critical mineral). And, indeed, the final list released in late 2025 did formally designate uranium, copper, and potash as critical minerals. Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494 (Nov. 7, 2025).

241. 30 U.S.C. § 1606(c)(3).

priority lists provides a window into conceptual dimensions of criticality and opportunities to use the critical minerals list as a tool internationally.

1. Canadian Critical Minerals List

Canada released its first list of critical minerals in 2021, updating the list in 2024.[242] Unlike the United States, Canada considers domestic production and export potential for minerals in addition to consumer-focused import and use metrics. For Canada, a "critical mineral" has a threatened supply chain but also has a reasonable chance of being produced in Canada.[243] The mineral must also meet at least one additional criterion, including (1) essentiality to Canada's economic or national security; (2) necessity in facilitating national transition "to a sustainable low-carbon and digital economy"; or (3) positioning Canada desirably in global supply chains.[244]

Canada's definition of criticality reflects the country's mineral wealth and high mineral production output, with its list differing from the U.S. list in two ways. First, domestic production potential is required for listing.[245] Second, Canada considers essentiality differently, and may list a mineral if production of that mineral would position Canada favorably in global supply chains—even if Canadian economic or national security would be less impacted.[246] Relative to the United States, whose definition of "critical mineral" captures a more consumer-centric focus,[247] Canada incorporates a focus on mineral production.

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242. *Canada's Critical Minerals*, GOV'T OF CANADA (Feb. 21, 2025), https://www.canada.ca/en/campaign/critical-minerals-in-canada/critical-minerals-an-opportunity-for-canada.html.

243. *Id.*

244. *Id.*

245. *Id.*

246. *Id.*

247. *See* 30 U.S.C. § 1606(c)(4)(A) (qualifying supply risk, in part, on "restrictions associated with foreign political risk, abrupt demand growth, military conflict, violent unrest, [and] anti-competitive or protectionist behaviors"); FORTIER ET AL., 2018 METHODOLOGY, *supra* note 166, at 2, 9 (noting importance of net import reliance to a determination of a mineral's criticality in the United States).

2. Australian Critical Minerals List

Australia also maintains a critical minerals list, releasing its most recent update in 2024.[248] Geoscience Australia defines critical minerals as metallic or non-metallic elements that are essential to modern technologies, economies, or national security and that have risk of supply chain disruption.[249] The Australian Department of Industry, Science and Resources adds additional characterization, noting that the Australian Critical Minerals list contains minerals "for which Australia has geological potential for resources" and that are "in demand from our strategic international partners."[250]

Like Canada, Australia's mineral production potential informs how it identifies critical minerals, with its listing process evaluating production and export potential. In the country's recent *Critical Minerals Strategy 2023–2030*, Australia recognized that its critical minerals are essential to supporting not only domestic clean energy transition and technological advancements,[251] but also the country's economic future as a mineral exporter.[252] Australia's position on criticality thus considers domestic production as an important outcome itself, not simply as a means to meet domestic industrial demand. This again differs from the United States, whose definition of "critical mineral" may capture domestic production, but only as it affects supply chain vulnerabilities for minerals, not as an independent factor.

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248. Australia currently lists thirty-one minerals and mineral groups. *Australia's Critical Minerals List and Strategic Materials List*, AUSTL. DEP'T OF INDUS., SCI. & RES. (Feb. 20, 2024), https://www.industry.gov.au/publications/australias-critical-minerals-list-and-strategic-materials-list.

249. *Critical Minerals at Geoscience Australia*, GEOSCI. AUSTRL. (Mar. 26, 2025), https://www.ga.gov.au/scientific-topics/minerals/critical-minerals.

250. AUSTL. DEP'T OF INDUS., SCI. & RES., *supra* note 248.

251. AUSTL. DEP'T OF INDUS., SCI. & RES., CRITICAL MINERALS STRATEGY 2023–2030, at 10–11, 16 (2023), https://www.industry.gov.au/sites/default/files/2023-06/critical-minerals-strategy-2023-2030.pdf.

252. *Id.* at 9, 12, 14; *see also* GEOSCI. AUSTRL., *supra* note 249 ("[Geoscience Australia] support[s] the Critical Minerals Office to help grow Australia's critical minerals sector and *position Australia globally as a secure, reliable, and ethical supplier of critical minerals*." (emphasis added)).

3. European Union Critical and Strategic Raw Materials Lists

The European Union (EU) maintains a list of critical commodities known as the "critical raw materials list."[253] The EU defines a "critical raw material" as a raw material commodity that has high economic importance to the EU and a high risk of supply disruption.[254] Economic importance considers factors such as the material's use in EU manufacturing and availability of effective substitutes.[255] Supply risk is measured based on the material's supply concentration, government performance of nations with supplies, and recycling and substitution capabilities of the material that might reduce risk.[256] A subset of "strategic raw materials" is defined as "[r]aw materials important for technologies that support the twin green and digital transition and defense and aerospace objectives."[257] The European Commission recently enacted the European Critical Raw Materials Act, codifying the 2023 Critical Raw Materials List and methodology into law.[258] The Act also provides a definition and methodology for strategic raw materials.[259]

The critical raw materials list reflects the relative need of the EU, as a major resource consumer, to source key minerals from beyond the borders of its member nations. This reality makes the EU's Critical Raw Materials List more akin to the U.S. critical minerals list. Listing requires finding serious supply risk for raw materials as well as demonstrating economic importance to EU members.[260]

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253. The list was first released in 2011, and the EU updates it every three years, with the recent update published in 2023. The EU's 2023 Critical Raw Materials List contains thirty-four materials and highlights a subset of separately defined "strategic raw materials" contained within the list of critical raw materials. *An EU Critical Raw Materials Act for the Future of EU Supply Chains*, EURO. COUNCIL (Mar. 21, 2025), https://www.consilium.europa.eu/en/infographics/critical-raw-materials/.

254. EURO. COMM'N, STUDY ON THE CRITICAL RAW MATERIALS FOR THE EU 2023 – FINAL REPORT 1, 44 (2023), https://op.europa.eu/en/publication-detail/-/publication/57318397-fdd4-11ed-a05c-01aa75ed71a1.

255. *Id.* at 1.

256. *Id.*

257. *Id.* at 45.

258. European Critical Raw Materials Act, 2024 O.J. L 1252, art. 4 annex I–II, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32024R1252.

259. *Id.* art. 3, annex I–II.

260. *See id.* annex II, § 2.

Those criteria are similar to the Energy Act of 2020 criteria, requiring that critical minerals serve an essential function in manufacturing a product without which would threaten U.S. economic or national security.[261] The European Union does not list its critical raw materials based on potential to supply to global partners, reflecting the EU's status as a global manufacturing power and its import dependency for many of the minerals necessary to support its economy and national defense.[262]

4. Japanese Critical Minerals List

In 2022, the Japanese Diet passed an Act on Promotion of Ensuring Security by Taking Economic Measures in an Integrated Manner to promote Japanese economic security.[263] Article 7 of the Act requires identification of specified critical products. Critical products are commodities, including minerals, essential to Japanese citizens and their economy for which Japan is exposed to harm from supply vulnerabilities arising from reliance on foreign sources.[264] The Act further requires ministers of the Japanese government to produce policies to ensure more stable supplies of these minerals.[265] As of 2024, Japan's list of critical minerals includes thirty-five minerals and mineral groups.[266]

Japan's list is similarly unique from those of other governments, highlighting the role that context plays when determining what is

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261. 30 U.S.C. § 1606(c)(4)(A).

262. *See* EUROPEAN COMM'N, EUROPEAN INNOVATION P'SHIP ON RAW MATERIALS, RAW MATERIALS SCOREBOARD 47–49 (2021), https://rmis.jrc.ec.europa.eu/uploads/scoreboard2021/Scoreboard2021_web.pdf.

263. Keizai taisaku no ittai-teki jisshi ni yoru anzen kakuho no suishin ni kansuru hōritsu [Keizai sonomono suishin-hō] [Economic Security Promotion Act], Law No. 43 of 2022 (Japan). For an unofficial English translation of the Act, *see Act on the Promotion of Ensuring National Security Through Integrated Implementation of Economic Measures, Japan*, WORLD INTELLECTUAL PROP. ORG., https://www.wipo.int/wipolex/en/legislation/details/22642 (last visited Apr. 10, 2025).

264. Economic Security Promotion Act, Law No. 43 of 2022, art. 7 (Japan).

265. *Id.* art. 8.

266. *See* Masato Nagahara, *Overview of Lists of Critical Minerals and Substances by Countries and Regional Associations*, JAPAN ENERGY & METALS NAT'L CORP. (Jan. 24, 2025), https://mric.jogmec.go.jp/reports/mr/20250114/185205/.

critical. For example, Japan's list includes uranium, which the Japanese Ministry of Economy, Trade and Industry found vital to fueling nuclear power generation in the country.[267] Because Japan lacks sufficient domestic uranium reserves, the determination reflects how consumer needs impact what is "critical."[268] Unlike the United States, which specifically excludes "fuel minerals" from the definition of a "critical mineral,"[269] Japan's definition of "critical mineral" includes fuel minerals, allowing greater flexibility.[270]

V. PURPOSE AND EFFECT OF THE U.S. CRITICAL MINERALS LIST

Having considered other mineral and material priority lists, this Part returns to the USGS critical minerals list to provide a description of purpose and effect for creating the list. The technical nature of the critical minerals list may obscure how parties use the list. Yet the list is the only national screening, quantification, and prioritization of criticality, making it indispensable for determining which minerals require federal support. While there is growing national conversation around critical minerals, that conversation must be grounded in an understanding of the purpose for creating the critical minerals list as well as how the list is actually used. This Part goes beyond technical details to outline the list's broad function in U.S. mineral policy.

A. WHAT DOES THE CRITICAL MINERALS LIST DO?

The critical minerals list allows the government to make sense of mineral supply challenges facing the United States. The list

267. Jūyō kōbutsu ni kakaru antei kyōkyū kakuho o hakaru tame no torikumi hōshin [Policy for Ensuring a Stable Supply of Critical Minerals], Keizai sangyō-shō [Ministry of Economy, Trade and Industry] 4–5, 12 (Mar. 29, 2024), https://www.meti.go.jp/policy/economy/economic_security/metal/torikumihoshin.pdf.

268. *See* Kit Million Ross, *Uranium as a Critical Mineral: How Can We Ensure Supply?*, MINING TECH. (Mar. 27, 2024), https://www.mining-technology.com/features/uranium-as-a-critical-mineral-how-can-we-ensure-supply/?cf-view.

269. 30 U.S.C. § 1606(a)(2)(A).

270. *Compare* Economic Security Promotion Act, Law No. 43 of 2022, art. 7 (Japan) *with* 30 U.S.C. § 1606(a), (c).

synthesizes a wide body of data, identifies risk, and prioritizes minerals for action.[271] The critical minerals list provides coherence and direction to national minerals policy by (1) evaluating and synthesizing information to identify risk; (2) informing public and private actors of supply risk; (3) prioritizing key minerals for risk reducing action; and (4) enabling coordination among government actors on mineral supply programs.

First, the critical minerals list synthesizes mineral criticality by evaluating data and producing a shared metric.[272] Prior to list development, USGS has information on factors impacting risk, but not a measurement of risk itself. For example, high net import figures may increase vulnerability, making a mineral at greater risk of supply disruption and therefore more likely to be critical. But these figures may not increase risk because other data (such as stability in trade relationships with that nation) decreases risk. While these factors impact criticality, they do not measure criticality directly. By assessing a mineral holistically and synthesizing multiple pieces of information, USGS can better conceptualize criticality, or risk. Calculating criticality itself produces a shared metric that allows minerals to be compared against each other.

Second, the critical minerals list informs government decisionmakers and the public of relative risk across mineral supply chains. The list and its underlying evaluation are a warning device; a mineral's inclusion on the list indicates it is subject to greater risk that may develop into future supply shortage.[273] Using information about risk, actors can make more informed decisions.[274] For example,

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271. *See* MINERAL RES. PROGRAM, *supra* note 35.

272. USGS composed the draft list in 2021 using supply risk scores and in 2025 using probability-weighted net decrease in U.S. gross domestic product. *See* NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3; NASSAR ET AL., 2025 METHODOLOGY, *supra* note 152, at 1.

273. *See* MINERAL RES. PROGRAM, *supra* note 35.

274. Statement of Dr. Nedal T. Nassar, Chief of Minerals Intelligence Research, National Minerals Information Center, U.S. Geological Survey before the House Committee on Natural Resources Subcommittee on Energy and Mineral Resources (Sept. 13, 2023), https://naturalresources.house.gov/uploadedfiles/testimony_eggert.pdf (noting the list "can be used to better understand the specific risks potentially affecting individual technologies, industries, or commodities . . . ; to identify key trade relationships . . . ; and to target investments in alternative sources of supplies . . . .") [hereinafter *Statement of Dr. Nedal T. Nassar*].

the reason for listing a mineral (e.g., single point of supply chain failure) can inform relevant agencies of where best to target efforts to strengthen supply chains. Additionally, the critical minerals list narrows the field of minerals for which more in-depth analysis may be useful.[275]

Third, the critical minerals list helps the government prioritize which minerals should be prioritized in policy. While listing signals action is necessary, inclusion of a mineral triggers few automatic responses. The Energy Act of 2020 requires the critical minerals list to serve as a foundation for USGS publishing an annual comprehensive review and forecast "of critical mineral production, consumption, and recycling patterns . . . ."[276] The Infrastructure Investment and Jobs Act requires BLM and the U.S. Forest Service "[t]o improve the quality and timeliness of Federal permitting and review processes with respect to critical mineral production on Federal land" through a series of prescribed actions and reporting requirements.[277] Where the critical minerals list works best, then, is to prioritize a narrower subset of minerals for action, leaving Congress and executive agencies to take up the charge and leverage "policies, incentives, targeted investments and trade relationships" to secure mineral supply chains.[278] While these actions are not directly triggered by the listing of a mineral, they are the natural consequence of listing and can involve large investments of resources.

Examples of such practical uses are many. The list helped Congress determine which minerals should qualify for the Inflation Reduction Act's Section 45X Advanced Manufacturing Credit,[279]

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275. *See* Statement of Roderick G. Eggert, Research Professor at the Colorado School of Mines before the House Committee on Natural Resources Subcommittee on Energy and Mineral Resources, *Examining the Methodology and Structure of the U.S. Geological Survey's Critical Minerals List* (Sept. 13, 2023), https://naturalresources.house.gov/uploadedfiles/testimony_eggert.pdf ("A list is most useful when it is viewed as an intermediate product . . . the result of an initial screening and identification of minerals and materials deemed most important for further, more-detailed evaluation.") [hereinafter *Statement of Roderick G. Eggert*].

276. 30 U.S.C. § 1606(j).

277. *Id.* § 1607.

278. Mineral Res. Program, *supra* note 35.

279. Congress passed the Advanced Manufacturing Tax Credit to allow projects producing critical minerals to claim a tax deduction. *See* Inflation Reduction Act, Pub. L. No. 117-169, § 45X, 136 Stat. 1818, 1972-81 (2022).

which allows producers to claim a tax credit for ten percent of the production costs for an "applicable critical mineral."[280] Congress defined applicable critical minerals as the group of minerals designated critical by USGS in 2022.[281] Another example is USGS's Earth Mapping Resources Initiative (Earth MRI).[282] Launched to modernize mapping and "identify potentially mineralized areas containing critical minerals," Earth MRI benefits mineral exploration by providing its data to the public.[283] Congress allocated $320 million to enhance and accelerate Earth MRI in the IIJA, adding to the program's reach.[284] Rather than focusing on trying to rapidly map *all* domestic mineral resources, the USGS prioritizes mapping for the smaller universe of listed critical minerals. Identification of critical minerals has also enabled the U.S. government to negotiate trade agreements, such as its agreement with Japan for cobalt, lithium, graphite, manganese, and nickel,[285] and target investments in mineral production, including partial government ownership of a rare earths company in the U.S.[286]

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280. *See* 26 U.S.C. § 45X(c)(6).

281. *Compare id. with* 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381, 10381 (Feb. 24, 2022).

282. *See About*, EARTH MAPPING RES. INITIATIVE, https://www.usgs.gov/special-topics/earth-mri/about (last visited June 25, 2025).

283. *See* U.S. GEOLOGICAL SURV., TECHNICAL OVERVIEW OF THE U.S. GEOLOGICAL SURVEY EARTH MAPPING RESOURCES INITIATIVE (EARTH MRI), FACT SHEET 2020-3055 (2020), https://pubs.usgs.gov/fs/2020/3055/fs20203055.pdf.

284. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, § 40201, 135 Stat. 429, 959 (2021).

285. *See* Agreement Between the Government of the United States of America and the Government of Japan on Strengthening Critical Minerals Supply Chains, Japan-U.S., Mar. 28, 2023, U.S. TRADE REP., https://ustr.gov/sites/default/files/2023-03/US%20Japan%20Critical%20Minerals%20Agreement%202023%2003%2028.pdf.

286. *See, e.g.*, Katha Kalia et al., *MP Materials Seals Mega Rare-Earths Deal with US to Break China's Grip*, REUTERS (Jul. 10, 2025), https://www.reuters.com/business/mp-materials-partners-with-department-defense-boost-us-rare-earth-magnet-supply-2025-07-10/ (discussing multibillion-dollar investment in rare earths manufacturing).

Finally, the critical minerals list provides a foundation to coordinate policymaking at the federal level.[287] The Energy Act of 2020 situates the critical minerals list as a more universal tool. First, the required use of quantitative analysis supports robust, data-driven evaluation and provides an objective understanding of supply risk for the entire U.S. Using the critical minerals list as a basis, USGS expanded its range of official annual mineral statistics and began developing a series of "five-year global mineral outlooks."[288] Second, the broad scope of the "critical mineral" definition allows USGS to consider "minerals used in over 230 sectors of the economy," making the list and its analysis relevant to agencies across the federal government.[289] USGS analysis and forecasting furthers a whole-of-government response, with USGS providing "mineral supply chain data and analyses to a variety of Federal decision-makers, including the Defense Logistics Agency's stockpile managers, the National Security Council, the State Department, the Department of Commerce, the U.S. Trade Representative, and the Intelligence Community."[290]

B. WHAT DOES THE CRITICAL MINERALS LIST NOT DO?

As important as the critical minerals list is, it is only one piece of the policy puzzle. The list does not develop a comprehensive critical minerals policy—nor should it.[291]

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287. Much of the coordination on science and technology to secure supply chains is conducted by the interagency National Science and Technology Council Subcommittee on Critical Minerals, as codified in the Infrastructure Investment and Jobs Act. *See* CRITICALMINERALS.GOV, https://www.criticalminerals.gov/ (last visited Jul. 10, 2025); Statement of Dr. Nedal T. Nassar, *supra* note 274 ("By partnering with other agencies that specialize in sector-specific demand forecasting and the potential for demand shocks associated with the emergence and growth of specific technologies, [USGS] can provide an even richer picture of the future risks to mineral supply chains.").

288. Statement of Dr. Nedal T. Nassar, *supra* note 274. 30 U.S.C. § 1606(d) outlines requirements for critical mineral resource assessments from USGS.

289. *See* 30 U.S.C. § 1606(c)(4)(A); Mineral Res. Program, *supra* note 35.

290. Statement of Dr. Nedal T. Nassar, *supra* note 274.

291. *See* FORTIER ET AL., 2018 METHODOLOGY, *supra* note 116, at 1 ("Lists of critical minerals, although useful to identify and prioritize materials of concern, are, by necessity, a simplification of a complex issue . . . .").

First, the critical minerals list does not develop a "one-size-fits-all" strategy to strengthen mineral supply chains and reduce risk. While listing is important, it is not the final word. The U.S. must undertake additional policy formulation (i.e., planning how to address risk) and policy implementation (i.e., taking concrete action to secure supply chains). Congress and the executive branch consider the critical minerals list as one source of information among many to inform management of competing resource priorities and policy goals in de-risking supply chains. Decisionmakers have creative latitude in addressing risk; the list is an opportunity, not a limitation.

Second, the critical minerals list does not identify domestic mineral production as the only or the most effective solution to de-risk supply chains. This is not to say the United States is unconcerned with domestic production. Increasing domestic production when possible is the preferred policy.[292] USGS also considers domestic production indirectly in calculating criticality.[293] However, domestic production is not always possible, particularly at the scale necessary to supply all economic and national security needs of the United States. The purpose of listing critical minerals is to promote U.S. economic and national security, strengthening supply chains by any means. Unlike Canada and Australia, there is no definitional requirement that the United States be capable of domestic production or export.[294] Indeed, geologic and technical conditions make domestic production infeasible for many critical minerals, especially in the short term. For example, cobalt is unlikely to ever be produced in large quantities within the United States.[295] If decisionmakers prioritize domestic

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292. *See, e.g.*, 30 U.S.C. § 21a (declaring congressional policy "to foster and encourage private enterprise" in mining and mineral development); Exec. Order 14,241, 90 Fed. Reg. 13673 (Mar. 25, 2025) (establishing executive policy to "take immediate action to facilitate domestic mineral production").

293. *See* NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 3–4 (considering domestic production's contribution to disruption potential and trade exposure); 30 U.S.C. § 1607(b).

294. *See supra* Part IV.C.1 & 2.

295. *See, e.g.*, Stacey Vanek Smith & Eric Whitney, *Cobalt Is in Demand, so Why Did America's Only Cobalt Mine Close?*, NPR (Dec. 14, 2023), https://www.npr.org/2023/12/14/1219246964/cobalt-is-important-for-green-energy-so-why-has-americas-only-coablt-mine-closed (noting U.S. reliance on cobalt from mines controlled by China and the DRC caused, in part, by lack of domestic cobalt deposits).

production at the expense of other methods to reducing supply risk, the purpose to strengthen supply chains and promote U.S. economic and national security may be frustrated.

Third, the critical minerals list does not provide in-depth sector or supply chain specific analysis. Additional research and evaluation are necessary to understand critical minerals in detail. Developing other lists, such as DOE's critical materials list and DOD's strategic materials list can be helpful for evaluating mineral use in the energy- and national defense-sector contexts without duplicating the work of the USGS critical minerals list.

Finally, the critical minerals list does not indicate that excluded minerals lack essential uses, economic or national security importance, or supply risk. USGS stresses that criticality exists on a continuum.[296] The critical minerals list does not give a "yes or no" answer on criticality, but rather "more or less." Minerals not critical today may become critical tomorrow and vice-versa as conditions change.

C. WHY HAVE A CRITICAL MINERALS LIST?

Without the critical minerals list, the U.S. government would not have a nationwide evaluation of supply risk for minerals. If evaluating minerals for criticality is done with rigor, the resulting output is indispensable in flagging minerals with the greatest supply risk. A list that reflects real-world conditions—not changing political priorities—prevents the U.S. from being surprised by supply shortages of key minerals in the future. This evaluation, via rigorous methodology, is the heart of the list's importance. After all, a "list is simply the most basic of the outputs of an evaluation."[297]

Additionally, evolving criticality makes periodic evaluation a necessity.[298] Regular list updates provide a series of criticality snapshots based on observed conditions, helping track trends across time. Maintaining a stable process between list updates enables the government to determine whether action to secure critical mineral

296. 2021 Draft List of Critical Minerals, 86 Fed. Reg. at 62202.
297. Statement of Roderick G. Eggert, *supra* note 275.
298. *See* U.S. DEP'T OF COM., *supra* note 37, at 33.

supply chains has had an effect. Without the critical minerals list, no other federal program would provide this information.[299]

VI. POINTS OF CONCERN AND RECOMMENDATIONS FOR THE FUTURE

Historically, efforts to develop and implement federal minerals policy were largely ad hoc and developed in response to a crisis.[300] Lack of early planning and identification of supply risk led to avoidable shortfalls and rushed responses by government. Once the immediate threat passed, interest in government intervention gave way to greater reliance on the free market. Over time, federal mineral policy moved from targeted solutions to subsidization of political favorites and short-term boosterism, or little policy at all. Absent a targeted response today, a later crisis may catch industry off guard, causing the pattern to repeat.

Investing in a critical minerals list grounded in robust methodological analysis positions the United States to break free from the pattern discussed above. But the critical minerals list is simply a tool, and a tool is only as effective as its use. Congress designed the list to organize a proactive response to de-risking critical mineral supply chains. However, the list remains susceptible to frustration. Misunderstanding the purpose of the list, politicizing designation of critical minerals, and overextending the term "critical mineral," all limit the list's usefulness. This Part examines those concerns before offering recommendations to address them.

A. MISUNDERSTANDING THE PURPOSE OF THE LIST

The technical process for measuring criticality is complex, creating potential misunderstanding about what the resulting list accomplishes. This Section dispels that misunderstanding by noting

299. Projection of future supply concerns for mineral commodities on the critical materials list is limited to mineral materials essential to the energy sector and is methodologically distinct from evaluation for the critical minerals list. Maintenance of a list of strategic and critical materials is primarily concerned with stockpiling, not in directly addressing supply chain risks.

300. *See supra* Part II.

two essential details. First, maintaining the critical minerals list is a scientific process prescribed by law and delegated to USGS, a scientific bureau whose mission is to provide objective and impartial science. The evaluation underlying the list measures supply risk, producing an appraisal of real-world conditions. USGS and DOI provide this information to the broader federal government in hopes that the actions of interested parties are informed. However, because developing the critical minerals list is a largely scientific exercise, it is not the final say on mineral policy. Therefore, second, USGS and the critical minerals list leave the work of responding to the information represented by the list to the political decision-making of Congress and other executive agencies.

The critical minerals list also does not represent the whole of mineral policy, even on critical minerals. Both specific policies and programs to secure critical mineral supply chains (e.g., investing in refining, entering trade agreements, researching recycling) and fully understanding the risks of mineral criticality are broader than the critical minerals list itself. For example, President Biden issued EO 14,017 to conduct in-depth analyses of important supply chains.[301] In the resulting report, DOD examined mineral supply chains at a more granular level than USGS had in developing the first critical minerals list. Additionally, though the critical minerals list informs energy and national defense policy, DOE and DOD possess access to sector-specialized examinations of materials through identification of critical materials and strategic materials, respectively. Thus, compiling the critical minerals list is not the final say, nor does it represent a zero-sum exercise that prevents promotion of non-designated minerals. While pursuing non-designated minerals may come with a greater political cost or divert scarce resources to less at-risk minerals, listing is not a prerequisite for federal action, nor its exclusive priority.

To reduce confusion, increasing communication and transparency about the critical minerals list's use is essential. To that end, federal departments and agencies should discuss how they use the critical minerals list and underlying USGS analysis. This would make connection between mineral policies and programs and risk identified

301. Exec. Order No. 14017, §§ 3–5, 86 Fed. Reg. 11849, 11849–53 (Mar. 1, 2021).

by the critical minerals list explicit. Another recommendation is to task the NSTC Critical Minerals Subcommittee with developing a clearinghouse for federal programs, policies, and actions that build on the work of USGS on critical minerals, including its development of the critical minerals list. This information can be made accessible to the public at the Subcommittee's criticalminerals.gov website.

B. POLITICIZING DEVELOPMENT OF THE LIST

A second concern is that development of the critical minerals list will become politicized. Determining critical minerals should not be a political decision-making exercise, but the outcome of objective analysis. This is intentional; if critical minerals were determined by politics, the critical minerals list would reflect concerns other than empirically demonstrated supply risk. The list's measurement of risk is vital to government efforts to secure supply chains and reduce the potential for supply disruptions.

The importance of scientific integrity is why Congress entrusted the compilation and update of the critical minerals list to USGS. USGS's role as a scientific bureaus make it a natural fit to create the critical minerals list. USGS has both reputation and legal responsibility to provide objective information and scientific analysis to the government and broader public. Using the diverse mineral data it collects, USGS can determine risk based on measured geologic and market conditions for the mineral.

Trends present in the second Trump administration, however, threaten to obstruct USGS's scientific role and introduce politics into developing the critical minerals list. Public access to scientific data viewed as opposing the priorities of the current administration is being limited.[302] President Trump has challenged statistical information that does not reflect his political vision.[303] If the administration places itself in opposition to data measured and evaluated by USGS, it could make it more difficult to conduct and

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302. Austyn Gaffney, *Government Science Data May Soon Be Hidden. They're Racing to Copy It*, N.Y. TIMES (Mar. 21, 2025), https://www.nytimes.com/2025/03/21/climate/government-websites-climate-environment-data.html.

303. Jeff Sommer, *What If You Can't Believe the Official Numbers?*, N.Y. TIMES (Aug. 8, 2025), https://www.nytimes.com/2025/08/08/business/jobs-numbers-trump-economy-statistics.html.

publish the evaluation for the critical minerals list. Further, directive in executive orders complicate listing, with some openly pushing for including certain minerals.[304]

Politicization may occur in multiple ways. First, politics may limit or result in the manipulation of the methodology used to determine mineral criticality. USGS applies a rigorous methodology utilizing the most current scientific information to evaluate mineral criticality.[305] This methodological rigor insulates the list from politics. While the statutory text attempts to limit subjectivity in analysis,[306] modifications of the quantitative methodology are permissible within the letter of the law.[307] The Energy Act of 2020 requires regular review of the methodology, authorizing revisions as necessary. In a vacuum, this authorization does not present concerns. Flexibility allows USGS to continually update the methodology to reflect the evolving science and increased precision in measuring mineral criticality.[308] However, goals of the critical mineral list—namely that the list effectively predict problems before they occur—may be compromised if the methodology is coopted to advance political objectives. Such politicization imperils many benefits of creating a list, like coordinating government-wide implementation of critical minerals policy and tracking changes in mineral criticality over time.

Another concern is that USGS may fail to make the process of updating the list as transparent as it has in the past. The Energy Act of 2020 only requires that USGS publish a short description of its methodology in the *Federal Register*, not the whole report.[309] Foregoing a detailed methodological discussion invites scrutiny and

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304. *See, e.g.*, Exec. Order No. 14154, § 9(c), 90 Fed. Reg. 8353, 8358 (requiring consideration of uranium); Exec. Order No. 14261, § 9(b), 90 Fed. Reg. 15517, 15519 (requiring consideration of metallurgical coal).

305. *See* Press Release, Jason Burton, U.S. Geological Surv., U.S. Geological Survey Releases 2022 List of Critical Minerals, Feb. 22, 2022, https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals.

306. For example, the Energy Act requires quantitative analysis be used over qualitative when sufficient data exist. 30 U.S.C. § 1606(c)(2).

307. *Id.* § 1606(c)(5); *see also* NASSAR & FORTIER, 2021 METHODOLOGY, *supra* note 152, at 1 (noting use of "updated evaluation methodology" in 2021).

308. *See generally* Statement of Dr. Nedal T. Nassar, *supra* note 274.

309. *See* 30 U.S.C. § 1606(c)(1), (3).

could undermine trust in the process.[310] Such action may also limit the opportunity for meaningful public comment on the process. In 2018, 2021, and 2025, USGS released detailed reports explaining the methodology used to create the critical minerals list. At present, political winds appear to favor transparency,[311] but whether this will change is an open question.

Finally, there is a serious concern that USGS may forgo adherence to the analysis to comply with a presidential directive. The aggressive nature with which the second Trump administration has pursued its goals by executive order, even in lieu of clear authority to do so,[312] raises questions of whether the administration will simply list minerals as critical outside the required process. Amongst the orders issued in his second administration, President Trump appears to be testing the limits of what constitutes a critical mineral by expanding its scope in executive order.[313] These executive orders have limited instruction to require considering certain minerals for listing or to implement particular mineral policies, both of which may be compatible with the critical minerals list legally, if not in spirit. The final 2025 critical minerals list indicates what realization of this top-down approach looks like. That list includes five minerals designated

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310. This has been a concern since the first Trump administration. *See* U.S. DEP'T OF COM., *supra* note 37, at 33 ("Mineral criticality is not static, but changes over time. Accordingly, the critical minerals list should be updated periodically using a transparent, documented methodology that considers changes to supply, demand, concentration of production, and current policy priorities.").

311. *See* 2025 Draft List of Critical Minerals, 90 Fed. Reg. 41591, 41593 (Aug. 26, 2025).

312. *See e.g.*, *Barbara v. Trump*, No. 25-cv-244-JL-AJ (Jul. 10, 2025) (order granting a class-wide preliminary injunction) (finding likelihood of success on the merits for plaintiffs challenging Executive Order 14160's redefinition of citizenship despite constitutional precedent); *V.O.S. Selections, Inc. v. U.S.*, No. 25-00066, 2025 WL 1514124 (Ct. Int'l Trade May 28, 2025) (per curiam) (finding imposition of retaliatory tariffs under the International Emergency Economic Powers Act was *ultra vires*).

313. *See* Exec. Order No. 14241, § 2(a), 90 Fed. Reg. 13673, 13673 (Mar. 25, 2025) (expanding priority for mineral projects that mine "uranium, copper, potash, gold" in addition to critical minerals listed by USGS under the Energy Act); Exec. Order No. 14261, § 9(b), 90 Fed. Reg. 15517, 15519 (Apr. 14, 2025) (requiring USGS to make a determination on whether metallurgical coal can be listed as a critical mineral); Exec. Order No. 14272, § 2(a), 90 Fed. Reg. 16437, 16438 (including uranium as a "critical mineral" under the order) (Apr. 18, 2025).

critical after other federal agencies declared them "strategic and critical to the defense or national security of the United States, notwithstanding the Energy Act's criteria for designating a critical mineral."[314] Without following Energy Act criteria or clearly defining the scope of "strategic and critical," the consultation process may now result in any number of minerals being included on the list as critical regardless of risk analysis. This may result in a critical minerals list focused on short-term political priorities rather than long-term risk mitigation.

The main recommendation for limiting politicization of the critical minerals list is straightforward; political decision-making should be cabined to responding to information in the critical minerals list, leaving list development to scientific analysis. Maintaining a clear division between these two phases upholds the role of USGS as scientific bureau while focusing political capital of decisionmakers where influence is needed. Political actors should focus on how to respond to criticality (an inherently political exercise), not whether criticality exists. Choices about which mineral to pursue first, which tool works best to limit risk, and whether a particular research program is a good investment require political choices.

Notwithstanding development of the critical minerals list, both Congress and the executive branch can still target non-critical minerals through policy. This includes the designation of groups of "priority" or "target" minerals. These designations have the potential to create confusion with existing designations—including critical minerals—as discussed in Part VI.C below. Therefore, if parallel designations are going to be made, the decisionmaker should use clearly distinct terms to separate these designations. To the maximum extent feasible, these parallel designations should include reasoning for their designation and how the minerals differ from critical minerals. Commentators in the minerals policy space should also be clear to distinguish between designations of "priority" or "target" minerals, clarifying that these minerals did not undergo the evaluation and designation process of critical minerals.

314. 2025 Final Critical Mineral List, 90 Fed. Reg. 50494, 50496 (Nov. 7, 2025).

C. OVEREXTENDING THE TERM "CRITICAL MINERAL"

Overextending the perception of which minerals are "critical" (whether during or after listing) is another concern for limiting efficacy of the critical minerals list as a tool. Reducing the "critical mineral" term to a catch-all for any important mineral obscures the purpose for the critical minerals list. The Energy Act of 2020 defines "critical mineral" as a term of art, conferring meaning in designation. As the term is stretched, the critical minerals list begins to look like a thought exercise. This may produce problems as the government directs millions of dollars toward securing critical mineral supply chains.

The first means of overextending the term "critical mineral" is by over-including minerals on the critical minerals list. As one scientist asked, "If everything is critical, then is anything really critical?"[315] The most recent list of critical minerals includes a record-breaking sixty minerals, reflecting an ever-expanding list as updates occur.[316] Further, that list added six minerals *after* completing methodological evaluation, with five of those minerals designated after other agencies found them to be "strategic and critical" in consultation.[317] What constitutes "strategic and critical" remains broad and undefined, only summarily discussed publicly in the *Federal Register*.[318] Remaining judicious about which minerals are critical enough to be listed is necessary for a priority list to function. The broader the list becomes, the less meaning a "critical" designation has, leading to USGS including minerals not as essential or vulnerable. This leads the list to be less useful in communicating information about supply risk and government priorities.

A second means of overextending the meaning of the term "critical mineral" comes outside list creation, through "priority" designations appearing to bypass the critical minerals list. President Trump's EO 14,241, *Immediate Measures to Increase American Mineral Production*, treats uranium, copper, potash, and gold the same as critical minerals, allowing projects producing these minerals access

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315. Statement of Roderick G. Eggert, *supra* note 275.

316. *See* Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494, 50495 (Nov. 7, 2025).

317. *Id.*

318. *Id.* at 50495–96.

to permitting prioritization, investment opportunities, and greater control over project siting on public lands.[319] While the EO did not, and could not, officially designate these four minerals as critical, this type of designation confuses what it means to be critical.[320] Treating these minerals the same makes it unclear whether supply risk or something else is motivating policy. As the government blurs the line between what is critical and what is not, listing critical minerals begins to look like it requires lobbying. This makes it easier to justify designating minerals without substantial risk of supply disruption as critical in the future, regardless of supply risk.

Maintaining the integrity of the term "critical mineral" remains important to delimit which minerals have been assessed and determined critical. Political decisionmakers should treat critical minerals as areas of risk, not new "pork barrel" priorities. Legal and practical boundaries exist to limit the expansion of the critical minerals list. The text of the law and measurable conditions set these boundaries. Prior exclusions of uranium and copper demonstrate how these boundaries can operate in practice.

1. Uranium as Critical Mineral: Legal Bounds

Eligibility for listing uranium as a critical mineral has produced differing opinions from USGS. The Energy Act of 2020 and earlier EO 13,817 both exclude "fuel minerals" from the definition of critical minerals.[321] Because uranium is used primarily as fuel for

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319. *See* Thomas Mitchell & Wesley Peebles, *EO 14,241 — Immediate Measures to Increase American Mineral Production: El Dorado or Bust?*, 55 ENV'T L. REP. 10505 (2025); *see also* Exec. Order No. 14241, 90 Fed. Reg. 13673 (Mar. 25, 2025).

320. This is reflected in commentary on the executive order, such as from the Center for Strategic and International Studies. *See* Gracelin Baskaran & Meredith Schwartz, *Unpacking Trump's New Critical Minerals Executive Order*, CTR. FOR STRATEGIC & INT'L STUDS. (Mar. 21, 2025), https://www.csis.org/analysis/unpacking-trumps-new-critical-minerals-executive-order (confusing the scope of the Mineral Order, stating the "EO also leaves the critical minerals list open to other materials as determined by the NEDC."). While the NEDC may add additional priority minerals, these minerals are not added to the critical minerals list developed by USGS. Exec. Order No. 14241, 90 Fed. Reg. 13673, 13673 (Mar. 25, 2025).

321. *See* 30 U.S.C. § 1606(a)(3)(B); Exec. Order No. 13817, § 2(a), 82 Fed. Reg. 60835, 60835 (Dec. 26, 2017).

nuclear power,[322] it appears to be a fuel mineral, thus falling outside of the definition. USGS found exactly that in developing the 2022 critical minerals list and declined to evaluate uranium, citing its definitional exclusion.[323] However, in 2018, USGS evaluated and found uranium critical.[324] Three points help to explain this difference for uranium.

First, USGS created the 2018 list under EO 13,817, whereas the agency created the 2022 list under the Energy Act of 2020. It is possible USGS was more flexible in creating the 2018 list, as the list responded to an executive order from President Trump. As "fuel mineral" is not defined in the EO, intent may have been for the term to reference traditional hydrocarbon fuel minerals (e.g., coal, natural gas, oil).

Second, legal arguments for uranium's inclusion exist on both sides of the ledger. Advocates for considering uranium argue that "fuel minerals" refers to traditional hydrocarbon mineral fuels, thus excepting uranium.[325] Advocates also contend that *non-fuel* uses of uranium allow it to be considered, despite uranium's primary use as fuel for nuclear reactors.[326] In 2018, USGS adopted the second position, citing important non-fuel applications.[327] However, to

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322. *See* U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT, *supra* note 111, at 205.

323. 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381, 10381–82 (Feb. 24, 2022).

324. Final List of Critical Minerals 2018, 83 Fed. Reg. 23295, 23295 (May 18, 2018).

325. *See, e.g.*, Travis Deti, Wyoming Mining Association, Comment Letter on 2021 Draft List of Critical Minerals (Sept. 8, 2021), https://www.regulations.gov/comment/DOI-2021-0013-0995 ("Uranium is distinct from other fuel minerals since it is a metal and uranium minerals that occur in nature are metalliferous minerals. This distinguishes uranium from the excluded fuel minerals.").

326. *See, e.g.*, W. Paul Goranson, enCore Energy Corp., Comment Letter on 2021 Draft List of Critical Minerals (Dec. 9, 2021), https://www.regulations.gov/comment/DOI-2021-0013-1062 ("Uranium has significant non-fuel uses that are specific to national security that USGS did not consider in this review . . . ."); Nima Ashkesboussi, Nuclear Energy Instit., Comment Letter on 2021 Draft List of Critical Minerals (Dec. 9, 2021), https://www.regulations.gov/comment/DOI-2021-0013-1021 ("While uranium does power the nation's nuclear power plants, there are other non-fuel uses for uranium that would satisfy important national security needs.").

327. Final List of Critical Minerals 2018, 83 Fed. Reg. at 23296.

demonstrate criticality, USGS relied on data measuring uranium demand including use as nuclear fuel, citing fuel applications of uranium to demonstrate its essentiality.[328]

Third, the change in administration may explain the shift in opinion. Both Trump administrations have promoted increasing nuclear power generation and developing minerals, including uranium.[329] The Biden administration remained reticent to encourage uranium mining, closing swaths of public lands to entry for such purposes.[330] It is possible that policy sentiments at the Department of the Interior across administrations led to the adoption of differing legal interpretations, which have not been definitively resolved. Following President Trump's declaration of a national energy emergency and opening of public lands to increased mineral development in 2025, the environment appears to once again favor listing uranium to promote development.[331]

USGS reversed course during the list revision in 2021–22 when it declined to evaluate uranium and cited the Mining and Minerals Policy Act of 1970 as justification for its exclusion.[332] The MMPA

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328. It appears that USGS used data presented in the U.S. Energy Information Administration's *2016 Uranium Annual Marketing Report* to evaluate uranium criticality. *See generally* U.S. ENERGY INFO. ADMIN., 2016 URANIUM MARKETING ANNUAL REPORT (2017), https://www.eia.gov/uranium/marketing/archive/umar2016.pdf. However, the report presents information on domestic consumption and sourcing of uranium for nuclear power, not non-fuel uses such as creating medical isotopes. *Id.* Additionally, the methodology report by USGS stated "Uranium also is critical in ensuring a reliable supply of fuel for the 99 nuclear power reactors that supply about 20 percent of U.S. electricity," indicating consideration of fuel uses of uranium in its assessment. *See* FORTIER ET AL., 2018 METHODOLOGY, *supra* note 116, at 14.

329. *See, e.g.*, Exec. Order No. 13972, 86 Fed. Reg. 3727 (Jan. 14, 2021); OFF. OF NUCLEAR ENERGY, *9 Key Takeaways from President Trump's Executive Orders on Nuclear Energy* (Jun. 10, 2025), https://www.energy.gov/ne/articles/9-key-takeaways-president-trumps-executive-orders-nuclear-energy.

330. *See* EARTHJUSTICE, *New National Monument Protects Grand Canyon Region from Uranium Mining* (Aug. 8, 2023), https://earthjustice.org/brief/2023/new-national-monument-protects-grand-canyon-region-from-uranium-mining.

331. *See* Exec. Order No. 14154, 90 Fed. Reg. 8353 (Jan. 29, 2025); Exec. Order No. 14241, 90 Fed. Reg. 13673 (Mar. 25, 2025).

332. 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62199, 62200 (Nov. 9, 2021).

defines "mineral fuels" to expressly include uranium.[333] Even if the MMPA did not apply, USGS stated uranium's status as a "major fuel commodity" in the United States indicated that including uranium would be unlawful given the Energy Act's bar on fuel minerals.[334]

Beyond a purely textual argument, the federal government has long treated fuel (or energy) minerals as distinct from non-fuel minerals.[335] The MMPA, which marked the first modern attempt to create a national minerals policy, excludes uranium as a mineral fuel and exempts it from coverage.[336] More recently, the Energy Act of 2020 legislated on the issue of uranium, but in a different title than the provisions for critical minerals and materials.[337] This does not mean that uranium is unimportant. Rather, it is an acknowledgement that fuel minerals, including uranium, present unique challenges. Designating fuel minerals as critical may divert attention from more difficult to supply non-fuel minerals. Higher demand and established markets for uranium also make government intervention less necessary relative to, for example, byproduct non-fuel minerals.

The 2025 final critical minerals list's designation of uranium may unravel the legal limiting principle on fuel minerals. USGS designated uranium by the pathway not requiring USGS analysis under the Energy Act. USGS cited DOE's recommendation to include uranium for "steel production, energy, and defense" purposes as sufficient for designation.[338] While the Energy Act allows minerals another federal agency finds "strategic and critical to the defense or national security of the United States,"[339] to be listed, exercise of this authority to completely bypass critical mineral criteria may prove to be the exception that swallows the rule. Qualifications for "strategic

333. 30 U.S.C. § 21a.

334. 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381, 10381–82 (Feb. 24, 2025).

335. While uranium is treated as a hardrock mineral under the General Mining Law of 1872, it is in most other respects governed by a separate regulatory regime governing its handling, processing, and distribution in the United States. Its nuclear character makes it somewhat of a special case.

336. 30 U.S.C. § 21a.

337. *Compare* Energy Act of 2020, Pub. L. No. 116-260, div. Z, tit. II, 134 Stat. 1182, 2453-79 *with* Energy Act of 2020, tit. VII, 134 Stat. at 2561-78.

338. 2025 Final List of Critical Minerals, 90 Fed. Reg. 50494, 50495 (Nov. 7, 2025).

339. 30 U.S.C. § 1606(c)(4)(B).

and critical" may originate in the Stock Piling Act but are not defined in the Energy Act of 2020. If, as DOI suggests, any mineral can be listed regardless of critical mineral criteria so long as another agency makes a declaration of mineral as "strategic and critical," the legal bounds of the Energy Act may be meaningless.[340]

2. Copper as Critical Mineral: Practical Bounds

Copper, like uranium, has also been subject to ongoing debate as to whether it should be listed as a critical mineral. In both 2018 and 2022, USGS did not list copper on the critical minerals lists, as both evaluations measured copper below the criticality threshold.[341] Following the latest revision and updates to the methodology, USGS recommended copper for inclusion on the draft critical minerals list.[342] When copper has been left off the list, many of the arguments for including the mineral referenced projections of future demand, especially demand from the clean energy transition.[343] While USGS continues to develop and refine models to project future conditions, USGS largely uses previously recorded data for criticality analysis.

Much like uranium, copper's periodic exclusion has not meant that copper lacks importance or vulnerability. USGS acknowledged that while copper is essential, it was not vulnerable at the times of

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340. *See* 2025 Final List of Critical Minerals, 90 Fed. Reg. at 50496.

341. *See* Final List of Critical Minerals 2018, 83 Fed. Reg. 23295, 23296 (May 18, 2018); 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62199, 62202 (Nov. 9, 2021).

342. 2025 Draft List of Critical Minerals, 90 Fed. Reg. 41591, 41592 (Aug. 26, 2025).

343. *See, e.g.*, John Vittori, Web Comments on Draft List of Critical Minerals (Feb. 16, 2018), https://www.regulations.gov/comment/DOI-2018-0001-0004; David Marin, Web Comments on Draft List of Critical Minerals (Feb. 16, 2018), https://www.regulations.gov/comment/DOI-2018-0001-0007; Rio Tinto, Comment Letter on 2021 Draft List of Critical Minerals (Dec. 9, 2021), https://www.regulations.gov/comment/DOI-2021-0013-1039; Dennis Bartow, Greentech Minerals Advisory Grp., Comment Letter on 2021 Draft List of Critical Minerals (Dec. 9, 2021), https://www.regulations.gov/comment/DOI-2021-0013-1059; Claire Diver, Trafigura, Comment Letter on 2021 Draft List of Critical Minerals (Dec. 9, 2021), https://www.regulations.gov/comment/DOI-2021-0013-1063; Martin Durbin, U.S. Chamber of Com., Comment Letter on 2021 Draft List of Critical Minerals (Dec. 9, 2021), https://www.regulations.gov/comment/DOI-2021-0013-1066.

evaluation to be determined critical.[344] Meanwhile, the projected importance and resulting constraints of copper from its use in energy technologies are the precise reasons DOE, testing models to project importance to energy, listed copper as a critical material.[345]

Copper's repeat exclusion illustrates a few points. First, the critical minerals list cannot include all important minerals. This is by design. By emphasizing the minerals that are *most* critical, the list prioritizes commodities that may otherwise be ignored until a supply shortfall. Second, when copper is not designated as a critical mineral, it may be addressed elsewhere. For example, copper's projected importance to the energy sector is, in part, justification for DOE's critical materials list. Including copper on the DOE critical materials list enables energy-specific policy and programs to address copper's criticality in that context. Finally, copper may *become* critical, as evidenced by inclusion in the 2025 list.[346] In both 2018 and 2021, copper was quite near the criticality threshold but was not listed, largely due to higher levels of domestic production relative to other minerals. The benefit of periodic updates to the critical mineral list is that, when real-world conditions increase copper's risk, it may be listed. Ultimately, determination of copper's criticality should be based in science, reflecting risk to the U.S. and enabling the federal government to make informed decisions.

The future of copper demand also remains greatly in flux in light of changing presidential administrations and subsequent shifts in energy policy. In 2025, USGS found via its methodology that copper warranted a critical designation, largely due to the economic importance of *refined* copper to the United States.[347] Since the start of the second Trump administration, the Republican Party has changed tack on its approach to energy, moving from an "all of the above" approach to energy policy that promotes "traditional" hydrocarbon-based energy generation alongside renewable energy, to an approach de-emphasizing clean energy, particularly wind and

344. 2021 Draft List of Critical Minerals, 86 Fed. Reg. at 62202.

345. *See* U.S. DEP'T OF ENERGY, CRITICAL MATERIALS ASSESSMENT, *supra* note 111, at xi, 148.

346. Final 2025 List of Critical Minerals, 90 Fed. Reg. 50494 (Nov. 7, 2025).

347. *See* NASSAR ET AL., 2025 METHODOLOGY, *supra* note 152, at 17.

solar.[348] Much of the growing demand for copper is linked to the clean energy transition, meaning slowdown or obstruction of new wind, solar, and transmission projects in the United States may alter copper criticality.[349] Further, the current administration has issued two EOs—EO 14,156, *Declaring a National Energy Emergency*, and EO 14,241, *Immediate Measures to Increase Mineral Production*—that, if fully implemented, could increase domestic copper production and further cut against listing in the future.[350]

It is likely that some minerals such as copper will alternate between inclusion and exclusion on the critical minerals list. This is not a flaw, but a design element reflecting how real-world conditions affect mineral eligibility under the Energy Act of 2020 criteria.

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A few recommendations can help reduce overextending the scope of the term "critical mineral." First, the text of the Energy Act of 2020 limits the scope of consideration through its definition of "critical mineral" and criteria for inclusion. Adherence to the letter and spirit of the Energy Act by USGS, DOI, and other executive agencies when developing or engaging with the critical minerals list will police the list's bounds. Should the alternative pathway be treated as a way to ignore statutory criteria, Congress should clearly delimit the meaning of "strategic and critical" by amending the Energy Act of 2020.

Second, USGS's objective, scientific approach to calculating criticality should also be promoted as defining criticality. USGS's methodology provides that critical mineral designations reflect empirical evaluation, taking guesswork out of determining criticality. USGS and other parties may then use the critical minerals list with confidence, responding to supply risk proactively.

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348. *See* Brad Plumer & Lisa Friedman, *Suddenly, the Trump Administration Tightens the Vice on Wind Farms*, N.Y. TIMES (Aug. 7, 2025), https://www.nytimes.com/2025/08/07/climate/trump-wind-solar-power-projects.html.

349. *See* IEA, OUTLOOK 2025, *supra* note 15, at 108. A more uncertain economic environment following announcement of tariffs and investigations into copper is also likely to complicate an evaluation of copper. *Id.* at 103–04.

350. *See* Exec. Order No. 14156, 90 Fed. Reg. 8433 (Jan. 29, 2025); Exec. Order No. 14241, 90 Fed. Reg. 13673 (Mar. 25, 2025).

Third, parties creating priority designations of minerals should clearly explain their purpose, including by providing criteria for a mineral's priority designation. Discussions of DOE critical materials and DOD strategic materials usually include statements to differentiate those designations from the list of critical minerals created by USGS. However, clearly distinguishing between priority lists requires more than federal discipline, and includes academia, policy groups, news media, and the public. Where possible, language use should be specific. Commentators should reserve the term "critical minerals" for minerals designated under the Energy Act of 2020 and use terms like "priority minerals" to apply to special designations, such as those in EO 14,241.

CONCLUSION

Technological advancements and geologic realities have produced a race for critical minerals. This race is producing relationship-building between nations, shaping the conversation about climate change, and driving strategic planning for defense, industry, and energy. It also informs decisions at a granular level, including whether research into the use of alternative components in popular consumer electronics can reduce mineral demand, or whether opening a new mineral processing facility can increase supply. Regardless of the level of concern, the importance of critical minerals makes an effective and organized policy response necessary. As time passes, the likelihood of the U.S. ceding advantages to rivals or permitting risks to grow increases. In short, to tend to economic and national security, the U.S. must get critical minerals policy right.

The critical minerals list ensures that the U.S. leads with its best foot forward. The list provides a tool for the U.S. to scope the problem and organize a response. As a tool, the list is multi-functional, evaluating information to determine criticality, informing the government and broader public on supply risk, prioritizing minerals with the greatest risk, and providing a shared foundation to coordinate critical minerals policy. At base, the critical minerals list ensures that the government does not face the mineral policy challenge blindly. With complex challenges and the surfeit of steps

ahead, the usefulness of the critical minerals list in reducing supply risk must not be taken lightly.

However, perhaps because of the scale of the problem, the topic of critical minerals is difficult to access. Consider the technical nature of creating the critical minerals list and this fact becomes even more so. Confusion makes it easy to become overwhelmed, permitting a slow creep of politicization to occur in designating critical minerals. Lack of understanding about list creation and purposes, use of "critical minerals" as a catch-all term, and efforts to influence or create alternative designations do more than threaten the critical minerals list. Rather, they also threaten to divert valuable time, political capital, and millions of dollars in resources away from the greatest mineral supply risks to those selected to favor changing political priorities. If between two truly equal classes of minerals, this would not be a problem. Given the global race for critical minerals, however, the United States cannot afford to dismiss the urgency posed by critical minerals.

This Article offers a few recommendations. First, government actors should clearly define the scope and purpose of the critical minerals list and discuss its use in decision-making. Second, the government should treat critical minerals designation and policy responding to designations as discrete. The former process should maintain its scientific integrity, complying with the Energy Act of 2020 and empirically assess mineral criticality. The latter process should then use the information provided by evaluation to inform political decision-making. Finally, the critical minerals list developed by USGS should remain distinct from other priority lists. For the government, this involves maintaining separate lists for separate goals. The government should clearly articulate what the goals of each list are and should be sure to contrast the critical minerals list by its broad, nation- and sector-wide focus. For academics, policymakers, and commentators, use of the term "critical mineral" should clearly refer to minerals designated by USGS according to the Energy Act of 2020. This reduces confusion and increases understanding of critical minerals as commodities with quantifiable risks and characteristics established by law. Though individual minerals on the list may change, what the list of critical minerals represents remains constant.

National minerals policy, including that addressing critical minerals, is broad. The critical minerals list enables policymakers to respond more efficiently than would be possible without the list. As such, its role is important not only to understand, but to protect as an integral piece in the effort to secure mineral supply chains.