Bipartisan Policy Center

Resilient Resource Reserve

A PLAN TO CATALYZE THE AMERICAN CRITICAL MINERAL PROCESSING INDUSTRY

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DISCLAIMER

The development of this report by the Bipartisan Policy Center is the result of a broad workshop dialogue and extensive engagement with numerous stakeholders and experts. Signatories should be understood to support the goals and direction of the recommendations in this report but not necessarily every individual detail.

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Introduction

The critical mineral supply chains of 2024 are fragile, volatile, and threaten both American national security and the energy transition. While sources of raw ores containing critical minerals are distributed globally, the processing phase that transforms these ores into purified forms of the critical minerals required by modern technologies is highly geographically concentrated, with few exceptions. China dominates this crucial segment, hosting 57% of lithium, 77% of cobalt, 92% of rare earth elements, and 91% of natural graphite processing capacities within its borders.[1] Beyond domestic projects, China further solidifies its market concentration by investing in projects abroad. This concentration is expected to grow as Chinese companies doubled their investments in the critical mineral sector in 2022.[2] Consequently, the United States depends on China as the primary supplier of 24 of the 50 critical minerals listed by the U.S. Geological Survey (USGS).[3] Risks created by the increasing monopolization of the mineral processing sector are compounded by China's demonstrated willingness to leverage its market power and manipulate prices—most recently through export restrictions on gallium, germanium, graphite, and the technologies used to process many critical minerals including rare earth elements.[4]

SUPPORTING ORGANIZATIONS

- American Critical Minerals Association
- The Breakthrough Institute
- Draslovka
- Employ America
- Federation of American Scientists
- Nyrstar
- 6K

As America deploys more energy and defense technologies that rely on critical minerals, diversification of mineral processing supply chains is necessary, starting with building domestic capacity. Both Democrats and Republicans recognize the need for U.S.-based mineral processing projects. Congress has worked across the aisle to bolster the U.S. critical mineral industry in recent legislation, including the Energy Act of 2020,[5] the Bipartisan Infrastructure Law,[6] the CHIPS and Science Act,[7] and the fiscal year 2024 National Defense Authorization Act.[8] These provisions include vital support for critical mineral research and development, workforce development, and geologic mapping.

Yet, recent legislation does not address one of the primary barriers preventing substantial private sector investment in the American critical mineral processing industry: extreme price volatility and price risk. Dramatic swings in critical mineral prices threaten the economic viability of U.S. projects. Recognizing this challenge, in December 2023 the House Select Committee on the Strategic Competition Between the United States and the Chinese Communist Party recommended that Congress "authorize and appropriate a critical mineral Resilient Resource Reserve to insulate American producers from price volatility and PRC weaponization of its dominance in critical mineral supply chains."[9]

The remainder of this report addresses the pricing challenges facing the U.S. critical mineral sector and makes recommendations on the implementation of price support tools to mitigate price risk and volatility for domestic critical mineral projects as proposed by the House Select Committee.

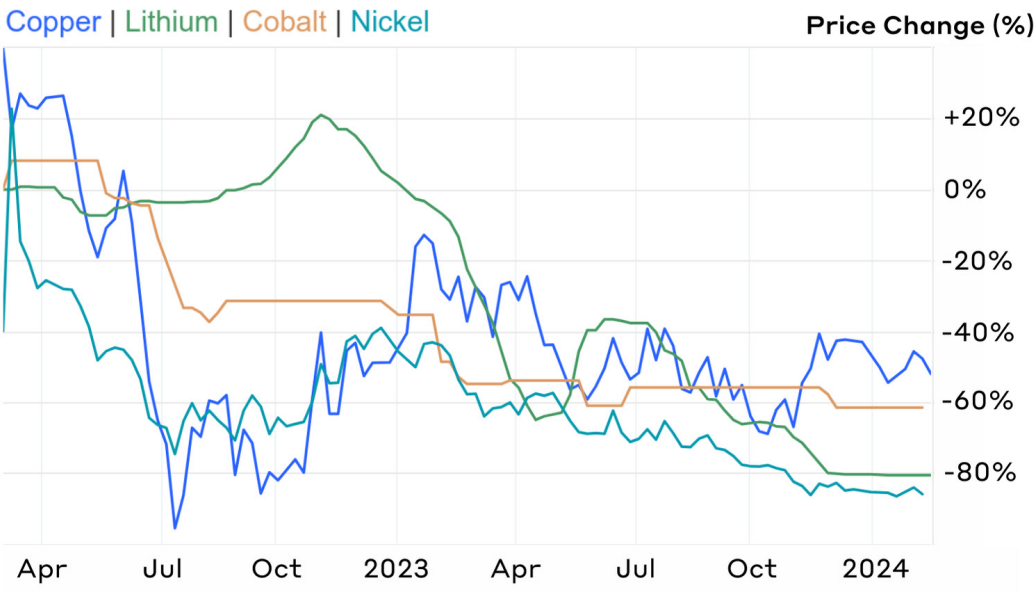
This report proposes a wholly owned government corporation, the United States Reserve of Critical-Mineral Commodities (U.S. ROCC), as a means to demonstrate the implementation of a comprehensive critical minerals support entity. The U.S. ROCC utilizes a toolbox of financial support mechanisms to de-risk domestic critical mineral projects and increase investor confidence in the sector. The U.S. ROCC could be set up as a new federal entity or its mission and tools could be assigned to an existing federal entity tasked to play this role.

These recommendations were informed by insights shared at a private Bipartisan Policy Center workshop on this topic, which included experts from industry, NGOs, and federal agencies. The organizations listed have endorsed the goals and direction of recommendations in this report but not necessarily individual details. BPC thanks these stakeholders for their insights and contributions.

Price Risk and Volatility Deters U.S. Investment

Due to the assertion of market power by dominant producers, opaque price signals, and a lack of alternative sourcing, critical mineral markets are characterized by dramatic price swings that inherently make investments in U.S. projects risky. Since all-time highs in early 2022, lithium carbonate prices have fallen from about $84,000/ton to just $13,400/ton, an 84% decrease. In the same time period, cobalt prices fell by 64%, nickel prices fell by 67%, and copper prices fell by 22%.[10] Other critical mineral markets, such as those for rare earth elements and graphite, are even less diversified and more opaque, due to not being listed for trading on public exchanges. As a result, price signals for these minerals are not trustworthy indicators of supply and demand creating even greater risk for domestic projects and investors as they tread into uncertain waters in markets dominated by bilateral transactions.

Figure 1: Price Volatility has Rocked Mineral Markets



Some experts attribute the extreme price volatility to Chinese producers flooding the market with low-priced minerals, aiming to undermine emerging projects and consolidate their market share in an effort to achieve geopolitical and strategic priorities.[11] Supporters of this viewpoint highlight China's aggressive growth in lithium ventures with higher operating costs, which,

despite boosting supply, are presumably not sustainable financially.[12] This strategy by China is not unique to the critical minerals industry. From PV solar panels[13] to batteries,[14] over the past two decades, China has flooded global markets with cheap goods to secure market dominance over the sector. While Chinese subsidies can result in lower-priced products for American consumers, they also destabilize markets, increase risk of supply chain disruption, increase carbon intensity of products, and harm U.S. manufacturing.

Regardless of the immediate cause, the solution is a diversified market of established producers who can respond to price signals and stabilize supply. Diversification reduces the ability of any single actor to control critical economic inputs, a risk that was illustrated clearly through Russia's control over 45-50% of European natural gas supplies prior to the invasion of Ukraine.[15] Following the invasion, Russia weaponized its gas exports by suspending deliveries to some EU member states. As a result, the EU diversified its sources, reducing Russian gas imports to 15% of total EU gas imports by 2023.[16] The rapid shift in sourcing caused average EU industrial energy prices to rise by 127%, and consumer energy prices to increase by 63%.[17]

If domestic critical mineral projects cannot sell their product at a price that yields a viable return on investment, they will struggle to obtain financing and will have no rationale to operate commercially. For existing projects, unexpected price drops can leave committed investors in the red and potential investors on the sidelines. This has played out since the second half of 2022, with low prices forcing many promising domestic critical mineral projects to scale back or shutter.[18] Furthermore, low prices are troublesome for U.S. projects that have higher production costs than many foreign counterparts, due to stricter environmental[19] and labor practices,[20] as well as more expensive input costs in terms of feedstock procurement. The issue is twofold: U.S. projects are at the higher end of the cost curve, and market manipulation creates artificially low prices that force more sustainable and reliable projects offline. Intervention can be justified by considering both the national security benefits provided by American projects and the fact that current market prices are being manipulated to undermine competition.

Price risk and volatility are often not alleviated by government support programs as currently implemented in the United States. For example, federal loan programs aimed at reducing borrowing costs for projects frequently mandate securing long-term offtake agreements to reduce the risk of the financing. However, securing long-term offtakes benchmarked to unfavorable market prices is not optimal for companies. This difficult operating environment compounds the disadvantages for U.S. projects caused by these volatile and manipulated pricing dynamics. The resulting increased risk profiles associated with U.S. projects cause investors to look elsewhere or demand significantly higher returns for their investment, further decreasing the economic feasibility of domestic projects. Foreign producers, particularly those that are much more mature and driven by national security interests like

those within China's critical mineral sector, tolerate and even thrive on lower prices. This ensures they maintain market dominance and discourage new competitors.[21]

Addressing these challenges necessitates price support to encourage private investment in the U.S. sector. For a federal strategy to catalyze a commercial industry in the U.S., it must go beyond existing tools and programs that simply stockpile critical minerals for emergency scenarios.

Think Bolder Than a Stockpile

In response to America's extreme reliance on China for processed critical minerals, Congress and the Pentagon have scaled-up federal stockpiling.[22] While stockpiling — defined as the storage of minerals to be used only during emergencies — can play a role against supply disruptions, it doesn't tackle the core issue: dependence on limited and sometimes adversarial sources. This approach does little to stimulate the market or encourage the development of alternative sources, offering minimal, if any, catalytic impact towards diversifying supply chains and enhancing market resilience. A stockpile could pledge to procure solely from domestic sources, establishing some minimally defined demand for these projects, but one-off procurement contracts are often not enough to provide projects with an investible business case. Moreover, by merely buying and storing these minerals, stockpiles remove supply from the market, potentially destabilizing it further. Lastly, stockpiles require active management, dynamically responding to evolving technologies and their requirement for ever-changing mineral inputs. Minerals stockpiled today will likely be insufficient for future needs.

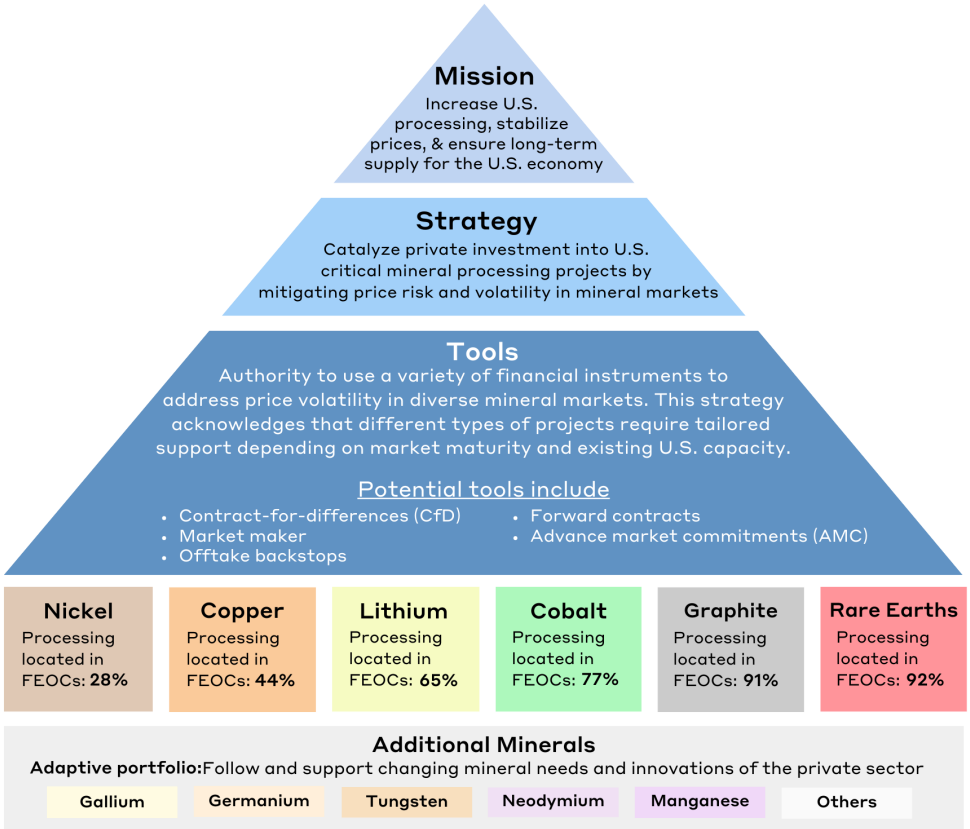
SECURING AMERICA'S CRITICAL MINERAL SUPPLY CHAINS REQUIRES MOVING BEYOND STOCKPILING FOR EMERGENCIES. A MORE PROACTIVE AND DYNAMIC APPROACH IS NEEDED.

This report explores design decisions for a resilient resource reserve that would play this role by supporting U.S. mineral processing projects that acquire domestic and reliably sourced feedstock.

Designing the United States Reserve of Critical-Mineral Commodities (U.S. ROCC)

This report outlines the establishment of a wholly owned government corporation, the United States Reserve of Critical-Mineral Commodities (U.S. ROCC), as a means to demonstrate the implementation of a comprehensive critical minerals support entity. The mission of the U.S. ROCC would be to increase domestic mineral processing capacity, stabilize prices, and ensure long-term adequate supplies for the U.S. economy. To accomplish this, the entity will need to be a proactive and nimble market participant, equipped with flexible financing tools to overcome pricing challenges in diverse mineral markets and encourage private-sector investment in the industry. The U.S. ROCC could be set up as a new federal entity or its mission and tools could be assigned to an existing federal entity tasked to play this role.

Figure 2: U.S. Reserve of Critical-Mineral Commodities (U.S. ROCC)
A Wholly Owned Government Corporation to Secure American Supply Chains



- Foreign Entity of Concern (FEOC) consists of China, Russia, North Korea, and Iran. The percentages provided (IEA) include FEOCs only if they are a top three global producer, potentially understating the share of global processing that is controlled by these countries.[23]
- Graphite refers to natural graphite and does not include synthetic graphite.

STRUCTURE

The U.S. ROCC would be structured as a wholly owned government corporation, similar to the Development Finance Corporation, Export-Import Bank, and Commodity Credit Corporation.[24] This organization is particularly fitting for entities like the proposed U.S. ROCC, which have a commercial focus and require significant private sector interaction. Compared to conventional government programs, this structure offers advantages for conducting numerous business-type transactions. It provides the flexibility needed for contracting with private entities and utilizing financial mechanisms typically not utilized by government programs.

Moreover, the U.S. ROCC's operations will be influenced by the fluctuating market conditions, leading to unpredictable annual expenditures. This variability renders traditional appropriations an inefficient funding method. A business-type budget approach, as used by other wholly owned government corporations, would be more suitable. This design would allow U.S. ROCC to deploy financial tools as needed to bolster the U.S. critical mineral sector and provide investors with confidence that the entity will be able to fulfill obligations. Additionally, a business-type budget also allows the entity to generate revenue to offset expenditures, a feature baked into many of the tools suggested for the U.S. ROCC.

The advantages of this structure will become clear in the following sections on how the entity should be designed and the type of tools it should utilize.

MISSION

The U.S. ROCC's mission is to serve as the federal government's primary instrument for diversifying and reducing risks in critical mineral supply chains. It aims to 1) increase domestic processing capacity and critical mineral supply chain security and 2) stabilize critical mineral prices.[25] This mission requires a comprehensive approach focusing on enhancing the entire U.S. processing sector rather than just projects for the narrow needs of the federal government and military. It seeks to proactively establish a competitive critical mineral processing sector that can meet U.S. public and private sector needs.

STRATEGY

Addressing the price risk and volatility is crucial for unlocking private sector capital, as these factors often deter investment in domestic critical mineral processing projects due to their unpredictability and the high risk of financial loss. The U.S. ROCC's strategy would employ flexible financial support to mitigate these risks, making domestic projects more attractive to private investors. By prioritizing transactions between U.S. producers and industry

offtakers, the strategy aims to create sustainable and competitive private markets.

Flexible financing authority would allow the U.S. ROCC to address the challenges unique to various mineral markets and act proactively to incentivize new projects that would mitigate supply disruption risks. Different tools are likely needed for different domestic markets, from those that are relatively mature with many producers, to those just getting off the ground, to those that currently do not exist. When implementing these tools, the U.S. ROCC should ensure that the support incentivizes economically competitive and efficient projects rather than propping up high-cost producers that require forever subsidies. The entity should also utilize a portfolio approach to support varied projects in each mineral market, including those that utilize innovative technologies and are capable of processing mining byproducts or recycling waste.

TOOLS

Utilizing the advantages of a wholly owned government corporation structure, the U.S. ROCC will deploy a range of financial instruments to support its strategy, each designed to address unique pricing challenges in critical mineral markets. Tools should be deployed to drive investment in the sector while minimizing the costs associated with the entity's support. Mineral markets that are more diversified with existing domestic capacity likely require less support than those that are highly concentrated and exposed to price manipulation. The tools utilized should include opportunities for the entity to generate revenue when prices are high, either through reimbursement by supported projects or by reselling procured products.

These tools, with examples outlined below, are not one-size-fits-all but are tailored based on the maturity and specific needs of each mineral market. A more in-depth summary of these tools and how they work can be found in the Bipartisan Policy Center's recent report, *Kickstart Markets for Clean Energy Technologies | A Newbie's Guide to Demand-Side Support*.[26]

Potential tools include:

Tool	Description	Best suited for...	Existing Examples
Contract-for-Differences (CfD)	Compensates producers if market prices fall below an agreed-upon price floor while requiring producers to reimburse the entity if market prices rise above an agreed upon price ceiling. CfDs could be designed to average prices over different time horizons to provide more certainty for projects.	Markets with high demand and the market price could exceed a set price ceiling	USDA utilizes a similar tool for agricultural commodities, but it does not include a price ceiling. CfDs are used by the UK for offshore wind and clean hydrogen, as discussed later.
Market Maker	Serves as an intermediary, purchasing minerals from producers on long-term agreements and selling to customers in short-term transactions. The reserve takes on any profit or loss from price differences between procurement and resale. Could utilize double-sided auctions to minimize support and foster competition.	Relatively mature markets with many producers and customers	Not currently utilized by the U.S. The EU is utilizing the market maker approach with double-side auctions for clean hydrogen, as discussed later.
Forward Contracts	Commits to buying a certain amount of minerals at a set price in the future, allowing producers to hedge against price volatility.	Emerging markets with demand and price uncertainty and existing but volatile markets with price uncertainty	The Strategic Petroleum Reserve uses forward, fixed-price contracts, allowing producers with these contracts to ignore market price volatility between investment and delivery, as discussed later.
Offtake Backstops	Ensures the U.S. ROCC will purchase minerals at a minimum price if producers cannot find a market, guaranteeing a buyer of last resort.	Emerging and nascent markets where demand and price are uncertain	The USDA previously utilized offtake backstops for dairy products to support the industry. If the price of the product fell below a set reference price, USDA would purchase and store the product to provide producers with price certainty.
Advance Market Commitments (AMC)	Provides offtake agreements or backstops with a guaranteed price before production begins, encouraging the development of supply chains where the U.S. lacks capacity.	Yet-to-emerge markets where demand signals are needed to stimulate initial development	Operation Warp Speed accelerated the creation of COVID-19 vaccines by using an AMC to signal to pharmaceutical companies that there is about $18 billion worth of demand if vaccines are developed and manufactured.

As a domestic mineral market becomes more mature and self-sustaining, financial support should decrease or change forms to a less interventionist tool. For example, if the U.S. has no domestic capacity for a specific mineral at risk of disruption, an Advance Market Commitment could help kickstart new projects. As more projects come online and the market develops, CfDs could provide price certainty. As the market matures, CfDs could lower their price floor and raise their price ceiling, decreasing support. If a market becomes diversified and the risk of supply disruption dissipates, support should no longer be provided. Future research can help identify which tools are best suited for which mineral markets and the advantages and drawbacks of using each in different scenarios.

COVERED MINERALS

This report illustrates the structure of the U.S. ROCC, highlighting various minerals that *could* be supported by the entity. It is designed to demonstrate the focus on different mineral markets, which have varying needs, rather than to prescribe which minerals should be supported by the entity. Instead, mineral eligibility should be tied to existing federal critical mineral lists. This helps prevent further fragmentation of existing federal mineral supply chain programs and helps politically insulate the U.S. ROCC from controversy that may ensue if a specific mineral is not eligible for support. Potential lists include the USGS's List of Critical Minerals,[27] DOE's Critical Materials List,[28] and DOD's Materials of Interest.[29] The existence of separate federal lists with their own unique considerations, such as USGS not including copper, has drawn criticism from stakeholders seeking a unified federal strategy across agencies. For this reason, it may be best to take a comprehensive approach and deem minerals that appear on any three of these lists as eligible for U.S. ROCC support.

However, eligibility does not entitle a specific mineral market to support. The U.S ROCC maintains flexibility to adapt the level of support for specific mineral markets based on changing market conditions, security concerns, and the needs of technology. As the entity successfully diversifies supply chains, continued support could prove wasteful. Instead, the entity should have an adaptive portfolio that supports domestic mineral markets that are particularly concentrated by dominant producers, exposed to global price volatility, and in demand by the U.S. economy. As mineral markets mature, supply chains become more secure, and the needs of U.S. industry change, the U.S. ROCC should shift both the types of support that is provided for specific minerals and the minerals that are covered. If industry begins utilizing a mineral that is not currently in high demand but is at risk of disruption, the U.S. ROCC should increase its level or type of support. If a mineral supply chain becomes secure and is no longer at risk of disruption, the U.S. ROCC may remove that mineral from its portfolio.

PROJECT ELIGIBILITY

Types of Projects

Domestic critical mineral projects that refine and process raw materials into a purified state suitable for first-use applications are eligible for support. Eligibility should extend to projects that utilize feedstock from non-traditional sources, such as recycling and mine tailings projects. Projects receiving support from other government programs, such as the DOE Loan Programs Office (LPO), DOE Office of Manufacturing and Energy Supply Chains, or Ex-Im, should still be eligible for U.S. ROCC support. Further, U.S. ROCC support should not make a project ineligible for other government support programs, including LPO.

DEFINING "PROCESSING" PROJECT

Facilities that undertake the operations required to transform raw mineral or waste feedstock, including but not limited to ores, brines, or waste streams, into a refined state, achieving the necessary purity standards for use in advanced manufacturing processes. These projects encompass the full scope of processing activities needed to obtain a concentrated form of the mineral that meets industry-specific requirements.

To qualify for support, producers should enroll and have the flexibility to select support on a mineral-by-mineral basis. While the effort to diversify critical mineral processing supply chains should extend to U.S. trade partners, the U.S. federal government cannot shoulder the cost of price support for the foreign projects, which are not subject to U.S. regulatory oversight.

Ownership

Eligibility should extend to domestic mineral processing projects excluding those that are owned by, controlled by, or subject to the jurisdiction of a foreign entity of concern as defined by DOE's guidance.[30] This requirement ensures that U.S. ROCC does not merely diversify processing capacity geographically while maintaining the current national security and monopolistic concerns of critical mineral supply chains. Bolstering national security and marketplace competitiveness depends on diverse and reliable project ownership.

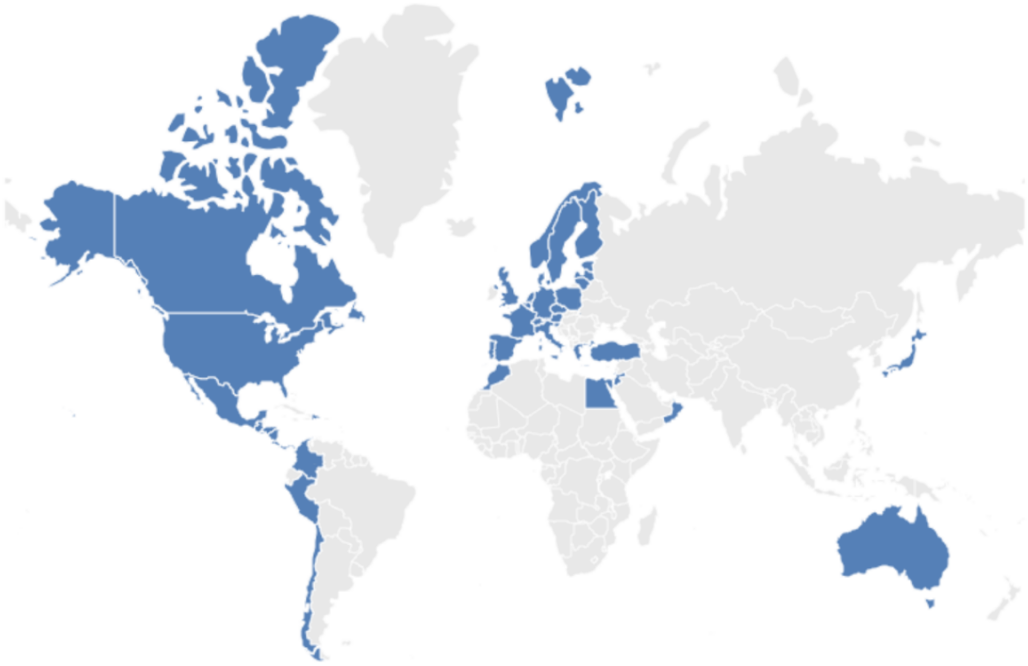
Restrictions on Feedstock Sourcing

Securing U.S. critical mineral supply chains requires considering where feedstock is sourced from as well as where the minerals are processed. Some processing projects are vertically integrated with the mineral extraction at the same site. But others need to source raw minerals from mining projects across the globe. If the source of raw minerals is owned by, controlled by, or subject to the jurisdiction of a foreign entity of concern, supply chain risks may persist even with expanded domestic processing capacity.

Processing projects should qualify for U.S. ROCC support only if they source their feedstock from reliable sources, with priority given to processing projects that acquire feedstock from domestic sources. If a processing project sources feedstock from multiple sources, only the portion that is sourced from reliable sources should qualify for support. This requirement allows the U.S. ROCC's support to trickle up the supply chain by incentivizing processing projects to pay a premium for domestic and reliably acquired feedstock in order to receive price support. From the feedstock project's point of view, they will now have an offtaker that values the national security, environmental, and labor benefits of their project rather than seeking the cheapest feedstock available in global markets. The result is a demand-pull for both domestic processing projects and reliable feedstock projects.

Recent legislation has attempted to define "reliable sources" but has left out major U.S. allies and trade partners. A potential definition could be facilities owned by, controlled by, or subject to the jurisdiction of any country with which the United States has a free trade agreement in effect or are deemed reliable sources as defined by the FY24 National Defense Authorization Act.[31] It is important that the definition of reliable sources is continuously updated to reflect global developments, but this analysis is better suited for programs with national security expertise rather than at the U.S. ROCC. Eligible countries under this definition can be seen in the figure below. This definition encompasses a wide swath of the U.S.'s strongest partners. These countries, particularly Australia and Chile, control significant reserves of lithium, copper, cobalt, nickel, and rare earth elements via a recent discovery by Norway.[32] Additionally, extraterritorial feedstock sources, particularly those acquired through deep sea extraction, could qualify as being reliably sourced if the extraction company is not owned by, controlled by, or subject to the jurisdiction of an FEOC. With U.S. ROCC support, these feedstock sources will now have another pathway to market that does not go through a FEOC.

Figure 3: Processing Projects would be Eligible for U.S. ROCC Support if they Acquire Feedstock from these Reliable Sources



Australia	Chile	Greece	Luxembourg	Peru	Turkey
Austria	Colombia	Guatemala	Mexico	Poland	United Kingdom
Bahrain	Costa Rica	Honduras	Morocco	Portugal	United States
Belgium	Czech Republic	Israel	Netherlands	Singapore	
Canada	Denmark	Italy	Nicaragua	Slovenia	
Egypt	Dominican Republic	Japan	Norway	Spain	
El Salvador	Estonia	Jordan	Oman	Sweden	
Finland	France	Korea	Panama	Switzerland	

This definition will also leave vast amounts of critical mineral feedstock ineligible. The Democratic Republic of the Congo's substantial cobalt reserves and Brazilian nickel reserves would not be eligible. 64% of graphite and 60% of rare earth elements are extracted in China, making these feedstock sources also ineligible. With these sources deprioritized, significant market share will open up for reliable projects. However, in instances where reliable feedstock sourcing for certain minerals is not feasible, national security waivers could be issued to allow domestic processing projects to still be eligible for support. These waivers should be reserved for extreme cases in which physical mineral reserves are constrained to certain projects or countries rather than instances where reliable sources are available but output needs to be scaled up. A waiver should not be provided if it would disincentivize reliable feedstock development.

OVERSIGHT

The U.S. ROCC should be governed by an independent, bipartisan board of directors that oversees and advises the entity to ensure mission direction and accountability to Congress. This type of oversight structure governs the Development Finance Corporation (DFC)[33] and the recently established Foundation for Energy Security and Innovation (FESI),[34] and was recommended by BPC's American Energy Innovation Council in its 2022 report, *Scaling Innovation*.[35] Candidates for the board should be bipartisan and can be selected from nominations from Congressional leadership, as was done for DFC, or by contracting with a reputable third party, such as the National Academies, as was done for FESI.

Effective congressional oversight is vital to maintain bipartisan support and legitimacy, which in turn increases private sector confidence that the entity's support will be sustained long-term. The board should steer decisions at the heart of the program, including national security waivers and changes in the type of support provided for each mineral market.

EXPERTISE

Flexible Hiring Authority

An advantage of many wholly owned government corporations is flexible hiring authority and the ability to work outside traditional Office of Personnel Management pay schedules. Implementing complex financing mechanisms, understanding the conditions of mineral markets, and maximizing the catalytic effect of support requires varied and deep expertise. The U.S. ROCC will need flexible hiring authority to employ individuals with backgrounds in commodity markets, project finance, and trade. This authority is crucial to hire private sector commercialization and finance expertise that typically does not exist within the federal government.[36] Flexible hiring authority has also played a crucial role at DOE's ARPA-E, the CHIPS program, and recent DOE commercialization efforts.

Interagency Coordination

To increase the effectiveness and efficiency of U.S. ROCC support, the entity should incorporate interagency coordination between relevant critical mineral efforts across the federal government. These efforts include the USGS's Earth MRI initiative to map existing U.S. mineral reserves, DOE's supply chain programs, the Department of Defense's (DOD) procurement and supply chain security strategy programs, the Defense Advanced Research Projects Agency's (DARPA) OPEN program to increase critical material price transparency, the Department of State's Mineral Security Partnerships, and the United States Trade Representative's (USTR) critical mineral trade agreements. These programs

bring deep commodity, mining, supply chain, and national security expertise that the U.S. ROCC can utilize to increase effectiveness and efficiency. The U.S ROCC should take a bird's-eye view of federal critical mineral investments across agencies so that it can target follow-on support needed for market development. Additionally, this effort could kickstart a more unified federal approach to diversifying critical mineral supply chains. The current lack of coordination and inconsistency between federal efforts is a primary concern of companies in the sector.

FUNDING

Initial Appropriation

To stand up the entity, the U.S. ROCC will need an initial appropriation of $50 million. The initial appropriation allows the U.S. ROCC to hire needed expertise and invest in the infrastructure necessary to conduct market analysis, implement programs, and deploy varied financial mechanisms. Along with the initial appropriation, the entity will need access to capital that will be utilized to deploy financial support.

Borrowing Authority and Annual Appropriations

To provide financial support, the U.S. ROCC will need permanent annual borrowing authority from the U.S. Treasury, which is replenished by annual appropriations equal to the amount of the previous year's net realized loss. Backing U.S. ROCC support with the full faith and credit of the U.S. government is important to maintain long-term private sector confidence in the entity's tools and allow the entity to adapt its support to changing market conditions. This funding approach is utilized by the USDA's Commodity Credit Corporation (CCC), which provides price support for U.S. agricultural commodities. CCC maintains permanent annual borrowing authority of $30 billion from the U.S. Treasury, which is replenished by annual appropriations equal to the amount of the previous year's net realized loss.[37]

We recommend an initial level of $1 billion in annual borrowing authority for the U.S. ROCC. This recommendation is based on input from stakeholders regarding current fiscal constraints in Congress, rather than an economic analysis of the support needed to accomplish the U.S. ROCC's mission. The $1 billion figure is comparable to recent demand-side programs, such as the DOE's demand support program for hydrogen hubs, and should be seen as a starting point for the U.S. ROCC. Although more analysis is needed to determine the precise funding level, the U.S. ROCC will likely need expanded borrowing authority in the future to mitigate risks in the U.S. critical mineral sector and secure supply chains. Follow-up analysis can help uncover the cost of demand-side tools, the support needed for specific critical mineral markets, and the ability of the program to generate revenue. The proposed pilot program

discussed later in this report can help address this gap by deploying tools on a limited scale and conducting economic analysis on the cost and impacts.

Revenue Sources

In addition to borrowing authority, the U.S. ROCC should be authorized to implement a revolving fund that allows the entity to reinvest any returns into new projects, similar to the authority that was recently proposed for the Development Finance Corporation.[38] Utilizing the revolving fund, the U.S. ROCC should consider approaches that establish sources of revenue rather than relying solely on annual appropriations. This approach was recommended by the House Select Committee on the Strategic Competition Between the United States and the Chinese Communist Party, which stated "The reserve would be used to sustain the price of a critical mineral when it dips below a certain threshold and replenished via contribution from companies when the price of the mineral is significantly higher."[39] This recommendation can be accomplished utilizing tools, such as contract-for-differences and market maker that bring in revenue when the market price is higher than a reference or procurement price. If market conditions cooperate, utilizing these tools would be akin to an insurance fund where projects pay in when prices are high to receive assurance they will not be on the hook if prices drop.

However, the U.S. ROCC should not have a statutory mandate for revenue to exceed costs. While the entity may have opportunities to "buy low and sell high," it may not be possible for the entity to both accomplish its mission of supporting domestic capacity and maintain a balanced budget on a consistent basis. Continuing appropriations may be unavoidable if prices remain below levels that would provide a viable return on investment, either for specific markets or across all mineral markets, as was the case throughout 2023. The greater the geopolitical need for support, the higher likelihood that the program will operate at a loss in the near-term.

Additional Design Decisions

WHERE SHOULD THE U.S. ROCC BE HOUSED?

Implementation of the U.S. ROCC will be impacted by the priorities, expertise, authorities, funding, and culture of the agency it's housed under. With a focus on increasing production to meet the needs of the U.S. economy, the entity needs a culture focused on commercialization and catalyzing private investment. The U.S. ROCC could be independent or a myriad of agencies could house the entity.

Design Options include:

Independent

Pros	Cons
• Ability to build a new culture of commercialization and supply chain security that fits the mission • Flexibility to utilize novel financial mechanisms without being burdened by existing agency processes • Can focus on critical mineral processing sector and needs of U.S. economy as a whole rather than specific end-uses, such as energy or national security • Less likely to be seen as political or have swings in priorities when administrations change.	• Might be slower to stand up the entity, hire experts, and implement support programs than if it could rely on existing agency resources and expertise • Independence may limit the entity's ability to spearhead interagency coordination

As an independent entity, the U.S. ROCC could cultivate a novel culture of private sector commercialization and supply chain security needed to accomplish the entity's mission. Federal agencies have existing processes for providing financial support that may not align with the tools deployed by the U.S. ROCC and would prove burdensome. Starting from scratch would allow the entity to tailor process and culture around the support needed for domestic market development. Independence would also help insulate the program politically and ensure that the entity focuses on the critical mineral sector and needs of the U.S. economy as a whole rather than specific end-uses. However, establishing a new independent entity from scratch might take significantly longer than placing it inside an agency. The U.S. ROCC would not be able to rely on existing agency expertise or infrastructure. Independence could also hinder interagency coordination by placing the U.S. ROCC outside the core structure of federal agencies.

Department of Energy (DOE)

Pros	Cons
• Culture of private sector commercialization • Deep expertise on mineral supply chains for energy infrastructure • Existing programs supporting critical mineral processing projects • Currently implementing programs using tools similar to those described for the reserve • Potential to implement support tools relatively quickly using existing authorities • Affiliation with U.S. National Laboratories provides expertise on innovative technologies • Received significant appropriations from recent legislation that could be utilized • Existing and broad Critical Materials list that could be utilized for mineral eligibility	• Narrow focus on energy infrastructure, requiring interagency coordination to include national security expertise • Lacks domestic mining and critical mineral market expertise, requiring interagency coordination

The DOE is focused on mitigating challenges associated with critical mineral supply chains and the risks for the energy transition. It has various programs supporting domestic critical mineral projects, including through direct investments and loan guarantees. The agency has begun using Other Transaction Authority for similar mechanisms, such as for Regional Clean Hydrogen Hubs.[40] Workshop participants noted DOE's commercialization expertise and broad sectoral focus, making it suitable for housing the U.S. ROCC. However, interagency coordination will be crucial for incorporating concerns beyond energy, including national security.

Department of Commerce (DOC)

Pros	Cons
• Implementing CHIPS programs and at the forefront of recent U.S. industrial policy efforts • Currently tasked with establishing a Supply Chain Center with stakeholder collaboration • Experience in public-private partnerships • Deep expertise in commodities and international trade dynamics • Can take a broad focus on the critical mineral industry rather than specific end-uses	• Lacks existing authorities for support tools • Lacks domestic mining and critical mineral expertise, requiring interagency coordination • Does not have an established critical mineral list, requiring it to rely on other federal lists or create a new list

The DOC has taken a leading role in recent U.S. industrial strategy efforts, including the implementation of the CHIPS program to support the construction of semiconductor fabrication plants in the U.S.[41] Additionally, DOC recently established a new Supply Chain Center that cultivates partnerships between government and industry stakeholders to proactively mitigate supply chain challenges.[42] DOC has longstanding manufacturing and international trade expertise but relatively little experience in the critical minerals sector, particularly domestic mineral projects. The agency can take a broad, sector-wide perspective, but it may need to rely on interagency coordination for national security, energy, and domestic mineral development expertise. Lastly, while DOC did receive statutory Other Transaction Authority for implementation of the CHIPS programs, Congress has never provided the agency with broad OTA. Utilizing OTA for critical mineral support tools at DOC would require new legislation.

Department of Defense (DOD)

Pros	Cons
• Deep expertise on mineral supply chains for national security • Experience procuring and reselling critical materials • Leading interagency coordination on the critical materials stockpile • Tasked with creating strategies to secure U.S. mineral supply chains • Potential to implement support tools relatively quickly using existing authorities • Existing and broad Materials of Interest list that could be utilized for mineral eligibility	• Lacks culture of and expertise in private sector commercialization for consumer markets that are not related to national defense • Focused on procurement for internal purposes rather than stimulating private investment • Can be difficult for companies to engage with • Narrow focus on supporting the defense industrial base

The DOD is home to federal critical material stockpiling efforts, particularly through the National Defense Stockpile. However, since the end of the Cold War, the National Defense Stockpile has dwindled in terms of both its physical reserves and role in national security efforts.[43] Additionally, DOD programs stockpile materials for emergencies rather than focusing on stimulating investment. The FY24 National Defense Authorization Act attempts to revitalize the stockpile through a new pilot program to utilize commercial best practices to procure and sell critical materials.[44] Furthermore, while DARPA has successfully supported innovative projects on their way to market, many DOD programs lack a culture of or expertise in private sector commercialization beyond military needs. The agency is also limited in transparency for national security reasons, which can complicate collaboration with private sector projects.

Department of the Interior (DOI)

Pros	Cons
• Deepest expertise in critical minerals, commodities, and mining • Strong knowledge of U.S. mining regulations • Broad focus on critical minerals, not limited to specific end-uses • History of leading policies related to the U.S. mineral sector • Existing efforts to track critical mineral markets, import dependence, and domestic investment • Existing effort to map U.S. mineral reserves, allowing proactive development • Actively advising DOE, DOC, and DOD to inform investments made available through recent legislation • Existing USGS Critical Minerals list that it could utilize for mineral eligibility	• Lacks existing authorities or appropriations for support tools • Lacks culture of private sector commercialization • No existing programs to financially support domestic critical mineral projects • Requires new authorizing legislation for program implementation • Existing USGS Critical Minerals list is politically controversial for not including copper

The DOI, formerly home to the U.S. Bureau of Mines, remains an expert on regulatory and market analysis in the U.S. mineral sector. However, it does not actively support industry or supply chain security efforts. DOI's expertise and broad focus on the mineral industry make it a suitable candidate for housing the reserve program, but it would need new authorities, appropriations, and a shift toward a culture of commercialization and private sector engagement.

SHOULD A PHYSICAL RESERVE BE ESTABLISHED?

Whether to establish a physical reserve is an important aspect of designing the U.S. ROCC. If established, a physical reserve, which would essentially be warehouses operated by the entity for storage of processed minerals, should not operate like a traditional stockpile; instead of simply accumulating critical minerals, it should receive delivery and store them temporarily before reselling them into the market. Rather than hoarding materials to be used for emergencies, a U.S. ROCC physical reserve would cycle inventory and only be utilized as a buyer of last resort for supported projects.

Opportunities that come with physical reserve

Establishing a physical reserve would provide the U.S. ROCC with greater control over contracting terms and overall market supplies. When utilizing tools that involve procurement, such as offtake backstops, advance market commitments, and the market maker approach, the physical reserve could take

delivery of minerals, guaranteeing projects with a customer of last resort that is capable of storing the product. Additionally, when market prices are high, the reserve could release whatever supplies it has on hand to decrease prices, and vice versa. Lastly, by establishing a clearinghouse for critical minerals, a physical reserve could help facilitate more mature markets and establish spot prices that provide price transparency and offer both producers and offtakers greater flexibility. For example, substantial U.S. crude oil pipeline infrastructure travels through Cushing, Oklahoma, which has the world's largest onshore oil storage facility.[45] As a result, Cushing is the location where contracts are settled and the West Texas Intermediate crude benchmark is set.

While a physical reserve is not required to implement many, if not all, of the potential tools that the U.S. ROCC could utilize, it could prove useful in specific circumstances, particularly for projects in nascent domestic industries that initially have trouble finding offtakers and during moments of extreme supply volatility. A physical reserve does not need to be established prior to implementing the U.S. ROCC, but this tool should not be removed from the toolbox.

Challenges that come with physical reserve

Establishing a physical reserve also comes with some challenges that are worth recognizing. Firstly, establishing the reserve requires significant resources. Expansive warehousing would be needed, as well as the requisite infrastructure for receiving, storing, and reselling products, alongside the necessary staffing for operational management. Secondly, the storage of processed minerals may also prove challenging. While raw ores are inert, refined minerals are prone to volatility and rapid degradation. Specialized infrastructure is essential to preserve these processed minerals, along with meticulous management of the procurement-to-resale timeline to prevent wastage. Thirdly, the inclusion of a physical intermediary imposes additional costs and time constraints on the supply chain as a whole. The transportation costs incurred in delivering products to the reserve would be borne by the U.S. ROCC. Given the geographical diversity of mineral deposits and the vertical integration of processing in certain projects, such as lithium brine projects, the geographic placement of a physical reserve may be more useful for some projects than others. These challenges can be overcome, but they will require additional appropriations for the program to establish and maintain the physical reserve.

The concept of "virtual warehousing" could also be utilized in instances where federal procurement is beneficial, particularly if a physical reserve is not available. Rather than centralizing inventories within government-managed facilities, virtual warehousing entails compensating projects to independently store their products, particularly in cases where an offtaker cannot be secured. This decentralized approach may require a bureaucratic apparatus to manage, but it enables the U.S. ROCC to oversee geographically dispersed inventories without disrupting the regular supply chain through product removal and transportation.

Deploying Price Support in the Near-Term

Those worried about the fragility of current critical mineral supply chains might be interested in immediate actions to leverage the substantial bipartisan backing for the creation of a critical mineral resilience reserve. There are opportunities for both legislation and federal agency initiatives to initiate a price support program that could eventually expand to encompass the broad scope and tools of the U.S. ROCC. A new pilot program could validate the effectiveness of this strategy, while agencies equipped with Other Transaction Authority and existing critical mineral programs could play a role.

An essential factor to consider for near-term support is that it may pave the way for broader assistance in the future within that agency. The most straightforward options for immediate support might not align with the requirements of a more comprehensive and expansive entity like the U.S. ROCC.

LEGISLATE A PILOT PROGRAM

Congress should enact new legislation to launch a $100 million pilot program dedicated to assessing the effectiveness and cost of proposed financial tools and strategies for the U.S. ROCC. This initiative should include a detailed examination of how various financial instruments influence market dynamics and what level of support, if any, is needed for different types of minerals. To accomplish this while mitigating expenditures, the pilot should provide support to individual projects in different mineral markets awarded through a competitive process. The goal of the support should be to gain insight into the concerns of private investors in different mineral markets and the impact of different tools on catalyzing final investment decisions. The pilot should also analyze the point in which support for a specific market can be scaled back depending on successful market diversification. Additionally, the pilot can kickstart efforts to enhance interagency coordination by integrating existing expertise in existing critical mineral programs at DOE, DOD, DOI, DOC, and USTR. This strategic legislative effort aims to lay the groundwork for more comprehensive price support mechanisms within the U.S. critical mineral industry, such as the U.S. ROCC, while gathering valuable insights on the practical effects of different intervention tools.

NEAR-TERM OPTIONS AT THE DEPARTMENT OF ENERGY

Several tools outlined in this report mirror proposals made by the Department of Energy for their recently introduced clean hydrogen demand-side support program. This effort leverages DOE's broad statutory Other Transaction Authority (OTA), which allows federal agencies with the authority to use flexible financial arrangements and access goods and services outside of traditional acquisition processes. The Energy Act of 2005 originally authorized DOE's OTA.[46] However, unlike DOD's usage of OTA for procurement and NASA's usage of OTA for commercial space flight programs, DOE's initial OTA implementation was narrow, only used for Technology Investment Agreements that are similar to cooperative agreements.[47] This changed with DOE's clean hydrogen demand-side support program, which marks the first time DOE has expanded its utilization of OTA for flexible financial agreements.[48] While OTA is not mentioned, DOE recently released a Request for Information seeking input on how the agency can deploy tools similar to those proposed in this report and those for the clean hydrogen demand program to support U.S. critical mineral processing projects.[49]

Although funding for this effort might be constrained without new appropriations, DOE could leverage OTA to offer price support to specific processing projects through contract for differences agreements. In more established domestic markets like lithium, copper, and nickel, DOE could utilize the market maker approach to aggregate demand and facilitate private transactions, intervening with price support when necessary to bridge the gap between producer and customer prices. While existing DOE authority and funding may not suffice to bolster the entire domestic processing sector, they could assist in securing financing for individual processing projects and ensuring they remain online during periods of low prices. DOE's focus on private sector commercialization and market liftoff makes the agency a logical fit for near-term support efforts.

NEAR-TERM OPTIONS AT THE DEPARTMENT OF DEFENSE

While Congress must provide appropriations to stand up the program, DOD could offer limited assistance through the new commercial best practices pilot within the National Defense Stockpile, as established by the FY24 NDAA. This initiative is designed to employ "commercial best practices" for procuring and disposing of critical materials. Leveraging its Other Transaction Authority,

DOD can utilize flexible financing tools; however, the program's focus on mineral acquisition and disposal restricts it to tools that leverage procurement rather than direct price support mechanisms. Additionally, DOD can leverage its existing critical mineral procurement by prioritizing domestic projects in long-term offtake agreements, providing individual projects with stable demand that improves their risk profile for investors. The FY24 NDAA requires contractors that provide advanced batteries and components to DOD to disclose the countries in which the lithium, nickel, cobalt, manganese, and graphite used in the battery were mined and processed as well as the countries in which the battery cells were manufactured.[50] DOD can now use this information to prioritize contractors that use domestic and reliable sources.

Lessons from Similar Programs

The U.S. and foreign governments have leveraged price and demand-side support tools for sectors important to national security and the energy transition. This section examines these programs and the lessons learned to develop a more effective strategy for critical minerals.

DOE STRATEGIC PETROLEUM RESERVE

The Strategic Petroleum Reserve (SPR) operates as the U.S. supply stabilization mechanism for the domestic oil market. When prices are elevated, the reserve releases petroleum in an effort to increase supply and decrease prices. Operating as an immense physical reserve, the SPR requires hundreds of millions of dollars to upgrade and maintain[51] and must pay a higher price than the market price to cover delivery costs.[52] In 2022, the Department of Energy implemented a rule allowing the purchase of crude oil through forward, fixed-price contracts, aiming to incentivize investment in oil production by offering price certainty to producers. Yet, despite these efforts, the SPR has faced challenges in swiftly responding to market needs and finalizing long-term contracts with producers, partly due to stringent DOE oversight and the aforementioned higher acquisition costs.[53]

USDA COMMODITY CREDIT CORPORATION

The Commodity Credit Corporation (CCC) administers the USDA's agricultural price support initiatives, such as the Price Loss Coverage program. This program operates on a pay-for-difference basis, where farmers who participate receive payments when the price of a covered product drops below a minimum reference price established by the USDA.[54] While these agricultural subsidy programs have effectively boosted production, some have criticized the program, claiming it fails to foster competition, instead channeling significant resources toward inefficient projects. Critics argue that these subsidies have incentivized overproduction of certain crops and distorted price signals, hindering alignment between consumer preferences and production. The CCC lacks competitive procedures for allocating support and does not offset expenditures by generating revenue.[55]

UK LOW CARBON CONTRACTS COMPANY

The Low Carbon Contracts Company (LCCC) enters into and manages contract-for-differences (CfD) agreements with clean energy projects in the United Kingdom. Under the program, a competitive bidding process awards and sets a reference price for the electricity generated by a project over a set period of time, typically 15 years.[56] Following a competitive bidding process in 2022, five projects were awarded a reference price of £37.35/MWh.[57] If the market price is lower than £37.35/MWh, LCCC pays the difference to the project developer. If the market price exceeds £37.35/MWh, the company pays the difference to LCCC. Due to high energy prices across Europe, the LCCC's CfD agreements generated more than £1 billion in revenue between April 2022 and March 2023.[58]

EU H2GLOBAL

The European Union's H2Global Instrument applies the market maker concept to clean hydrogen.[59] In 2024, a third-party intermediary, Hintco, will begin procuring clean hydrogen derivatives from producers via long-term offtake agreements awarded through a reverse auction. Hintco will then sell the green hydrogen to end-users in short-term transactions using a regular auction. If the price to procure green hydrogen exceeds its selling price, H2Global will lose money on the transaction, but it will profit if the opposite is true. The auction design maximizes price transparency by finding the lowest price hydrogen producers will sell at and the highest price end-users will purchase at—this should also minimize the cost of the subsidy per transaction. The effectiveness of this approach will become more clear once it is fully implemented.

Conclusion

Diversifying the U.S. critical mineral processing supply chains is crucial to mitigate national security, economic, and energy transition risks posed by our current over reliance on concentrated and adversarial sources. Recognizing these challenges, the House Select Committee on the Strategic Competition Between the United States and the Chinese Communist Party has underscored the strong bipartisan support for bolstering domestic processing capacity. This report, informed by insights from industry, NGOs, and federal agencies, identifies the urgent need for an entity to alleviate price risk and volatility, which are significant barriers to private investment in critical mineral processing projects.

In the near term, before the proposed United States Reserve of Critical-Mineral Commodities (U.S. ROCC) can be fully implemented, there are actionable steps that can be taken. Congress should establish a pilot program to scope the impact of various price support mechanisms and the needs of different mineral markets. Existing programs, specifically at the Department of Energy and the Department of Defense, have the potential and authorities necessary to begin providing price support and encouraging investment. These measures, while not a comprehensive solution, pave the way for the broader assistance the U.S. ROCC aims to offer, demonstrating a proactive federal response to a pressing issue.

The Bipartisan Policy Center extends its gratitude to the many organizations that have informed and support these recommendations. Their consensus highlights not only the broad support for these initiatives but also the collective commitment to securing a more resilient and diversified critical mineral supply chain for the United States.

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  - Paid Family Leave
- Energy
- Health
- Housing
- Infrastructure
- Technology

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