CONGRESSIONAL TESTIMONY

China's Monopoly on Rare Earths: Implications for U.S. Foreign and Security Policy

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Reliable access to critical minerals is a matter of both economic and geostrategic importance to the United States. Although concern about access to minerals waxes and wanes, it is rising now due to increasing demand, new competitors capturing large market shares, limited information sharing and the changing nature of the defense industrial base and the broader economy. These same trends can interfere with American foreign and defense policy goals and give mineral suppliers easy leverage over the United States and other countries reliant on global supply chains. Today, no minerals are more troubling to U.S. security and foreign policy than rare earth elements.

China's current dominance of rare earths exports is at the heart of this challenge. Its 2010 cutoff of rare earth elements – a unique set of minerals that are difficult to process yet critical to many high-tech applications – attracted particular attention. After Japan detained a Chinese trawler captain over a skirmish in the East China Sea, Japanese companies reported weeks of stalled shipments of rare earths from China amid rumors of an official embargo. This may sound like a minor trade dispute, but China currently controls production of about 95 percent of the world's rare earths, which are critical to building laser-guidance systems for weapons, refining petroleum and building wind turbines. Coinciding with possessing this incredible leverage over the rest of the world, China has also reduced its export quotas for these minerals and temporarily halted production. For its part, the Chinese government contends that it did not put any formal export embargo in place, and that its plans to reduce exports simply reflect the need to meet growing domestic demand for rare earths and address environmental concerns. Still, Japan and China experienced further strain in their already tense relationship as a result. Feeling blindsided, some in the United States characterized the situation in a manner that demonized China rather than using the opportunity to better understand the true nature of U.S. supply chain vulnerabilities related to rare earths or other minerals.

These tensions with China concerning the supply of rare earth elements should challenge U.S. policymakers not because the United States' import dependence is inherently problematic (which it is not) or because rare earth minerals are geologically scarce (which they are not). Rather, rare earths deserve attention because U.S. supply options are currently limited: Supplies are concentrated mostly in the hands of one supplier with its own rising demand, and the United States today has no good options for recycling rare earth minerals or substituting more easily obtained minerals. While China is nearly the sole producer and exporter of rare earths today, it does not possess a permanent "corner" on this market. Indeed, China holds only about half of known world reserves – not a terribly high concentration. Even more important to the current circumstances, the United States possesses rare earth reserves that will be economical to produce, which will be an important means of mitigating the foreign policy challenge surrounding rare earths while creating domestic jobs.

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The risks to U.S. foreign policy include rare earths or other mineral-related tensions creating new roadblocks for achieving U.S. foreign policy goals around the world, especially in Asia, trade disputes that entangle other U.S. security interests and unintentionally funding human rights atrocities and fueling black markets. In worst-case scenarios, supplies of minerals that the United States does not produce domestically may be disrupted, creating price spikes and lags in delivery. Even short of major supply disruptions, sometimes-hostile supplier countries can exert leverage over the United States by threatening to cut off certain key mineral supplies. The United States may also lose ground strategically if it continues to lag in managing mineral issues, as countries that consider assured access to minerals as far more strategically important are increasingly setting the rules for trade in this area.

Several specific defense assets have also been identified publicly as requiring rare earths in their production and operation. These include Joint Direct Attack Munitions (JDAMs), jet fighter engines, antimissile defense systems, smart bombs and night vision goggles. Notably, the demand for rare earths in defense equipment has changed dramatically over the past few decades. The defense industrial base is different from previous eras. Many telecommunications, aerospace and other assets that the U.S. military relies on today have both civilian and defense applications. Supply chains for defense assets are also fully globalized today, increasing the potential for international actors to affect defense production – and to use this power for political leverage.

It is critical to note for this committee's consideration that the security-related repercussions go beyond the direct effects on the United States. China's actions regarding rare earths are affecting U.S. allies such as Japan and several NATO partners. When Chinese rare earth exports to Japan were halted in 2010 as part of a broader dispute between these two countries, the United States was forced to dedicate time and great effort to trying to ease tensions and resolve the disputes at hand.

Moving forward, it is important to note that these challenges are ultimately manageable, and future foreign policy challenges related to rare earths and other minerals are preventable.

First, lessons from the history of U.S. mineral import disruptions and trade disputes indicate that the current rare earths issues with China should have been predictable. In previous disruptions of minerals critical to defense assets and private sector demand – rhenium, uranium and cobalt, for example – supplier concentration appears to be a consistent and strong warning sign that exporting countries are likely to use their mineral supplies for geopolitical leverage. The global trends leading to China's dominance in supplying rare earths exports have been clear for years.

China's behavior has also been logical and relatively predictable concerning rare earths over the past few years. Given its government's high premium on social stability, it was a safe assumption that it would eventually focus greater attention on reducing the environmental impacts of rare earths production. It is also predictable that the Chinese government would act to wield the political power and strategic advantage its corner on rare earths supplies has created.

To better prevent foreign policy and security challenges arising from these circumstances in the future, U.S. policy should focus on:

- Preventing supplier countries and companies from wielding undue leverage over the United States.
- Mitigating fiscal risk and cost overruns to federal agencies.
- Reducing vulnerability to supply disruptions through supplier diversification, especially for critical military assets.
- Ensuring the ability of the United States to meet its economic growth goals in clean energy and other high-tech fields.

Specifically, the U.S. government can mitigate the geopolitical and security risks of global trade in rare earths and other minerals by taking the following measures.

Administration officials and Congress should regularly identify and prioritize the minerals most important to defense acquisitions, energy innovation and other key functions. Today, rare earths are clearly the country's biggest challenge, but other minerals may be equally problematic in the future. Government officials should evaluate mineral issues proactively as a regular, ongoing part of their operations. The Department of Defense, for example, has been largely reactive, responding to the recent rare earths disruptions and issuing one-off reports. By contrast, the Department of Energy has adopted a proactive approach that prioritizes the minerals most important to its core missions. Specifically, government officials can watch for warning signs that minerals are likely to become strategically problematic or challenging in terms of protecting U.S. foreign policy and national security interests. These warning signs today include supplier concentration, political instability in exporting countries, lack of U.S. stockpiles, lack of substitutes and an inability to recycle and recover critical minerals. Interagency communication and coordination to relay these warning signs to key officials around the government and to Congress will also be crucial.

The Department of Defense should conduct new assessments of defense supply chains. Developing a proactive and prioritized approach will require serious consideration of the future of warfare, drawing on expertise from other government agencies, academia, non-governmental organizations, think tanks and private industries. While DOD is currently reviewing rare earths in its supply chains, its efforts must not end with consideration of rare earths. The Defense Science Board should conduct a new assessment building on its 1999 and 2008 studies examining the changing nature of defense supply chains, to include more extensive consideration of minerals and raw materials. These two studies outlined many of the key dynamics that are heightening mineral and raw material concerns today and described DOD's increasing dependence on dual use technologies and global supply chains. However, neither study focused specifically on control of minerals or raw materials, which could give suppliers strategic leverage over the United States. Beyond these omissions, the nature of minerals trade and the global supply system have changed enough in the past five years that an update is warranted.

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To protect the U.S. government's ability to manage critical minerals appropriately, Congress should protect the government's role in analyzing critical mineral vulnerabilities and producing its own data. As Congressional leaders in both political parties strive to reduce spending and seek efficiencies, they should maintain a strong U.S. government capacity for research and analysis – a public good that is both necessary to protect U.S. interests and undersupplied by the private sector. Without vigilance, the United States risks being blindsided by regular trade disputes and supply disruptions, and by countries exerting political leverage. Improving how the U.S. government handles mineral issues should not require major increases in manpower or spending. But the administration and Congress must maintain the existing capacities and preserve the knowledge infrastructure that the government has redeveloped in the past few years in the Department of Energy and U.S. Geological Survey. In addition to continuing to produce good data, the U.S. government can do more to leverage its relationships with contractors. The private sector will continue to withhold important information in order to keep information proprietary or because it could be perceived as harmful to the bottom line if shared with the government. But when DOD, for example, has billion-dollar contracts with suppliers for critical military assets, it should be able to have contractual requirements that these companies share information about major supply chain vulnerabilities that can provide other countries with leverage over the United States or potentially cause major disruptions.

The Department of Defense should integrate conflicts over minerals and raw materials into relevant war games. One of the chief risks in ignoring access to critical minerals is the leverage such negligence can provide to suppliers, which alters the strategic context in which DOD operates. Exploring how disruptions or threats of disruptions in mineral supplies could affect various American interests would provide valuable information for U.S. policymakers. Relevant games should include a range of scenarios in which supplies of minerals critical to defense equipment are cut off for extended periods of time and supplier countries use embargoes for political leverage. Major seabed mining sites should be included as strategic locations in games focusing on the East and South China Seas and the Arctic, among other locations, just as energy resources and storage facilities are mapped in considering assets that countries may protect or target today. Appropriate scenarios would also include those involving great unrest or major, long-term strikes that halt mineral exports from Latin America or South Africa.

Congress and the executive branch should continue updating stockpiling policies. Stockpiling critical minerals exhibiting several warning signs (for example, those important to current and future defense production, concentrated in the hands of only a few suppliers and also experiencing high global demand growth) remains one of the best policies for ensuring supplies, especially for DOD. Despite Pentagon efforts to improve U.S. stockpile management, many members of Congress still worry that DOD is not taking threats of minerals supply disruptions seriously enough, and that it may be placing too much faith in the private sector to address the strategic threats posed by threats of supply disruptions to critical minerals. To mitigate these concerns, DOD should be more transparent about its mineral policies with Congress and other government agencies, including its process of reconfiguring the stockpile into an inventory system that focuses on mitigating risks and watching for warning signs such as supplier concentration. Even if Pentagon officials believe that they can develop proper inventory strategies to

hedge against challenges to military readiness, they will still require Congressional support for their efforts to continue modernizing the stockpiling system.

The U.S. government should create incentives to reduce consumption and promote recycling and recovery when its security and foreign policy interests are on the line. My research has focused primarily on the nature of current and potential *supply* challenges, but solutions must also include *reducing demand* for minerals that see major disruptions or erratic prices. In the recent rare earths case, the private sector responded by providing some capital for a domestic mining operation to resume. While helpful to the current rare earths circumstances, such private sector action does not always solve the foreign policy and geopolitical challenges the U.S. government experiences. In particular, for minerals that private companies will not reliably produce or more defense-specific applications, U.S. government interests may be at stake while private interests are not. Policymakers can maximize the potential of substitution and recycling by clearly identifying the minerals for which U.S. government interests are affected most directly, and then offering incentives to develop substitutes for these minerals. The Departments of Defense and Energy already have mechanisms for offering low-interest loan guarantees for businesses in a broad range of strategically important fields, from semi-conductors to military assets to energy infrastructure. Similarly, these agencies can use loan guarantees to facilitate production or advance research and development related to minerals, including lending funds to support research on the more efficient use of rare earths, rhenium or lithium in defense or energy applications. In the case of loan guarantees, it will be important for the country's leaders to balance budget priorities and national security concerns while minimizing protectionist tendencies.

Finally, Congress and the Executive Branch should promote information sharing with the private sector and internationally. Regular dialogues and information sharing among the U.S. Departments of Energy, State and Defense, and with industry and international stakeholders, can be a cost-effective means of helping the U.S. government prevent mineral disruptions and trade disputes from negatively affecting U.S. foreign policy goals, defense readiness or economic growth.

Because disputes related to natural resources tend to be preceded by clear warning signs, complacency is perhaps the biggest challenge for the U.S. government. This committee must therefore be commended for calling a hearing on U.S. challenges with rare earth minerals. And while the rare earths challenge is perhaps the most important foreign policy and security problem the U.S. government currently faces with regard to natural resource imports, it unfortunately does not mark the last time the country will face these types of issues given rising demands for finite natural resources. It is critical for the country's leaders to extract lessons from this conundrum in order to manage the current tensions over rare earths with China, and to reduce the risks of similar problems impinging on American foreign policy and security goals in the future.

Biography

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Christine Parthemore is a Fellow at the Center for a New American Security (CNAS), where she directs the Natural Security Program and the Natural Security Blog. This program explores national security and foreign policy issues related to natural resources and their consumption, including energy, minerals, land, water, climate change and biodiversity loss. She is also an Adjunct Professor in Johns Hopkins University's Global Security Studies Program, and serves on the Council of Advisors for U-Mass Boston's Collaborative Institute for Oceans, Climate and Security. Ms. Parthemore is the author or co-author of publications including: *Sustaining Security: How Natural Resources Influence National Security*; *Broadening Horizons: Climate Change and the U.S. Armed Forces*; *Iran: Assessing U.S. Strategic Options*; *Uncharted Waters: The U.S. Navy and Navigating Climate Change*; and *A Strategy for American Power: Energy, Climate, and National Security*. She also co-authored a chapter in the 2008 book *Climatic Cataclysm: The Foreign Policy and National Security Implications of Global Climate Change*.

Prior to joining CNAS, she worked as an assistant to journalist Bob Woodward on *State of Denial: Bush at War Part III* and *The Secret Man: The Story of Watergate's Deep Throat*. Her research covered a broad range of American foreign and defense policy, the war on terror, and the Iraq War. She has contributed to *The Washington Post, Roll Call,* and the *Atlanta Journal-Constitution* and is a guest expert contributor to *National Journal*'s Energy and Environment blog. Ms. Parthemore has a B.A. from The Ohio State University and an M.A. from Georgetown University's Security Studies Program. Her academic backgrounds lie in international political economy, and unconventional threats and nonproliferation.

United States House of Representatives
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Christine Parthemore	Center for a New American Security

3. Date of Committee hearing:

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4. Have you received any Federal grants or contracts (including any subgrants and subcontracts) since October 1, 2008 related to the subject on which you have been invited to testify?	5. Have any of the organizations you are representing received any Federal grants or contracts (including any subgrants and subcontracts) since October 1, 2008 related to the subject on which you have been invited to testify?
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