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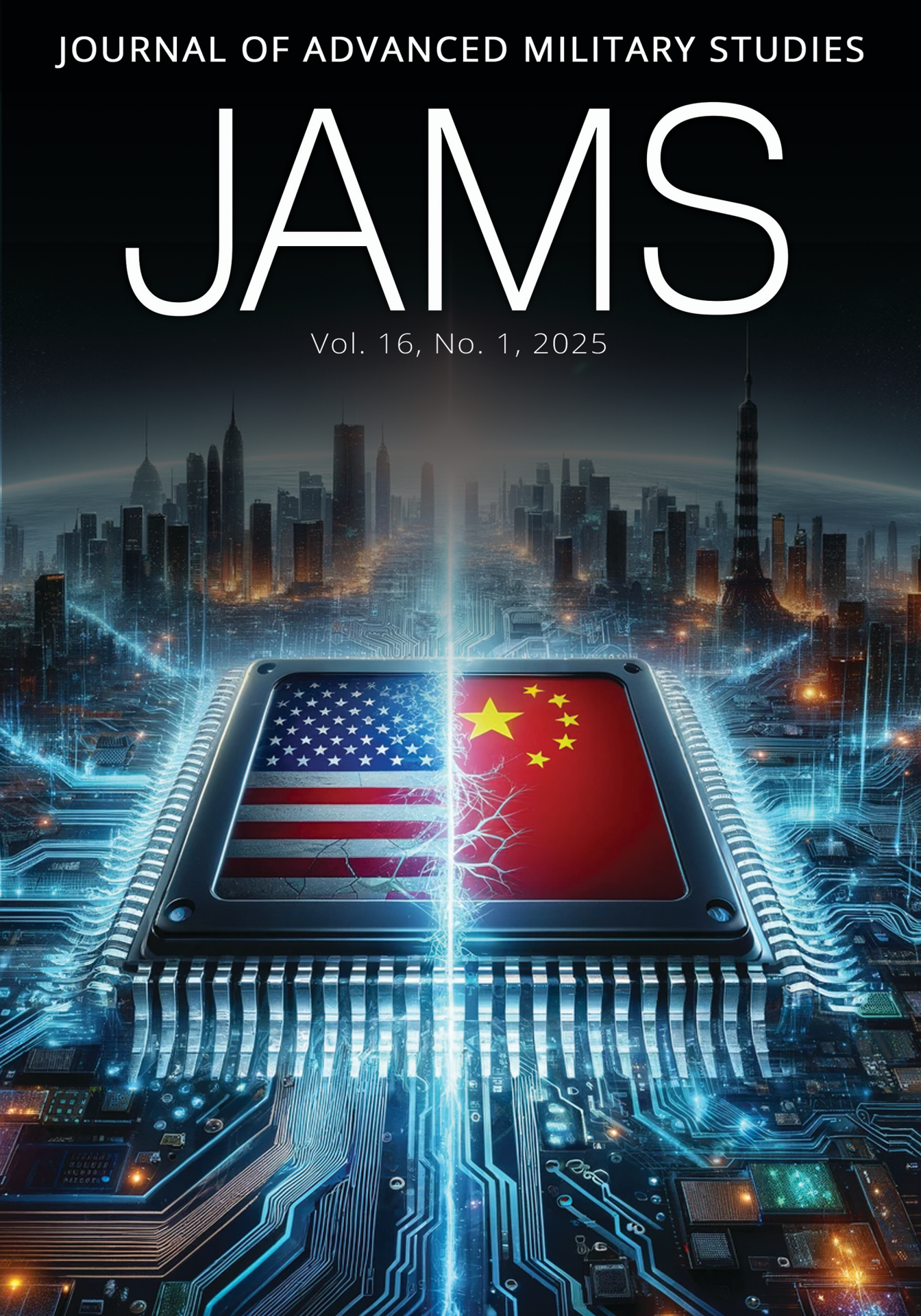

The Winds of Change
How China's Focus on Rare Earth Minerals Reshapes the World

Ian Murphy and Kevin Johnston

Abstract: This article examines how rare earth minerals and the People's Republic of China's (PRC) strategic dominance in the global economy affect U.S. national security. The PRC's near monopoly on rare earth processing and its use of export controls as leverage pose significant risks to global supply chains and U.S. national security interests. This analysis explores contemporary PRC strategies in the rare earth sector and their implications for U.S. national security by explaining how the PRC's view of international cooperation differs from the United States' view. In essence, the PRC is using the transition to renewable energy to pursue its broader security goals and enhance its position in the global power hierarchy. Furthermore, the article offers policy recommendations aimed at mitigating vulnerabilities and ensuring the secure and sustainable supply of resources critical to U.S. interests.

Keywords: rare earth minerals, climate change, Sino-American cooperation, Malacca dilemma, great power competition

The Looming Rare Earths Crisis: China's Strategic Leverage in a Changing World

The shift from U.S.-China cooperation to competition has been a gradual process. The Donald J. Trump administration's 2017–18 implementation of tariffs, escalating into a trade war, marked a stark departure

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from economic cooperation. This shift was driven by concerns over Chinese military modernization, aggression, and persistent trade disputes. The bilateral relationship further strained in 2020 due to the COVID-19 pandemic, with both countries trading blame and escalating diplomatic tension. The Joseph R. Biden administration continued many Trump-era policies, leading to expectations that future administrations will likely continue challenging the People's Republic of China (PRC) on trade and technology in the name of U.S. national security.[1] Even amid heightened tensions, the Biden administration sought to boost cooperation on combating climate change with the PRC. This echoes functionalist thought, which centers on the practical needs of people and states, rather than prioritizing state power, and suggests that cooperation should begin in nonpolitical areas, such as technical or economic sectors, where there is a common interest and a need for collaboration.[2] However, the PRC has not engaged in mutual cooperation with the United States and instead seeks to challenge the U.S. economic and security interests.

Kevin Johnston's perspective on the PRC aligns with functionalism by advocating for U.S.-China cooperation on climate change, which the West often views as a shared global challenge that can foster collaboration and potentially spill over into other areas. The authors' argument for Sino-American cooperation on climate change implicitly acknowledges their economic interdependence, a key tenant of neofunctionalism, which posits that economic integration promotes cooperation and that crises offer opportunities for deeper integration.[3] Johnston suggests that cooperation on climate change could improve the overall relationship and lead to cooperation in other areas. However, Johnston's primary focus on security and the potential for military conflict differs from the functionalist emphasis on nonpolitical issues as the starting point for cooperation.

Johnston's approach to climate change involves treating it as a common enemy that can unite the two countries and foster the norm of shared cooperation. In this way, Johnston draws a parallel to the Marshall Plan, suggesting that a similar collaborative effort to combat climate change could lead to economic growth, reduce military tensions, and foster a long-term alliance between the two nations.[4] By emphasizing the potential for cooperation and shared benefits, this approach is optimistic and hopeful. However, despite U.S. attempts to engage the PRC on climate, Beijing has continued to prize relative security and economic gains over shared values. A realistic and effective approach to Sino-American climate action recognizes that both countries are primarily motivated by their national interests and that cooperation will only occur when it aligns with those interests, even in the absence of shared values or norms.

The contrast between Johnston's idealistic model for cooperation and the PRC's actions highlights a critical challenge in U.S.-China relations. While the United States has sought to engage the PRC on climate change based on shared

international values and the potential for mutual benefits, the PRC is primarily using the transition to renewable energy to pursue its broader security goals and enhance its position in the global power hierarchy. Chiefly, the PRC is prioritizing its own security and economic interests, leveraging climate action as a means to advance its national power. This misalignment in motivations and goals has hindered the possibility of genuine cooperation on climate change and has led to a more competitive dynamic.

The PRC has taken advantage of U.S. and European willingness to engage on climate by reciprocating with economic dumping of electric vehicles and working with sanctioned nations to further its goals. The PRC's economic dumping of electric vehicles involves selling them below cost to gain market share, which can harm domestic industries and give the PRC an unfair advantage. This strategy aims to dominate the U.S. and European electric vehicle markets by undercutting competitors and establishing a strong foothold in the growing industry. First an economic threat, the PRC now presents a direct security challenge by monopolizing the rare earths mineral industry, revealing a pattern of behavior that shows a willingness to choose domination over cooperation.

This article begins with an explanation of E. H. Carr's political realist framework to lay the theoretical foundation to explain why the PRC has not engaged in joint climate change action, before turning attention to the PRC's dominance of the rare earth metal supply chain from supply to patents. The article then focuses on the consequences of that control, including the PRC's strategic military advantage, and its ability to dominate foreign economies. This article concludes with policy recommendations for U.S. policymakers.

Understanding the PRC's Strategic Motivations through Political Realism

To better understand the PRC's strategic posture on climate change cooperation, we can turn to the insights of E. H. Carr's political realism. Carr, a British international relations theorist, argued that national interest and power, rather than idealism and international institutions, are the primary drivers of state behavior. His work, *The Twenty Years' Crisis*, was inspired by the failed peace in the wake of the Treaty of Versailles and challenged the utopian belief in the power of international organizations to prevent conflict, highlighting the League of Nations' failure to prevent the reemergence of war.[5] Carr's political realism, defined by military power, economic power, and power over public opinion, provides a framework for understanding the PRC's actions, particularly its reluctance to fully engage in collaborative efforts to address climate change, as described by Johnston. Through this lens, the PRC's efforts to decrease emissions are not solely aimed at reversing the trend of global climate change, but also at securing its national interests. This realist perspective helps us better understand

the PRC's priorities around its climate action and predict potential future crises, such as the PRC hoarding rare earth minerals to the detriment of the United States and its allies.

In its bid to reach energy security, the PRC is playing a double game of defense and offense. Largely dependent on petroleum imported from abroad, the PRC is vulnerable to the so-called Malacca Dilemma, whereby large quantities of its petroleum are imported through the Strait of Malacca. A disruption of oil tanker traffic through the Strait of Malacca would severely jeopardize the PRC's energy security, potentially causing fuel shortages for both its military and economy. At 3.2 kilometers wide at its narrowest point and easily defendable by the U.S. Navy, the Strait of Malacca poses a significant risk to the PRC's military in the event of a conflict. The PRC is playing a defensive game here by diversifying its energy supply away from imported petroleum. The offensive side of the PRC's energy strategy is to take advantage of collective climate action initiatives abroad to fuel Chinese low-cost exports of solar panels, electric vehicles, and batteries. By engaging in economic dumping, PRC grand strategy seeks to kill U.S. and EU manufacturing and place the PRC in a position where it can out-manufacture and politically coerce foreign countries into providing concessions for continued access to Chinese products.[6]

Just as collective climate action became a security threat for developed economies, the PRC's dominance of rare earth minerals will become politicized at the time of the PRC's choosing. Rare earths are essential components for a variety of products, such as high-tech consumer products (computers, phones, new energy vehicles, etc.) and military equipment (lasers, guidance systems, radar systems, etc.). Rare earth minerals are used in permanent magnets—its biggest and most important use—without which the spindle motors and voice coils of phones and laptops would not work. PRC dominance of rare earth minerals comes in the form of supply, investment, processing capability, technical expertise, and global patents.[7] As the world continues to transition away from fossil fuels, the demand for rare earth minerals will grow exponentially to meet the demands of manufacturing advanced and green technologies.

With a near monopoly on every aspect of this new supply chain, the PRC will be poised for economic domination and gain key strategic military and economic advantages. As with climate action, the PRC is posed to play a dual strategy where it secures its supply of rare earths, unaffected by foreign sanctions and will use its dominance offensively to coerce by restricting access. To understand the implications of this strategy, it is essential to examine it through the lens of E. H. Carr's political realism.

Political realism posits that states, first and foremost, pursue their own national interests, even if it means conflicting with the goals of the broader international community. This pursuit of self-interest is deeply ingrained in

the fabric of international relations. Classical realism, as articulated by Hans J. Morgenthau, explains international politics as inherently bound by human nature—specifically, our innate desire for power.[8] John J. Mearsheimer takes this a step further, arguing that the anarchic nature of the international system compels states to constantly seek power to ensure their survival, with international institutions being an expression of this desire.[9] This relentless pursuit, he argues, ultimately leads to either hegemony or a security dilemma.

While both classical and offensive realism provide a compelling framework for understanding the PRC's worldview, they are somewhat constrained by their inherent assumptions. Political realism, as described by Carr, offers a more nuanced perspective, better able to grasp the complexities of Sino-American relations. It provides a framework for understanding how the United States might cooperate with the PRC without necessarily triggering a security dilemma or leading to undesirable hegemonic dominance.

The PRC's current path to securing its energy needs exemplifies this realist perspective. It includes the determined pursuit of energy independence, the economic domination of foreign markets, and the monopolization of critical minerals, even at the expense of environmental concerns. Political realism acknowledges that while collective action may be discussed and even pursued to some extent, the reality of international politics is often characterized by competition and the unwavering pursuit of individual state interests. PRC actions in the realm of energy security and its strategic use of economic leverage, such as its policies on electric vehicles and rare earth exports, are entirely consistent with this realist view.[10] Instead of simply adopting renewable energy to support the international community, the PRC is actively attempting to dominate the renewable energy sector, both militarily and economically. Adopting a purely utopian perspective when it comes to understanding cooperation and conflict with the PRC has significant limitations.

Assuming that the PRC holds a shared "world interest" effectively ignores the reality of world politics, leading the United States to have unrealistic expectations about the PRC's willingness to cooperate. Specifically, a utopian perspective overlooks PRC strategic actions in the realm of "unrestricted warfare," a concept that offers a new dimension in realism, encompassing political, informational, and legal domains.[11] The PRC's approach to energy security and climate change better aligns with the concept of unrestricted warfare than with any notion of a "harmony of interests." It seeks to leverage its growing dominance in the energy industry and critical mineral supply chains to gain advantages over its perceived adversaries. Using the combined lenses of political realism and unrestricted warfare helps us to better interpret observable PRC economic behavior and thus allows the United States to respond in a more impactful and realistic way.

The PRC's Strategic Calculus in Its Quest for Dominance

When viewed through the lens of Carr's political realism, it becomes evident that energy security is a critical component of the PRC's broader pursuit of national rejuvenation and global ambitions, rather than simply an appeal to international values or a reflection of shared environmental concerns. The PRC's concept of unrestricted warfare further informs this analysis, as it suggests that the pursuit of national objectives transcends the traditional military realm and encompasses economic, technological, and information domains.[12]

The PRC undoubtedly aims to lead the global shift toward cleaner energy sources, but unlike the European Union and the United States, its primary focus is on strengthening national security and gaining economic leverage, with reduced emissions being a by-product of this national security-centric strategy. While the PRC has invested heavily in renewable energy sources, it also continues to rely heavily on coal and petroleum, making emission reductions a secondary outcome. Furthermore, the PRC's participation in global climate agreements can be seen more as a matter of global prestige and a means to advance its geopolitical influence, rather than a genuine commitment to environmental protection for its own sake. [13]

This strategic approach echoes past instances where Western powers, particularly in Europe, prioritized engagement and cooperation with potentially adversarial states, only to find themselves vulnerable to economic and political coercion. The prime example is the relationship with Russia before the invasion of Ukraine. Western Europe believed that increasing engagement and cooperation with Russia was key to sustained political change, but it instead led Europe to become dangerously dependent on Russian energy supplies and vulnerable to Russian economic and political pressure.[14] As the war in Ukraine enters its third year, countries are now questioning their global supply chains and are actively working to reshore or near-shore their supply routes, particularly those involving the PRC.[15]

The PRC's energy security strategy is intricately linked to its broader national security strategy in several ways. First, PRC dependence on fuel imports, particularly petroleum, poses a significant vulnerability. While the PRC's overall petroleum imports increased by 10 percent in 2023, driven by growing demand and refining capacity, the source of these imports has become more concentrated. In 2023, Chinese crude oil imports saw the biggest increase from Russia, Iran, Brazil, and the United States, with Russia becoming the PRC's top crude oil source, supplying 19 percent of its imports.[16] This reliance on a mixture of politically volatile and sanctioned sources, along with a potentially hostile United States, puts the PRC in a precarious position where it is vulnerable to price fluctuations, supply disruptions, and potential political pressure. To mitigate this risk, the PRC has been actively seeking to diversify its energy

sources, including increasing domestic production of fossil fuels, investing in renewable energy technologies, and securing access to energy resources in other countries.[17]

Second, the PRC's heavy reliance on coal for its energy needs presents both a challenge and an opportunity. While coal remains a significant source of energy for the PRC, the country has been actively pursuing cleaner and more sustainable energy sources.[18] As part of its energy security strategy, the PRC adopted a long-term "dual carbon" plan that aims to have China reach peak carbon emissions by 2030 and achieve carbon neutrality by 2060.[19] Although on the surface it appears that the PRC is making progress to reduce its carbon footprint and address environmental concerns, the PRC's roadmap to carbon emission reduction includes deepening energy cooperation with Russia, Iran, Pakistan, Myanmar, and Central Asian countries.[20] While the PRC's "dual carbon" strategy addresses environmental concerns to some extent, it is closely linked to national security considerations and is not tied to a sense of international solidarity on combating climate change.

Third, the PRC's efforts to dominate rare earth mineral supply chains and promote its clean technology industry can be seen as a way to gain economic leverage and technological advantages over other countries. This strategy aligns with the realist perspective articulated by Rui Feng in his review article on the PRC's energy security and geopolitical imperatives. He explicitly links the PRC's energy strategy with its view of international politics, emphasizing the competitive nature of international relations and the fundamental need for states to prioritize their own survival and development.[21] In this context, the PRC's actions can be seen as a strategic effort to secure its national interests and enhance its position in international politics and should not be interpreted or pursued for purely altruistic motives—to do so, according to Feng, would be naive.

Rui Feng further advises a pragmatic and cautious approach to international relations with his emphasis on the PRC's use of "moral neutrality," recognizing that the pursuit of ideals and ambitions should be tempered with a realistic assessment of the situation without being corrupted by a sense of moral mission.[22] This explains why we see the PRC using moralistic language and joining multilateral climate agreements while simultaneously pursuing its own strategic goals. In essence, the PRC is using the transition to renewable energy as a means to pursue its broader security goals and enhance its position in the global power hierarchy.

The Malacca Dilemma's Influence on PRC Resource Strategy

On New Year's Eve 2023, Chairman Xi Jinping gave an address stating that

Map 1. The Strait of Malacca is a strategic choke point between Malaysia and Indonesia

Source: Thomas Dent, *The Strait of Malacca's Global Supply Chain Implications*.

a PRC reunification with Taiwan was "inevitable" and a "historical inevitability."[23] Though Chairman Xi did not mention military force that night, the People's Liberation Army Navy (PLAN) continues to hold large-scale military exercises around the island nation, where the PLAN simulates operations that would close Taiwan's ports.[24] Working toward this goal, the PLAN is now the world's largest navy with more than 350 ships and submarines.[25] Despite its rapid military modernization, the PRC's relentless pursuit of national rejuvenation and its ambition to take Taiwan by military force hinges on securing a stable and reliable supply of energy. However, its reliance on maritime transport for energy imports, particularly through the narrow Malacca Strait, presents a significant strategic vulnerability.[26] This vulnerability, referred to as the "Malacca Dilemma," casts a long shadow over the PRC's energy security and its broader strategic ambitions.

Reliance on the Malacca Strait for most of its oil imports exposes the PRC to a range of risks, including potential blockades, disruptions due to piracy or accidents, and political pressure from regional powers. As Ian Storey emphasizes, this vulnerability has become a major preoccupation for PRC policymakers, who recognize the potential for hostile forces to exploit this weakness in times of crisis.[27]

Despite the rapid modernization of the PLAN in recent years, the PRC still lacks the naval power to guarantee the security of the Malacca Strait in a

direct confrontation with the United States Navy.[28] The U.S. Navy's superior capabilities, combined with its extensive network of alliances in the Indo-Pacific region, pose a formidable challenge to the PRC's ability to project power in the region and safeguard its vital sea lanes. This imbalance further exacerbates the Malacca Dilemma, forcing the PRC to explore alternative strategies to mitigate its energy vulnerability.

One such strategy involves diversifying its energy import routes and sources. The PRC has been actively pursuing pipeline projects with Russia, Central Asia, and Myanmar to reduce its reliance on maritime transport.[29] However, these overland routes face their own set of challenges. Existing pipelines currently provide only a small fraction of the PRC's energy needs, and expanding this infrastructure would require navigating complex geopolitical terrain and making substantial investments in potentially unstable countries. The establishment of new pipelines takes several years to plan, build, and reach operational capacity, severely limiting pipelines as a silver-bullet solution to the PRC's energy security needs.[30] Moreover, as recent conflicts have demonstrated, pipelines are not immune to disruption, whether through sabotage, accidents, or political instability. The ongoing war in Ukraine provides a stark reminder of the vulnerability of energy infrastructure, even in well-established and seemingly secure regions. The Nord Stream pipeline explosions and attacks on other energy facilities highlight the ease with which critical infrastructure can be targeted and disrupted, even in the face of sophisticated defenses.[31] This reality underscores the limitations of relying solely on pipelines to address the PRC's energy security concerns.

Another strategy involves accelerating the transition to renewable energy sources, reducing the PRC's dependence on fossil fuels and, by extension, its vulnerability to disruptions in maritime transport.[32] This approach aligns with the PRC's broader ambitions to dominate the renewable energy sector and control the supply chains for critical minerals, particularly rare earth elements. This strategy also presents significant challenges, including the need for technological breakthroughs, the security of mineral supply chains, and the potential for new geopolitical dependencies.

The Malacca Dilemma casts a long shadow over the PRC's strategic ambitions. This critical vulnerability shapes not only its energy policy, but also its military strategy and approach to regional security. To overcome this dependence on the Strait of Malacca, PRC policymakers are driven to diversify energy sources, pursue technological innovation, and expand geopolitical influence. However, as this analysis has shown, securing alternative routes for energy imports, whether through naval expansion or overland pipelines, presents immense challenges. This leaves the PRC with the imperative of transitioning to renewable energy sources, which in turn creates new dependencies on rare earth

minerals. Ultimately, the PRC's success or failure in mitigating the Malacca Dilemma will profoundly impact its future trajectory and its role in the evolving global order. The country is already making significant strides in renewable energy development, with a recent Global Energy Monitor report highlighting that the PRC is "home to almost two-thirds of the world's utility-scale solar and wind power in construction."[33] Whether these efforts will be sufficient to overcome the Malacca Dilemma and secure the PRC's energy future remains to be seen.

The Rare Earths Advantage: PRC Strategic Leverage in a Technology-driven World

The PRC's strategic approach to rare earth minerals extends far beyond simply controlling the raw materials. While the PRC does indeed possess significant reserves, holding approximately 44,000 metric tons of rare earth oxides—twice the amount of Vietnam, the second-largest holder—its dominance lies in its comprehensive control over the entire rare earth supply chain.[34] Unlike oil-producing countries that primarily focus on extraction and export, the PRC has strategically built an entire ecosystem around rare earths. This ecosystem encompasses everything from mining and processing to the manufacturing of finished products, including critically important rare earth magnets.[35] While the PRC controls about 60 percent of global rare earth production, its dominance in processing is even more pronounced, with control over nearly 90 percent of the world's rare earth mineral processing capacity.[36]

To further solidify its grip on this strategic sector, the PRC recently banned the export of technologies related to rare earth extraction and separation.[37] This move effectively prevents other countries from developing independent processing capabilities, ensuring the PRC's continued centrality in the global rare earth market. As the world transitions away from fossil fuels and toward renewable energy technologies, the demand for rare earths is projected to increase dramatically. The PRC's strategic foresight in securing its dominance in this sector positions it to reap significant economic and geopolitical benefits.

Beyond controlling the physical supply chain, the PRC has also made significant strides in securing intellectual property related to rare earth technologies. Since surpassing the United States in the number of rare earth patents in 1997, the PRC has continued to expand its lead, accumulating more than 23,000 more patents than the United States as of 2019.[38] This dominance in intellectual property not only grants the PRC a technological edge but also provides leverage in the form of potential patent litigation and licensing agreements.

As James Kennedy points out, Chinese companies can employ strategies like patent trolling and patent ring-fencing to undermine or nullify non-

Chinese patents, further consolidating their control over the industry.[39] This multifaceted approach to dominating the rare earth sector has allowed the PRC to reshape the global economic landscape and gain a significant advantage in the production of both high-tech consumer goods and advanced military equipment. The Baker School of Public Policy and Public Affairs at the University of Tennessee aptly summarizes the implications of PRC dominance, stating that it has created "a supply chain dominance that has made it impossible for other countries to contend with them on any impactful level."[40] Even if other countries were to invest heavily in developing their own rare earth industries, catching up to established PRC infrastructure and expertise would be a monumental task. This reality underscores the strategic challenge posed by PRC control over this critical sector. The PRC's near monopoly on rare earth patents has allowed it to reshape the world's economy and control clear military weapons production.

Charting a Path Forward: Recommendations for U.S. Policymakers

Considering the PRC's strategic approach to climate change action and its dominance in the rare earth sector, the United States must adopt a realistic and proactive policy stance. The United States must first realize that it cannot affect the PRC's progress on climate action as Chinese behavior is set by its own national security and economic considerations, which is tied to how the PRC views the world. Recognizing that the PRC views climate action through a lens of moral neutrality and prioritizes its own economic and security interests, the United States should focus on building its resilience and pursuing its climate goals independently. Additionally, to effectively navigate and mitigate the challenges posed by the PRC's current dominance of the rare earth mineral supply chain, U.S. policymakers should consider the following recommendations.

1. **Embrace Marine Corps peer competition**: The Marine Corps must prepare for future conflicts characterized by disrupted sustainment and logistics. Building on its existing efforts to operate in austere environments, the Marine Corps should further evaluate and address its supply chain vulnerabilities. This includes exploring alternative suppliers for critical equipment, investing in renewable energy sources and reused materials, and promoting technological innovation to reduce logistical burdens. Prioritizing technologies like 3D printing, unmanned supply transport systems, and energy-efficient equipment will be crucial in enhancing the Marine Corps' operational resilience.
2. **Strengthen maritime security**: Protecting sea lanes of communication is essential for ensuring the secure transport of critical resources

and maintaining access to global markets. The United States should continue to invest in its naval capabilities and strengthen maritime partnerships with allies and partners in the Indo-Pacific region. Building robust multilateral security cooperation frameworks will enhance deterrence, reduce the risk of conflict, and safeguard vital sea lanes, including the strategically crucial Strait of Malacca.

3. **Foster international cooperation**: Collaboration with allies and partners is vital for coordinating resource management, addressing supply chain vulnerabilities, and promoting joint manufacturing initiatives. This cooperation should encompass Joint research and development, information sharing, coordinated responses to resource-related threats, and the expansion of the International Traffic in Arms Regulations exemptions to facilitate technology transfer and collaboration. By working closely with like-minded nations, the United States can enhance its global influence, diversify its industrial base, and strengthen the collective resilience of its allies and partners.
4. **Establish strategic stockpiles**: The United States should create and expand strategic reserves of critical resources, including rare earth minerals and other industrial materials, to provide a buffer against supply chain disruption, shortages, and price volatility. These stockpiles will ensure the continuity of operations for critical industries and defense capabilities during emergencies and times of conflict. A robust strategic reserve policy will enhance national security and reduce dependence on unreliable suppliers.

   While the United States currently has some strategic stockpiles, such as the National Defense Stockpile, these reserves are limited in scope and quantity.[41] The U.S. government should expand these stockpiles to include a wider range of critical minerals and resources, ensuring that there is sufficient supply to meet the needs of key industries and defense applications in times of crisis. This effort could involve increasing funding for the National Defense Stockpile, establishing new stockpiles for specific minerals or resources, or incentivizing the private sector to maintain their own reserves that would allow them to maintain industrial output amid sudden disruptions.

   Additionally, the United States can protect its allies and partners from risks posed by the PRC's control over the rare earth minerals supply chain at a minimal cost. Pursuing a strategy of cooperative stockpiling initiatives with its allies involves negotiating bilateral agreements with key partners to establish strategically located stockpiles of critical industrial materials in secure and stable environments. These agreements would outline the terms of storage, access, and sharing of

the materials, cost, and procurement, ensuring accountability in their management. By diversifying the sources of these critical materials and coordinating with existing initiatives like the Australia-United Kingdom-United States (AUKUS) partnership and the Quad (Australia, India, Japan, and the United States), the United States can enhance its resilience to supply-chain disruptions, reduce collective dependence on China, and encourage its allies to responsibly provide for their own defense.

5. **Diversify supply chains**: Overreliance on any single supplier for critical minerals and resources creates strategic vulnerabilities. The United States should actively pursue diversification by sourcing these resources from multiple countries, reducing its dependence on the PRC, and mitigating the risks of geopolitical coercion. This diversification effort should include investing in exploration and development of domestic resources, fostering partnerships with resource-rich countries, namely Australia through the AUKUS partnership, and supporting the development of alternative technologies that reduce reliance on critical minerals.

   To achieve diversification, the U.S. government could offer subsidies to companies that produce critical minerals domestically, incentivizing them to compete with cheaper Chinese-sourced minerals. Additionally, restrictions could be placed on the Department of Defense to prevent the usage of Chinese-sourced minerals in defense technologies. These measures would help to level the playing field and encourage the development of a diverse and secure supply chain.

6. **Reshore critical production**: To enhance U.S. economic resilience and national security, reshoring critical mining and production capacities should be pursued strategically, focusing on industries with significant national security implications and those where overreliance on unreliable foreign suppliers poses unacceptable risk, such as in the large-capacity battery supply chain.[42] This strategy involves increasing domestic production of critical resources and technologies, which will lead to job creation, economic growth, and ensure a stable supply of essential resources for both domestic consumption and support for allies in future conflicts. In addition to the need for subsidies, as mentioned above, to incentivize the use of domestically sourced minerals and reduce reliance on unreliable foreign sources, expanding the base of reliable international sources is also necessary. Expanding the Defense Production Act to include Australia in the waiver that currently allows Canadian minerals to count as domestically sourced for the Department of Defense would further strengthen North American collaboration and accelerate the shift away from China.

The United States has implemented policies to reduce its reliance on China for rare earth minerals by diversifying supply chains through domestic mining and processing, strengthening partnerships with allies like Australia, Canada, and the United Kingdom and supporting the development of alternative technologies. Additionally, there is a growing focus on reshoring critical production capabilities to enhance U.S. economic resilience and national security, involving increased domestic production of critical resources and technologies through initiatives like the Inflation Reduction Act of 2022 and the 2021 Bipartisan Infrastructure Law.[43] The United States also recognizes the importance of international collaboration with like-minded nations to coordinate resource management, address supply chain vulnerabilities, and promote joint manufacturing initiatives, including expanding ITAR exemptions to facilitate technology transfer. However, despite these efforts, several challenges hinder the United States' ability to break PRC dominance of the rare earth mineral sector, including China's cost advantage, investment uncertainty, limited domestic processing capacity, delays in issuing permits, price uncertainty, environmental concerns, PRC strategic policies like banning the export of mining equipment, and skilled labor shortages.[44] To meet these challenges, the United States needs to adopt a comprehensive and coordinated approach involving government policies, private sector investment, and international cooperation.

Conclusion

The PRC's ambitious pursuit of renewable energy and its dominance in the rare earth sector are not driven solely by environmental concerns or altruism. Rather, these initiatives are deeply intertwined with the PRC's broader strategic objectives, including its desire to achieve energy independence, secure economic dominance in emerging markets, and overcome the strategic vulnerability posed by the Malacca Dilemma. As E. H. Carr observed in *The Twenty Years' Crisis*, nations consistently act in their self-interest, even if it means challenging international norms or disrupting the existing global order.[45] The PRC's actions in the realm of rare earths and renewable energy clearly exemplify the political realist perspective. By securing control over the entire rare earth supply chain, from extraction and processing to manufacturing and intellectual property, the PRC is strategically positioned to dominate the global renewable energy market. This dominance will not only fuel the PRC's economic growth but also enhance its military capabilities and geopolitical leverage. As the world transitions away from fossil fuels, the PRC's control over rare earths will become increasingly critical, potentially granting unprecedented influence over the global economy and security landscape.

In the words of Sun Tzu, "every battle is won before it is fought."[46] The

PRC's strategic approach to rare earths can be seen as a preemptive maneuver to secure victory in coming economic and geopolitical competitions. In its bid to establish a near-monopoly over this critical sector, the PRC aims to gain a decisive advantage in the emerging renewable energy era and reshape the global balance of power in its favor. However, the United States and its allies are not powerless to counter PRC ambitions of domination. To counter PRC ambitions and maintain a stable international system, the United States and its allies must proactively and strategically mitigate the risks posed by PRC dominance in the rare earth sector, preventing it from achieving uncontested control and safeguarding their own national interests. The challenges posed by the PRC's rise demand a clear-eyed assessment of its strategic intentions and a commitment to safeguarding the principles of a free and open international order.

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