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White Paper



Strategic resources are fundamental to human existence, global trade, and to global power competition. Energy is used to plant, harvest, cook food, heat homes, produce, deliver goods and services to consumers, and to power ideas. Minerals are the source of materials necessary to produce goods and services. Agriculture and fishing are vital to humankind. Based on current national and global trends, and recent regional areas of conflict, the scale and impact of all these topics have the potential to become flash points and game changers influencing the behaviors of the Great Powers, the G7, to the Global South via the levers of national power (Diplomacy, Informational, Military and Economic, known as “DIME”).

This White Paper explores the security implications of these strategic capabilities, specifically energy and mineral resources; next month’s White Paper will be Part 2, focusing on agriculture and fishing, the other two key strategic resources.

Key Points:

Energy: There are three primary categories of global energy supply: fossil fuels, nuclear energy, and renewable sources.

There are several factors in play regarding energy:

- **U.S. Supply Chain:** The United States has been a net energy exporter since 2019. Primary sources for U.S. imported oil are Canada, Mexico, Columbia, Saudi Arabia, and Brazil.
- **U.S. Houthi attacks** on shipping in the Red Sea will likely have little impact on global energy prices and supply chains as shippers redirect oil through alternate and safer routes, albeit at increased costs of shipping by taking the long path around the Cape of Good Hope.
- **Ukraine-Russia War:** Initially, EU nations had struggles with energy after imposing sanctions on Russian energy along with Russia simultaneously slowing exports to the EU, but they are now largely resolved with sources from other than Russia.
- **Climate Transition:** Although there have been gains in climate friendly sources of energy, fossil fuels will remain the primary source of energy for the foreseeable future.

Minerals and Rare Earth Elements (REEs): Below are two definitions along with challenges presented by China in this space:

- **Strategic Minerals** – Strategic minerals are essential to national defense and the supply lies outside of the U.S. Industries that rely on strategic minerals and their use includes aerospace, energy, defense, telecommunications, and transportation.
- **Rare Earth Elements (REE)** – According to the American Geosciences Institute, REEs consist of seventeen metallic elements found on the periodic table. Examples of these elements and their uses include florescent lighting, cell phones, flat panel screens, magnets, and lasers/fiber optics. What makes REE’s rare is the limited quantities in which they are found and the complex, and to obtain, requires environmentally hazardous processing.
- **China** currently produces 60% of the ore extracted for REEs, and it owns 90% of the global processing capability. Therefore, China can coerce and disrupt any advanced commercial, defense, space, and medical technology. Incentivizing a robust private sector ecosystem for exploration, extraction, and processing in an environmentally friendly and sustainable way, offers opportunities.



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The following Bancroft Capital GEO-Intel papers provide background information: [Great Power Competition](#), [Strategic Competitors](#), and the [Global South](#).

Energy:

According to the U.S. Department of Energy, there are three primary categories of global energy supply: nuclear energy, fossil fuels, and renewable sources. The Energy Institute Review of World Energy (2023) states that the consumption of global energy by type is as follows: oil 31.6%; coal 26.7%; natural gas 23.5%; renewables (less hydropower) 7.5%; hydropower 6.7%; and nuclear 4%.

Access to these sources of energy lies at the center of global competition. China, Russia, and the United States are the major players vying for these resources where supply and demand capacity and capabilities drive competition. Overall, the United States has been a net energy exporter since 2019.

Here are some statistics with fossil energy products:

Oil:

- The United States, China, and India represent 20%, 16%, and 5% respectively of global consumption for oil.
- China is the lead global importer of oil at 23% followed by the United States, at 12.9%.
- Primary sources for United States, imported oil are Canada, Mexico, Columbia, Saudi Arabia, and Brazil.
- The United States is the top producer of oil for global markets at 21%, followed by Saudi Arabia at 14%; Russia 10%, and Canada at 6%, and then Iraq.
- Top exporters are Saudi Arabia, Russia, Canada, Iraq and then the United States.

Coal:

- China is the world’s largest consumer of coal at 50.5% of global demand, followed by India at 11.3% and the US at 8.5%.
- China leads global coal extraction followed by India, the US, Australia, and Indonesia.
- China, India, Japan, South Korea, and Taiwan are the largest coal importers representing 64% of global coal imports.
- The top coal exporters are Australia, Indonesia, Russia, United States, South Africa, and Canada.

Natural Gas:

- The United States leads global natural gas consumption (43.5%) followed by Russia (23.4%), China (15.6%), Iran (11.2%), and Canada (6.3%).
- The United States also leads global natural gas production at (24%) followed by Russia, Iran, China, and Canada.
- Top Exporters of gaseous and liquified gas include:
 - Gaseous state (pipeline) – Norway, Russia, United States, Belgium, and Canada.
 - Liquified Natural Gas – Qatar, Australia, United States, Russia, and Malaysia.
- Top importers of gaseous and liquified Gas include:
 - Gaseous state (pipeline) – Germany, Italy, United Kingdom, Belgium, and France.
 - Liquified Natural Gas – Japan, China, South Korea, France, and Spain.

Energy can be quite vulnerable – here are some of the current concerns:

- **Houthis:** Their attacks on shipping in the Gulf of Aden and in the Red Sea will likely have little impact on energy prices and supply chains. According to a Goldman Sachs source, redirecting oil through alternate and safer routes should have a minimal impact on spot prices. That said, the costs of shipping by taking the long path around the Cape of Good Hope have significantly increased. For more information, please see [Houthi Attacks](#).
- **Ukraine-Russia War:** According to the S&P's Energy Security Sentinel, Russian gas accounts for only around 8% of EU imports, it was 45% before the war. Of note, Russia has expanded exports to China and India. Reuters states that "Russia is eyeing the Northern Sea Route across the Arctic Ocean to supply the cargoes to the east, to cut the time and cost of bringing its fuel to market. The route may cut the delivery time to Asia from Europe by as much as 40% compared to the Suez Canal." These plans may have to slow down considerably due to three "ice-class" LNG tanker orders that were canceled due to economic sanctions. For more information on this conflict, please see [Ukraine-Russia War](#).
- **South China Sea and Strat of Hormuz:** Current expectations are continued stability in energy import and exports due to the level of global dependency on the trade routes. For more information, please see [Global Commons](#).
- **Climate Transition:** There have been decreases in carbon emissions, fossil fuels will remain the primary source of importable/exportable energy for the foreseeable future. Exporting renewable energy at scale is aspirational, yet is also a science, technology, and logistical disruptive opportunity.

Strategic Minerals and Rare Earth Elements:

Producing advanced technology in any sector of modern society depends increasingly on obtaining minerals and elements that are difficult to find in quantities that can be easily mined, extracted, and processed. Such materials are referred to as strategic minerals and rare earth elements and they are essential in developing critical products ranging from phones and computers to medical devices, vehicles, advanced defense, and space systems, and even technologies necessary to curb global warming. Not only are they essential, but they are also costly; the techniques for mining, extracting, separating, processing, and commercializing ore are complex and expensive. And these techniques often produce derivative biproducts that are severely damaging to the environment, expensive to ameliorate, and hazardous to people.

Definitions:

Strategic Minerals – Strategic minerals are essential to national defense and the supply lies outside of the United States. Therefore, strict measures controlling conservation and distribution are necessary. Industries that rely on strategic minerals and their use includes aerospace, energy, defense, telecommunications, and transportation. In total, there are about 50 strategic minerals.

Rare Earth Elements (REE) – According to the American Geosciences Institute rare earth elements (REE) consist of seventeen metallic elements found on the periodic table. Some examples of these elements and their uses include florescent lighting (Yttrium, Europium, Cerium, Lanthanum, and Terbium); cell phones (Cadmium and Yttrium); flat panel screens (Yttrium, Europium, and Terbium; magnets (Neodymium and Samarium), and lasers/fiber optics (Erbium, Neodymium, and Ytterbium). What makes REE's rare is the limited quantities in which they are found and the complex, and environmentally hazardous processing necessary to obtain the material.

- Environmental concerns with mining and processing REEs include:
 - Disruption of ecosystems due to the open pits and vast amount of material that must be removed to extract the REEs.
 - Wastewater ponds contain acids, heavy metals, radioactive waste, and other toxic chemicals.
 - According to the Institute for Policy Studies, REE extraction has had a direct impact on the environment and driving conflict. Social and economic tensions have escalated in Madagascar, Brazil, India, Sweden, Finland, and direct and indirect threats and intimidation in Myanmar, India, and China. The Bayan Obo REE extraction and processing (China) has caused severe environmental damage
- Security concerns: The geopolitical risk associated with strategic minerals and REEs is the disruption of supply chains and derivative DIME implications when used as a weapon in great power competition. Currently China possesses significant the leverage in producing and processing REEs globally.
 - Production: Up to the 1980s, the United States was the world leader in REE production; however, according to the U.S. Geological Survey, by 1993, China passed the United States in REE production providing 38% of global REEs while the United States produced approximately virtual parity at 33% of REE supply. By 2011, China provided 97% of the global REE demand. And in 2022, the United States imported 95% of REEs from China.
 - Processing – according to a report by CSIS, China currently produces 60% of the ore extracted for REEs. However, they own 90% of the processing to meet global demand. That means, even in countries that have rich ore deposits like Africa, Australia, and the United States, the ore must be exported to China for processing at which time, it becomes a China asset for trade and geopolitical leverage.
 - Securing REEs amid China's efforts to maintain its global dominance and control over REEs through trade bans and restrictions.
 - The U.S. Department of Energy Critical Minerals and Materials program seeks to decouple REE reliance on China and reestablish the United States as a leader in secure REE supply and processing. Core technology investment areas includes enabling technologies, separation technologies, and processing systems.
 - The DOE and DOD are also investing in the Separation and Purification of Rare Earth Elements (SPREE) Advanced Research Concept (ARC) opportunity.

- Re-energizing the private sector has included the extraction and processing investments in key domestic areas where REE mining and environmentally sound processing could occur. Examples include (but are not limited) to the following:
 - ◇ MP Materials (CA and Texas).
 - ◇ American Rare Earths (WY, AZ, and NV).
 - ◇ U.S. Critical Materials (Idaho).
 - ◇ Academic and national lab research on REE production and processing.

Implications and Forecasts:

Energy

- When it comes to access to energy, near-term risk is high in Europe due to the war in Ukraine.
- Regional disruptions to energy supply chains can be expected because of the conflicts in the Middle East and Ukraine; for more information, please see [Israeli-Hamas War](#) and [Ukraine-Russia War](#).
- The United States domestic supply chain risk due to current political assumptions about how quickly our nation can transition from fossil fuel use to renewables at scale. This risk applies not only to the United States but also to global energy production due to the inability to export renewable energy at scale.
- The disruptive opportunity in energy markets in the mid to long term is overcoming the science, technology, and supply chain barriers in exporting renewable energy at scale.
- China's vulnerability due to reliance on oil, coal, and natural gas will continue to be the driver in its securing sources of supply.
- Russia's vulnerability due to Ukraine has had limited impact on their oil exports due to demand from China and India's. According to the Center for Global Energy and Policy, Russia is modifying its strategy for natural gas exports to provide LNG and pipeline gas to Turkey, China, and former Soviet Union Countries.

Minerals and Rare Earth elements – China will retain significant leverage to coerce and disrupt any commercial, defense, space, if it owns the REE processing market. Incentivizing a robust private sector ecosystem for exploration, extraction, and processing that is environmentally friendly and sustainable is a disruptive opportunity.

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