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# Rare Earth Elements in National Security Strategies: a Comparative Analysis of US, Japanese and Australian Policies

**Abstract:** In the face of increasing geopolitical rivalry and energy transition, access to rare earth elements (REEs) has become a key element of national security strategies. These raw materials are essential for modern civilian and military technologies, and their global supply remains highly concentrated, particularly in China. The purpose of this article is to provide a comparative analysis of the national security strategies of three countries – the United States, Japan and Australia – with a particular focus on their approaches to accessing, controlling and securing the supply of REEs. The research problem is to determine how the selected countries – the United States, Japan and Australia – integrate issues of access to rare earths into their national security strategies and what instruments they use to minimize their dependence on China. The analysis shows that, despite their differing roles as importers (US, Japan) and exporters (Australia), all three countries treat REEs as a component of strategic autonomy, taking steps to diversify supply, develop domestic processing technologies and build partnerships with other countries.

**Key words:** rare earth elements, national security strategy, geopolitical rivalry, critical raw materials

## Introduction

The purpose of the article is a comparative analysis of the raw material security strategies of the United States, Japan and Australia in the context of securing access to rare earth elements as a key element of their national security policies. An estimated 350,000 tons of rare earth elements were produced at rare earth mines worldwide in 2023. With more than 69% of the world's rare earth output in that same year, China currently leads the world in this regard and processes around 90% of the rare earth elements produced worldwide. Concern over supply security and susceptibility to geopolitical pressures, as a result of concentrating production and processing in one state, influenced the change in the raw material policies of other states (GlobalData, 2025). As the largest economy and technological leader in the world, the United States is reliant on imports of rare earth elements (REEs) and is working to restore its own mining and processing industry. Japan, which experienced a direct halt to REEs supplies in 2010 as a result of a territorial dispute with China, is diversifying its supply sources, investing in Australia and Vietnam (Terazawa, 2023). Australia, in turn, with one of the largest REE deposits in the world, is emerging as a key ally of Western countries in the effort to offset China's influence in the critical raw materials sector (Chater, 2025).

The article is divided into three main parts. The first part presents the properties of rare earth elements, their technological significance and role in sectors of strategic importance, such as defense, energy and high-tech industry. The second part focuses

on the analysis of the policies of the United States, Japan and Australia, taking into account their strategic documents, legislative actions and bilateral and multilateral initiatives. The third part is comparative and serves to identify similarities and differences in the approach of the analyzed countries to the issue of raw material security, indicating challenges and possible scenarios for the further development of their strategies in the context of global competition for access to rare earth elements.

The choice of countries analyzed in the article is based on the differentiation of their role in REEs global supply chain. The United States and Japan are advanced technological economies that are highly dependent on REE imports, while Australia is one of the largest producers of REE outside China (Dobransky, 2015, p. 95). At the same time, all three countries remain strategic partners within the Indo-Pacific political architecture. The analysis of their approach to REE allows to examine how countries with different geopolitical and economic conditions build resource resilience as a component of national security.

The article verifies the research hypothesis, which assumes that the raw material security strategies of the United States, Japan and Australia, despite their differences in geopolitical and economic circumstances, show convergence in their desire to reduce dependence on China in the rare earths sector through the development of domestic capabilities, diversification of supplies and increased strategic cooperation. This research objective is addressed by the following research questions: what steps are the United States, Japan and Australia taking to reduce dependence on China in the rare earths sector? What mechanisms of international cooperation do these countries use to achieve raw material security in the context of rare earth elements? Are there common elements of strategy that can be seen as characteristic of the response of democratic states to China’s dominance in the rare earths sector?

In the course of the research process, the author used following research methods: comparative analysis, descriptive method and synthesis. The comparative analysis made it possible to compare three case studies of countries representing different political, economic and geostrategic conditions. The use of comparative method helped to identify both universal trends and specific solutions implemented in response to China’s dominance in the rare earths sector. The descriptive method allowed for a detailed presentation of the policies, actions and instruments used by the governments of the United States, Japan and Australia in the field of the analyzed aspect. At the end of the research process, a synthetic approach was used. This made it possible not only to capture common threads, but also to identify systemic differences in the approach to the strategic issue of raw material independence in the aspect of extraction, refining and production of rare earth elements.

The following analysis is embedded in theoretical approach of offensive realism and resource nationalism. Offensive neorealism, represented primarily by John Mearsheimer assumes that states strive to maximize their power and autonomy in an anarchic system. In this approach, control over strategic resources, such as REEs, becomes one of the key tools for strengthening a state’s position in the international arena (Mearsheimer, 2001, p. 29–31). Nowadays access to critical raw materials no longer is simply an economic issue, but becomes a security policy issue, a tool of pressure, and at times a potential source of conflict (Klare, 2008, p. 56–60). The theory of resource nationalism was also

used as a research framework. It typically arises in nations endowed with substantial natural resources, where the extraction and exportation of these resources are crucial to the economy (Wilson, 2015, p. 399–416). This phenomenon is frequently motivated by the aim to enhance domestic advantages, safeguard national interests, and diminish reliance on external entities, particularly foreign corporations or investors (Simsek, 2018, p. 33). Once a state secures control over its natural resources, it can further its political, social, and economic goals (Dubey, Howe, 2021, p. 310). In the theoretical approach of resource nationalism nation-state governments are key players. They are responsible for the accumulation of geological knowledge, which they share with institutions of science (Kotilainen, 2021, p. 113).

## Properties of rare earth elements, their technological importance and role in strategic sectors

Rare earth elements, which include fifteen elements from the lanthanide group and two related elements — scandium and yttrium — are today one of the most strategic groups of raw materials (Wen, Wang, 2014, s. 121). Although their name suggests rarity, in fact they are quite common in the Earth’s crust. The problem is not their presence, but their dispersion, which significantly complicates their economic and ecological extraction and processing. Their common feature is their unique physicochemical properties, such as magnetism, luminescence, electrical and thermal conductivity, and the ability to absorb radiation, which are used in numerous advanced technologies (Ganguly, Agarwal, 2023, p. 259).

The worldwide geographical location of rare earth metals is fundamental to the understanding of the structure of global supply chains as well as of the geopolitics of such raw materials. Rare earth metal deposits occur on almost every continent, but their economic desirability – and therefore the probability of extracting and processing profitably – is restricted to fairly limited locations (Fernandez, 2017, p. 26–27). Today, the People’s Republic of China is far and away the outright leader in extraction, processing and export of the rare earth metals, and since the 1990s has created a quasi-monopolistic position in this market (Vandamme, Struye de Swielande, Orinx, 2023, p. 248). China has some of the largest and most advanced deposits, which are located mainly in Bayan Obo regions, Inner Mongolia province, and in the southern provinces, where so-called ion-sorption deposits are extracted – those with light rare earth metals which can be extracted relatively simply (Wang, Zhao, Yu, Dai, Deng, Zhao, Liu, 2018, p. 415–424).

The rare earth deposits also exist in other countries such as Canada, Brazil, India, Russia, Vietnam and African countries – e.g. Malawi, Madagascar, Democratic Republic of Congo. These countries are only beginning to develop their mining resources, with the additional disadvantage of having limited exposure to capital, technology and infrastructure (Castro, Blazquez, Gonzalez, Munoz, 2021, p. 210–211). In recent years, Nordic countries – Sweden, Norway, Finland have also shown growing interest, since they have geological potential and are regarded as stable economic and political partners (Bye, 2023). As a result, geographical distribution of REEs not only determines the market structure, but also raw material security policy and international relations. Coun-

tries seeking autonomy from being controlled by China are investing more in national deposits, funding geological exploration, and forming strategic partnerships – e.g. Quad (USA, Australia, Japan, India) or EU initiatives – designed to create a more sustainable and secure supply system for major raw materials (Sharma, 2024).

The value of REEs has grown over the past two decades in tandem with the evolution of advanced industries and global energy and digital revolution. In the high-tech industry, the elements play a critical role in the manufacture of smartphones, computers, optical fibers, photovoltaic cells and electric vehicles (Reuters, 2025). For instance, neodymium and praseodymium are utilized to manufacture powerful permanent magnets, which are required in electric vehicle motors and wind turbines (Home, 2023). Dysprosium and terbium improve the performance of such magnets and thereby the overall devices. Without cerium, high-purity optical glass cannot be produced, while europium is used in the phosphors of LED screens and plasma.

Rare earth elements are now an essential part of modern medical and healthcare technology due to their unique chemical and physical properties. REEs bring precision, efficiency, and performance to diagnostic equipment, treatment technologies, and biomedical devices. The most apparent medical application of REEs is diagnostic imaging, i.e., magnetic resonance imaging (MRI). Gadolinium (Gd) is the most widely used contrast agent for MRI scans. It enhances the visibility of tumors, inflammation, and blood vessels by altering the magnetic properties of nearby water molecules, thereby improving image clarity (Ferris, Goergen, 2017). Gadolinium-based contrast agents (GBCAs) are especially useful in detecting central nervous system diseases, cardiovascular diseases, and cancers (U.S. Food&Drug Administration, 2018). Certain REEs also find significant use in oncology and radiotherapy. For example, yttrium-90 (Y-90), which is a radioisotope of yttrium, is used in targeted radionuclide therapy, say in the treatment of liver cancer through selective internal radiation therapy (McBride, 2023). Y-90 delivers the radiation directly to the tumor site and spares the normal tissues, maximizing the effectiveness of the treatment.

The use of REEs in the military sector is also crucial. They constitute a key part of modern military technology, such as missile guidance systems, lasers, radar systems, and jet engine and stealth technology (Laje, 2023). Because of this, the Pentagon and other US security agencies have warned for a decade of growing dependence on Chinese supply of these components (Pincus, 2024). For example, neodymium and dysprosium are present in missile guidance and long-range radars and samarium and gadolinium are used to make thermal sensors and submarine sonars.

The energy transition to reduce $CO_2$ emissions and move away from fossil fuels is completely reliant on rare earth element supplies. In renewable technology, such as windmills, solar panels or energy storage, they are directly involved (Barclay Pearce Capital, 2023). Precisely, they are used in advanced energy conversion and storage systems, next-generation batteries, and in components that increase the efficiency of solar and wind power conversion to electricity. As a result, the rare earth elements are considered to be needed to achieve climate goals, such as those presented in the Paris Agreement or in the Green Deal strategies (International Energy Agency, 2021).

As a result, REE have become a subject not only of economic analysis but also field of interest of political and geopolitical nature. China currently accounts for about 69%

of global rare earth production, 85% of its refining capacity, and more than 90% of global production of neodymium magnets – a critical component for many strategic sectors. This level of supply concentration means that many countries – including the United States, Japan, and Australia – are being forced to develop and implement national resource security strategies aimed at diversifying supply chains, supporting domestic mining and processing, and building reserves of critical minerals.

## Policies of the United States, Australia and Japan towards rare earth elements

Australia is taking an increasing share in the world REEs supply chain, processing them as a priority component of the country’s economic and geopolitical security. In the context of the People’s Republic of China’s hegemony in this sector, the Australian government has adopted a number of strategic documents aimed at strengthening domestic production, increasing export markets and developing cooperation with countries of similar values, such as the United States, Japan and European Union member states (Australian Government, 2024). The overall government document is the Australian Critical Minerals Strategy 2023–2030, which was approved by the federal government in June 2023. The strategy has six pillars: (1) supporting strategic projects, (2) attracting investment and forming international partnerships, (3) involving Indigenous Australians, (4) promoting robust ESG best practice, (5) creating infrastructure and services that support the sector, and (6) creating a skilled workforce (Department of Industry, Science and Resources, 2023, p. 17). The goal of the strategy is not merely to increase the extraction and processing of REEs, but also to build the development of complete value chains, i.e., production of distinct technologically advanced components (Department of Industry, Science and Resources, 2023, p. 27). In comparison to the 2019 strategy, the 2023–2030 strategy presents a broader vision designed to establish Australia as a notable producer of raw and processed critical minerals (Korolev, Wu, 2024; Cohen, Fazely, Crofts, 2022).

In 2021, the government also established the Critical Minerals Facility, a $2 billion fund managed by Export Finance Australia, which lends to projects within the field of mining and processing of critical metals (International Energy Agency, 2023). This entity is complemented by the Northern Australia Infrastructure Facility (NAIF), which lends to infrastructure within regions of abundance of raw material, such as Queensland and the Northern Territory (Northern Australia Infrastructure Facility, 2024, p. 20).

Australia possesses prominent rare earth resources, especially in the states of Western Australia, Queensland, and New South Wales (Neary, Highley, 1984, p. 431). Initiatives like Mount Weld – run by Lynas Rare Earths and the Nolans Project – Arafura Resources are fundamental to the Australian REE industry and garner both financial and political backing (Lynas Rare Earths, 2024; Tibben, 2025). A crucial component of Australia’s strategy is the social endorsement and involvement of indigenous communities in resource projects. The federal government advocates for a co-management approach that considers the interests of Aboriginal people, via consultation and participatory methods (Department of Industry, Science and Resources, 2023, p. 30–35).

Australia is also enthusiastically developing bilateral ties to support its role as a serious supplier of important raw materials. In 2019, there was signed a Memorandum of

Understanding on cooperation in the area of critical minerals with the United States, which resulted in American support for the Australian company Lynas – the biggest in the world producer of REEs outside of China. Collaboration includes also the area of scientific research and technology transfer (U.S. Department of the Interior, 2019).

Most of the agreements have a shared goal: to diversify and secure supply chains while ensuring their sustainability from environmental, social, and economic viewpoints. The Australian government and related entities have committed to 25 international agreements and processes. A 26th is currently being negotiated with the European Union. The Australian government’s involvement in so many critical minerals agreements and processes indicates it is actively seeking opportunities for exports and inward investment. It, along with most state governments, is promoting domestic critical minerals exploration, mining, and processing, with incentives that include financial assistance (Satchwell, 2024).

In April 2024, the government of Australia, under the leadership of Prime Minister Anthony Albanese, unveiled an extensive new economic program known as Future Made in Australia, which seeks to significantly bolster the nation’s industrial, technological, and raw materials capabilities. This plan is directly connected to the approach of diversifying supply chains and enhancing the resilience of the Australian economy against external geopolitical disruptions, including China’s control over rare earth metals markets (Carouso, 2024).

Future Made in Australia sees the state playing a larger role in strategic sectors, including through direct investment, tax breaks and infrastructure spending. One of the most significant pillars of this agenda is the creation of sovereign value chains for critical metals and advanced technologies, including renewable energy, electric vehicles and defense. The focus is placed upon integrated development of national REEs resources – not only their extraction, but local processing, refining and production of half-products and components (neodymium magnets, for instance). The agenda also envisions, inter alia, creating a new investment fund based on the US Inflation Reduction Act (BDO Australia, 2024). As well as public expenditures to support so-called downstream projects, which so far have been in development largely overseas. According to the federal government’s statements, this way, the state will play a more active role in coordinating public and private investments in strategic industries, according to the logic of the so-called industrial and raw materials partnership.

The agenda is supposed to provide incentives for companies to locate processing and component-making plants in Australia, with the intention of balancing third-country export of raw, unprocessed materials – mainly China (Australian Government, 2024, p. 24). The new political agenda is also supposed to further position Australia as an international provider of „friendly-sourced” strategic metals, i.e., those produced by democratic nations with strong environmental and labor practices. Most importantly, the Future Made in Australia policy is institutional-multi-annual, meaning that new rules are entwined together with a budget architecture, e.g., establishment of special expert advisory bodies complementing the activities of the science and industry sector (Australian Government, 2024, p. 13–14). According to Australian authorities, Australia not only hopes to remain a „mine for the world”, but a producer and seller of ready-to-use technological packages based on raw materials of domestic origin. Japan, one of the most

technologically advanced countries but devoid of significant natural resources, has been pursuing a consistent policy of raw material security for many years. Therefore, since the beginning of the 21st century, the country’s raw materials policy has been based on the pursuit of ensuring stable, secure and diversified supplies of critical metals, which in the case of REEs is of not only economic but also strategic importance.

A turning point in Japan’s policy was the so-called „resource war” with China in 2010. The event started with a naval accident in disputed waters off the Senkaku Islands, where a Chinese fishing boat captain was detained by the Japanese Coast Guard after colliding with a patrol vessel. China right away demanded his release, and Tokyo’s denial prompted Beijing to respond with a series of pressure measures, the most significant of which – symbolically, and economically – were the halting of rare earth element’s exports to Japan. At that time, Japan had imported more than 90% of its rare earth from China, and these raw materials were key to entire value chains in industries most vital to the Japanese economy, such as electronics, automobiles, precision manufacturing, and energy and military technology (Rachman, 2023).

The catalogue of corrective actions aimed at preventing the situation from September 2010 included, among others: searching for alternative suppliers, increasing expenditure on the development of recycling technologies, strengthening the Japan Organization for Metals and Energy Security (JOGMEC) existing since 2004.

Japan has made more efforts to diversify its supply sources, develop its own storage and technological expertise, and invest in alternative technologies. These have been and still are spearheaded primarily by JOGMEC, the government corporation responsible for the country’s raw material security. JOGMEC plays a fundamental role in ensuring new supply sources, supporting overseas investment, as well as co-financing mines and plants worldwide (Seth, 2024).

Japan’s activity has been significant also in the investment in foreign mines and processing plants (Obayashi, 2025). An excellent example of such cooperation is the long-term deal with Australian company Lynas Rare Earths, under which JOGMEC finance and technology were involved in developing the Mount Weld mine and REE separation plants in Malaysia (Japan Organization for Metals and Energy Security, 2023). As a result of these initiatives, Japan managed to reduce China’s share in REE supplies to approximately 58% by 2023, an excellent success in strategic diversification. The other important element of Japan’s strategy is the expansion of the country’s stock of strategic REE reserves, which are to ensure supply stability in the event of any future geopolitical crisis. These reserves are stored in specially modified state warehouses and are operated on a rotational basis, by mutual agreement with the industrial sector (Bakshi, 2025).

Simultaneously, Japan is increasingly developing technologies with the minimum utilization of rare earths and constantly finding alternatives of material and technologies possessing equivalent characteristics. Already, companies like Toyota and Hitachi from Japan have successfully developed electric motors containing minimal quantities of dysprosium or alternative chemical arrangements of magnets based on the country’s strategy to minimize reliance on raw material materials that are important in character (Toyota, 2018). Another highly promising area of innovation is exploring the deep sea, especially off Minami-Torishima Island, where Japanese scientists have found potentially the largest in the world deposits of rare earth elements in sea floor sediments. Though extraction

from the ocean bottom is still at the test stage, Japan is actively developing technologies that can make it relatively self-sufficient in raw materials in the area in the future.

From an institutional perspective, Japan’s rare earth elements policy fits into the broader framework of the Japanese Economic Security Strategy. In May 2022, Japan passed the Economic Security Promotion Act, ushering in a new era of thinking about the economy in terms of national security (“Asia Business, Law Journal”, 2025). This document is part of a broader trend of redefining security in conditions of global dependence on critical resources and new technologies. One of the four main pillars of the strategy is securing supplies of critical raw materials, including rare earth elements, which have been officially recognized as materials essential for economic survival and technological advantage (Nagino, Glosserman, 2025). It emphasizes Japan’s desire to reduce its dependence on China by investing in mining and processing projects in third countries (including Australia, Vietnam, India, and Canada). An important element of the discussed strategy is also the development of state reserves of rare earth elements, similar to the case of crude oil or LNG. The reserves are to act as a buffer in the event of crises or a sudden suspension of supplies. Based on the American experience from the 1990s, the strategy introduces special control mechanisms over the transfer of REE-related technologies and supervision of foreign investments in Japanese companies operating in the critical metals sector. The aim is to protect know-how and prevent takeovers by entities associated with authoritarian states (Office of the United States Trade Representative, 2023).

The 2022 Economic Security Strategy is a significant strengthening of the state function in commodity risk management. While Japan previously focused primarily on diversification and technological improvement, the new strategy introduces legal and institutional mechanisms enabling more overt state intervention – domestically as well as towards foreign partners (Igata, Glosserman, 2021). With regard to rare earth elements, such a policy establishes a framework on which Japan’s commodity policy becomes systemic and long-term in nature. It is not merely a response. to previous experiences. with China, but also part of proactive build-up of „strategic resilience” in a time of escalating. geopolitical. and technological rivalry.

In 2023, Japan, alongside the US and the European Union, also initiated the Minerals Security Partnership (MSP). It is currently one of the most important formats of international cooperation in ensuring the security of supplies of critical metals, including rare earth elements (European Commission, 2024a). The idea for establishing this initiative in 2022 was initiated by the United States, and Japan was one of the first countries to join it, treating the initiative as a natural extension of their own economic security strategies. The MSP had 14 members in 2023, including: the USA, Canada, Australia, the European Union, the United Kingdom, Germany, France, South Korea, Japan and other democratic countries with a developed technology industry. The main goal of MSP is to establish a robust, transparent, and sustainable supply chain for essential raw materials by means of: collaborative funding for extraction, refining, and recycling initiatives, exchanging technical and geological expertise, reducing reliance on authoritarian governments, primarily China, and fostering investments in Global South nations in the spirit of „win-win” (Wauters, Hertel, 2024).

Since joining the MSP, Japan has been actively involved in a number of projects. Through JOGMEC and the Ministry of Economy, Trade and Industry (METI), it pro-

vides financial and expert support for raw material projects in the Global South, especially in Southeast Asia (Vietnam, Malaysia), Africa (Namibia) and South America (NikkeiAsia, 2025). Moreover Japan together with the US and Australia supported initiatives in Tanzania aiming to develop mining sector in that country (Mining.com, 2024).

Japan’s rare earth policy therefore has three pillars: diversification of supply sources by foreign partnership and investment, reduction of REE consumption through technological substitution, and strategic reserve accumulation and economic security enhancement. Japan combines economic pragmatism with long-term planning and therefore is among the best-placed countries for potential crises in access to major raw materials (Agency for Natural Resources and Energy, 2020).

The United States has been a leader in rare earth metal mining and processing for decades. In the 1990s, as a result of market liberalization and growing competition from China, their domestic industry become marginalized (Oberhaus, 2023). Over the last twenty years, the US government has slowly acknowledged the extent of their reliance on REE supplies from China, but it is only in recent years, amid increasing geopolitical competition, that this concern has risen to prominence in national security and industrial strategy (Martins, 2023).

One of the marker events was when President Donald Trump signed Executive Order No. 13817, „A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals.” In this paper, there was shown to be a pressing need to reduce American dependency on foreign producers of critical raw materials, most especially those essential to the defense, aviation, renewable energy, and digital economies (Federal Register, 2017). Consistent with Executive Orders 13817, the U.S. Department of the Interior, together with the United States Geological Survey (USGS), in 2018 put together a list of 35 raw materials considered critical, out of which 17 are rare earth elements (U.S. Geological Survey, 2018). This directive was a prelude to later federal work, such as supply chain gaps analysis, investment barriers identification, and domestic producers incentives creation. This report laid an institutional foundation for U.S. raw material policy in the following years.

Due to increased tensions with China, Executive Order No. 13953 „Addressing the Threat to the Domestic Supply Chain from Reliance on Critical Minerals from Foreign Adversaries and Supporting the Domestic Mining and Processing Industries” was signed in 2020, which was a declaration of national emergency on the supply of critical raw materials (Federal Register, 2020). The signed document permitted the Department of Commerce and the Department of Energy to act to support domestic mining, processing and recycling (International Energy Agency, 2022). Financial mechanisms were also made available, including preferential loans from federal funds, and the capacity for engaging into government contracts with companies that are building REEs infrastructure.

One of the most comprehensive is the Executive Order No. 14017 „America’s Supply Chains” signed by President Joe Biden in February 2021. It ordered federal agencies to review supply chains in four strategic categories: semiconductors, pharmaceuticals, batteries, and critical raw materials – including rare earth elements (The White House, 2021a). In June 2021, a report was published, „Building Resilient Supply Chains, Revitalizing American Manufacturing and Fostering Broad-Based Growth,” which recommended developing U.S. rare earth mining and processing capability, subsidizing re-

search into substitutes and recycling technology, diversifying foreign sources through strategic partnerships (e.g. with Australia, Canada, Japan), expediting mining permitting procedures (The White House, 2021b, p. 162–165). The report formed the basis for subsequent actions, such as the Inflation Reduction Act of 2022, which provides vast tax credits and subsidies to companies that are investing in strategic raw materials and low-carbon technology.

When examining the National Defense Authorization Act, the annual budgetary act for the United States Department of Defense, a clear trend emerges. It is characterized by a renewed appreciation of the importance of rare earth metals to maintaining the United States’ position as a global power. The 2019 law banned the Department of Defense from purchasing neodymium-iron-boron (NdFeB) magnets from China, Russia, Iran, and North Korea (Federal Register, 2019). It also emphasized the development of domestic supply chains independent of strategic adversaries. Subsequent annual documents provided for the creation of strategic reserves of rare earth metals and established a priority for domestic mining and processing of strategic metals. In its 2024 National Defense Industrial Strategy, the Department of Defense set a goal to develop a complete mine-to-magnet REE supply chain that can meet all U.S. defense needs by 2027 (U.S. Department of Defense, 2023, p. 43–45).

As part of the mine-to-magnet strategy, the US is supporting the development of the full value chain of REEs in the country, from mining to the production of industrial components. An example is the expansion project of the Mountain Pass mine in California (operated by MP Materials), which received support from the Department of Defense in the amount of USD 35 million to develop heavy metal separation technology (U.S. Department of Defense, 2022). The US is also investing in the establishment of processing plants in Texas (Globe Newswire, 2025).

Following the Executive Order No. 14017, in February 2022, the United States Department of Energy published a document of strategic importance entitled “National Strategy to Secure the Supply Chain for a Robust Clean Energy Transition.” The document clearly emphasizes the growing change among decision-makers about the importance of critical raw materials, especially rare earth elements as core elements of national security, energy transformation and the development of high-tech industries. The authors of the strategy identify People`s Republic of China as the main threat to global supply chain of REE due to excessive concentration of the analyzed minerals in this country (U.S. Department of Energy, 2022, p. 13).

„National Strategy to Secure the Supply Chain for a Robust Clean Energy Transition” is based on four complementary pillars, enabling the US to reach sustainable and resilient to potential crisis, supply chain. The first emphasizes the need to increase domestic extraction as well as processing of rare earth elements. According to the authors of the analyzed document this aspect can be achieved thru streamlining procedures for granting environmental permits for mining (U.S. Department of Energy, 2022, p. 22). Simultaneously it advocates for the development of technological substitutes, promoting recycling and recovery of raw materials from industrial waste (U.S. Department of Energy, 2022, p. 36). The last foundation involves actions to support international cooperation, especially in the field of infrastructure and scientific research. The strategy indicates the need to create alliances with countries sharing similar democratic

values and high environmental standards, like for example Australia, Canada, South Korea or Japan.

## A comparative analysis of the rare earth elements policies of Australia, Japan and the United States

Raw material policies related to rare earth elements in Australia, Japan and the United States are based on the common denominator of seeking to diversify supply sources, secure strategic raw materials and become independent from China’s dominance. Although each of these countries is pursuing a different strategy based on local geological conditions, industrial potential and technological capabilities, it is clear that raw material security is becoming a national priority. In the context of global economic and geopolitical competition, control of rare earth supply chains is becoming one of the key elements in securing strategic interests.

Considering the context of rare earth metals exploitation and production, the countries analyzed show a noticeable difference. Australia stands out among Japan and the United States as being among the world’s significant producers of rare earth elements. Due to its extremely concentrated deposits, the country plays an important role in the world’s supply chain (Vernon, 2024). Through the Critical Minerals Strategy 2022 and the Future Made in Australia initiative, the Australian government is significantly investing in developing domestic processing and mining capacity (Ministers for the Department of Industry, Science and Resources, 2024). Priority is not only to increase mining capacity but also to increase on-site capacity for raw material processing, thus reducing dependence upon Chinese separation plants. Australia is pursuing this in cooperation with the US and Japan, and trying to create substitute supply chains. In the United States, the situation is different. Although the country historically dominated the mining of REE (until the 1990s), dependence on Chinese processing of raw materials has become a strategic problem. Documents such as the National Strategy to Secure the Supply Chain for a Robust Clean Energy Transition set goals for rebuilding domestic capacity, including reactivating mines, developing processing infrastructure and investing in recycling technologies. U.S. policy focuses on increasing domestic production, including upgrading infrastructure and supporting new technologies that could reduce dependence on China. Japan, unlike Australia and the US, does not have significant REE deposits of its own. In response to restrictions on access to raw materials, especially after the diplomatic crisis with China in 2010, Japan has invested in recycling technologies and diversifying its sources of supply (Willing, 2023). The country has become a pioneer in recovering rare earth elements from electronic waste and used appliances, minimizing its dependence on primary sources. These efforts have been supported by Japan Oil, Gas and Metals National Corporation, which is actively investing in mining projects abroad, mainly in Australia and Africa.

In the realm of processing ability, Australia is in the early stages of enhancing its skills. Collaborating with the United States and Japan, Australia aims to create local infrastructure for separation. Collaborations like the one with Lynas Corporation, among the few non-Chinese entities involved in REE processing, play a significant role in

achieving this goal (Page, Coyne, 2021). Although the United States possesses ample natural resources, it still relies on Chinese technology for separation processes. Due to increasing geopolitical strains, the national government has initiated programs aimed at building new processing facilities. Moreover, policy documents such as Executive Order 13817 from 2017 and Executive Order 14017 from 2021 highlight the importance of developing homegrown separation technologies to ensure a reliable supply in case of trade disputes. Conversely, Japan has concentrated on cutting-edge methods for recovering REE. Utilizing advanced recycling technologies, Japan is minimizing its reliance on newly mined raw materials, which is crucial due to its limited mining operations. Additionally investments in international projects help to alleviate the shortfall in domestic production.

In terms of supply diversification, Australia acts as a key supplier of raw materials to the U.S. and Japan, strengthening trilateral cooperation. Under the Minerals Security Partnership (MSP) initiative, the three countries are stepping up information sharing, investment and development of new mining projects. Australian resources are thus secured with contracts that minimize the risk of supply chain disruptions (European Commission, 2024b). In its strategy, the United States is focusing on rebuilding its domestic capabilities and cooperating with Australia and Canada, seen as stable political partners (Hernandez-Roy, Ziemer, Toro, 2025). In addition, the U.S. strategy includes the development of regional partnerships within Latin America to create alternative sources of supply. Japan, although it has no deposits, is investing heavily in diversification through trade agreements and investments in resource-rich countries such as Australia, Vietnam and African countries. The goal is to reduce dependence on China and increase supply stability.

International cooperation is particularly important for all three countries analyzed. Australia, Japan and the US are working together through the Minerals Security Partnership to improve raw material security. The scheme promotes transparency, the creation of sustainable supply chains and investment in mining and processing plants (Err.ee, 2024). It is particularly important to Japan, which lacks large resources and relies on overseas raw material imports. Australia is the source in this instance, and the US provides technology and investment support (Prime Minister of Australia, 2022). Another forum for cooperation is the Quad Critical and Emerging Technology Working Group, established as part of the broader Quad format (Australia, Japan, the US and India). While the group’s main focus is technology cooperation in areas such as artificial intelligence, 5G telecommunications and biotechnology, rare earths are an important part of the strategy (NikkeiAsia, 2021). Quad recognizes critical minerals as a cornerstone of innovative technologies and seeks to enhance the security of supply chains through regional partnerships – India is a key element in this as a potential mining market, common funding for mining and processing projects in member and allied countries (Castellino, 2025). In addition, the forum aims to standardize mining regulations and standards to standardize environmental and social practices.

The main differences between the countries analyzed are based on their geological position and technological potential. Australia, being one of the main suppliers of REE, is betting on developing mining and processing locally. Japan, lacking significant resources, is developing recycling technologies and securing supplies through foreign

investment. The U.S., meanwhile, is betting on rebuilding domestic industrial capacity and diversifying supplies through international cooperation. However, all three countries share a common goal – to become independent of China’s dominance and ensure stable, secure supplies of REE for key industries.

## Conclusion

The purpose of this article was to analyze the raw material policies of Australia, Japan and the United States with regard to rare earth elements, taking into account strategic documents, international initiatives and actions taken in response to the dominance of the People’s Republic of China in the global supply chain for these raw materials. The analysis carried out made it possible to verify the research hypothesis that the raw material policies of Australia, Japan and the US are converging on reducing dependence on China and strengthening the domestic and regional production and processing potential of REE, while taking into account the specific geopolitical and economic conditions of each country.

The research confirmed that with the largest reserves of rare earth elements among the countries analyzed, Australia has focused on expanding its domestic mining infrastructure and exporting raw materials to allied countries such as Japan and the United States. Australia’s participation in international projects such as the Minerals Security Partnership (MSP) strengthens its position as a key supplier in secure supply chains. Japan, with no large-scale REE deposits, has been looking into diversifying sources through foreign investment, mainly to Australia and African countries. Global mining projects and recycling technology development are backed by JOGMEC in this matter. This was, however, highlighted as crucial in the 2022 Economic Security Strategy as it focuses on increasing independence from resources amid strengthening geopolitical tensions. The United States is rebuilding its domestic mining and processing capacity, as reflected, among other things, in the 2022 National Strategy to Secure the Supply Chain for a Robust Clean Energy Transition. Backed by regulations such as the National Defense Authorization Act (NDAA) and Executive Order 14017 of 2021, the policy aims to make the U.S. economy less dependent on Chinese supplies through increased domestic production and cooperation with key international partners.

The analysis confirms that Australia, Japan and the United States are actively seeking to diversify their sources of rare earth elements and reduce dependence on China. Their strategies are well embedded in the framework of international initiatives that strengthen stability and raw material security. At the same time, further steps should include: intensifying joint research into new technologies for processing REE, the development of mining projects in previously underserved regions, such as Africa and Latin America and promote sustainable mining that meets high environmental and social standards.

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**Metale ziem rzadkich w strategiach bezpieczeństwa narodowego: analiza porównawcza polityk USA, Japonii i Australii**

**Streszczenie**

W obliczu rosnącej rywalizacji geopolitycznej i transformacji energetycznej, dostęp do metali ziem rzadkich (REE) stał się kluczowym elementem strategii bezpieczeństwa narodowego. Surowce te są niezbędne dla rozwoju nowoczesnych technologii cywilnych i wojskowych, a ich globalna podaż uzależniona jest od największego ich producenta, Chin. Celem niniejszego artykułu jest analiza porównawcza strategii bezpieczeństwa narodowego trzech państw – Stanów Zjednoczonych, Japonii i Australii – ze szczególnym uwzględnieniem ich podejścia do dostępu, kontroli i zabezpieczenia dostaw pierwiastków ziem rzadkich. Problemem badawczym rozważań podjętych w niniejszym artykule jest próba określenia, w jaki sposób wybrane państwa – Stany Zjednoczone, Japonia i Australia – włączają kwestie dostępu do metali ziem rzadkich do swoich strategii bezpieczeństwa oraz jakich instrumentów używają, aby zminimalizować swoją zależność od Chin. Przeprowadzona analiza pokazuje, że pomimo różnych ról jako importerów (USA, Japonia) i eksporterów (Australia), wszystkie trzy państwa traktują metale ziem rzadkich jako element strategicznie ważnej niezależności i podejmują kroki w celu dywersyfikacji dostaw, rozwoju własnych technologii przetwarzania oraz budowania relacji partnerskich z innymi państwami.

**Słowa kluczowe:** metale ziem rzadkich, strategia bezpieczeństwa narodowego, rywalizacja geopolityczna, surowce krytyczne

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