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The Rare Metals War Between China and the United States: Export Restrictions and National Security Exceptions

A Study within the Framework of World Trade Organization Rules and the Reshaping of the Legal Framework of International Trade

Dr. Yousfi Mohammed
Professor in the Faculty of Law and Political Science – Abdelhamid Ibn Badis University of Mostaganem, Algeria

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Abstract
This study examines the "rare metals war" between China and the United States as a trade-geopolitical dispute centered on rare earth elements (17 elements including the lanthanides, in addition to scandium and yttrium), as well as the inclusion of tungsten and molybdenum among "critical raw materials" due to the concentration of production and their defense significance. This occurs within the context of Chinese dominance over supplies (approximately 97% in 2012) and its continued control in 2025 of around 70% of extraction and 90% of refining. The study places this dispute within the framework of World Trade Organization rules and examines the limits of export restrictions, general exceptions, and national security exceptions, as well as their effects on the enforceability of the multilateral trading system and the reshaping of the legal framework of international trade. Conversely, the study examines dispute DS623, brought by China against the incentives contained in the U.S. Inflation Reduction Act (2022) related to local content and supply chains. The study concludes that the shift from Article XX to Article XXI, coupled with the paralysis of the Appellate Body since 2019 and the resulting "appeal into the void," highlights the need for a more comprehensive international framework governing trade in critical minerals that integrates resource security, environmental security, and transparency. The study recommends diversifying supplies through investment in alternatives, recycling, localization/friend-shoring, and repositioning environmental considerations and resource security within the concept of national security rather than marginalizing them within the dichotomy of free trade and its exceptions.
Keywords: Rare Minerals – World Trade Organization – China – United States – Export Restrictions – National Security – International Trade

Introduction

Rare minerals occupy a central position in modern technological industries, ranging from electric vehicles to communication devices, leading to growing global demand and highlighting China's role as a key player in their production and export. In recent years, trade relations between China and the United States have experienced significant tensions due to Chinese policies concerning rare mineral export restrictions, resulting in a series of trade disputes before

the World Trade Organization. This topic represents a model of the intersection between international law and global economic competition and raises fundamental questions regarding the effectiveness of the international legal system in regulating trade and constraining disputes among major powers.

The Rare Earth Elements (REEs) dispute, brought by the United States, the European Union, and Japan against China before the World Trade Organization (WTO) in 2012 (Case DS431), represented a critical turning point in international trade relations. This dispute was not merely a disagreement over customs duties but rather a strategic confrontation between the concept of free trade advocated by the WTO and the national, environmental, and sovereignty interests claimed by China. The case highlighted the central role played by vital natural resources as instruments of geopolitical leverage, leading to an erosion of the Organization's authority in matters touching upon states' national and economic security.

We adopted both the historical and analytical approaches to analyze the texts of GATT 1994 (Articles XI, XX, and XXI), China's Accession Protocol (Paragraph 11.3, "WTO-Plus"), review the jurisprudence of DS431/DS432 and DS623, and trace regulatory developments from 2010–2026 and supply-chain data. The findings showed that the Panel and Appellate Body reports in 2014 considered export quotas a violation of Article XI:1 and rejected their justification under Articles XX(b) and XX(g) due to the absence of "even-handedness" with domestic restrictions and the availability of less trade-restrictive alternatives. They also confirmed that Article XX could not justify a breach of the commitment to eliminate export duties under Paragraph 11.3 due to the absence of a textual link. This prompted China's formal compliance in 2015, followed by the adoption of more sophisticated instruments through MOFCOM controls in 2025 and Announcement No. 61, which expanded extraterritorial jurisdiction through the FDPR rule and a 0.1% threshold under a security rationale. Conversely, DS623 (30 January 2026) ruled that the incentives under the U.S. Inflation Reduction Act of 2022 violated national treatment obligations and TRIMs, while the "public morals" defense failed. We concluded that the shift from Article XX to Article XXI, combined with the paralysis of the Appellate Body since 2019 and the phenomenon of "appeal into the void," undermines rule enforcement and accelerates governance fragmentation through "friend-shoring," initiatives such as MSP and Project FORGE, minimum-price mechanisms, and strategic stockpiles (Project Vault), thereby increasing the costs of "geopolitical inflation" and necessitating a more comprehensive international framework integrating environmental security, resource security, and transparency into the regulation of rare mineral trade.

The rare minerals dispute, its implications for the legal framework governing this trade and WTO decisions, the effects of these decisions on the international trading system, the growing strategic importance of rare minerals in modern technological industries, and China's dominant role raise the issue of the effectiveness of the international legal system—particularly the World Trade Organization—in regulating international trade and constraining geopolitical disputes over strategic resources among major powers. How can the sovereign right over natural resources be framed within the international legal framework while highlighting the challenges states face in reconciling this right with the obligations imposed by international trade agreements? To answer these questions, the article is divided according to the following plan:

Plan: Two Main Sections

First Section: The International Legal Framework for Rare Mineral Trade

This section addresses:

- The definition of rare minerals and their economic and strategic importance in the contemporary world.
- China's position in the global market.
- The role of rare minerals in technological industries and the energy transition.
- The impact of Chinese export restrictions on global supply chains.
- The legal framework of the World Trade Organization and the dispute over rare minerals.
- The rules governing export restrictions under the GATT.
- The legal rules governing international trade in natural resources, with a focus on WTO member obligations concerning the export of primary and rare resources.

Second Section: The Trade Dispute Between China and the United States Before the WTO

This section examines in detail:

- The background and causes of the trade dispute.
- Chinese policies regarding rare mineral exports.
- Procedures and appeals brought by the United States before the WTO.
- Analysis of WTO decisions concerning this dispute and their implications for the international trading system and global supply chains.
- Assessment of the effectiveness of WTO rules in resolving such disputes, with proposals for improving the framework.
- The effectiveness of dispute settlement mechanisms in dealing with strategically sensitive issues.

First Section: The International Legal Framework for Rare Mineral Trade

The strategic importance of rare earth elements and China's dominance of their market have placed this trade at the heart of geopolitical tensions, necessitating the application of WTO rules concerning quantitative restrictions and specific contractual obligations.

First Requirement: Definition of Rare Minerals and Their Economic and Strategic Importance

1. Definition of Rare Earth Elements (REEs), Their Strategic Importance, and China's Position in the Global Market

1.2 The Role of Rare Minerals in Technological Industries and the Energy Transition

Rare minerals constitute vital resources for the production of modern technology due to their unique physical and chemical properties. They are used in the manufacture of numerous components such as electric motors, permanent magnets used in wind turbines and electric vehicles, and semiconductors, which are pillars of the global energy and technological transition. Demand for these minerals continues to rise as the global economy increasingly relies on clean and renewable energy, making rare minerals essential for achieving sustainability goals and reducing carbon emissions (Depraiter et al., 2025; Zhou et al., 2016).

Rare minerals comprise a group of 17 chemical elements, including the 15 lanthanides in the periodic table (ranging from cerium to lutetium), in addition to scandium and yttrium. These elements derive their importance from their unique physical and chemical properties, particularly in magnetism, luminescence, and hardness, making them indispensable inputs in advanced technological industries.

In the context of international trade disputes, particularly Case DS431 brought before the WTO against Chinese restrictions, the legal complaint was expanded to include tungsten and molybdenum in addition to rare earth elements. Although these two minerals do not technically belong to the rare earth group from a chemical perspective, they are included within the strategic context due to the concentration of their production in limited geographical areas and their considerable importance in defense and military industries (Kucyi et al., 2018).

Globally, these materials are classified as "critical raw materials" or strategic minerals because of the high risks associated with disruptions in their supply chains and the complete dependence of vital sectors such as renewable energy (wind turbines), electric mobility (vehicle batteries), and defense systems (fighter aircraft and guided missiles) upon them.

2. Economic and Strategic Importance

Rare earth elements possess unique characteristics, including magnetism, luminescence, and strength. These properties make them "essential for many modern technologies" and strategic products in the contemporary world:

- **High Technology and Clean Energy:** They are used in permanent-magnet electric vehicle motors, wind turbines, batteries, energy-efficient lighting, and advanced electronics.
- **National Security and Defense:** These elements are considered "vital" for the development of military systems and weapons technologies, directly affecting a state's national security calculations.
- **Environmental Cost:** The mining and separation of these elements involve expensive and demanding processes that generate toxic pollutants and hazardous waste, increasing the complexity of related policies.

Thus, rare earth elements (REEs) constitute a cornerstone of technological advancement and geopolitical balance in the twenty-first century. They have evolved from conventional industrial inputs into "non-kinetic strategic weapons" capable of disabling adversaries' capabilities and altering international power balances. These minerals, consisting of 17 chemical elements, derive their importance from unique physical properties such as strong magnetism, luminescence, and structural strength.

1. Technological and Industrial Importance

Rare minerals are the "vitamins" of modern industry. Although used in small quantities, no adequate substitutes currently exist to replace their unique properties.

- **Digital Transformation:** They are used in consumer electronic devices such as smartphones, laptops, and flat-panel displays.
- **Clean Energy Technology:** These minerals are the primary component of neodymium-iron-boron (NdFeB) permanent magnets, which are essential for producing wind

turbines and electric vehicle motors. More than 90% of these vehicles worldwide rely on this technology.

- **Artificial Intelligence and Semiconductors:** They are used in the manufacture of advanced chips (smaller than 14 nanometers) and high-performance computing equipment, making them a lifeline of technological innovation.

2. Economic Importance and Supply Chains

Rare minerals are at the center of economic competition due to the extreme geographical concentration of production and processing.

- **Chinese Monopoly:** China controls approximately 70% of global mining extraction and 90% of processing and refining capacity. This monopoly grants Beijing dual leverage over both raw materials and final manufacturing supply chains.
- **Absolute Advantage and Price Competitiveness:** Chinese control over exports has created a price gap whereby foreign manufacturers sometimes pay three times more than Chinese competitors for the same raw material, forcing many global companies to relocate operations to China.
- **Growing Market:** Global demand for these minerals is expected to double by 2030 and quadruple by 2050, with annual revenues potentially reaching $400 billion.

3. Military and Security Importance

Rare minerals represent a strategic vulnerability in the national security of Western countries, particularly the United States, due to the dependence of their most advanced defense systems on them.

- **Advanced Weapons Systems:** These minerals are used in the manufacture of F-35 fighter jets, Tomahawk missiles, radar systems, nuclear submarines, and Predator drones.
- **Non-Kinetic Strategic Deterrence:** Control over rare mineral supplies is viewed as a means of weakening an adversary's military-industrial system without waging a conventional war, through what is known as "Indirect Capability Collapse."
- **Security Vulnerability:** Mathematical modeling indicates that disruptions in rare mineral supplies could reduce electronic warfare and precision-strike capabilities by more than 62% within less than a year.

4. Strategic and Geopolitical Importance

Rare minerals have become an instrument of leverage in the "trade war" and the race toward digital sovereignty.

Politicization of Supply Chains: China has used its influence over rare minerals as leverage in its disputes with Japan (2010) and the United States (2025) by imposing export restrictions and extending its jurisdiction to products manufactured outside its territory that contain more than 0.1% Chinese content.

Search for Alternatives (African and Space Frontiers): Western powers are seeking to diversify sources by turning to Africa (which possesses 30% of the world's critical reserves). Recent research also indicates the possibility of extracting these minerals from asteroids and carbonaceous meteorites as a long-term strategic option.

Friend-shoring Policies: The United States and the European Union have adopted legislation such as the Inflation Reduction Act (IRA) to encourage investment in allied countries and build independent supply chains away from Chinese dominance.

Second Requirement: China's Position and the Legal Rules of the World Trade Organization

1. Chinese Dominance in the Production and Export of Rare Minerals

China controls more than 58% of global rare mineral production and is the largest exporter of these minerals, despite the fact that these resources are not geographically concentrated solely within its borders. Its dominance stems from an integrated strategy encompassing not only mining but also processing activities and related technologies such as beneficiation and industrial processing, in addition to a network of technological patents that reinforces its superiority in the global market. This dominance is further strengthened by its extensive control over resources in Africa and Western Asia and its strategy of imposing export restrictions to regulate global markets (Kohnert, 2024; Woods, 2025; Mancheri, 2012).

2. Impact of Chinese Export Restrictions on Global Supply Chains

China imposed restrictions on the export of rare minerals with the aim of protecting its resources and controlling prices, leading to disruptions in global supply chains, price increases, and a climate of market uncertainty. These restrictions affected importing countries, particularly in Europe and the United States, causing sharp fluctuations in the availability of critical materials needed for technological industries and renewable energy. This prompted efforts to restructure supply chains, diversify sources, expand recycling technologies, and develop alternative technologies. It also contributed to geopolitical integration among countries seeking to reduce dependence on China (Depraiter et al., 2025; Zhou et al., 2016; Mancheri, 2012).

China rose to a dominant position in the production and export of rare minerals, supplying approximately 97% of the global rare earth element supply in 2012. However, its reserves account for only about 50% of global reserves. China's production dominance is partly attributable to lower labor costs and less stringent environmental regulations compared to other countries. This situation created a "virtual monopoly" that compelled trading partners, led by the United States, to file a complaint before the World Trade Organization (Jingxia & Xing-Xing, 2015).

International trade in natural resources, particularly rare earth elements, is governed by a complex legal framework that balances freedom of global trade with the right of states to exercise sovereignty over their exhaustible resources and protect their national security. The legal dispute between China and its trading counterparts (the United States, the European Union, and Japan) constitutes a landmark case in WTO jurisprudence regarding the interpretation of contractual obligations and general exceptions (Espa, 2018).

The WTO Legal Framework and the Rare Minerals Dispute: The Legal Rules Governing This Sector

1.1 Rules Governing Export Restrictions under the GATT: Prohibition of Quantitative Restrictions (GATT Article XI) (Jingxia & Xing-Xing, 2015)

The GATT provides that states may not impose export restrictions except in specific circumstances justified by a public interest, such as the protection of natural resources, provided that such restrictions are not discriminatory or unfair to international trade. The Agreement seeks to strike a balance between national sovereignty and the need to ensure the smooth flow of international trade. However, these rules become controversial when restrictions are used as strategic political and commercial tools.

Article XI of the General Agreement on Tariffs and Trade (GATT 1994) constitutes the fundamental basis for prohibiting interference in the volume of trade. Paragraph 1 prohibits the imposition of any prohibitions or restrictions other than customs duties, whether through quotas, export licenses, or any other measures.

1.2 Legal Analysis of Case DS431 and the Claims Brought Against China

In the case known as DS431, several countries accused China of using rare mineral export restrictions in a manner that violated WTO rules. These countries argued that the restrictions led to market monopolization and hindered fair commercial competition. The WTO ruled in favor of the complainants, holding that the restrictions violated GATT rules, thereby triggering extensive debate concerning the balance between compliance with international trade obligations and states' rights to manage their natural resources.

1.3 Legal Interpretations of the Principle of Sovereignty over Natural Resources versus Trade Obligations

Legal discussions revealed the complexity of applying the principle of sovereignty, which grants states the right to exploit their resources as they see fit, in contrast to their international obligations not to impose arbitrary restrictions on trade. This conflict between national sovereignty and international commitments reflects an urgent need to reformulate trade rules to align with new challenges associated with strategically significant resources such as rare minerals.

Legal Characterization: In disputes DS431 and DS432, the Panel found that China's export quota system constituted a clear violation of Article XI:1 because it restricted the quantity of minerals available to international markets.

Failure of the "Critical Shortage" Defense: China attempted to invoke Paragraph 2 of Article XI, which permits "temporary" restrictions to prevent a critical shortage of essential materials. However, the Appellate Body rejected this argument, emphasizing that the Chinese restrictions were long-term and structural rather than a response to an emergency crisis.

Export Duties and "GATT-Plus" Obligations (Paragraph 11.3)

When China joined the WTO in 2001, it signed an Accession Protocol containing commitments that went beyond the general rules, legally referred to as "GATT-Plus obligations." Paragraph 11.3 of the Protocol required China to eliminate all export duties except for 84 products listed in a special annex.

The Appellate Body in both the "Raw Materials" and "Rare Earths" cases rejected the application of general exceptions (Article XX) to justify violations of Paragraph 11.3 due to the absence of a textual link in the Protocol permitting reliance on GATT exceptions to defend special accession commitments. This means that China's obligations regarding export duties are absolute obligations and cannot be justified on environmental grounds.

General Exceptions (GATT Article XX): The Conflict Between Ends and Means

Article XX serves as the legal refuge through which states seek to justify protective measures. However, the WTO imposes strict conditions to ensure that it is not used as a form of disguised "green protectionism."

Article XX(g): Conservation of Exhaustible Natural Resources

To invoke this exception, there must be a "close and genuine relationship" between the measure and the objective pursued.

Even-handedness Requirement: WTO jurisprudence has consistently held that export restrictions (such as those on rare minerals) must be imposed simultaneously with comparable restrictions on domestic production or consumption.

The Legal Flaw: In the Rare Earths case, the Panel found that China reduced export quotas while domestic production continued to grow, resulting in lower domestic prices and higher global prices. This undermined the claim of "resource conservation" and instead demonstrated a discriminatory industrial policy.

Article XX(b): Protection of Life, Health, and the Environment

This exception requires proof of "necessity," meaning that the measure adopted must be the only available and least trade-restrictive means of achieving the health or environmental objective.

The WTO argued that China could have used other instruments besides restricting trade, such as domestic production taxes or strict environmental regulations on mining operations, measures that do not discriminate between foreign and domestic consumers.

The Shift Toward the "National Security Exception" (Article XXI)

The strategic and legal shift toward Article XXI of the GATT represents a critical turning point in the management of international trade conflicts, reflecting the failure of traditional general exceptions to protect the national interests of major powers in the face of WTO rulings.

First: The Transition from Article XX to Article XXI

Over the past two decades, many countries, foremost among them China, attempted to justify trade restrictions on natural resources under Article XX of the GATT, which allows exceptions related to environmental protection and the conservation of exhaustible natural resources. However, these attempts suffered significant legal defeats in prominent disputes such as the first Rare Earths case, where the dispute settlement bodies confirmed that the restrictions were not "even-handed," as China imposed export restrictions while domestic production and consumption continued to grow, revealing an intention to support domestic industry rather than protect the environment (Espa, 2018).

The repeated loss of such cases prompted states in 2025 and 2026 to abandon the legally fragile "environmental defense" and instead resort to the "national security exception" contained in Article XXI, which provides broader legal protection and greater immunity from international scrutiny (Qin, 2014).

Second: The Concept of "Self-Judging Sovereignty" and National Security Flexibility

The strength of Article XXI lies in its self-judging nature. Major powers, particularly the United States and China, adopt the interpretation that the member state alone is authorized to determine what constitutes a threat to its national security and that the WTO lacks the legal authority to review or invalidate such sovereign determinations.

China has exploited this legal flexibility to legitimize its new restrictions, arguing that control over rare minerals is not merely a commercial issue but a pillar of strategic national security. Consequently, any challenge before the WTO faces a dead end because intervention in the definition of national security is viewed as interference with the core of state sovereignty (Switzer et al., 2015).

Third: Announcement No. 61 and Extraterritorial Jurisdiction

Announcement No. 61 of 2025 represents a revolution in Chinese trade legislation, as Beijing applied the Foreign Direct Product Rule (FDPR) for the first time. Under this announcement, Chinese control no longer applies solely to raw materials leaving its territory but extends to extraterritorial jurisdiction (Van Calster, 2013).

The 0.1% threshold means that any product manufactured anywhere in the world containing this minimal percentage of Chinese-origin rare minerals, or produced using Chinese technology, becomes subject to the Chinese licensing system. This measure grants Beijing the ability to monitor global supply chains and impose restrictions on re-exports, particularly when the final user is a foreign military entity (Van Calster, 2013).

Fourth: The "Weaponization" of Legal Rules and Reciprocity

This Chinese shift may be viewed as a form of "reciprocal response" to U.S. policies that have long employed similar legal tools, such as U.S. Department of Commerce rules governing technology export controls. By adopting justifications based on "security and national interests," China has moved the rare minerals conflict from the realm of economic competition into the realm of non-kinetic strategic deterrence (Schoenbaum, 2016).

The objective of these restrictions is not merely to protect the resource but also to exert strategic pressure capable of disrupting advanced defense and technological industries of rivals (such as the production of F-35 fighter aircraft or advanced semiconductors), while shielding these measures behind a legal framework that is difficult to challenge through the traditional channels of the World Trade Organization, which already suffers from paralysis in its appellate mechanism (Wu, 2017).

In conclusion, what we are witnessing is the end of the era of "absolute free trade" and the beginning of the era of "security-driven trade," in which Article XXI has become the primary legal weapon in shaping the boundaries of dominance over the future of the global economy and defense industries. We shall elaborate on this in the second section (Peng, 2012).

Second Section: Implications of the Dispute for the International Trading System and International Economic Law

The dispute escalated to the World Trade Organization when China transformed its market dominance into direct export restrictions, resulting in a landmark ruling that affirmed the priority of collective commercial interests over individual sovereign defenses (Qin, 2014).

First Requirement: Background of the Dispute and the Impact of the WTO Decision on Chinese Trade Policies

At the beginning of the first decade of the twenty-first century, China began restricting exports of rare minerals, and these restrictions intensified significantly when export quotas were reduced by approximately 37% in 2010. This reduction led to a "significant increase in global prices and major market disruption." The stated objectives of the Chinese policies—which included export duties, quotas, capital requirements, and non-transparent allocation procedures—were as follows (Switzer et al., 2015):

- **Environmental Resource Protection:** Limiting severe environmental damage resulting from mining and refining.
- **Resource Conservation:** Directing the extraction of rare minerals toward a sustainable path due to excessive exploitation that had depleted supplies (Van Calster, 2013).
- **Industrial and Strategic Objectives:** Retaining added value domestically, "leading global mineral prices," and granting a competitive advantage to local Chinese companies in the manufacturing of downstream products (Peng & Cunningham, 2012).

Review of Jurisprudence: Cases DS431 and DS432 – Procedures and Appeals

In 2012, the United States, the European Union, and Japan led a legal challenge against China before the World Trade Organization concerning export restrictions on rare minerals, tungsten, and molybdenum. China argued that these restrictions were justified under Article XX(g) of GATT 1994, which permits measures relating to the conservation of exhaustible natural resources, as well as Article XX(b), which concerns the protection of human, animal, and plant life from pollution caused by mining activities.

China based its defense on the justification of the measures under the exceptions of Article XX, particularly paragraphs (b) and (g), relying on its sovereign right to regulate environmental and resource protection.

In March 2014, the Panel issued its report, and in August 2014 the Appellate Body upheld the ruling, with the WTO deciding against China (Schoenbaum, 2016).

However, the Panel and the Appellate Body rejected these defenses, emphasizing that the measures adopted by China, such as export quotas and export duties, were not closely related to the objective of resource conservation. The ruling noted that China failed to impose comparable restrictions on domestic consumption of these minerals, indicating that the restrictions were primarily intended to provide a competitive advantage to domestic manufacturing industries by lowering prices within China and increasing them in global markets. This price discrimination resulted in foreign manufacturers paying up to three times more than their Chinese competitors for the same raw material (Matsushita & Schoenbaum, 2016).

One of the most significant outcomes of the case was that the Appellate Body unanimously rejected China's arguments, confirming that "there is no textual basis" for applying Article XX exceptions of the GATT to China's obligation to eliminate export duties under its Accession Protocol (Zhang, 2024; Wu, 2017).

Regarding export quotas, the WTO found that the quantitative restrictions were inconsistent with Article XI of the GATT. China's defense under Article XX(g) was also rejected because the measures were not "made effective in conjunction with" restrictions on domestic production.

The WTO ruling forced China to reconsider its export-restriction policies. At the same time, other countries sought to avoid future disruptions by building diversified supply systems and increasing investments in exploration and alternative technologies to strengthen supply security (Schmid, 2019).

3.3 Legal Interpretations of the Principle of Sovereignty over Natural Resources versus Trade Obligations

This legal framework addresses the relationship between the right of states to sovereignty over their natural resources and the obligations that may arise within the context of international trade.

It concerns legal interpretations relating to states' rights to sovereignty and full control over their natural resources while examining how this sovereignty may be affected or constrained by trade obligations or international agreements concluded with other states or entities.

Simply put, this section discusses how states balance their legal right to manage natural resources against trade commitments that may sometimes limit that right, highlighting the tension or harmony between national sovereignty and international trade obligations.

This can be detailed as follows:

1. Principle of Sovereignty over Natural Resources

This principle is one of the fundamental principles of international law, granting states the sovereign right to control, exploit, and regulate natural resources within their territorial boundaries. This right includes decisions concerning extraction, disposition, and conservation of these resources in a manner that serves national interests.

2. International Trade Obligations

At the same time, states enter into multilateral or bilateral trade agreements that may impose legal obligations toward trading partners or international institutions. These obligations may include requirements relating to free trade, non-discrimination, and protection of foreign investments, potentially restricting or modifying the exercise of sovereignty over resources.

3. Legal Balance between Sovereignty and Obligations

The legal challenge lies in achieving a balance between the sovereign right that guarantees full control over resources and the need to respect trade obligations that may impose limitations on this right. This balance is interpreted through the rules of public international law, international trade treaties, and international arbitral decisions.

4. Multiple Legal Interpretations
Legal interpretations of this balance differ depending on the legal context and the agreements involved. Some interpretations emphasize the primacy of national sovereignty, while others stress the importance of complying with trade agreements to ensure stable international economic relations.

5. Legal Consequences
These interpretations determine the scope of states' rights in managing natural resources and the extent to which they may be bound by trade-related conditions affecting such management, including issues such as the protection of foreign investors, dispute settlement, and property rights.
In summary, the issue concerns how the sovereign right over natural resources is framed within the international legal order and the challenges states face in reconciling this right with obligations imposed by international trade agreements.

Within international trade law, practical examples of the principle of sovereignty over natural resources versus trade obligations include several legal situations illustrating the balance or conflict between a state's right to control its natural resources and the obligations imposed by international trade agreements:

1. Protection of Foreign Investors in the Natural Resources Sector
Many states conclude bilateral or multilateral investment agreements that provide protection for foreign investors involved in natural-resource extraction projects such as oil, gas, and mining. These agreements require states not to expropriate investments without fair compensation and to respect property rights, which may limit a state's ability to modify laws or policies concerning natural resources.

2. Settlement of Investment Disputes
When disputes arise between a state and a foreign investor regarding resource exploitation, parties often resort to international dispute-settlement mechanisms such as international arbitration (ICSID). These mechanisms balance state sovereignty and investor rights and may result in decisions requiring compensation or policy adjustments.

3. Obligations under Free Trade Agreements
Free trade agreements such as the North American Free Trade Agreement (NAFTA) and WTO agreements contain provisions governing freedom of trade and non-discrimination in goods and services, including natural resources. These provisions may limit a state's ability to impose export restrictions or restrictive conditions on foreign investors.

4. Restrictions on Environmental and Regulatory Measures
Certain international trade agreements impose limits on measures adopted by states to protect natural resources from overexploitation or pollution when such measures are considered unjustified trade barriers. This creates a legal challenge in reconciling resource sovereignty with international trade commitments.

5. Balance between National Sovereignty and International Obligations in Public International Law

The International Court of Justice and international arbitral tribunals have issued decisions affirming states' sovereign rights over natural resources while emphasizing the need to respect international commitments undertaken by states, reflecting legal balance and flexibility in interpreting these rights and obligations.

In summary, these practical examples illustrate how the principle of sovereignty over natural resources in international trade law is exercised within a legally binding framework that balances state interests in controlling resources with obligations imposed by international trade agreements to ensure stable economic relations and investment protection.

The preference for commercial interests has been interpreted under WTO rules in a manner that favored the collective commercial interests of member states over China's sovereign rights to regulate its internal environmental affairs. Although environmental protection remains an important issue, WTO rules effectively "placed trade at the top of interstate relations."

When China joined the WTO in 2001, it accepted special legal obligations that exceeded the general rules imposed on other members, known as "GATT-plus" obligations. Paragraph 11.3 of China's Accession Protocol is decisive in this regard, requiring Beijing to eliminate all export duties unless explicitly listed in Annex 6 of the Protocol. Since rare minerals were not included in that annex, any export duty imposed by China constitutes a direct violation of its international contractual commitments.

This table summarizes the proceedings, arguments, and appeals:

Legal Provision	Description	WTO Position in DS431/432
Article XI:1	Prohibition of quantitative restrictions on exports and imports	China violated this article by imposing export quotas
Article XX(g)	Exception for conservation of natural resources	Defense rejected because restrictions did not apply to domestic consumption
Article XX(b)	Exception for protection of health and the environment	Defense rejected due to the absence of a necessary link between the duties and environmental protection
Accession Protocol (Paragraph 11.3)	Obligation to eliminate export duties	China violated its commitment by imposing export duties on rare minerals

This legal defeat in 2014 led China to abolish export quotas in 2015, but it also pushed Beijing toward more sophisticated strategies based on national security controls and technological regulation rather than explicit quantitative restrictions (Schmid, 2019).

In 2025, China significantly escalated the use of export controls as a tool of geopolitical deterrence. In April 2025, China's Ministry of Commerce (MOFCOM) announced export controls on seven heavy rare earth elements and associated magnets, including dysprosium and terbium, which are indispensable to defense industries (Gu, 2011). This move was a response

to tariffs imposed by the U.S. administration and signaled China's open politicization of supply chains under the justification of national security (Wu, 2017).

Announcement No. 61 of 2025 and Extraterritorial Jurisdiction

Announcement No. 61 of 2025 aims to regulate judicial cooperation among states in cases extending beyond national borders. It includes mechanisms facilitating information exchange and recognition of judicial decisions issued in other countries. It also establishes rules regarding jurisdiction and applicable law in cross-border disputes to protect the rights of concerned parties.

Announcement No. 61 of 2025, issued in October, represents a major legal turning point, as China applied its own version of the Foreign Direct Product Rule (FDPR) and the De Minimis principle for the first time (Qin, 2014).

Under these rules, China extends its jurisdiction to products manufactured outside its territory if they contain Chinese-origin rare minerals exceeding 0.1% of their value or if they were produced using Chinese mining or processing technologies (Gavin, 2013).

This legal expansion directly targets U.S. defense industries and their allies by imposing complex licensing requirements on global companies and requiring disclosure of the identity of end users (Switzer et al., 2015). Legally, this system places China in the position of defending "national security," a concept afforded broad flexibility under WTO law, though it raises questions regarding its compatibility with Article XI:1, which prohibits non-tariff restrictions (Verrax, 2014).

Regulatory Measure (2025)	**Date**	**Strategic Content**	**Legal Effect**
Announcement No. 18	4 April 2025	Controls on 7 heavy elements and magnets	Export licensing based on national security
Announcement No. 61	9 October 2025	Application of FDPR and De Minimis (0.1%) rules	Expansion of Chinese jurisdiction to foreign products
Announcement No. 62	October 2025	Controls on mining, refining, and magnet technologies	Restriction on technology transfer and human expertise abroad
Announcement No. 57	November 2025	Addition of 5 new elements (holmium, erbium, etc.)	Inclusion of all strategic rare elements under controls

These measures reflect Beijing's desire to monopolize added value and protect its technological leadership. Some countries, including the United States, describe them as the "weaponization" of natural resources aimed at undermining U.S. efforts to build an independent defense industrial base (Jingxia & Xing-Xing, 2015).

The U.S. Inflation Reduction Act (IRA) and Legal Dispute DS623

Conversely, the United States adopted an aggressive industrial policy through the Inflation Reduction Act of 2022, which allocated hundreds of billions of dollars to support the transition toward clean energy. However, these incentives were tied to strict "local content" requirements.

The law primarily seeks to reduce dependence on China by requiring that a significant proportion of the critical minerals used in electric vehicle batteries be extracted or processed in the United States or in countries with which it has free trade agreements (Natural Resources, International Cooperation and Trade Regulation, 2010).

The Landmark Ruling and "Public Morals": The Dilemma of National Security, Security Exceptions, and Article XXI—A Clash of Sovereignties

In March 2024, China filed an official complaint before the WTO (DS623) against these subsidies, alleging that they violated the principle of national treatment and constituted prohibited subsidies because they were contingent upon the use of domestic goods.

On 30 January 2026, the Panel issued a decisive report condemning the United States, concluding that the tax incentives under the IRA violated Article III:4 of the GATT and Article 2.1 of the TRIMs Agreement.

The most legally significant aspect was the United States' attempt to justify these measures under Article XX(a) of the GATT concerning the protection of "public morals." Washington argued that the measures were necessary to counter Chinese non-market practices, forced labor, and theft of trade secrets, practices allegedly inconsistent with the moral values of American society.

Nevertheless, the Panel rejected this defense, holding that the United States failed to demonstrate that trade discrimination against Chinese products was the only "necessary" means of protecting those morals and that industrial and economic objectives were the dominant motivating factors.

The table illustrates the course of the dispute.

U.S. Legal Argument (DS623)	**WTO Panel Response**	**Legal Conclusion**
Protection of public morals (Article XX(a))	Failure to demonstrate "necessity" and a substantive connection	Article XX(a) does not justify discriminatory industrial policies
Countering China's non-market practices	Not considered sufficient justification for violating national treatment	Trade obligations prevail over general economic justifications
National security exception (Article XXI)	Not fully adjudicated in this particular dispute	Remains a strategic option for the United States in other disputes

This legal defeat for the United States has led to increasing calls for reforming the Organization or even disregarding its decisions, thereby deepening the crisis of the multilateral trading system.

With the erosion of the effectiveness of the general exceptions (Article XX), both great powers have increasingly resorted to Article XXI concerning national security. This article grants members the right to take any action they consider necessary to protect their "essential security interests." The United States adopts a radical position claiming that this article is entirely "self-judging," meaning that the World Trade Organization lacks jurisdiction to review measures taken under this designation (Miao, 2023).

Beginning in 2025, China started adopting the same American legal language within the framework of reciprocity to justify its controls on rare minerals, referring in Ministry of Commerce announcements to the necessity of "protecting national security and interests." This shift places the global trading system in an existential dilemma; if the American interpretation of Article XXI as a blank check is accepted, it would mean the end of binding rules, as any state could evade its obligations under the pretext of security (Liang & Peng, 2023).

Recent jurisprudence, such as the "Russia – Transit" case, indicates that panels tend to reject the absolute "self-judging" interpretation and insist on the existence of a genuine emergency in international relations (such as war or severe military tension) to activate Article XXI(b). Nevertheless, the absence of the Appellate Body makes these interpretations fragile and unenforceable against major powers (Wang, 2025).

Second: The Second Requirement: Evaluating the Effectiveness of WTO Rules, the Appellate Body Crisis, and the Strategic Shift

The Appellate Body Crisis and Its Impact on the Stability of Mineral Trade

Since December 2019, the WTO dispute settlement system has suffered from near-total paralysis at the appellate stage due to the United States' obstruction of the appointment of new judges. This situation has given rise to the phenomenon known as "appeal into the void," whereby the losing party at the panel stage may appeal the ruling to prevent a final binding decision from being issued, thereby obstructing the implementation of trade sanctions.

In the context of the rare minerals war, this paralysis serves the interests of both parties in different ways. For China, it allows the continuation of its 2025 export controls and the avoidance of potential future rulings through legal delay tactics. For the United States, it provides cover for maintaining domestic subsidy policies (the IRA Act) despite the ruling issued against it in January 2026, as Washington appealed the decision to a body that does not effectively exist.

Despite attempts by the European Union and other partners to activate the "Multi-Party Interim Appeal Arbitration Arrangement" (MPIA), the refusal of the United States to join it places bilateral disputes with China outside the scope of effective judicial oversight.

Although the ruling in dispute DS431 represented a "decisive victory" for the United States and its allies, the effectiveness of the Organization's rules in resolving such strategic disputes appears limited in the long term.

Formal Compliance and Continued Market Control

China formally complied with the WTO ruling by abolishing quotas and duties in 2015. However, it maintained effective control over the market through domestic regulatory mechanisms, such as consolidating the industry under state-owned enterprises (SOEs) and implementing a more complex and less transparent licensing system. This demonstrates that China shifted the confrontation from an explicit legal framework to less transparent tactics based on national security and geoeconomics.

Use of Minerals as a Geopolitical Pressure Tool

Subsequent developments (such as restrictions on gallium and germanium in 2023 and rare mineral export controls in 2025) demonstrated that China uses rare minerals as "tradable

bargaining chips" in the broader tariff war with the United States. This has contributed to the erosion of the WTO's authority in strategic disputes.

Strategic Landscape and Market Dominance: Strategic Alliances and Supply Chains

Statistical data compiled for 2024 and 2025 indicate the continuation of China's overwhelming dominance over rare mineral supply chains, a situation that has not fundamentally changed despite intensive Western diversification efforts. In 2025, China controlled approximately 70% of global rare mineral extraction and 90% of global processing and refining operations. This concentration in refining capacity gives Beijing influence extending beyond mere ownership of resources to control over the technology required to transform raw materials into high-value products such as permanent magnets.

Statistical Indicator	**China's Share (2025)**	**United States' Share (2025)**	**Additional Notes**
Rare mineral extraction (mining production)	69% (270,000 tons)	13% (51,000 tons)	U.S. production increased from 45,500 tons in 2024
Rare mineral processing and refining	90%	Very small share	China monopolizes technology and technical expertise
High-performance permanent magnet manufacturing	93%	Dependent on imports	Magnets are vital for electric vehicle motors
Proven rare mineral reserves	44 million metric tons	Not precisely specified (lower ranking)	China possesses the largest reserves in the world

U.S. trade statistics for 2025 reveal that, despite efforts to increase domestic production, the United States still depends on imports for 67% of its rare mineral consumption, with 71% of those imports coming directly from China. This deep dependence extends to highly sensitive sectors such as aerospace, renewable energy, advanced manufacturing, and defense, creating a strategic vulnerability in U.S. national security that lawmakers have sought to address through incentive legislation and strict trade controls.

The gap between China's production of 270,000 metric tons and U.S. production of 51,000 metric tons reflects a structural reality that is difficult to change in the short term, particularly because mining operations in this sector require strict environmental standards and high operating costs that the United States abandoned in previous decades in favor of the lower-cost Chinese model.

Western powers realized that legal solutions within the corridors of the WTO would not break the Chinese monopoly in the near term, leading to the emergence of strategies of plurilateralism and value-based alliances (friend-shoring).

In April 2026, the European Union and the United States came close to signing a strategic agreement to coordinate the production and security of critical minerals.

Market Protection Mechanisms and the 2026 Minerals Agreement

Drafts leaked from this agreement (Project FORGE) include innovative mechanisms that go beyond traditional trade, most notably:

1. **Price Floor Mechanism:** Intended to protect investors in Western mines from price volatility or Chinese attempts to artificially lower prices in order to bankrupt competitors, as occurred previously with the Molycorp mine. The Rare Minerals War Between China and the United States: A Legal Analysis of WTO Disputes and National Security Transformations.
2. **Minerals Security Partnership (MSP):** An initiative involving 54 countries (excluding China and Russia) aimed at financing and coordinating mining and refining projects in "trusted" countries such as Australia, Canada, Brazil, and African states.
3. **Strategic Stockpiles (Project Vault):** A U.S. plan supported by a $10 billion loan to accumulate reserves of cobalt, lithium, and rare minerals to ensure continuity of defense industries in the event of disruptions in Chinese supplies.

Strategic Initiative (2026)	**Main Objective**	**Principal Participants**	**Legal Status**
Critical Minerals Agreement (EU–US)	Coordinate supply chains and prevent dependency	European Union, United States	Draft non-binding memorandum of understanding
Project FORGE	Collective action against geopolitical risks	54 countries and the European Union	Political coordination platform
EU–Mercosur Agreement	Secure access to lithium and mineral resources in South America	European Union, Mercosur countries	Awaiting final ratification (2027)
Pax Silica Initiative	Secure AI supply chains	United States, Japan, Korea, UAE, etc.	Technology and security partnership

These alliances represent a departure from the fundamental WTO principle of "Most-Favoured-Nation" (MFN) treatment, as trade and investment advantages are granted to a specific group of countries on security and political grounds, thereby reinforcing the fragmentation of global trade into competing blocs.

Geopolitical Challenges and the Need for a New International Legal Framework

The legal and trade dispute cannot be understood without addressing the technical difficulties that make breaking Chinese dominance extremely challenging. Rare minerals, contrary to their name, are not "rare" in terms of geological existence, but rather "rare" in terms of economically extractable concentrations that can be exploited without causing environmental catastrophe.

The separation and refining process involves the use of strong acids and produces radioactive waste (such as thorium and uranium), which led Western countries to close their mines during the 1980s and 1990s due to strict environmental regulations and high labor costs. In contrast, China invested for decades in building enormous technological and human infrastructure,

enabling it today to possess the technical know-how and an absolute advantage that cannot be replicated merely by injecting financial resources.
Reports for 2026 indicate that strategic projects in the European Union (such as those in France, Poland, and Sweden) face financing and licensing bottlenecks, making the goal of extracting 10% and processing 40% of domestic needs by 2030 uncertain. This technical reality strengthens China's legal argument that its restrictions are necessary measures to protect its environment from destruction caused by excessive global demand.

Toward a New Model of Trade Governance
The current conflict over rare minerals reveals a deep gap in existing WTO rules, which were designed in an era when trade was viewed as a tool for peace and prosperity rather than as a geopolitical instrument. The years 2026–2030 are expected to witness the following trends:

1. **The Rise of "Resource Clubs":** Bilateral and plurilateral agreements will replace the comprehensive global system, with "trusted" countries exchanging access to resources in return for security and technological guarantees.
2. **Redefining "Public Benefit" in Subsidy Law:** Pressure will increase to amend the SCM Agreement to allow "green" and "security-related" subsidies that are not considered trade-distorting, in order to address market failures in securing strategic resources.
3. **Weaponization of Intellectual Property:** China, Russia, and the United States will use patent laws and technology controls (such as China's FDPR) as tools of economic containment, potentially leading to new disputes under the TRIPS Agreement.
4. **The Challenge of "Data Sovereignty":** China's requirement that end-user data be disclosed in order to obtain rare mineral licenses poses challenges to corporate privacy and technological security and is likely to become a major issue in future negotiations.

Conclusion and Recommendations
The rare minerals war between China and the United States has evolved from a dispute over export quotas into a comprehensive legal confrontation touching the very core of national security and technological sovereignty. In light of the preceding analysis, the following conclusions may be drawn:

Legal Framework
The legal framework of Article XX of the GATT has not been able to fully reconcile commercial interests with China's legitimate environmental and security concerns. To improve the regulation of rare mineral trade in the future, the following measures should be adopted:

- **Diversification of Supply Chains:** Importing countries, particularly the United States and the European Union, should reduce their near-total dependence on China by developing technological alternatives, investing in recycling, and localizing production and processing domestically or with allied countries (friend-shoring).
- **Integration of Environmental and Security Considerations:** The international legal system should establish a better balance so that environmental issues and resource security are treated as integral components of national security rather than being marginalized in favor of absolute free trade.

- **Enhancing Transparency and Global Standards:** A coordinated global effort, possibly under United Nations auspices, is required to establish transparent markets with consistent standards and regulatory systems based on environmental protection and community participation in order to ensure fairness in the trade of critical raw materials.

The World Trade Organization has lost its role as an effective arbiter due to the paralysis of the Appellate Body and the expansion of states' reliance on national security exceptions (Article XXI). The ruling against the United States in January 2026 (DS623) demonstrates that traditional rules still exist in theory, but they lack effective enforcement power against major powers.

Strategically, China has succeeded in building a "technological fortress" through the 2025 controls that grant it extraterritorial jurisdiction, making any Western attempt at diversification dependent either on Beijing's approval or on the replication of enormous investments extending over decades.

Economically, the world is likely to experience "geopolitical inflation" resulting from the costs of constructing parallel and less efficient—but more secure—supply chains, thereby increasing the prices of green technologies and defense systems.

The Rare Earths Dispute (DS431) confirmed that the World Trade Organization places collective commercial interests above traditional interpretations of sovereignty based on the unilateral right of states to regulate their resources. Despite the legal victory achieved by the United States and its allies and China's obligation to abolish explicit quotas and duties, the dispute exposed structural weaknesses in the Organization's ability to address deeply strategic geopolitical issues.

The "minerals war" has shifted from a legal arena to a geoeconomic conflict, with China continuing to use its dominance over supply chains as a "silent weapon" of political pressure. This confirms the urgent need for a more comprehensive international legal framework that takes economic and environmental security into account in an interconnected and increasingly complex world.

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