Two paths towards resilience: EU and US strategies to combat raw materials dependency on China

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Abstract

This thesis investigates why the European Union (EU) and the United States (US) have adopted divergent strategies to address their dependencies on China for critical raw materials (CRM). Despite facing similar levels of exposure and global supply chain vulnerabilities, the two actors have implemented different policies in terms of strategic focus and policy instruments. This thesis examines how institutional factors influence policy choices. It applies a historical institutionalist framework, drawing on concepts such as path dependency and division of competences. Through structured process tracing and a qualitative comparative analysis of EU and US strategic minerals strategies from 2008 to 2024, the research demonstrates that the EU has favored regulatory coordination, external partnerships, and innovation-driven resilience, while the US has relied more on direct financial interventions, national stockpiling, and production mandates. The findings contribute to scholarship on public policy by highlighting the explanatory power of institutional constraints in shaping industrial and trade responses to resource dependency. This thesis also informs ongoing debates on strategic autonomy, de-risking from China, and the future governance of CRM supply chains.

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List of abbreviations

Abbreviation	Definition
CRM	Critical Raw Materials
CRMA	Critical Raw Materials Act
DoC	Department of Commerce
DoD	Department of Defense
DoE	Department of Energy
DG	Directorate General
DG GROW	Directorate General for the Internal Market, Industry, Entrepreneurship and SMEs
DG INTPA	Directorate General for International Partnerships
DPA	Defense Production Act of 1950
DV	Dependent Variable
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
ESI	Emergency Support Instrument
IRA	Inflation Reduction Act
IV	Independent Variable
MoU	Memorandum of Understanding
MSP	Minerals Security Partnership
NDS	National Defense Stockpile
NSA	National Security Advisor
NSC	National Security Council
REE	Rare Earth Elements
R&I	Research & Innovation
RMI	Raw Materials Initiative
TFEU	Treaty on the Functioning of the European Union

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1. Introduction

Over the last decades, globalization has driven international trade liberalization and deepened global interconnectedness, creating global supply chains characterized by specialized production chains and competitive advantages. While the risks of dependencies were acknowledged, the momentum of post-Cold War economic integration overshadowed concerns about strategic autonomy and resource security.[1] Only in the second decade of the 20th century, and following several geopolitical shocks, did these issues return to the center of policy-making discussions. The Chinese Belt and Road Initiative (BRI) revived concerns about dependencies for infrastructure development.[2] The COVID-19 pandemic highlighted vulnerabilities in the supply chains of sectors such as healthcare and semiconductors.[3] Lastly, the 2022 Russian invasion of Ukraine served as a wake-up call for several countries, which rediscovered the realities of dependency, with a specific focus on energy provisions.[4]

These events heightened awareness of other strategic vulnerabilities. With the energy transition accelerating and the tech industry growing in size, the attention partially shifted to dependencies on critical raw materials (CRM) fundamental for green, communication, and military technologies. The critical nature of these materials depends on several factors, such as high import-to-consumption ratio and concentration of import suppliers, geopolitical considerations on the governance of exporting countries, and technological aspects regarding the possibilities for recycling or the use of innovative substitute materials. Based on these factors, countries generally construct their own methodology to evaluate risks and create lists of critical materials, which differ based on the specificity of each dependency.

Conversations on the dependencies for these materials started to appear in policy-making environments as a consequence of the strong dominance of Chinese companies in the sector. The timeline below (Figure 1) describes developments in the CRM market since the 2000s, describing how Chinese companies gradually gained control over the global market and contextualizing the policy responses of the EU and the US. It highlights key shocks, particularly concerning China's dominant market role and strategic export controls, which

[1] Campanella, "Economic Self-Reliance in a Leaderless World."

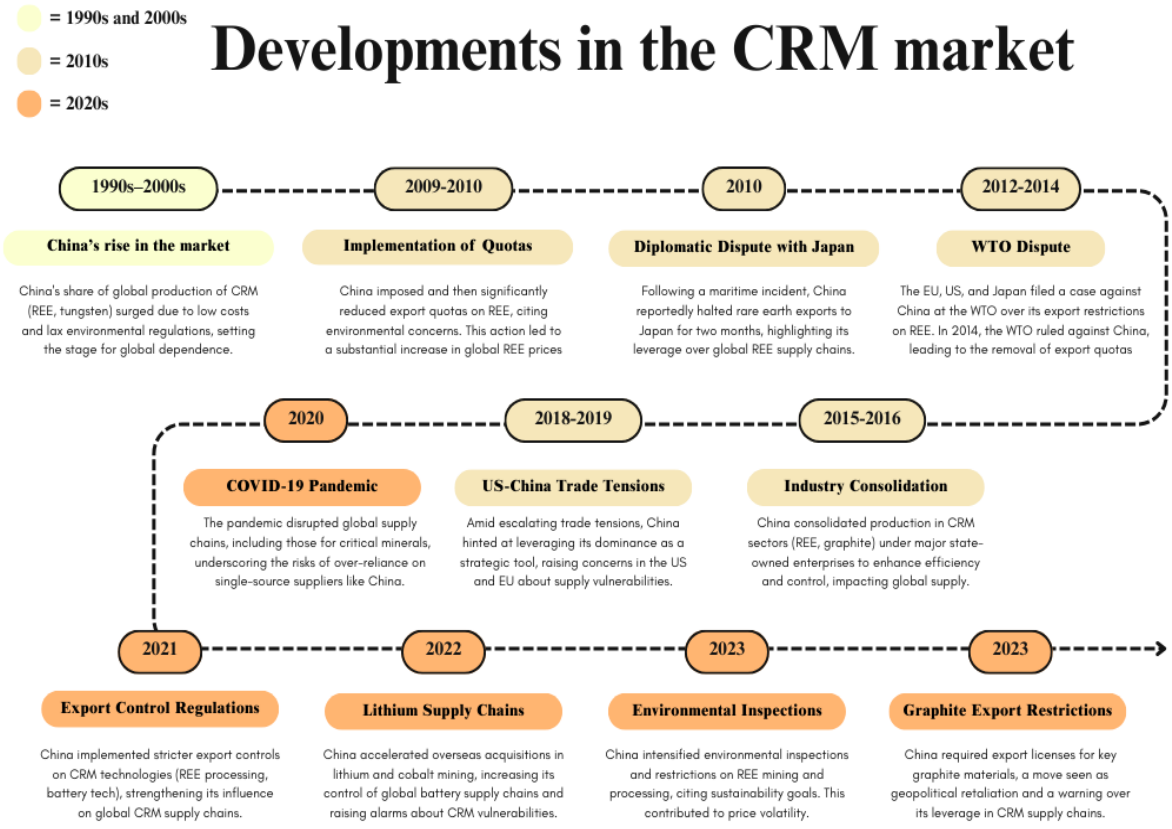
[2] Müller, "The 'New Geopolitics' of Mineral Supply Chains: A Window of Opportunity for African Countries."

[3] Campanella, "Economic Self-Reliance in a Leaderless World."

[4] Müller, "The 'New Geopolitics' of Mineral Supply Chains: A Window of Opportunity for African Countries."

repeatedly disrupted global supply chains and shaped international responses. Events such as the 2010 diplomatic dispute with Japan and the COVID-19 pandemic made evident to policymakers the geopolitical and structural vulnerabilities of over-reliance on a single supplier. These disruptions enhanced global awareness of risks in the CRM market and prompted policy shifts in both the EU and the US to secure alternative supply sources and enhance domestic capacity.

Figure 1: timeline of external shocks in the CRM market. Authors' own visualization.



As shown in the timeline above, policy responses were developed when Western industries started suffering because of the monopolization of the strategic minerals market by Chinese companies. One clear example of this is the decision of China in 2010 to halt rare earth elements (REE) exports to Japan. In response to a collision of maritime Chinese and Japanese vessels, the Chinese government decided to use this geopolitical leverage as a political weapon.[5] At the time, Chinese companies controlled approximately 97% of the global market of these minerals. The high reliance of the Japanese automotive industry on rare earth imports heavily disrupted its operations, prompting major discussions all over the world on how to

[5] de Boer and Lammertsma, "Scarcity of Rare Earth Elements."

prevent this weaponization of materials.[6] In the aftermath of this event, several legislative proposals were drafted in the US, and a joint claim by the US, EU, and Japan was brought in front of the WTO against Chinese restrictions.[7] The WTO ruled in favor of the complainants, and the export restrictions were then removed in 2015.[8] In a similar and most recent case, China also implemented export restrictions on gallium and germanium in 2023, likely in retaliation for joint US/Dutch measures on semiconductor technologies.[9] As Chinese companies control more than 80% of the global market for these minerals, such measures are a clear indication of the willingness of Chinese leadership to use resource control and market manipulation as a leverage in international politics.[10]

This event and other supply disruptions occurred since 2008 prompted most major powers, including the EU and the US, to introduce policies to address their dependencies on China. Differently from other materials, in this case the urge to create policy strategies did not come from the realization of the scarcity of these materials, but rather from the fear that one geopolitical adversary could use them as a strategic tool to control its opponents. In addition to this, the range of materials whose supply chains were substantially controlled by Chinese companies was broad for both the EU and the US in 2008, and in part it still remains large now. This situation therefore prompted these actors not only to create policy strategies, but also to frame them under generic terms, in order to create instruments that would allow tackling multiple dependencies at once. For this reason, even the terms employed are different: the EU uses the phrasing CRM, while the US refers to this group of materials as critical minerals. The lists of such materials however have strong overlaps, and most of the minerals whose market presents high rates of Chinese control (REE, germanium, gallium, graphite) are present for

[6] Lewicka, Guzik, and Galos, "On the Possibilities of Critical Raw Materials Production from the EU's Primary Sources"; Ferreira and Critelli, "China's Global Monopoly on Rare-Earth Elements."

[7] Shuai et al., "Assessing the International Co-Opetition Dynamics of Rare Earth Resources between China, USA, Japan and the EU: An Ecological Niche Approach."

[8] He, "The Trade-Security Nexus and U.S. Policy Making in Critical Minerals"; Silberglitt et al., "Critical Materials: Present Danger to U.S. Manufacturing"; Rabe, Kostka, and Smith Stegen, "China's Supply of Critical Raw Materials: Risks for Europe's Solar and Wind Industries?"

[9] Leichthammer, "Mining for Tomorrow. The Strategic Importance of Critical Raw Materials for Europe's Industry."

[10] European Commission, "Study on the Critical Raw Materials for the EU 2023"; Ali, Shah, and Raza, "The Geopolitical Implications of Rare Earth Mineral Dependencies and Technological Rivalries."

both actors.[11] To prevent confusion, this study uses the term CRM when referring to EU policies, critical minerals for US policies, and the more neutral strategic minerals for sentences not focused on one specific case. Reflecting the broad orientation of their strategies, this thesis approaches the topic with a public policy focus, studying the EU and US strategies in their entirety.

This thesis examines why policy responses have diverged despite a common goal of supply diversification by answering the question of how and why the strategies adopted by the EU and the US to secure strategic minerals differ. To answer this question, this thesis analyzes the policy documents drafted by the EU and the US to combat their current dependencies on China for raw materials. The term strategy is intended as the underlying logic that motivated and guided EU and US policies in the past fifteen years. Especially at a time when US-China tensions are rising again, and minerals are taking the center stage in global security policy in Ukraine, understanding where past approaches stemmed from and how they got implemented is essential for the study of both past and present dependencies.

With this goal in mind, this thesis pursues two objectives. First, to identify how the strategies employed by the EU and US differ, and secondly, to discover why. For this second purpose, this thesis employs methods of process tracing to understand what mechanisms led to the result of two diverging strategies. These methods include specific tests, further described in Chapter 4, meant to verify the existence of causal mechanisms and trace the influence of institutional factors on current policies. By institutional factors, this thesis refers to the division of competences between different institutions in the EU and the US and to patterns of path dependency that bind current policy approaches with past trajectories. Specifically, it attempts to uncover how these two factors shape the current strategies to secure the provision of strategic minerals.

The choice to focus on these strategies in their entirety and not on specific minerals is motivated by two reasons. The first one is connected to the data collected for this study: most legislative Acts implemented by the two actors to secure the supply of strategic minerals address dependencies in general. These documents in fact mostly refer to CRM for the EU or

[11] European Commission, "Study on the Critical Raw Materials for the EU 2023"; USGS Communication and Publishing, "U.S. Geological Survey Releases 2022 List of Critical Minerals"

critical minerals for the US, without diversifying parts of the legislation based on each mineral. It would therefore be difficult to draw specific conclusions from policy documents that were not drafted to address dependencies for one specific mineral. This consideration then leads to the second reason. The market for these minerals is constantly changing, not only in size, but also in the variety of minerals and their respective importance. The speed of innovation has constantly expanded the uses of different materials over the last decades. Therefore, materials that were fundamental for certain technologies fifteen years ago have now been substituted by more efficient alternatives, or technologies that were driving raw materials demand have now become outdated.[12] This is also partially what prompted the EU and US to draft generic strategies that could be then applied accordingly to the case of specific minerals. Lastly, rapid changes in the market have also been reflected in the share of minerals produced by China in the last two decades. While for some minerals Chinese companies have consolidated their control, for others alternative suppliers have emerged. It is therefore coherent to reflect the approach by dependent actors in the analysis of their policies as well, by not focusing on any specific material.

This thesis contributes academically to the fields of public policy and historical institutionalism by examining the institutional mechanisms that shape the divergent responses of the EU and US to strategic minerals dependency, a relatively underexplored topic given the rapid evolution of this sector. Additionally, this study contributes to the literature on de-risking and strategic autonomy, situating its analysis within broader debates on industrial policy, global supply chain resilience, and geopolitical competition. It also offers insights into the political economy of resource security, engaging with discussions on the intersection of economics and security studies. Lastly, it also offers societal value by informing current debates on EU/US-China relations and policymaking for CRM.

This thesis is structured as follows. The next Chapter situates it within the existing literature on the topic, highlighting why it represents an innovative approach that would fill a current gap in the scholarship. Chapter 3 then lays out the theoretical framework guiding this thesis. This includes both the theory of historical institutionalism, from which it draws key concepts, and the hypotheses and expectations of this thesis that are then tested in the analysis section. Chapter 4 outlines the methodological approach, combining a comparative case study

[12] Communications and Publishing Office of the USGS, "Critical Minerals of the United States."

analysis with process tracing techniques. It describes the details of the data collection and case studies selection processes, before constructing the process tracing tests that guide part of the analysis. Chapter 5 contains the core of the thesis, with different sections dedicated to verifying the four hypotheses laid out in Chapter 3. The analysis in Chapter 5 is divided into four sections. The first one provides an overview of the historical setting in which the EU and US policies have developed. Sections 5.2 and 5.3 focus either on the policy scope of the two actors or on their preferred instruments. Each of these sections then includes both an evaluation of the existing policy divergence and a study of the influence of institutional competences and path dependency. The last section of Chapter 5 then draws from the preceding sections to answer the research question. Chapter 6 presents the final results of this study, identifies potential future research directions, and discusses the societal and political relevance of this topic.

2. Literature Review

The scholarship on strategic minerals dependencies has offered different potential explanations behind policy choices, but the main strand of literature addressing this topic approaches it from a materialist point of view derived from realist or neo-realist currents. Several scholars highlight how the US domestic resource base, industrial sectors (e.g. defense, tech), or geopolitical vulnerabilities drive its critical minerals' strategy, thereby essentially linking material conditions to state behavior. The US is geologically favored by the presence of some mineral deposits (most famously at Mountain Pass, California, and reserves in states like Wyoming, Texas, and Alaska).[13] It also has a legacy of mining and processing know-how from the Cold War era, when the US was the leading producer of several materials. US mining for most minerals (especially REE) dwindled after the 1990s due to cheaper Chinese competition and environmental costs. Nevertheless, the US has an existing (if dormant) domestic mining sector to "revitalize," as recent policy aims to do.[14]

Realist scholars have also applied the same logic to the EU case, linking its CRM strategy to limited domestic reserves and underdeveloped industrial capacity. The EU possesses

[13] Andrews-Speed and Hove, "China's Rare Earths Dominance and Policy Responses."

[14] Ali, Shah, and Raza, "The Geopolitical Implications of Rare Earth Mineral Dependencies and Technological Rivalries"; Goldman, "The U.S. Rare Earth Industry: Its Growth and Decline."

only modest CRM deposits within its territory, such as lithium in Portugal, REE in Sweden, and other resources scattered across member states, and its mining and processing sectors for many of these materials remain comparatively small in scale.[15] Scholars within this realist group argue that the resource endowment gap means the US can realistically strive for some level of self-sufficiency by restarting mines and processing facilities, while the EU is structurally more dependent on imports, at least in the near term.[16]

According to this interpretation, this difference encourages the US to pursue a supply-side strategy centered on national mining, whereas the EU must emphasize demand-side measures (recycling, circular economy, efficiency) and securing supply abroad. Moreover, moving the analysis from the supply to the usage of critical minerals, the US has a sizable defense and aerospace industry, as well as high-tech manufacturing (e.g. electronics, electric vehicles) that require several minerals for components. This gives the US a strategic economic incentive to ensure a stable internal supply for national security production. By contrast, the EU's industrial might is somewhat differently distributed. While it has automotive, renewable energy, and defense sectors needing CRM, these are not always integrated at a European level and are comparably smaller in size.[17] This emphasizes how the US's more nationalist approach reflects the interests of the state and its economic structure, providing ground for those realist explanations that see resource availability and material power as the main driving forces behind policy choices. However, the strand of literature that focuses on these factors, while providing a useful lens to analyze part of the different drivers of policies, fails to examine the institutional causes of issues such as diverging partnership strategies or the instruments used to promote resilience in the strategic minerals supply chains.

Staying within a realist framework, scholars have also often referred to the US's securitization of critical minerals and its framing of China as a strategic threat as dynamics of power competition shaping state behavior. The US has explicitly treated critical minerals as a national security issue since the 2010 shocks in the REE market. US policy discussions

[15] Hache and Normand, "Critical Materials: Assessing the EU Strategy."

[16] Crochet and Zhou, "Critical Insecurities? The European Union's Strategy for a Stable Supply of Minerals"; Charalampides et al., "Rare Earth Elements: Industrial Applications and Economic Dependency of Europe"; Jetin, "Electric Batteries and Critical Materials Dependency: A Geopolitical Analysis of the USA and the European Union."

[17] Hache and Normand, "Critical Materials: Assessing the EU Strategy."

frequently cast China as a strategic competitor or adversary, which has spurred a more security-driven approach to minerals supply.[18] This has included measures like stockpiling critical minerals for defense needs, investing in domestic production to reduce dependency on Chinese supply, and forging alliances with partners. The logic is a purely realist one: ensure that adversarial powers cannot weaponize resource interdependence. Scholars such as Shuai, He, and Jetin have argued that as a result of this, the US critical minerals' strategy has a tone of urgency and often bypasses pure market logic in favor of strategic investment, something relatively unusual for the traditionally free-market-oriented US.[19] The EU instead recognizes the geopolitical risk of over-reliance on China, but its approach is moderated by its broader multilateral and economic instincts. Historically, the EU framed critical raw materials as an issue of economic security and supply resilience rather than direct great-power rivalry, and it stopped short of casting China as an enemy, but rather balanced between diversifying supply and maintaining trade relations.[20] Authors investigating the geopolitical relations with China, such as Andrews-Speed and Fabry, therefore argue that divergence in rhetoric and action can lead to different outcomes: the US might impose export controls or investment screening on China related to critical minerals, whereas the EU might be more hesitant to take such hardline measures unilaterally.[21]

Moreover, scholars also noted how the EU and the US lack a common strategy on critical materials and at times even become competitors in securing resources.[22] These dynamics reinforce realist interpretations of policy divergence, but these fail to capture some elements of it. While realism might be a good lens to argue that competition is what stopped the EU and US from fully coordinating their strategy, it does not capture why the partnership

[18] Kalantzakos, "Introduction: Rare Earths: A Crisis in the Making."

[19] Shuai et al., "Assessing the International Co-Opetition Dynamics of Rare Earth Resources between China, USA, Japan and the EU: An Ecological Niche Approach"; He, "The Trade-Security Nexus and U.S. Policy Making in Critical Minerals"; Jetin, "Electric Batteries and Critical Materials Dependency: A Geopolitical Analysis of the USA and the European Union."

[20] Jetin, "Electric Batteries and Critical Materials Dependency: A Geopolitical Analysis of the USA and the European Union"; Müller, "The 'New Geopolitics' of Mineral Supply Chains: A Window of Opportunity for African Countries."

[21] Andrews-Speed and Hove, "China's Rare Earths Dominance and Policy Responses"; Fabry et al., "Shields Up: How China, Europe, Japan and the United States Shape the World through Economic Security."

[22] Hache and Normand, "Critical Materials: Assessing the EU Strategy."

strategies of the two actors differ (bilateral vs. multilateral) or why the EU has so far avoided investing strongly in its mining industry despite the clear benefits that would have derived from this. For these reasons, this type of realist interpretation provides useful insights to scholars analyzing this phenomenon but does not suffice on its own to shed light on some traits of the policy divergence.

Other scholars have instead delved more into sociological aspects of the question. For instance, public opposition to mining is a well-documented phenomenon in Europe. Many communities and civil society groups have historically resisted new mining projects, including those for CRM, due to environmental concerns, land-use conflicts, and Not-In-My-Back-Yard (NIMBY) sentiments. Righetti argues that this "rooted public opposition to mining projects across the EU" often delays or even blocks extractive operations, such as in the case of the lithium mine in Portugal's Barroso region or the proposed Kvanefjeld rare earth mine in Greenland (not part of the EU but closely linked via Denmark).[23] Other scholars similarly argue that such societal pushback makes European governments cautious about pursuing domestic CRM extraction, even when strategic logic might call for it.[24] The result is a preference to import or develop substitutes rather than face domestic political backlash.

The US also faces popular opposition to mining, but there are some differences in degree and political context. US communities and advocacy groups have opposed mining projects on grounds of pollution, ecological damage, or impacts on sacred lands (a recent example being resistance to a lithium mine in Nevada on indigenous lands).[25] Furthermore, the US permitting process gives scope for environmental review and litigation, which can significantly slow projects. A 2015 industry study found that among developed countries, the US had some of the most severe delays in obtaining mining permits.[26] Thus, the social and regulatory hurdles exist on both sides of the Atlantic. Nevertheless, the political handling of these hurdles differs. US discourse increasingly frames critical mineral projects as essential for national security and the clean energy transition, which can rally political will to override

[23] Righetti and Rizos, "The EU's Quest for Strategic Raw Materials: What Role for Mining and Recycling?"

[24] Correia, Rosendo, and Falck, "Understanding the Narratives in the Public Debate about Mining in Europe"; Crochet and Zhou, "Critical Insecurities? The European Union's Strategy for a Stable Supply of Minerals."

[25] Human Rights Watch, "US: Lithium Mine Permit Violates Indigenous Peoples' Rights."

[26] O'Sullivan and Bordoff, "A Critical Minerals Policy for the United States: The Role of Congress in Scaling Domestic Supply and De-Risking Supply Chains."

opposition in some cases. For instance, there have been efforts to fast-track permits for rare earth processing facilities in Texas and magnet factories, with federal and state authorities trying to avoid the cancellation of projects.[27]

In the EU, by contrast, the precautionary environmental culture is stronger, and policymakers are generally not willing (nor able, given legal constraints) to bypass local opposition. In summary, the analysis of the literature on this phenomenon shows how popular opposition has impeded CRM policy implementation in the EU more uniformly, whereas in the US the government sometimes manages to push through or compensate for opposition, albeit still slowly.[28] Based on these considerations, it has been argued that community concerns regarding mining contribute to the EU lagging behind the US in developing a domestic CRM supply chain.[29] This however would explain divergence in mining policies between the two actors but does not provide insights for differences in the EU/US policies regarding partnership strategies or security considerations.

Despite the existence of these lines of research, there is a lack of studies addressing the factors included in this thesis in combination. There are hardly any comprehensive studies comparing the EU and US approaches. Only one comparative study by Bartekova was published in 2016 on this issue of national strategies, but it was focused on the case of REE and it could now be considered outdated, as many relevant CRM legislations and strategies have been enacted after 2016.[30] In addition, scholarship has so far been centered on the structural analysis of the dependencies (the cause behind the policies) or the hypothesized effects of the strategies on the market (the result of the policies). Very few authors, such as Fabry and Ingulstad, have instead included in their work considerations on the policy-making that led to these strategies, intended as the dynamics and processes that took place in EU and

[27] Cantrell, "Rare Earth Mining Project at Round Top near Sierra Blanca Could Have Significant Implications for Entire Big Bend Region"; Texas Mineral Resources Corporation, "Texas Mineral Resources and JV Partner USA Rare Earth Advance Round Top Rare Earth Project."

[28] Righetti and Rizos, "The EU's Quest for Strategic Raw Materials: What Role for Mining and Recycling?"; O'Sullivan and Bordoff, "A Critical Minerals Policy for the United States: The Role of Congress in Scaling Domestic Supply and De-Risking Supply Chains."

[29] Correia, Rosendo, and Falck, "Understanding the Narratives in the Public Debate about Mining in Europe."

[30] Barteková and Kemp, "National Strategies for Securing a Stable Supply of Rare Earths in Different World Regions."

US institutions and that influenced the strategic minerals policies.[31] Moreover, the existing studies do not include in their considerations the impact of institutional factors on the policies implemented by different actors. Historical institutionalist scholars have often looked at how the institutional set-up of the EU and the US influences their governance.[32] However, while this strand of literature offers valuable insights, it rarely anchors its analysis in a specific policy domain, tending instead toward broader theoretical discussions. Notably, although some of the patterns discussed in historical institutionalism are reflected in the case of CRM and are discussed in the analysis, these frameworks have yet to be explicitly applied to this type of policy. For these reasons, an explanation of the current differentiation of strategies by countries trying to de-risk their strategic minerals dependencies still represents a gap in the literature. This study adds a comprehensive evaluation to the current scholarship examining the reasons behind the differentiation of strategic minerals policies of the countries considered. It does so by analyzing how the competences assigned to different institutions and patterns of path dependency have influenced the direction of the strategies adopted by both actors.

3. Theoretical Approach

Albeit to a different extent, the EU and the US are on comparable paths of distancing themselves from Beijing. The US has swayed between total "decoupling" and a more wary "de-risking" depending on the administration, while the EU has committed itself to the latter option.[33] They both face challenges in their diversification efforts related to popular opposition to new mines and a lack of an industrial base for refining purposes.[34] Based on these similarities, it would be reasonable to expect aligned policies. Nonetheless, there are a few differences, such as the presence of a higher number of operational critical minerals' mines in

[31] Fabry et al., "Shields Up: How China, Europe, Japan and the United States Shape the World through Economic Security"; Ingulstad, "The Interdependent Hegemon: The United States and the Quest for Strategic Raw Materials during the Early Cold War."

[32] Calabresi, "Does Institutional Design Make a Difference?"; Checkel, "Mechanisms, Process, and the Study of International Institutions"; Egeberg, "EU Institutions and the Transformation of European-Level Politics: How to Understand Profound Change (If It Occurs)."

[33] Müller, "The 'New Geopolitics' of Mineral Supply Chains: A Window of Opportunity for African Countries."

[34] Jetin, "Electric Batteries and Critical Materials Dependency: A Geopolitical Analysis of the USA and the European Union."

the US. The different influence of protectionist right-wing ideologies also plays a part in this context, as the "America first" ideology entails an economically protectionist stance vis-à-vis China and therefore influences critical minerals' policies.[35]

This thesis, however, focuses on the impact of different institutional factors of EU and US decision-making bodies and investigates how these factors influence the decision-making process and consequently the resulting policies. To do so, it derives concepts from Historical Institutionalist theories to explain the US-EU policy divergence on strategic minerals. Despite representing a clearly defined field of study, institutionalist theories are not limited to the analysis of one single factor. The way institutions are designed includes in fact numerous considerations, each with its own set of consequences on policymaking. The following paragraphs identify a few of these factors. The first two, division of competences and path dependency, represent the institutionalist bulk of this thesis, while the other two appear throughout the analysis to complement it with additional insights.

The first of these factors considered in this thesis is the importance of path dependency, defined as the idea that past policy choices and institutional factors constrain the range of feasible options available to policymakers.[36] Path dependency is a fundamental concept in historical institutionalist analysis, emphasizing the process through which early choices and policy decisions create "lock-in" effects that limit future options. Scholars like Pierson and Thelen have argued that these early decisions shape the range of policies available for institutions and the interests of key actors over time, creating loops that reinforce initial pathways.[37] This perspective highlights the "increasing returns" nature of institutional development, where the costs of changing course become progressively higher as policies become deeply entrenched in the nature of the institutions. Once a particular trajectory is established, it tends to become self-reinforcing over time, shaping both the direction and the instruments of future policy responses. Applying these concepts to the specific case, this thesis looks at past approaches to raw materials policy employed by the EU and the US and tries to

[35] Skonieczny, "The Persistence of Populism: Why American Protectionism toward China Is Here to Stay."

[36] Koremenos, Lipson, and Snidal, "The Rational Design of International Institutions," 763; Pierson, "The Path to European Integration. A Historical Institutionalist Analysis."

[37] Pierson, "The Path to European Integration. A Historical Institutionalist Analysis"; Thelen, "Historical Institutionalism in Comparative Politics."

show how historical trajectories have a strong influence on the range of possible policy choices. For instance, the US has historically viewed resource security through a national security lens, building on Cold War measures that framed the necessity to secure strategic minerals as a race against a geopolitical adversary (then the USSR, now China). In contrast, the EU's institutional framework evolved from economic integration and regulatory harmonization, with early efforts such as the European Coal and Steel Community setting a precedent for market-based coordination.

Secondly, it is also necessary to consider the issue of the competences that delimit the action of these actors. With the evolving dynamics of globalization, the number of cross-cutting policy issues has grown, often placing the EU in supranational debates where its capacity to Act is only partial.[38] This is evident in the case of policies concerning the supply of strategic minerals. Here, the EU primarily leans on trade measures, drawing on its exclusive competence for commercial policy and the internal market. However, when it comes to alternative measures, such as those falling within the industrial domain, the EU holds only a supportive competence, limiting its role to coordinating the actions of member states rather than legislating independently.[39] In contrast, the US federal government has legislative authority over industrial policy, derived mainly from the Commerce Clause and the Necessary and Proper Clause in the Constitution, allowing it to directly regulate and coordinate economic activity across all states.[40]

In addition to this, even when the EU has the legitimacy to take binding measures, certain types of EU policies still require not only agreement in Brussels but also implementation at the member-state level, where additional hurdles arise.[41] The coordination of different legal systems, combined with the use of legislative instruments that require national interpretation and implementation (EU directives), adds to this complexity, creating a situation where the efficacy of EU policies does not depend solely on the EU.[42] Applying these concepts

[38] Marks and Hooghe, *Multi-Level Governance and European Integration*.

[39] European Union, The Treaty on the Functioning of the European Union, art. 6.

[40] Congressional Research Service, "The Constitution of the United States of America. Analysis and Interpretation.," art. 1.8.3, 1.8.18.

[41] Egeberg, "EU Institutions and the Transformation of European-Level Politics: How to Understand Profound Change (If It Occurs)."

[42] Haag, Hurka, and Kaplaner, "Policy Complexity and Implementation Performance in the European Union."

to the specific case of raw materials, Correia and Falck argued that EU governance is "complex, fragmented and at times contradictory," as competencies are split. The EU sets overarching rules or targets, but spatial planning and land use decisions "remain a member state prerogative," often made at local/regional levels.[43] On the other side of the Atlantic, the US also has a federal system dividing powers between Washington and the states, which control land use and permitting to a degree. However, the coordination challenge is different. In the US, federal legislation (for example, a law funding critical mineral R&I or streamlining mine permits) applies uniformly across states, and there is a single hierarchy of courts and agencies to navigate.[44] Therefore, the complex division of competences in the EU provides many more opportunities for delay or restrictions at different levels, contributing to a "joint-decision trap" in which ambitious initiatives get watered down by institutional limitations and the need for widespread agreement.[45]

Leaving aside the two main factors guiding this thesis, historical institutionalist analyses also highlight the role of veto players, actors whose agreement is required to change policy, and how those shape policy outcomes. According to Tsebelis's veto players theory, the greater the number of veto players (or the wider their ideological differences), the higher the policy stability, meaning it becomes harder to enact significant policy change.[46] The EU multi-level governance often features a larger "constellation" of veto players than the US, which can make EU policy-making especially difficult.[47] In the case of the strategic minerals' policies, veto players theory is useful to understand how the US might favor executive-driven strategies to avoid Congressional gridlocks, while the EU is constrained by the multi-level governance that favors the use of vetoes in the EU Council.[48]

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[43] Correia, Falck, and Komac, "Invisible Mining: Addressing EU Raw Material Challenges Through Technological Innovation."

[44] Hickey, "Federalism-Based Limitations on Congressional Power: An Overview."

[45] Scharpf, "The Joint-Decision Trap: Federalism and European Integration."

[46] Tsebelis, *Veto Players: How Political Institutions Work*.

[47] Marks and Hooghe, *Multi-Level Governance and European Integration*; Tsebelis, *Veto Players: How Political Institutions Work*.

[48] Fioretos, "Historical Institutionalism in International Relations"; Pierson, "The Path to European Integration. A Historical Institutionalist Analysis"; Hall and Taylor, "Political Science and the Three New Institutionalisms."

Lastly, this thesis also pays attention to the type and number of agencies and departments drafting policies for strategic minerals. For instance, it studies how the major role played by the Department of Defense (DoD), the National Security Advisor (NSA), and the National Security Council (NSC) in the US prevails over the Department of Energy (DoE) or Commerce (DoC), resulting in a security-centered approach.[49] In contrast, the EU's CRM policy emerges from a more fragmented, multi-stakeholder process, where different Directorates-General (DGs) of the European Commission shape policies based on industrial, energy, trade, and environmental interests.[50]

This thesis builds on this institutionalist framework to examine how the division of competences and the influence of path dependency explain the policy divergence between the EU and the US in managing strategic minerals dependencies. This divergence is evaluated through three dependent variables, as shown in Table 1 below. The first variable (DV_1) corresponds to the strategic focus, defined as the binary overarching policy orientation toward resilience, which is either security-oriented or market resilience-oriented. The definition of this variable is justified by a preliminary analysis of the policy documents and by existing literature, which shows how the EU and US frame their dependencies as either a security or a market resilience issue. The second dependent variable (DV_2) is the policy scope, which captures the range of government actions aimed at building a comprehensive minerals strategy. This can be divided into six policy clusters, each addressing an aspect of reducing material dependencies: 1) promoting national exploration and mining to expand domestic resource availability, 2) supporting strategic minerals processing to reduce reliance on foreign processing capabilities, 3) establishing national stockpiles to buffer against supply disruptions, 4) promoting trade diversification to reduce supply risks, 5) regulating recycling practices to recover critical materials from waste, and 6) funding research and innovation (R&I) to develop alternatives and reduce demand for specific critical minerals. Together, these clusters form the core of strategic minerals strategies by addressing both the supply and demand sides of the resource chain. The third variable (DV_3) describes the types of policy instruments used to achieve the goals set by each actor. These include six different options: enact regulatory measures, provide

[49] He, "The Trade-Security Nexus and U.S. Policy Making in Critical Minerals."

[50] Barteková and Kemp, "National Strategies for Securing a Stable Supply of Rare Earths in Different World Regions."

direct funding to industries, establish tax incentives, streamline permitting procedures, set up alliances between private and public sectors, and sign trade partnerships with other countries.

Table 1: table of variables.

Variable	Definition	Categories/Clusters/Options
Strategic Focus	Overarching policy orientation toward resilience	1) Security-oriented 2) Market resilience-oriented
Policy Scope	Functional domain targeted by policy interventions	1) Exploration & Mining 2) Processing 3) Stockpiling 4) Trade Diversification 5) Recycling 6) Research & Innovation (R&I)
Policy Instruments	Tools and mechanisms used to implement policy goals	1) Regulatory Measures 2) Direct Funding to mining/processing industry 3) Tax Incentives or Exemptions 4) Permit Streamlining 5) Alliance-Building (between industrial and public sectors) 6) Bilateral/Multilateral Partnerships

Based on these variables, this thesis then formulates four hypotheses to identify how the strategies of the two actors differ and why the two institutional factors considered can explain the policy divergence. The first two hypotheses correspond to the first part of the research question, which looks at how the EU and US strategies differ. These aim to identify differences between EU and US policies in terms of their strategic focus (first dependent variable, DV_1), policy scope (second dependent variable, DV_2), and the types of instruments used to implement these strategies (third dependent variable, DV_3).

H_1: EU and US policies to address strategic minerals dependencies diverge in terms of strategic focus and policy scope (DV_1 and DV_2), with the US prioritizing security-oriented national production (clusters 1, 2, and 3) and the EU emphasizing market resilience-oriented trade diversification, recycling and innovation (clusters 4, 5 and 6).[51]

H_2: EU and US policies differ in the instruments employed to promote resilience (DV_3), with the EU favoring regulatory market-based tools and bilateral partnerships and the US relying more on ad hoc financial interventions for national projects and multilateral initiatives for trade.

The third and fourth hypotheses instead explain why the EU and US strategies differ by exploring the institutional factors driving the policy divergence. Specifically, H_3 examines how the institutional division of competences (IV_1) shapes the strategies employed. H_4 investigates how path dependency resulting from earlier institutional and legislative choices (IV_2) steers the EU toward regulatory solutions and the US toward direct market interventions.

H_3: The institutional division of competences (IV_1) between levels of government in the EU and US shapes the strategic focus and policy scope (DV_1 and DV_2) of their strategies to address raw materials dependency, with the US favoring broad comprehensive strategies focused on national production and the EU emphasizing trade diversification and market-based resilience.

H_4: Path dependency stemming from historical, institutional and legislative frameworks (IV_2) predisposes the EU to adopt regulatory approaches, while encouraging the US to favor direct market interventions (DV_3).

The hypotheses above guide the analysis section in verifying whether the expectations of this thesis are corroborated by evidence. This research anticipates that the EU's multi-stakeholder governance process results in regulatory, market-driven policies centered on partnerships and sustainability. In contrast, the US's executive-dominated policymaking

[51] 1) promote national exploration and mining or 2) minerals processing, 3) establish national stockpiles, 4) promote trade diversification, 5) regulate recycling practices to recover materials from waste and 6) fund research and development (R&I) to lower the need for specific minerals.

enables ad hoc interventions, often involving substantial public investment in national projects. Notably, despite the US federal structure, the expansion of presidential authority, particularly in the realms of national security and industrial policy, has facilitated 'fast-track' mechanisms for critical minerals' policy, circumventing traditional state and congressional oversight.[52]

4. Research design

The following four sections describe how this thesis addresses the question it intends to answer. Section 4.1 represents a brief overview of the method employed. Section 4.2 goes into more detail on what type of data has been used and how it was collected. Section 4.3 describes the rationale behind the selection of cases for this thesis. Section 4.4 describes in depth the process tracing analysis that has been performed on the collected data and how this informs sufficiently to answer the research question.

4.1 Overview of the research method

This thesis adopts a qualitative approach by employing methods of process tracing in a structured focus comparison. Since the goal of the project is to understand how institutional factors steered the decision-making process towards a specific result, this method is the most appropriate. It allows to look at mechanisms of causal inference through the study of different types of sources, ranging from declarations of politicians to technical studies.[53] Process tracing represents an appropriate lens to study divergent policy choices, as it captures complexity and highlights the patterns leading to changes and contradictions in the ways states frame policies and justify their actions.[54] As these policies have evolved in the past 15 years, process tracing also allows tracking the influence of several dynamics along the process, thereby facilitating the analysis of the long-term impact of the institutional factors considered. Specifically, the issue of competences and the role of path dependency are the main dynamics observed.

[52] Jung and Clyde Haufbauer, "Lessons Learned from Half a Century of US Industrial Policy."

[53] Beach and Pedersen, *Process-Tracing Methods: Foundations and Guidelines*.

[54] Checkel, "Mechanisms, Process, and the Study of International Institutions"; Beach and Pedersen, *Process-Tracing Methods: Foundations and Guidelines*.

The in-depth analysis of the mechanisms leading to the policy outcomes is performed through a close reading of the policy documents published by the two actors, which represent the final result of the policy-making process. It is then corroborated by using several supporting documents to contextualize relevant information. In the analysis process, the qualitative analysis software ATLAS.ti is used to code parts of the text in the policy documents, thereby categorizing paragraphs based on the strategic focus, the policy scope, and the policy instruments, representing the three variables described in Table 1.

Limiting the analysis to a relatively small set of policies in legislative documents keeps its scope manageable, ensuring feasibility. It also maintains internal validity by allowing for a precise assessment of the relationship between these policies and the institutions that shaped them. Simultaneously, constructing a framework that links the institutional factors of the two actors to the observed differences in their respective policies allows for the generalization of some conclusions to other similar cases of public policy, thereby achieving a measure of external validity. This approach increases the applicability of the findings, making them relevant for cases beyond those in the immediate scope of this analysis. In terms of replicability and reliability, this thesis relies on clearly defined process tracing tests, as outlined in the sections below. These tests can be replicated using the same publicly available documents, ensuring that the research can be performed again and therefore verified. Additionally, reinforcing these tests by considering different types of sources and cross-checking for potential alternative explanations further strengthens the credibility of the findings and the robustness of the results.

4.2 Data sources and data collection

This study is based on the analysis of primary source documents such as regulations, legislative proposals, official governmental Acts, studies sponsored by institutions, reports of parliamentary debates, and secondary sources such as newspaper articles discussing related political developments. Primary sources were collected from the official web repositories of the EU and the US to obtain substantive information on the policies of the EU and the US, where different agencies intervene depending on the type of measure.[55] For the case of the EU, the sources collected include sixteen policy documents and official partnership agreements

[55] Mancheri, "World Trade in Rare Earths, Chinese Export Restrictions, and Implications."

published between 2008 and 2024. These documents were then combined with other sources and communications published by EU institutions without legal value, which were useful to contextualize and investigate the implementation of official measures. For the US case instead, the main policy documents analyzed include fifteen policy documents, divided between Presidential executive orders and laws enacted by the US Congress. As in the EU case, these were also supported by other types of communications by US agencies regarding implementation measures. All of the documents mentioned are listed in Appendix 1.

As the number of official legislative Acts on the topic is relatively low, the collection of supporting documents and other types of sources was necessary and sufficient to ensure the validity of the thesis' conclusions and compensate for possible limitations. For instance, most documents do not include explicit references to institutional factors as a cause for certain policy choices, but the type of sources allows to draw conclusions based on the repetition of certain patterns in decision-making. Lastly, the public availability of these documents for both cases facilitates data collection and guarantees the feasibility of the study. Interviewing policymakers could have reinforced the analysis by providing first-hand insights into how the division of competences and patterns of path dependency shaped and influenced their decisions. However, limited access to these actors made this approach unfeasible.

4.3 Case studies selection

Chinese companies hold a clear dominance on the minerals market, as they control from 50% to 97% of global extraction and refining for more than twenty critical minerals.[56] As a consequence of this, most industrial countries on the planet are dependent on China for their supply of strategic minerals. Within these, the focus of this study is placed on those economies that are attempting to diversify their supply chains to reduce vulnerabilities, such as the US, EU, Japan, Australia, Canada, South Korea, India, and Brazil.[57] Some of these countries,

[56] European Commission, "Study on the Critical Raw Materials for the EU 2023."

[57] Leichthammer, "Mining for Tomorrow. The Strategic Importance of Critical Raw Materials for Europe's Industry"; Barteková and Kemp, "National Strategies for Securing a Stable Supply of Rare Earths in Different World Regions"; Logan, "Material World: How Europe Can Compete with China in the Race for Africa's Critical Minerals | ECFR."

however, have either similar or coordinated strategies, such as in the case of Canada, the US, and Australia.[58]

The key determinants for case selection are the two institutional factors that serve as the independent variables of this thesis. The US, as a federal state, and the EU, as a union of sovereign nations, operate within fundamentally different institutional frameworks, each shaping decision-making processes in distinct ways. Even though within its exclusive competences the EU has a comparable range of actions as the US federal government, the list of competences also limits the EU's action in fields other than trade. These two actors therefore possess different sets of competences, whose influence will be studied in the analysis section. Differences are also particularly evident in the patterns of path dependency. While the US has engaged in raw materials policy for the entirety of the Cold War period, the EU bases its action on broader trends of market integration and regulatory coordination that were part of its development from the European Economic Community (EEC). Given these contrasts, the US and the EU provide the most appropriate cases for analyzing how these institutional factors influence policymaking in the field of strategic minerals. In addition to this, while other countries such as Brazil or India would also have a structure of competences of a nation state, placing the focus of the study on two of the main importers of strategic minerals (EU and US) guarantees the comparability of the cases. Lastly, Japan has also not been considered in the analysis for feasibility reasons related to language barriers and data accessibility. Nonetheless, it could be an interesting case to consider for further research and to verify the generalizability of this study.

After selecting the countries for the analysis, it is also important to establish the appropriate timeframe for the policies to be included in the study. For the scope of this research, 2008 represents an optimal point in time to start from, as the first initiatives in this arena such as the EU Raw Materials Initiative (RMI) were published from 2008 onwards. Regarding the end of the period to consider, this analysis limits its scope to documents until the end of 2024. This is to avoid skewing the results by taking into consideration policies that have either not been implemented yet or whose results are still unlikely to be seen. Moreover, the end of 2024 coincided with the end of the Biden administration and essentially with the first Von der Leyen

[58] USGS Communication and Publishing, "Critical Cooperation: How Australia, Canada and the United States Are Working Together to Support Critical Mineral Discovery"

Commission, which facilitates the analysis because of policy coherence. The list of Strategic Projects to promote under the 2024 Critical Raw Materials Act (CRMA), published by the EU in March 2025, is considered an integral part of the 2024 Act, and therefore within the timeframe considered.[59] This document represents substantially an integral part of a policy that is part of this analysis, and it cannot be excluded to avoid weakening the overall results.

4.4 Establishing Divergence and Applying Process Tracing Tests

Before going into the analysis of the impact of competences and path dependency, it is necessary to consider the first two hypotheses and find evidence in the collected data to argue that the EU and US policies are indeed different, both from a strategic (H_1) and an instrumental (H_2) point of view. This has been done through the close reading of the relevant sources published by the two actors and of those measures that are not contained in official documents but can be traced back to one of the policy clusters. These measures include the funding of mining/processing facilities through prizes or grants promoted by state-affiliated agencies, such as in the case of the US Texas REE companies.[60] Although they are not integrated in official legislative documents, these measures can still be qualified as policy actions, as their purpose and result are in line with the government's declared goals, and their implementation depends on state-controlled entities. The analysis performed on these documents, described in detail in the first section of Chapter 5, provides sufficient evidence to support H_1 and H_2 and therefore move to the evaluation of the impact of competences and path dependency.

To establish how institutional factors influence policy outcomes, this analysis relies on the third and fourth hypotheses (H_3 and H_4), each of which outlines a specific causal mechanism. H_3 focuses on how the division of competences within the EU and US policy-making structures (IV_1) shapes the strategic framing of strategic minerals dependency (DV_1): the EU's pluralistic, trade-oriented institutions such as DG Grow and DG Trade tend to favor strategies centered on partnerships and innovation, while the US's national security apparatus promotes a more security-driven, production-focused approach. H_4, by contrast, examines how

[59] European Commission, Annex to the Commission Decision recognising certain critical raw material projects as Strategic Projects under Regulation (EU) 2024/1252 of the European Parliament and of the Council.

[60] Texas Mineral Resources Corporation, "Texas Mineral Resources and JV Partner USA Rare Earth Advance Round Top Rare Earth Project."

historical institutional trajectories create path dependency (IV_2) that influences the choice of policy instruments (DV_2). The EU's long-standing reliance on regulatory governance reinforces the use of market-based regulations, whereas the US's history of involvement in industrial policy has enabled a more flexible use of direct interventions, such as ad hoc financial support and investment initiatives.

These differentiated mechanisms are evaluated using four separate process tracing tests, which fall into three main types. Specifically, "straw-in-the-wind tests" offer preliminary support without being decisive, "hoop tests" are necessary for a hypothesis to remain plausible, and "smoking-gun tests" provide sufficient evidence to confirm a hypothesis if passed.[61] These tests are fundamental to the methodology employed in this study, as they represent the structured diagnostic tools necessary to verify causal claims and test hypotheses.[62] By examining whether the expected causal mechanisms linking institutional factors to policy divergence are present in the data, these tests provide validation for the hypotheses. This is required to move from theoretical expectations to empirical confirmation, ensuring the internal validity of the study's findings.

The first "hoop test" in Section 5.2.5 involves a comparative analysis of the official policy documents produced by EU and US institutions in the field of strategic minerals. The test examines whether the scope of policy measures used by the EU, the US, or parts of these institutions aligns with their competences. If EU documents predominantly emphasize international partnerships, R&I support, and facilitation measures for recycling, this reflects the EU's limited competences in industrial and security policy. Conversely, if US documents include mostly centralized interventions such as exploration and mining permitting, national security-driven stockpiling, and federal funding, but also mention recycling and R&I, this reflects the broader competences of the US federal government. If the results of the test are in line with the expectations described above, this means that a broader range of competences is reflected in a broader range of policy scopes. Conversely, a narrower set of competences should correspond to limited policy scopes for the hypothesis to remain viable. Passing this hoop test does not by itself confirm causality, but is necessary to maintain the plausibility of H_3, which

[61] Collier, "Understanding Process Tracing.", 825.

[62] Ibidem.

states that the institutional division of competences influences the strategic focus and the policy scope of minerals strategies.[63]

Then, a "smoking-gun test" is used in Section 5.2.5 to determine whether the analysis of the documents presents sufficient evidence to accept the hypothesized causal inference regarding the issue of competences. For this purpose, it is useful to examine whether the institutional division of competences in the EU and the US structurally enables or constrains the adoption of certain strategies. If the expectations on the policy scopes are correct, the collected data should show that the US federal government, with its broad competences in national security and industrial policy, is able to implement direct interventions, such as domestic production incentives and strategic stockpiling. In parallel, the EU should be restricted to measures focused on external partnerships, innovation support, and regulatory coordination on recycling and recovery, due to the limits of its authority. If analysis of EU treaty provisions and policy practice confirms that measures in line with the US approach, including funding for mining projects, stockpiling, or centralized permitting, would be legally or procedurally infeasible at the EU level without major treaty changes, this further strengthens the argument. If these structural constraints are confirmed, this "smoking-gun test" provides strong evidence in support of H_3 and reinforces the validity of the thesis' causal claim that the division of competences influences strategic focus and policy scopes.

The "straw-in-the-wind test" in Section 5.3.5 moves to the verification of H_4. It examines whether the types of instruments employed by the EU and US to address strategic mineral dependencies are consistent with the patterns observed in their responses to other recent strategic challenges, such as semiconductor shortages or COVID-19 supply chain disruptions. If the EU consistently favors regulatory coordination, market-based facilitation, and partnership-building across different sectors, while the US consistently relies on direct financial interventions and national production incentives, this would provide "straw in the wind" evidence in support of H_4, which emphasizes the influence of path-dependent trajectories.[64] Such consistency across different crises would suggest that historical institutional paths shape the choice of policy instruments in each case.

[63] Ibidem.

[64] Ibidem.

The fourth and last test is a "smoking-gun test" used in Section 5.3.5 to determine whether historical institutional structures shape the choice of policy instruments in the EU and the US. The test examines whether the instruments selected to address strategic minerals dependencies reflect long-established governance traditions in each system. For the US, the analysis focuses on contemporary strategies, such as ad hoc financial interventions, national production incentives, and strategic stockpiling. It investigates whether these follow trajectories established during the Cold War, when resource management and security mobilization relied heavily on centralized executive action and federal funding mechanisms. For the EU, the test assesses whether current approaches emphasizing regulatory coordination, promoting external partnerships, and facilitating market-based resilience, continue patterns developed through the historical processes of market integration and regulatory harmonization. If the observed instruments align with these historical institutional trajectories, this will provide strong evidence in support of H_4. Confirming such continuity would reinforce the argument that path dependency explains divergence in policy instruments between the US and EU.

Combined altogether, these tests provide sufficient evidence to support the claims about the influence of the institutional division of competences and path dependency. These tests are essential to ensure the potential falsifiability of the theory. By tracing expected patterns in the analyzed documents, they provide a systematic way to evaluate the validity of the proposed hypotheses. If these expected trends are not observed or are contradicted by the evidence, the hypotheses are weakened or potentially disproven, allowing for the theory to be revised or rejected.

5. Analysis

Having set up the methodology used to study the phenomenon in question, this section moves to the core of this thesis, explaining the results of the analysis performed on the sources described before. It studies the policy documents published by the EU and the US in the field of strategic minerals from 2008 to 2024, looking at the impact of the distribution of competences and the influence of past policy trajectories. Section 5.1 describes the historical and institutional setting in which EU and US policies for strategic minerals developed, and what policies are at the core of the analysis. The three sections that follow (5.2 to 5.4) instead

elaborate on the four hypotheses drafted in the theoretical framework (Table 2 below). Each of them shows how the in-depth analysis of the policies implemented by the EU and the US between 2008 and 2024 provides sufficient evidence to support the hypotheses. Section 5.2 demonstrates the existence of different approaches between the two actors to address their strategic minerals dependencies and explains how the division of competences affects the scope of the policies. This section therefore provides evidence in support of H_1 and H_3. Section 5.3 then delves deeper into the instruments used by the actors and looks at how the impact that path dependency favored such divergence. This section corresponds to reasoning in favor of H_2 and H_4. Lastly, section 5.4 provides an answer to the research question of this thesis, by arguing that the institutional division of competences and path dependency are drivers behind the policy divergence.

Table 2: table of hypotheses.

	Proving the difference	**Tracing the cause**
H_1 (sections 5.2.2 - 5.2.4)	EU and US policies to address strategic minerals dependencies diverge in terms of strategic focus and policy scope, with the US prioritizing security-oriented national production and the EU emphasizing market resilience-oriented trade diversification, recycling and innovation.	
H_3 (section 5.2.5)		The institutional division of competences between levels of government in the EU and US shapes the strategic focus and policy scope of their strategies to address raw materials dependency, with the US favoring broad comprehensive strategies focused on national production and the EU emphasizing trade diversification and market-based resilience.

H_2 (sections 5.3.1 - 5.3.4)	EU and US policies differ in the instruments employed to promote resilience, with the EU favoring regulatory market-based tools and bilateral partnerships and the US relying more on ad hoc financial interventions for national projects and multilateral initiatives for trade.	
H_4 (section 5.3.5)		Path dependency stemming from historical, institutional and legislative frameworks predisposes the EU to adopt regulatory approaches, while encouraging the US to favor direct market interventions.

5.1 Historical context of raw materials policies

For the case of the US, raw materials management has assumed a security connotation since the beginning of the Cold War, when it was understood as part of the global economic competition with the Soviet Union. Policies in this field were always promoted by the federal government, either through the executive power of the President or through legislative Acts by Congress, and usually delegated the implementation of the measures to the DoD. Building on a wide range of competences granted by the Constitution, the US government developed since the 1950s interventionist strategies to secure raw materials of national importance. These measures, which included direct state investments in relevant industries and a prominent state role in building national supply chains, created policy paths that continue to influence US strategies today. The clearest evidence of this is the frequent reference in contemporary policies of the 1950 Defense Production Act (DPA) and the current existence of institutions set up in the same era to secure raw materials provision, such as the National Defense Stockpile (NDS).[65]

[65] Chappell, Gainer, and Guss, "An Organizational History of the Defense National Stockpile Center: America's National Stockpile."

For the EU the case is quite different. From 2008 to 2024, the three main policy documents (2008 RMI, 2020 Action Plan, 2024 CRMA) were issued under the main responsibility of the Directorate General for the Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), with the support of DG Trade and DG International Partnerships (DG INTPA) for the external diplomatic engagement. The type and number of Directorates involved in shaping those policies is a sign of what type of competences the EU institutions used to legislate on the issue. For instance, the focus on the internal market is reflected in the content of those policies, which promote measures of market coordination.

To assess the influence of patterns of path dependency in the EU, it is instead necessary to navigate the evolving landscape of European institutions since the foundation of the European Coal and Steel Community (ECSC) in 1951. The scope of this original institution is already a clear example of how raw materials issues were also dealt with in the past. The approaches employed by early European institutions, such as the ECSC or the European Community, created a framework that still influences the EU's strategic minerals policy. The market-oriented coordination and the use of regulatory measures developed with early European Institutions created in fact pathways for future EU institutions to deal with similar problems, thereby shaping the policies for the provision of CRM.

Going back to the temporal focus of this thesis, it is useful to visualize the chronology of the main policy developments considered in this analysis to understand what is being discussed as EU and US strategies. The timelines below (Figures 2, 3, and 4) show when the policy measures of the two actors were implemented. In both cases, one can see that early measures, such as the 2008 EU RMI or the 2010 US DoE Strategy, likely prompted by early concerns over the Chinese dominance on the market (Figure 2), were then followed by a relatively long gap without substantive measures. During this gap that lasted from 2011 to 2017, Chinese companies consolidated their control over the minerals market through strategic investments, vertical integration, and long-term supply agreements, as well as by leveraging state support and financial backing to outcompete international rivals.[66] Despite these developments of the market, the EU and the US limited their response to the WTO case that ended in 2014 with the removal of the Chinese REE export restrictions.

[66] Mancheri, "World Trade in Rare Earths, Chinese Export Restrictions, and Implications"; Müller, "The 'New Geopolitics' of Mineral Supply Chains: A Window of Opportunity for African Countries."

In the US, the policy debate revamped from 2017 onwards, producing several documents that showcase the US approach. Between 2017 and 2024, the US included several provisions on critical minerals in defense-related Acts (Figure 3), thereby securitizing this trade. Next to this, it also promoted tax incentives and other indirect funding measures to encourage industries to source these minerals either nationally or from trade partners. These measures were primarily included in the 2020 Energy Act and the 2022 Inflation Reduction Act (IRA).

On the other hand, the EU only released an updated strategy for CRM in 2020 (Figure 4). This document listed ten actions to improve CRM resilience, including a strategic plan for raw materials diplomacy. Based on this, the Commission concluded several partnership deals with non-EU countries between 2022 and 2024. Most recently, the EU published in 2024 its first legislative Act to improve its resilience through diversified CRM supply chains.

Figure 2: timeline of external shocks in the CRM market (small version). Authors' own visualization.

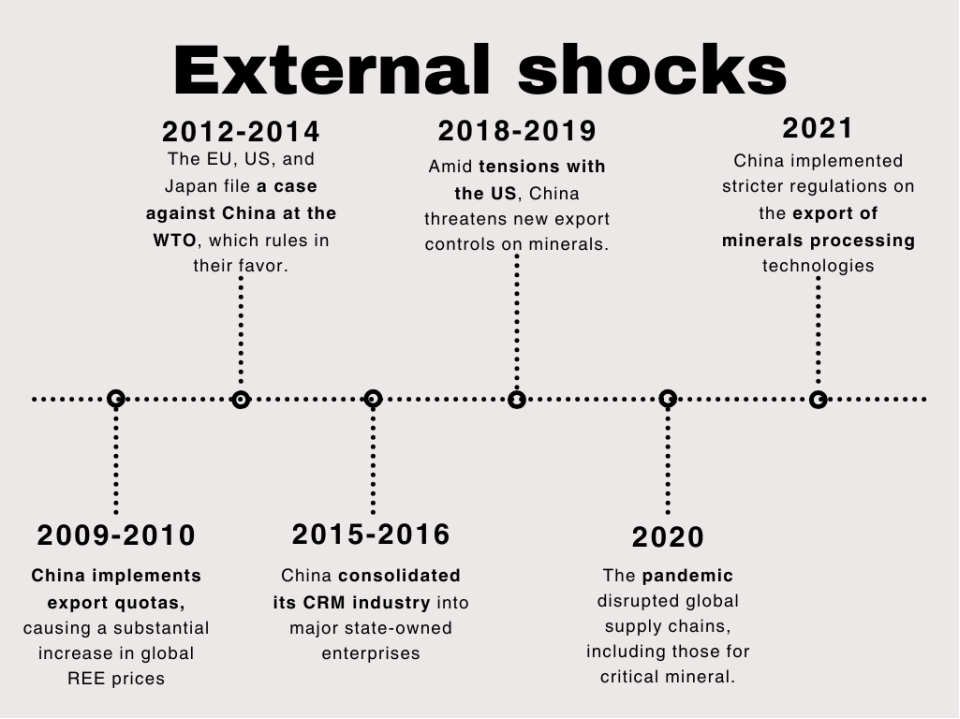


Figure 3: timeline of US CRM policies. Authors' own visualization.

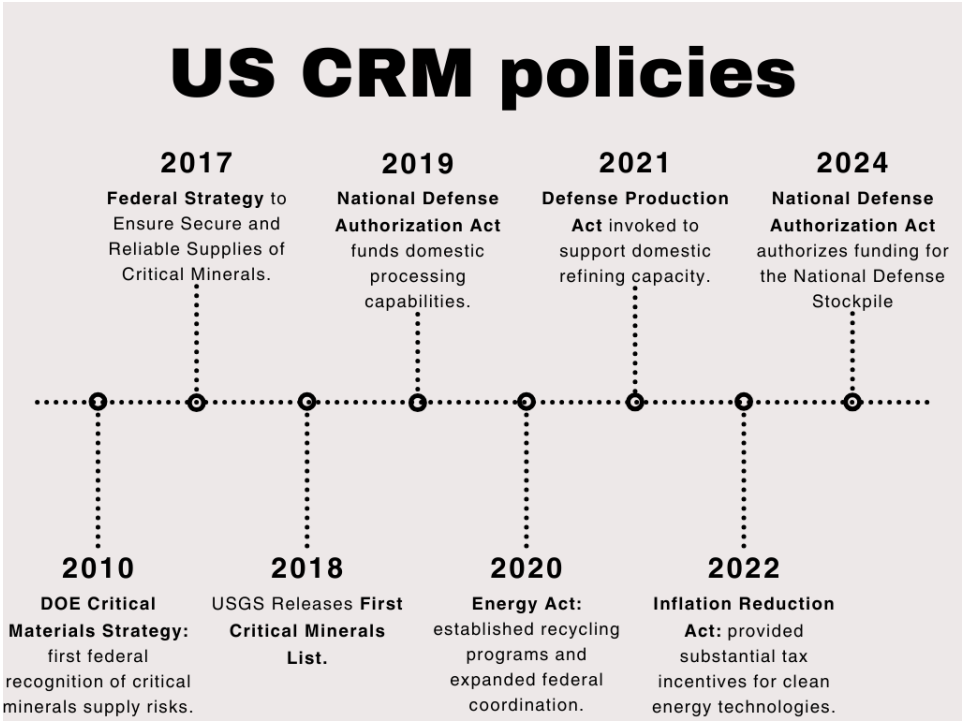
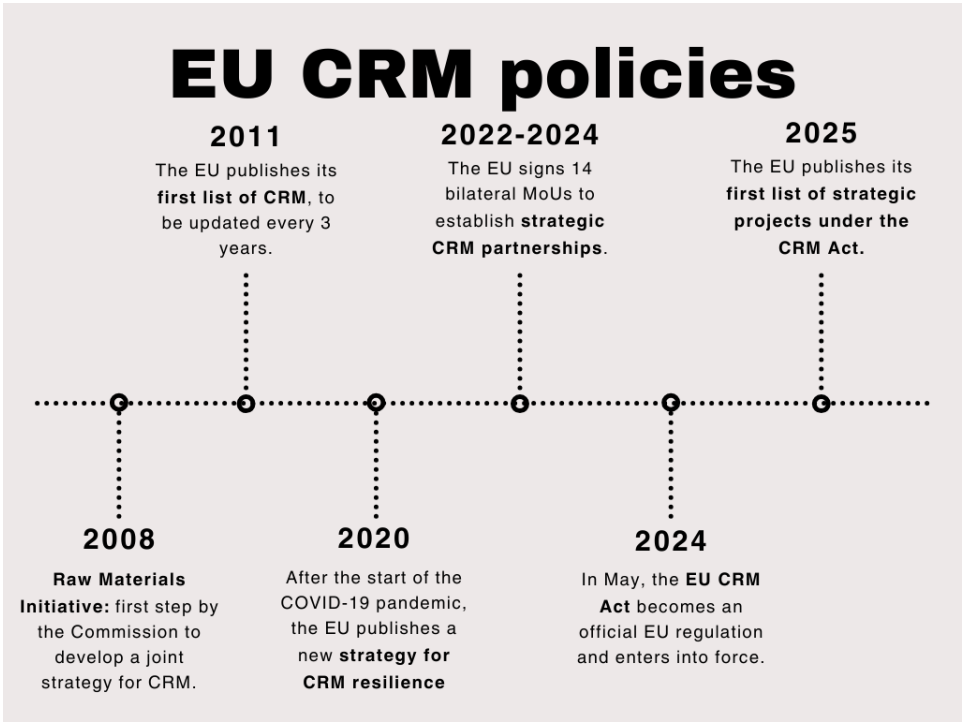


Figure 4: timeline of EU CRM policies. Authors' own visualization.



5.2 Institutions, strategic focus, and policy scope

5.2.1 Institutions involved in the decision-making

Before going into the analysis of their policies, it is useful to first provide a brief overview of the institutions involved in the policy-making process for both actors. For the US, these institutions include the US Presidency, which promotes executive orders, the US Congress, which publishes Acts of law, and several departments and agencies for purposes of implementation (DoD, DoE, DoC, NSC, NSA). For the EU, policies are normally promoted by the Commission, and specifically drafted by DG Grow and DG Trade, or DG INTPA for the partnership agreements. Apart from the Commission, the European Council and Parliament were also part of the legislative process to publish the CRMA.

5.2.2 EU: strategic focus and policy scope across time

The first part of the analysis of the EU and US policies to secure strategic minerals is centered on verifying whether they diverge in terms of strategic focus and policy scope. H_1 posits that the US prioritizes national production and stockpiling (clusters 1, 2, and 3) under national security considerations, while the EU emphasizes partnerships, recycling, and innovation (clusters 4, 5, and 6) to promote market resilience. This section describes how the close reading of the policy documents published by the EU Commission, the US Congress, and various US Presidencies provides supporting evidence for this claim. It first analyzes the EU and US policies chronologically, and then compares them. Subsequently, a "hoop test" and a "smoking-gun test" help verify how the division of competences (H_3) fosters the difference in strategic focus and policy scopes.

This section therefore starts by investigating chronologically the policies implemented by the EU in the last 15 years to secure CRM. Since 2008, the EU has published three main documents describing its strategy to combat dependencies for CRM: the RMI of 2008, the 2020 Action Plan for Critical Raw Materials Resilience, and the 2024 CRMA, the only document within these with binding legal value for the Member States.[67] These documents illustrate the

[67] European Commission, The raw materials initiative — meeting our critical needs for growth and jobs in Europe; European Commission, Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability; European Union, Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11

evolution of the EU strategy in this arena. Their close analysis shows how EU policies followed a pattern of continuity in the past 15 years.

Already in the 2008 RMI, the EU placed its primary focus on securing new international supply chains to promote diversification and increase resilience. The first pillar of the RMI outlines the EU's diplomatic approach to securing CRM by emphasizing two main objectives. First, it aims to promote partnerships with resource-rich countries, primarily in Africa, while reinforcing dialogue with major suppliers like China and Russia. Second, it seeks to participate in multilateral fora to strengthen international efforts to prevent market distortions.[68] This dual engagement, both on a bilateral and multilateral level, shows that the EU has focused since the beginning of its CRM policy on securing international supply chains before intervening to support EU internal production.

The second pillar delves into measures to support European sourcing. However, despite highlighting the issues of permitting and land use that slow down mining projects in the EU, it does not go beyond suggesting a better EU coordination of geological exploration programs to map the presence of resources.[69] This cautious approach likely reflects the EU's emphasis on sustainability and regulatory compliance, as all projects must adhere to strict environmental standards.

Highlighting the focus on sustainability, the third pillar sets out preliminary goals to promote the efficient use of materials and increase the share of secondary recycled materials. Key measures include promoting the full implementation and enforcement of relevant recycling legislation, such as the Waste Framework Directive, to ensure a reliable supply of high-quality secondary raw materials. This pillar also supports research through the 7th Framework Programme (FP7) to advance resource-efficient production, improve recycling technologies, and develop substitutes for CRM. In addition, the Lead Market Initiative on recycling is promoted to create transparent and competitive recycling markets through

April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020.

[68] European Commission, The raw materials initiative — meeting our critical needs for growth and jobs in Europe, 6.

[69] Ibid., 10.

coordinated actions in standard-setting, public procurement, financing, knowledge sharing, and international cooperation.[70]

The next EU communication on the topic of CRM is the 2020 Action Plan for CRM resilience.[71] Despite coming after twelve years, this maintains the strategic focus substantially unchanged. The circular use of resources, now promoted in line with the goals of the Green Deal, remains a major strategic point to address foreign dependencies.[72] Recovery of relevant minerals from waste is incentivized as a sustainable solution against materials shortages. International partnerships with resource-rich countries also remain at the center of discussion, and the document explicitly mentions that approaching states bilaterally is the preferable option.[73] The geographical focus of these efforts is expanded, with mentions to new partners such as Canada, Australia, and Ukraine, but the references to sustainable mining practices and due diligence standards remain in line with those outlined in 2008.[74] The wave of bilateral MoUs that the EU signed with partner countries after 2020 reflects this expansion of the geographical focus for partnerships.

Between 2022 and 2024, the EU signed 13 separate accords with countries in every continent to secure the supply of a wide range of CRM, and also joined the multilateral Minerals Security Partnership (MSP). These memoranda, while frequently mentioning the EU's social and environmental standards, represent a strong signal of the importance in the overall EU strategy of building a network of trusted partners to diversify supply (cluster 4). During the same years, the EU also intensified its efforts to fund R&I (cluster 6) through the Horizon 2020 and then Horizon Europe programs. Within these frameworks, the EU funded between 2020 and 2024 several research projects to find innovative solutions for recycling, processing, substitution, and exploration purposes.[75]

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[70] Ibid., sec. 2.3.

[71] European Commission, Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability.

[72] Ibid., 8.

[73] Ibid., 15,16.

[74] Ibid., 15–16.

[75] CORDIS, "S34I Project"; CORDIS, "SUPREEMO Project"; CORDIS, "BEETHOVEN Project"; CORDIS, "REEPRODUCE."

In 2024 the EU then enacted the CRMA, a binding regulation to secure a sustainable supply of raw materials. As the most comprehensive EU policy document in this area, it provides the clearest insights into the strategic clusters prioritized. Before listing the measures taken to achieve the EU goals, this Act starts by setting three specific targets for the EU CRM industry by 2030: 1) extract at least 10%, 2) process at least 40% and 3) obtain through recycling at least 25 % of the EU's global consumption of CRM.[76] The presence of mining within these targets indicates a slow turn towards including EU production concerns, but this remains limited, as visible in the list of strategic projects chosen in 2025. While approximately half of those include extraction or processing facilities, these focus primarily on a restricted group of minerals (lithium, copper, graphite, cobalt). Recycling projects instead, while fewer in number, generally work with a broader range of materials, or with those materials whose geological reserves are absent in the EU, through waste recovery and re-processing measures.[77] Moreover, the CRMA then includes specific articles to set up mandatory minerals exploration programs across the EU, but it does not set other specific measures to promote mining.[78] The purpose of the list of Strategic Projects is not to finance mining projects, but rather to coordinate permitting and facilitate the work of private companies, de facto substantially leaving legislation on mining activities in the EU unchanged.

Similarly, the CRMA requires member states to disclose and coordinate national strategic stocks for each material. Based on the information provided, the Commission is then assigned the task of setting specific non-binding benchmark targets necessary for the EU's safety.[79] This is the only instance in the entire Act where the EU hints at a security concern, but it nonetheless avoids using the term security in an explicit way.

[76] European Union, Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020, 21.

[77] European Commission, Annex to the Commission Decision recognising certain critical raw material projects as Strategic Projects under Regulation (EU) 2024/1252 of the European Parliament and of the Council.

[78] European Union, Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020, art. 19.

[79] Ibid., arts. 22–23.

These considerations show how, even when mining and processing concerns are present in EU policies, the EU does not go beyond offering a supporting role for those initiatives already initiated by the private sector. On the other hand, when discussing recycling or innovation funding, the EU approaches the topic more directly, by legislating and imposing obligations on its member states. For instance, Articles 26 to 29 of the CRMA expand the EU's efforts to promote waste recovery and recycling practices, instructing member states to promote several practices necessary to reach the overall recycling targets.[80] These measures highlight the EU's focus on recycling efforts (cluster 5). Similarly, Article 37 reiterates the importance of international partnerships for the bloc, signaling a commitment to the diversification of suppliers rather than European production.[81]

Overall, the EU policy approach does not show a shift in focus in the past fifteen years. As highlighted in the analysis of the policy documents mentioned above, recycling and trade diversification remain the two most favored long-term policies chosen by the EU to address its dependencies, with research and innovation funding also gaining traction since the start of Horizon 2020 to promote the study of substitute materials or more efficient uses of CRM. Recently, there have been signs of mining and processing gaining more prominence with the list of Strategic Projects. This list in fact selects relevant mining and processing projects active in Europe that would receive EU support, but the efforts in this field remain limited by the type of support provided, as further explained in Section 5.3.2.[82] In addition, the analysis of EU policies between 2008 and 2024 reflects the EU's commitment to addressing these dependencies as a matter of market resilience. While geopolitical considerations are part of several assessments by EU institutions, CRM dependencies are not framed in a security perspective, in stark contrast to the US approach.

[80] Ibid., arts. 26–29.

[81] Ibid., art. 37.

[82] European Commission, Annex to the Commission Decision recognising certain critical raw material projects as Strategic Projects under Regulation (EU) 2024/1252 of the European Parliament and of the Council.

5.2.3 US: strategic focus and policy scope across time

Moving to the other side of the Atlantic, the policies promoted by the US in the last 15 years have been more scattered across several legislative documents, whether executive orders by the Presidents or Acts by the Congress. Therefore, this section focuses on drawing common themes and trends in these policies, trying to highlight the strategic direction that remained constant throughout the years and the few features that varied depending on either the type of legislation or the political orientation of the administration.

The first US legislative measures on critical minerals appear from 2012 onwards, when the first Chinese REE export control measures hitting Japan showed the world the risks of mineral dependencies. These US measures take the form of executive orders by the President (three between 2012 and 2017), which immediately frame the US' perception of this issue as a security threat to the nation. Specifically, the recurring use of re-authorizations of the DPA, such as in the case of the 2012 order signed by President Obama, is illustrative of the approach taken by the US, focused on encouraging exploration and mining projects conducted under the authority of the Secretary of Defense.

This initial approach was continued by the first Trump administration, with two executive orders promulgated in 2017 to improve supply chain resilience and industrial base capacities of the US critical minerals' industry. These Acts include frequent references to national security concerns, thereby justifying incentives for geological exploration and mapping programs to discover critical minerals' deposits within the country (cluster 1).[83] The implementation of these orders was then carried out by the DoD, which supported financially multiple mining and processing (clusters 1 and 2) operations by US companies.[84] Towards the end of the first Trump term in 2020, the securitization of critical minerals' trade became even more evident when President Trump published an executive order in which he explicitly addressed dependencies from "foreign adversaries", thereby securitizing the importance of promoting national mining and processing.

[83] Trump, Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States, sec. 1; Trump, A Federal Strategy To Ensure Secure and Reliable Supplies of Critical Minerals, sec. 4.

[84] U.S. Department of Defense, "DOD Announces Rare Earth Element Awards to Strengthen Domestic Industrial Base."

Nonetheless, it is with the start of the Biden administration that the US promoted most of its measures to support critical minerals' supply chain resilience, in response to escalating trade tensions with China and the outbreak of the COVID-19 pandemic. Between 2021 and 2022, President Biden announced two separate executive orders addressing supply chain issues and stockpiling, and Congress also legislated on the issue by including specific measures within the 2020 Energy Act and the 2021 Infrastructure and Jobs Act. Building on previous recommendations, the latter specifically provided for the construction of a structure to "demonstrate the commercial feasibility of a full-scale integrated rare earth element extraction and separation facility", highlighting the alignment between Congress and the Administration on promoting national production of certain specific minerals.[85] On the other hand though, these laws also expanded the scope of US strategies to promote research programs on recovery of minerals from coal byproducts and battery waste reprocessing, showcasing how recycling concerns also made their way to US policy-making through Congress concerns.[86]

This trend of Congressional involvement reached its peak in late 2022, when measures regarding nationally sourced critical minerals were included in two of the flagship measures promulgated during the Biden Administration: the IRA and the Chips and Science Act. The first one introduced tax credits for domestic companies refining critical minerals and for consumers buying electric vehicles, provided that the minerals used in the vehicles' production were either sourced nationally, from a partner country, or recycled in the US.[87] To complement this, it also set up substantial funding of $ 500 million to spend within the purpose of the 1950 DPA. These were subsequently directed to the mining and processing of minerals necessary for battery components by a determination by President Biden.[88] The Chips and Science Act instead promoted awards to advance research on minerals exploration, mining, and processing. Lastly, the National Defense Authorization Act for 2024 provided for the Secretary of Defense to be able to sign contracts for the procurement of nationally sourced raw materials to replenish the stockpiles.[89]

[85] U.S. Congress, Infrastructure and Jobs Act, sec. 40205.

[86] U.S. Congress, Energy Act of 2020, sec. 7001; U.S. Congress, Infrastructure and Jobs Act, sec. 40207.

[87] U.S. Congress, Inflation Reduction Act, secs. 13401, 13501.

[88] U.S. Department of Defense, "Defense Production Act Title III Presidential Determination for Critical Materials in Large-Capacity Batteries."

[89] U.S. Congress, National Defense Authorization Act for Fiscal Year 2024, sec. 152.

Overall, the analysis of these policy measures shows how the US maintained a relatively constant focus on mining and processing measures corresponding to clusters 1 and 2, with the addition of stockpiling provisions (cluster 3) executed primarily by the DoD. The changes of administration that happened in 2013, 2017, and 2021 did not bring radical changes in the focus of critical minerals' policy, despite the different political priorities. However, a few differences can be noted between the measures included in executive orders and those in public law Acts adopted by Congress. These Acts, likely because of their broader scope and purpose, have included between 2020 and 2023 mentions of recycling programs and R&I funding (clusters 5 and 6). Nonetheless, the primary focus remained on promoting national mining and processing.

5.2.4 Comparing strategic focus and policy scopes

When comparing the actors' approaches, the documents described above show an evident divergence between the two. The EU has built its strategy around mutually beneficial bilateral partnerships (cluster 4), recycling regulations in line with its environmental standards (cluster 5), and the promotion of R&I to pursue the efficient use of materials and the development of substitutes (cluster 6). Moreover, it has overall framed the issue of dependency as one of market resilience and trade dynamics, avoiding clear ties with security considerations. The US on the other hand, while still showing differences between those Acts promoted under the authority of the President and those by Congress, has adopted a much clearer and stable securitized approach. It has used executive orders and public laws to promote national incentives for mining and processing (clusters 1 and 2). It has also coordinated the establishment of nationwide stockpiles (cluster 3) to prevent the weaponization of minerals. However, it has given relatively little attention to recycling practices. Altogether, the analysis of these policy documents provides sufficient evidence in favor of H_1, therefore establishing the existence of different strategic focuses and policy scopes between the EU and the US.

5.2.5 The influence of institutional factors: division of competences

After determining the existence of a difference in strategic focus and policy scope between the EU and US strategies, it is now time to move the focus to the influence of institutional factors in causing this divergence. H_3 posits that the division of competences between the different levels of government in the EU and the US shapes their strategic focus and policy scope.

In the case of the EU, its capacity to Act in the domain of CRM is based on the division of competences set out in Articles 2 to 6 of the Treaty on the Functioning of the European Union (TFEU).[90] This treaty provides the EU with five exclusive competences, including the right to decide its commercial policy; thirteen shared competences, including the organization of the internal market, environment, energy, and research and innovation; and seven supporting competences, including industrial policy. For measures falling within the exclusive and shared competences, the EU can adopt legally binding Acts, while for those in the supporting category it can only coordinate or complement the action of its Member States, as long as "the objective of a proposed action cannot be sufficiently achieved by the Member States, but could be better achieved at EU level".[91] While this principle aims to ensure that decisions are made as closely as possible to the citizens, its interpretation has been subject to ongoing debate. Scholars and policymakers have discussed the criteria of "sufficiency" and "EU added value", noting that these concepts are open to varying interpretations. Despite these discussions, the application of subsidiarity in practice often results in a cautious approach by the EU, particularly in areas of supporting competence. Consequently, the EU's ability to enact binding measures in such domains remains limited, reinforcing the predominance of Member States and showing the constraints on the Union's capacity to Act independently in these fields.[92] The division of competences described above therefore Acts both as an enabler and as a limitation for the EU, including in the case of CRM policy.

Looking at the US case, the US federal institutions possess a wider range of competences. For instance, the US Constitution determines that interstate commerce, international treaties, and national security and defense are purely federal competences. Environmental regulations and energy, industrial, and taxation policy are instead shared between federal institutions and states, even though the Spending Clause in Article 1 authorizes Congress to collect taxes and spend on the general welfare and common defense. Control over land use and zoning remains the responsibility of individual states, except when the land is

[90] European Union, The Treaty on the Functioning of the European Union, arts. 2–6.

[91] Ibid., arts. 3–6.

[92] van Kersbergen and Verbeek, "Subsidiarity as a Principle of Governance in the European Union."

federally owned.[93] Moreover, the Supremacy Clause included in the Constitution provides that in case of conflicting legislation, federal law takes precedence over conflicting state laws.[94]

This analysis of the division of competences between EU and US institutions suggests that the US federal institutions are empowered to take a broader range of measures in the context of their critical minerals' strategy, whereas the EU Commission is more limited in its scope. This paragraph is structured as a "hoop test" to prove the plausibility of H_3, which claims that the institutional division of competences influences strategic focus and policy scopes. In this context, the "hoop test" checks whether the observed policy measures align with the institutional constraints expected under the EU and US governance structures. The expectation is that actors with limited supranational authority, such as EU institutions, focus their policy responses on areas where they hold formal competences, namely trade policy, innovation funding, external partnerships, and regulatory coordination. Conversely, actors with broad and centralized competences, such as the US federal government, should adopt a wider range of measures, including direct financial interventions, strategic stockpiling, and production mandates. Failing this test, for example by identifying EU institutions proposing measures beyond the scope of its competences, would disprove the hypothesis.

Building on the previous sections (5.2.2 - 5.2.4), the analysis of the policy documents however indicates that EU/US strategies indeed align with their prescribed competences. In the last 15 years, the EU has built a vast web of partnerships with several countries such as Ukraine, Chile, and Kazakhstan. Moreover, its three policy documents published between 2008 and 2024 have focused on coordinating recycling practices among EU countries and promoting the recovery of critical minerals from waste. Only with the recent publication of the list of Strategic Projects under the CRMA the EU referred to mining and processing facilities, but even in this case its role was limited to streamlining permitting procedures and promoting coordination between member states.[95] It has therefore exercised its competences within the internal market domain by harmonizing rules for permitting, investment procedures, and risk management.

[93] Congressional Research Service, "The Constitution of the United States of America. Analysis and Interpretation.," arts. 1–4.

[94] Ibid., art. 6.

[95] European Commission, Annex to the Commission Decision recognising certain critical raw material projects as Strategic Projects under Regulation (EU) 2024/1252 of the European Parliament and of the Council.

Furthermore, EU documents substantially never reference security concerns. This highlights how the EU interprets CRM dependencies as a trade issue weakening its market resilience. As a reflection of this approach, the EU also never discussed the issue of stockpiling until 2024, when the CRMA promoted the coordination of national stockpiles for critical materials. It is hard, however, to consider this as a clear measure to incentivize building strategic stocks, as it sets out that future quotas for specific minerals will be established depending on the results of national assessments that have not yet been conducted, and these quotas would not have a binding character.[96]

Free from strict restrictions on their range of actions, the US has instead pursued a broader set of measures, despite still placing their focus on national mining and processing. Through several executive orders between 2012 and 2022, US administrations repeatedly voiced their security concerns over critical minerals dependencies and opted for measures incentivizing national exploration, mining, and processing for those materials that presented the biggest risk factors.[97] Mining permits and substantial funding were granted by the DoD to mining companies throughout the country, on the basis of the authority granted to the DoD by these executive orders.[98] To complement this, US Presidents also used provisions of the DPA to authorize increases in the strategic stockpiles of certain materials, and the Biden administration in specific exercised presidential authority over the National Defense stockpiles.[99] Between 2020 and 2022, the US Congress instead promoted legislation such as the IRA or the Chips and Science Act, which introduced provisions promoting the use of recycled minerals and establishing research programs to discover substitutes and more efficient uses of critical minerals. The US has therefore adopted a broader range of measures than the EU in the last 15 years, showcasing the ability of its federal institutions to implement different types of policies without incurring in substantial constitutional constraints.

[96] European Union, Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020, art. 46.

[97] Obama, National Defense Resources Preparedness; Trump, A Federal Strategy To Ensure Secure and Reliable Supplies of Critical Minerals; Biden, America's Supply Chains.

[98] U.S. Department of Defense, "DoD Awards $35 Million to MP Materials to Build U.S. Heavy Rare Earth Separation Capacity."

[99] Biden, Designation To Exercise Authority Over the National Defense Stockpile.

Based on these results, the evidence confirms that each actor's policy measures remain coherent with their institutional competences, thereby satisfying the conditions of the "hoop test" and allowing the hypothesis (H_3) to remain viable.

After determining that H_3 is a plausible hypothesis, it is now necessary to perform a "smoking-gun test" to provide enough positive evidence to claim that the division of competences plays a role in determining the strategic focus and the policy scope. In this case, the analysis focuses on the policies implemented by the US to pursue national security through incentives and funding for mining and processing companies. Specifically, it assesses whether these would have been possible to implement for the EU while respecting the boundaries of its competences. In the US, measures with this policy scope include the use of the DPA to fund upstream projects, the allocation of billions in federal subsidies through the IRA and Infrastructure Investment and Jobs Act, and strategic stockpiling initiatives managed by the DoD.[100] These actions were initiated and implemented at the federal level, often through executive authority, without the need for consensus among subnational units.

The competences assigned to the EU do not allow for comparable measures at the supranational level. Pursuant to Article 6 of the TFEU, industry falls under the category of supporting competences, which means that the Union can only take action to support, coordinate, or supplement national industrial policies, and may not harmonize national laws or pursue independent, binding interventions. These supporting actions typically include encouraging technological innovation, facilitating the exchange of best practices, funding R&I projects, and enhancing the competitiveness of EU industries through non-binding recommendations and guidelines. Energy policy falls instead under the shared competences (Article 4), but EU action in this area is subject to limitations explicitly outlined in Article 194(2), particularly with respect to the rights of Member States to determine the conditions for exploiting their energy resources.[101] No provision in the TFEU grants the EU the authority to compel or centrally finance mining, mandate extraction targets, or directly intervene in the operation of domestic raw material production. This institutional limitation is reflected in those Acts, such as the EU's CRMA, that discuss mining efforts. The policy framework focuses on

[100] Obama, National Defense Resources Preparedness; U.S. Congress, Inflation Reduction Act; U.S. Congress, Infrastructure and Jobs Act.

[101] European Union, The Treaty on the Functioning of the European Union, art. 4,6,194.

accelerating permitting procedures and coordinating national efforts through mechanisms such as the European Critical Raw Materials Board. Importantly, these tools operate within existing competences and stop short of centralized investment or direct operational control. The Commission does not propose mandatory production measures or deploy autonomous fiscal tools of the kind used in the US.

The inability of the EU to enact US-style security-driven, centrally funded policies for mining and processing is not simply a political preference but a result of treaty-based constraints. The absence of binding, interventionist measures in the EU strategy, despite a recognized urgency to reduce dependencies, constitutes a positive result under the "smoking-gun test". It demonstrates that the institutional division of competences under the TFEU imposes structural limits that shape the EU's strategic approach to CRM. Unlike the US, which can leverage national security competences to directly link industrial production to defense needs, the EU does not possess an exclusive or shared competence for defense or security matters. Its involvement is limited to actions under the Common Foreign and Security Policy (CFSP), which is however primarily focused on diplomatic and military cooperation, and constitutes an intergovernmental sector where policies are defined and implemented by the European Council.[102] This eliminates the possibility for the EU to adopt a security-centered strategic focus in its CRM policy. Moreover, the EU also cannot pursue direct financial interventions in industrial policy, as this falls under its supporting competences. This means the Union can only coordinate, support, or supplement national efforts, without the authority to centrally fund large-scale industrial projects or mandate production targets, as the US can under the 1950 DPA.

5.3 Diverging instruments

Having concluded that the two actors considered differ in their policy scope and strategic focus, this section now focuses on analyzing what instruments have been used by the EU and the US. With the word instruments, this thesis refers to tools and mechanisms used to implement policy goals, including regulatory measures, direct investments, and the use of partnerships. The first four subsections (5.3.1 to 5.3.4) describe the instruments used by both actors, analyze the issue of partnerships, and then compare the two cases. The last subsection

[102] Publications Office of the EU, "Division of Competences within the European Union."

(5.3.5) performs two process tracing tests to assess the influence of path dependency on EU and US policymaking in this field.

5.3.1 US: policy instruments across time

The analysis starts by studying the policies implemented by US institutions between 2008 and 2024. Already in the first executive order on the topic promoted in 2012 by President Obama, it is possible to see the core incentive used by US administrations to pursue their goals. Amid various security concerns and calls for an increase in national production, this executive order already provided for the utilization of ad hoc financial instruments, such as loans or loan guarantees, under the authority of departmental heads involved with national security matters to "reduce current or projected shortfalls of resources".[103] This provision was then resumed in 2020, when the Trump administration instructed the Secretaries of Interior and Defense to verify whether the 2012 order allowed for grants to "install production equipment for the production and processing of critical minerals in the United States".[104] These direct funding provisions were repeatedly included by the US administration in all those Acts that either referenced the DPA or in other ways referred to the authority of the DoD for the provision of critical minerals. In addition to promoting national production, these types of measures also culminated in the 2024 National Defense Authorization Act, which authorized the Secretary of Defense to sign national procurement contracts for critical minerals whose stockpiles needed to be replenished.[105] Funding measures were however not limited to defense-related provisions. At the end of 2020, the Trump administration also instructed the Secretary of Energy to verify whether projects supporting domestic supply chains could also benefit from loans, loan guarantees, and awards promoted under the Energy Act of 2005 or the Energy Independence and Security Act of 2007.[106] Under the authority granted by these Acts, the DoD and DoE have funded several projects in the last decade, with, for example, up to $439 million spent on reestablishing domestic rare earth supply chains.[107]

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[103] Obama, National Defense Resources Preparedness, secs. 301, 302, 801f.

[104] Trump, Addressing the Threat to the Domestic Supply Chain From Reliance on Critical Minerals From Foreign Adversaries and Supporting the Domestic Mining and Processing Industries, sec. 3.

[105] U.S. Congress, National Defense Authorization Act for Fiscal Year 2024, sec. 152.

[106] Trump, Addressing the Threat to the Domestic Supply Chain From Reliance on Critical Minerals From Foreign Adversaries and Supporting the Domestic Mining and Processing Industries, sec. 4.

[107] U.S. Government Accountability Office, "Critical Materials."

However, funding streams did not exclusively come from executive measures enacted by presidents. Similar instruments were set up by Congress as well, for instance, through loan guarantees established by provisions in the 2021 Infrastructure and Jobs Act.[108] Using funds appropriated under the IRA, the DoD was also able since 2023 to invest $250 million to expand domestic production of critical materials.[109] Lastly, the IRA also established more indirect ways to financially support the safe procurement of critical minerals by introducing tax incentives and credits to incentivize buying electric vehicles built with minerals partially sourced nationally or from trusted commercial partners.[110]

Altogether, these measures clearly show the US focus on setting up financial incentives to scale up national production, whether through direct funding streams for national industries or through indirect tax credits to incentivize consumption awareness. Nonetheless, other types of instruments were also used. Two executive orders, the 2020 Energy Act and the 2021 Infrastructure and Jobs Act included provisions to facilitate and coordinate the process of permit authorization for mining and processing companies.[111] These Acts also established R&I programs to promote innovation in the field, both in terms of efficient usage of minerals and developing substitute materials.[112] Overall though, the US focus has remained centered across time on financially supporting national sourcing of minerals, showcasing a vision on the type of instruments necessary to achieve policy goals.

5.3.2 EU: policy instruments across time

On the EU side, the evaluation of the policy instruments used in the last decade and a half represents a more complicated exercise. The first thing to look at is what types of measures were introduced by the few official Acts published between 2008 and 2024. For this purpose, the 2008 RMI does not provide substantial data, as it is a communication with no binding legal

[108] U.S. Congress, Infrastructure and Jobs Act, sec. 40401.

[109] Acquisition and Sustainment: Office under the Secretary of Defense, "IRA Funding."

[110] U.S. Congress, Inflation Reduction Act, sec. 13502.

[111] Trump, Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States, sec. 4; U.S. Congress, Energy Act of 2020, sec. 7002; U.S. Congress, Infrastructure and Jobs Act, sec. 40206.

[112] U.S. Congress, Energy Act of 2020, sec. 7002g; U.S. Congress, Infrastructure and Jobs Act, secs. 40205–40207.

value describing overall actions to pursue in the years to come. Within those actions, the document includes calls for discussions in the WTO forum, better networking between national geological surveys, and the establishment of research projects to promote recycling and substitutability.[113]

The 2020 Action Plan, despite still being included in a non-binding communication, already presents better indications of the instruments used, as it includes a list of ten actions to increase the EU's resilience. The first instrument promoted is the institution of a EU Raw Material Alliance, connecting industry representatives, the EU Commission, investors, the European Investment Bank, Member States, regions, and other relevant stakeholders in an effort to secure access to sustainable raw materials.[114] This organization is a perfect example of the EU approach: create platforms where all sectors of society can communicate their interest and needs and see how EU institutions can support them. In addition, the document also incentivized the promotion of CRM-related research programs under the Horizon Europe framework and national R&I programmes.[115] Next to this, the 2020 communication contained other actions to deploy exploration programs, identify relevant mining sites, and develop expertise in this sector, although neither of those involved operationalizable practices.

The CRMA, being the only legally binding Act adopted by the EU in this field, provides more information on the type of instruments utilized by the EU. It introduces in fact several regulatory measures meant to both harmonize legislation on CRM production within the Union and to impose specific obligations on the member states. For instance, Articles 19 and 20 mandate member states to set up a "national programme for general exploration targeted at CRM" within one year of the Act's entry into force.[116] Article 22 creates an obligation to report the state of national stocks of each raw material and their fluctuation over the years, so that the EU could then set non-binding benchmarks for advisory purposes. Article 24 imposes on large

[113] European Commission, The raw materials initiative — meeting our critical needs for growth and jobs in Europe, sec. 2.

[114] European Commission, Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability, sec. 3.1.

[115] Ibid., sec. 3.2.

[116] European Union, Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020, art. 19.

companies operating in the EU (as identified by member states) the duty to carry out a "risk assessment of their raw materials supply chain" every three years starting in 2025.[117] On the basis of these assessments, Article 25 then authorizes the EU to set up a system to match companies with demand for CRM to potential suppliers, in order to facilitate trade with trusted partners.[118] Moving towards recycling objectives, Articles 26 to 29 create obligations for member states in the realm of waste recovery and re-processing, in the attempt to promote circularity in line with provisions of the Green Deal.[119] The measures described above fall within the category of regulatory measures, defined as binding rules, procedures, and administrative requirements established to guide, enable, or constrain private and public sector actions related to CRM. Lastly, the CRMA also intervenes to streamline permitting procedures by asking member states to designate single points of contact "responsible for facilitating and coordinating the permit-granting process for critical raw material projects".[120]

The measures listed in this paragraph show how the EU has pursued its goals mostly through regulatory measures, streamlining of permitting procedures, and promoting coordination between institutions and the private sector. However, it remains necessary to discuss the issue of funding. Compared to the US, funding streams for mining and processing projects in the EU are far less direct and do not immediately correspond to legal Acts. None of the documents described above set up specific funding programs for such facilities. The EU RMI mentions European Investment Bank (EIB) funding for mining projects abroad, the 2020 Action Plan refers to its new lending policy open to CRM projects, and the CRMA opens to the possibility of financing Strategic Projects through the EIB or the European Bank for Reconstruction and Development (EBRD).[121] However, none of those policy documents

[117] Ibid., art. 24.

[118] Ibid., art. 25.

[119] Ibid., arts. 26–29.

[120] Ibid., art. 9.

[121] European Investment Bank, "EIB Financing for Mining Projects"; European Commission, The raw materials initiative — meeting our critical needs for growth and jobs in Europe, sec. 2.1; European Commission, Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability, sec. 3.1; European Union, Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020, art. 16.

clearly refers to direct EU funding of such initiatives. This explains why it cannot be said that the EU CRM policy focuses on direct funding streams for industrial projects.

Nonetheless, this does not mean that the EU has not acted at all to guarantee that projects for the supply of CRM receive the necessary financial support. For instance, since 2019, the EU has repeatedly allowed exemptions to its State Aid rules, in order to authorize member states to financially support projects in the raw materials value chains. The first use of this method dates back to 2019, when the EU Commission approved €3.2 billion investments by seven member states in the battery value chain under the label of the Important Project of Common European Interest (IPCEI).[122] This strategy was then used three more times in 2023, when the Commission overall approved approximately €6.5 billion in spending by three member states under the State Aid Temporary Crisis and Transition Framework, implemented to support measures to accelerate the green transition.[123]

While not specifically targeted at the mining or processing sectors, these measures still made funds available to companies involved in producing green energy equipment or the associated CRM. These efforts show how the EU has not remained inactive for what concerns funding efforts for mining and processing projects. Nonetheless, their nature is not one of direct funding by EU institutions, but rather one of regulatory character that permits exceptions to long-standing EU regulations for member states to mobilize their own funding. Therefore, this analysis concludes that it would still not be appropriate to say that EU policies favor ad hoc financial interventions, but instead they focus on regulatory measures and fostering cooperation between institutions and industrial sectors.

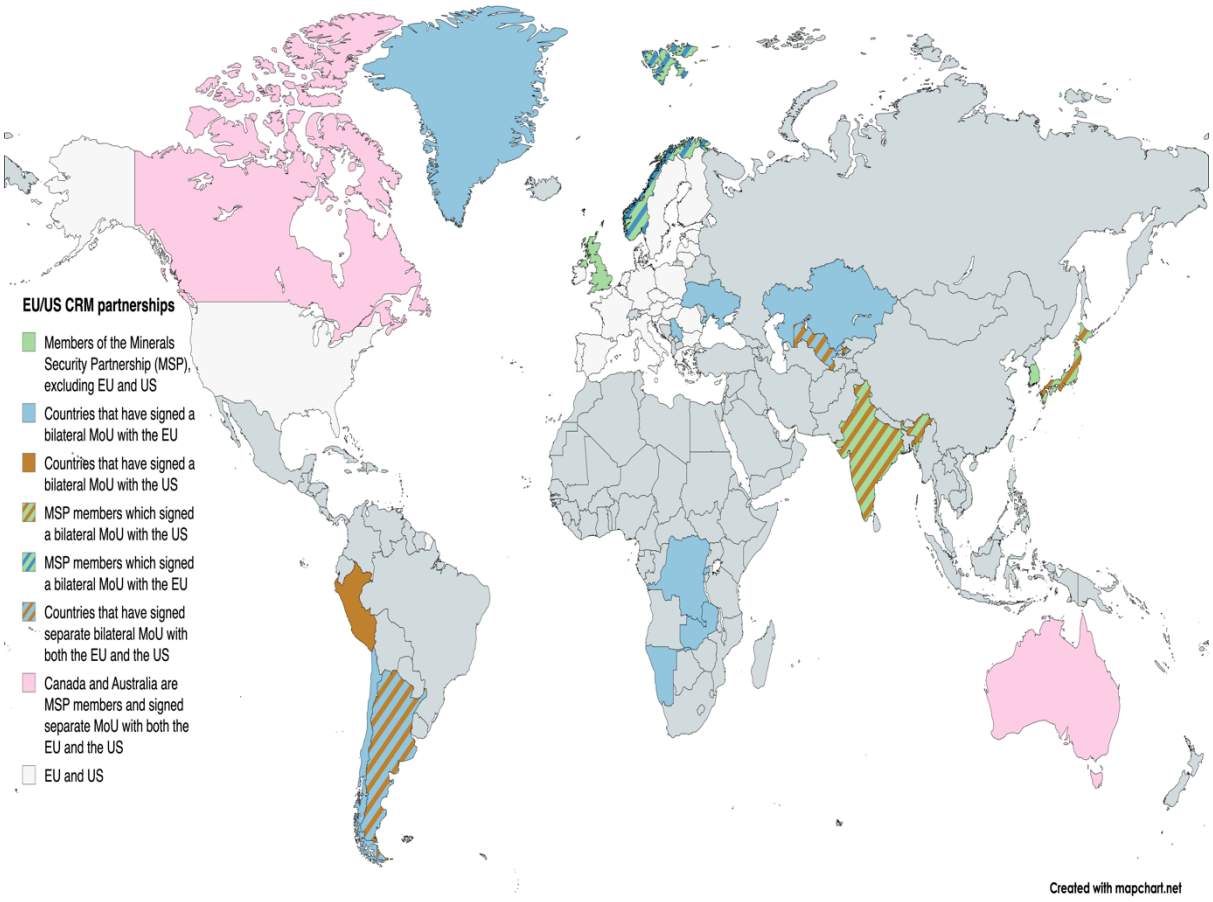
[122] European Commission, "State aid: €3.2 billion public support battery value chain."

[123] European Commission, "Commission approves €1.1 billion Spanish State aid scheme"; European Commission, "State aid: Commission approves €3 billion German scheme"; European Commission, "Commission approves €2.36 billion Hungarian scheme."

5.3.3 EU-US partnership networks

There is one instrument that has not been analyzed by the paragraphs above, which is the use of partnerships to promote trade diversification. The global map of partnerships below (Figure 5) illustrates the differing international outreach strategies adopted by the EU and the US to secure strategic minerals. The EU has pursued a broader diplomatic approach, establishing bilateral Memoranda of Understanding (MoU) with ten countries outside the MSP and with the government of Greenland. This reflects an intent to diversify supply sources beyond the existing multilateral alliance frameworks. Conversely, the US has predominantly focused on strengthening ties within MSP members and only began extending partnerships to non-MSP members in 2024, the final year of the analyzed period, by striking deals with Argentina, Uzbekistan, and Peru, whose documents are however not public. This contrast highlights the EU's broader diversification versus the US's MSP focus and recent bilateral expansion.

Figure 5: global map of CRM partnership networks. Authors' own visualization.



5.3.4 Comparing policy instruments

Building on the paragraphs above, the analysis of the instruments employed by the EU and the US to address strategic minerals dependencies reveals a divergence in methodological approach. The EU has predominantly relied on regulatory coordination, market-based coordination, and the negotiation of bilateral partnerships. In contrast, the US has consistently favored ad hoc financial interventions, including direct funding mechanisms, tax incentives, and strategic procurement initiatives, often enacted through executive authority. These findings provide sufficient evidence to support H_2, confirming that the EU and US differ significantly in the types of instruments used to promote resilience in their raw materials policies.

5.3.5 The influence of institutional factors: path dependency

Having discussed the existence of a difference in the instruments used by the two actors, this section moves to the analysis of the institutional causes of such divergence. To examine whether the policy instruments employed by the EU and US in the domain of strategic minerals reflect broader patterns of path dependency, this paragraph first introduces a "straw-in-the-wind test". It does so by applying the same analytical lens to two other strategic crises: the semiconductor shortages (2020–2022) and the COVID-19 pandemic supply disruptions. This test does not aim to create a decisive causal claim, but rather to verify whether similar instrument patterns appear in previous contexts. If this were indeed the result of the test, it would provide indications in support of H_4. The choice of these two crises is based on their recency, systemic nature, impact on supply chains, and the clear policy responses they triggered on both sides of the Atlantic.

In the case of semiconductors, the US response centered on direct market interventions, showing similarities with the approach for critical minerals. The Chips and Science Act of 2022*,* which also contained measures incentivizing research on critical minerals, allocated over $50 billion in funding between 2022 and 2026, primarily through subsidies and tax credits, for domestic manufacturing and R&I for semiconductor technologies.[124] This direct funding was justified under national security considerations, and based on previous assessments of the supply risks mandated under presidential authority and carried out by the DoE.[125] The same

[124] U.S. Congress, Chips and Science Act, sec. 102a.

[125] Biden, America's Supply Chains, sec. 3b.

funding streams seen in the critical minerals case were therefore also used to tackle semiconductor shortages, with grants under the Chips and Science Act directly awarded to companies investing in national production.[126]

In contrast, the EU's policies for the same scope emphasized regulatory coordination, facilitating investment environments, and structuring long-term public-private partnerships. The EU's Chips Act, while including limited references to state aid provisions, remained primarily regulatory and facilitative, reflecting the market-oriented resilience tools employed in the CRM domain. For instance, it set up an R&I initiative to promote research in the field, it created a European chips infrastructure consortium and a European network of competence centers in semiconductors, and it established specific permitting procedures for industrial centers operating in this field.[127]

The case of the pandemic response presents a less straightforward difference between the two approaches. The US executive branch rapidly invoked the DPA to mandate industrial conversion, streamline procurement by signing federal contracts, and centralize the distribution of medical supplies.[128] Substantial funding flows were also directed through the 2020 CARES Act and Operation Warp Speed, including $10B in federal contracts to develop vaccines.[129] The EU response was instead multifaceted. While the EU did allocate funding to support joint vaccine procurement during COVID-19, this was only possible by invoking the Emergency Support Instrument (ESI) and thereby relying on extraordinary procedures motivated by disasters.[130] Moreover, this derogation was not framed as centralized executive action, but as a coordination framework: Member States opted in voluntarily, and procurement contracts were negotiated jointly but implemented nationally.[131] If one looks beyond these emergency procedures, the EU institutional set-up only allowed for the establishment of new coordinating

[126] Reuters, "Intel Awarded up to $3 Bln from US for National Security Related Chip Production."

[127] European Union, Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694 (Chips Act), art. 7,11,15.

[128] Trump, Prioritizing and Allocating Health and Medical Resources to Respond to the Spread of COVID–19, sec. 1,2.

[129] U.S. Government Accountability Office, "COVID-19: Federal Efforts Accelerate Vaccine Development."

[130] European Court of Auditors, "Special Report 19/2022: EU COVID-19 Vaccine Procurement."

[131] Ibidem.

bodies like the Health Emergency Preparedness and Response Authority (HERA), designed to "improve preparedness and response to serious cross-border threats".[132]

The assumption behind this "straw-in-the-wind test" was to see whether the study of policy measures in response to the semiconductor and COVID-19 crises showed the replication of the same instrument logics across time. The results require a detailed interpretation to determine whether the test is successful or not. While semiconductor-related measures suggest that the divergence between EU and US policy responses is not crisis-specific, the COVID-19 policies implemented by the EU go beyond what has been used for the CRM case and employ substantial funding measures more aligned with the US approach. Nonetheless, this expansion of the EU's action was only possible by resorting to emergency procedures that expanded the Commission's powers to tackle a global challenge. This was not a modification of the EU institutional set-up, as the ESI was a framework designed within the EU rules. Nonetheless, this signals that the COVID-19 pandemic prompted the EU to activate processes that could not be used in the case of CRM. Therefore, these two cases end up not being truly comparable. Because of this, the analysis still provides sufficient evidence to consider the test passed, especially considering that its purpose was just to affirm the relevance of H_4. While still not conclusive, this "straw-in-the-wind test" offers support for the argument that historical institutional structures shape the recurring use of distinct instruments in the EU and US contexts.

To argue with more certainty that path dependency plays a role in shaping EU/US strategies, it is necessary to look at patterns further in the past. This paragraph applies a "smoking-gun test" to trace continuity from past industrial and resource governance frameworks to present-day policies. The goal is to determine whether the reliance on direct interventions in the US and regulatory coordination in the EU can be attributed to path-dependent logics embedded in each actor's historical development. The analysis draws on Cold War era industrial mobilization strategies in the US and the EU's market integration model to identify long-term policy trajectories.

In the US, the foundational role of the DPA at the beginning of the Cold War illustrates how executive authority over strategic minerals and every stage of their production became

[132] European Commission, Establishing the Health Emergency Preparedness and Response Authority.

institutionalized as a core function of industrial policy. Originally enacted in the context of the Korean War, the DPA gave the executive authority to the President to prioritize contracts, allocate resources, and provide direct financial support to private industry to ensure the timely production of goods essential for national defense.[133] This authority was frequently invoked for the procurement and processing of critical minerals such as beryllium, titanium, and tungsten, vital for aerospace and weapons development.[134] Some of these minerals are now included in the most recent US list of critical minerals, reflecting how current policies align with Cold War considerations. The DPA worked in parallel with the NDS, created under the Strategic and Critical Materials Stock Piling Act of 1939 and expanded during the Cold War to build up mineral reserves and prevent national security risks caused by geopolitical disruptions.[135] These tools were coordinated by the DoD, showcasing how the US' minerals strategy has been, since its beginning, centered around national security considerations. In addition to the strategic focus being the same as it is now, the policy scopes promoted by these legislative Acts were also similar: expansion of domestic mining, investments in stockpiling, and secondarily diversification of foreign supply. These policies represented a model of federal control, executive planning, and state-funded resource security that continues to structure contemporary US approaches.

By setting up this type of framework for the fight against foreign dependencies for minerals, these Acts created a trajectory that was then followed for several decades until today. The clearest proof of this is the fact that, among the policy documents published by the US since 2008, two executive orders, the 2022 IRA and the 2024 National Defense Authorization Act explicitly refer to the powers granted by the DPA in their text.[136] The 2024 National Defense Authorization Act includes mentions of the Critical Materials Stock Piling Act as well, highlighting how measures with a defense-oriented focus are still being approved within the Cold War framework. The persistence of this interventionist tradition and the alignment of

[133] U.S. Congress, The Defense Production Act, tit. 1.

[134] National Research Council, "Historical Context," 37.

[135] U.S. Congress, Strategic and Critical Materials Stock Piling Act, sec. 2.

[136] Obama, National Defense Resources Preparedness, sec. 1; Biden, Ensuring Robust Consideration of Evolving National Security Risks by the Committee on Foreign Investment in the United States, sec. 1; U.S. Congress, Inflation Reduction Act, sec. 30001; U.S. Congress, National Defense Authorization Act for Fiscal Year 2024, sec. 1080.

strategic focus and policy scope between legislation promoted during the 1950s and the 2010s show a clear pattern of path dependency shaping the US critical minerals' policy.

The case for the EU presents again more complexity, as the timeframe under which EU institutions can be compared to those that exist today is shorter, and there are not many examples of previous undertakings of the EU in resource policy. Despite this, indications of path dependency are present in this case as well. The EU's approach to strategic resource governance has evolved differently compared with the US, based on a clear trajectory of market coordination. Since its foundation, the Union's primary objective has been the creation of a liberalized internal market, governed by legal harmonization. This approach, formalized through the Single European Act and confirmed in successive treaties such as the TFEU, was reinforced by decades of policymaking that prioritized regulatory over fiscal instruments. One early example of how this approach was applied to resource policy is the evolution of the internal energy market from the 1990s onwards. This process liberalized gas and electricity markets through successive competition law reforms, access regulation, and standard-setting, with the primary aim of creating a competitive internal market.[137]

Remaining within the field of energy policy, this pattern has persisted over time. Even during geopolitical shocks, such as the 2022 gas crisis triggered by Russia's invasion of Ukraine, the EU's response approximately followed the trajectory of its established model. The REPowerEU Plan, launched in May 2022, mobilized regulatory initiatives, strategic partnerships, and infrastructure coordination to reduce dependence on Russian gas.[138] While it incorporated substantial funding elements, these were primarily drawn from existing budgetary instruments such as the Recovery and Resilience Facility, and were framed as supportive mechanisms for member states. This was supported by other measures such as mandatory storage targets, coordinated demand reduction, and the creation of a voluntary joint purchasing platform (AggregateEU).[139]

[137] European Union, Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity.

[138] European Commission, "REPowerEU."

[139] Council of the EU, Council Regulation (EU) 2022/1369 of 5 August 2022 on coordinated demand-reduction measures for gas; European Commission, "AggregateEU – One Year On."

As shown in sub-section 5.3.2, the instruments adopted in the CRM domain, such as permitting acceleration, strategic partnerships, and facilitative regulatory frameworks, reflect this same institutional reliance on coordination and market-based governance. The EU CRM policies follow the same rationale that the EU has used for resource management since the signing of the TFEU. It is therefore possible to argue that a pattern of path dependency formed by the legacy of market integration and regulatory oversight has influenced the policy choices of the EU in this field. Although the EU case presents greater complexity than the US, it remains accurate to argue that institutional path dependency has shaped its response to CRM vulnerabilities. The tools deployed remain fundamentally aligned with past practice: facilitating investment, guiding national action, and adapting existing legal frameworks to meet new strategic demands.

The paragraphs above therefore conclude that the "smoking-gun test", designed to demonstrate the influence of path dependency, is also successful. The EU's reliance on regulatory coordination, market-based solutions, and alliance-building aligns with its long-standing approach to economic integration and sustainability. In contrast, the US has consistently prioritized direct financial interventions, national production mandates, and strategic stockpiling. This reflects its historical focus on national security and rapid industrial mobilization, as seen in the repeated use of the DPA and funding measures. The analysis of the policy documents by the two actors therefore suggests that path dependency has played a role in shaping the choice of policy instruments in the EU and the US. Through this influence, the historical patterns described above have contributed to forming the divergence that has differentiated EU and US policies for critical minerals in the past fifteen years.

5.4 Key findings and reflections on public policy

In the introduction, this thesis set out the guiding research question of how and why the strategies adopted by the EU and the US to secure strategic minerals differ. In the previous sections, this question has been answered by tracing the development of these policy strategies and by looking at what institutional factors have played a role and when. Section 5.2 examined the policy scopes and strategic focuses pursued by the two actors and demonstrated how the US has centered its securitized strategy around national mining, processing, and stockpiling, while the EU has pursued market resilience through the use of recycling practices, R&I, and trade diversification. This section also showed how EU policies have been limited to these

scopes by the institutional division of competences that the founding treaties have established for the organization. In contrast, the US federal institutions have a broader range of competences, enabling them to include measures reflecting all possible policy scopes within their strategies.

Section 5.3 then explored the differences in the policy instruments used by the EU and the US. It described how the US has consistently employed direct market interventions through funding streams available for industries or tax incentives for nationally sourced minerals. The EU, on the other hand, relies primarily on regulatory measures to favor coordination between Member States and industrial sectors, supporting direct funding only for R&I programs. Lastly, these two actors also differ in the way they build their strategic minerals diplomacy, with the US opting for alliance-building with a few trusted partners and the EU embracing both multilateral and bilateral partnerships as a way to expand its trade network. These differences in the choices of policy instruments reflect long-standing patterns of path dependency, which trace back to US policies developed during the Cold War and the progressive integration of the EU market.

Together, these findings clearly address the research question. In terms of approach, the EU and the US differ in their focus, scope and instruments, with the EU favoring a market-oriented strategy focused on trade and sustainability, and the US adopting an executive-led securitized approach aimed at promoting domestic production. As for the underlying reasons, this thesis has demonstrated that institutional factors have significantly influenced the development of their respective strategies. The EU, constrained by a limitation of competences and following patterns of path dependency, has remained steady in promoting trade partnerships and measures to promote efficiency in the internal market. The US government, instead, free from limitations and following policy trajectories born during the Cold War, has constructed an approach promoting national security and guided by defense considerations.

Reflecting on these results, this thesis offers one main lesson for the study of public policy in the EU and the US, by reaffirming the importance of historical institutional factors such as the division of competences and path dependency in shaping strategic choices. While public policy is influenced by multiple factors, this analysis has shown how historical patterns represent both preferred trajectories to follow for policymakers and constraints to their range of actions.

For example, the US, drawing on Cold War precedents, continues to use defense-oriented mechanisms to address modern geopolitical challenges, framing China as a strategic adversary in ways that reinforce the defense-centered approach to resilience. This centralized method provides clear advantages in terms of mobilizing resources to build resilience in supply chains, understood as the capacity to absorb shocks and adapt to disruptions. However, it also risks intensifying geopolitical tensions and economic rivalry in the global minerals market.

In contrast, the EU deals with an ever-growing number of transnational issues, but remains at times constrained by the narrow definition of its competences. This has consequences for its emerging strategy for CRM, which is meant to tackle a global challenge of security of supply but requires the implementation of relevant measures from the Member States to be more effective. The EU measures promote mostly friend-shoring, efficient usage of materials and recycling, but action is also necessary at a national level to compensate for the lack of competences of the EU in industrial policy. This division of competences therefore limits the EU's capacity to Act to improve the overall resilience of EU supply chains.

While the previous sections of this Chapter provide valuable insights into the institutional factors shaping the divergent strategic minerals policies of the EU and US, it is still useful to acknowledge certain limitations. This thesis relies on publicly available legislative documents and secondary sources to understand the mechanisms that have influenced the policy-making processes of the two actors and their final results. These documents, while comprehensive, cannot capture behind-the-scenes negotiations and internal processes that can shape policy outcomes. These mechanisms are not visible in published documents, and the absence of direct interviews with policymakers limits the capacity to capture the motivations of the people working on these strategies. Nonetheless, the institutionalist approach employed in this thesis ensures that the focus remains on these organizations as a whole, thereby making the policy documents the most relevant sources and reducing the impact of this issue.

Moreover, as discussed in the introduction, this thesis primarily focuses on broad policy frameworks instead of the dynamics of specific minerals. This excludes from the scope of the analysis considerations related to the different structural conditions of each dependency. However, this was a conscious choice made to preserve the same approach used by

policymakers in this analysis of their strategies, and it also allows to maintain consistency across cases given the rapidly shifting landscape of CRM markets.

6. Conclusion

Critical minerals, or CRM, depending on whose definition one chooses to adopt, are already arguably among the most valuable non-renewable resources in today's global economy. Defined through context-specific lists that emphasize both strategic relevance and supply risk, these materials are essential to sectors as varied as defense, artificial intelligence, renewable energy, and telecommunications. Yet, their extraction and processing remain highly concentrated in a few countries, most notably China. In the last fifteen years, the consolidation of the dominance of Chinese companies in the markets for these materials and growing awareness of the importance of these resources have prompted powers such as the EU and US to draft strategies to secure their supply.

This thesis set out to answer the question of how and why the strategies adopted by the EU and the US to secure critical raw materials differ. To address this question, it examined both the content of EU and US policies to secure strategic minerals and the institutional factors that have shaped these choices. The result of the analysis shows how the US' strategy is centered on national production, stockpiling, and industrial funding instruments, while the EU emphasizes trade diversification, regulatory coordination, and innovation-based resilience.

While a lot has been written on dependencies and transatlantic policies, most analyses focused on strategic considerations, geological factors, and other types of explanations that would fit a realist analysis. This thesis has instead approached policy divergence through the lens of historical institutionalism, looking at factors such as path dependency and the division of competences. These represent variables that have always influenced policymaking within institutions, by building the policy space in which they can move and Act. With this approach, this thesis complements the existing research on this topic by expanding its temporal focus. It also contributes to the comparative politics and public policy literature by offering an analysis of how long-standing institutional frameworks continue to shape strategic responses to contemporary geopolitical challenges. In particular, the study of patterns of path dependency

shows how US policies to secure the supply of strategic minerals developed in a context of geopolitical confrontation with the USSR are still used as a model for current policies that deal with dependencies on China. In the EU case, instead, trends of market integration through regulatory measures and coordination follow the example of policies implemented in previous European institutions. By describing these patterns, this thesis has therefore also discovered that transatlantic allies do not always align their policies if different interests are at stake.

While this thesis provides insights into institutional explanations behind policy divergence, it remains clear that these do not constitute the only factor shaping these strategies. It would be in fact interesting to complement this study by looking one by one at all the possible factors behind those policies, such as the geological resources present in those areas, the industrial capacity of the EU/US, their diplomatic stance vis-à-vis China, and the influence of political ideologies. Further research could also expand the geographical focus of this analysis by looking at other countries such as Japan and India. Lastly, since the current speed of innovation makes the field of strategic minerals a constantly developing one, the study of policy responses would require frequent updates to account for new initiatives. Recent political developments, such as the signing of the US-Ukraine REE supply deal, show how intertwined this topic is with global security affairs, deserving academic attention.

In sum, this thesis has shown that while dependencies on strategic minerals present similar strategic dilemmas to both the EU and the US, the responses diverge due to deep-rooted institutional logics. These divergent approaches highlight the importance of institutional factors in shaping strategic responses to global challenges, providing a valuable lens for understanding broader public policy dynamics. The market dominance of Chinese companies continues to pose a strategic risk for both the EU and the US, making strategies for resilient supply chains essential. In this context, institutional factors will remain central in shaping the approaches adopted by each actor, with implications that are not only valid for scholars of international political economy and institutional theory but also for policymakers seeking to enhance resilience in an era of strategic interdependence.

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Appendix 1: List of documents used for the analysis

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