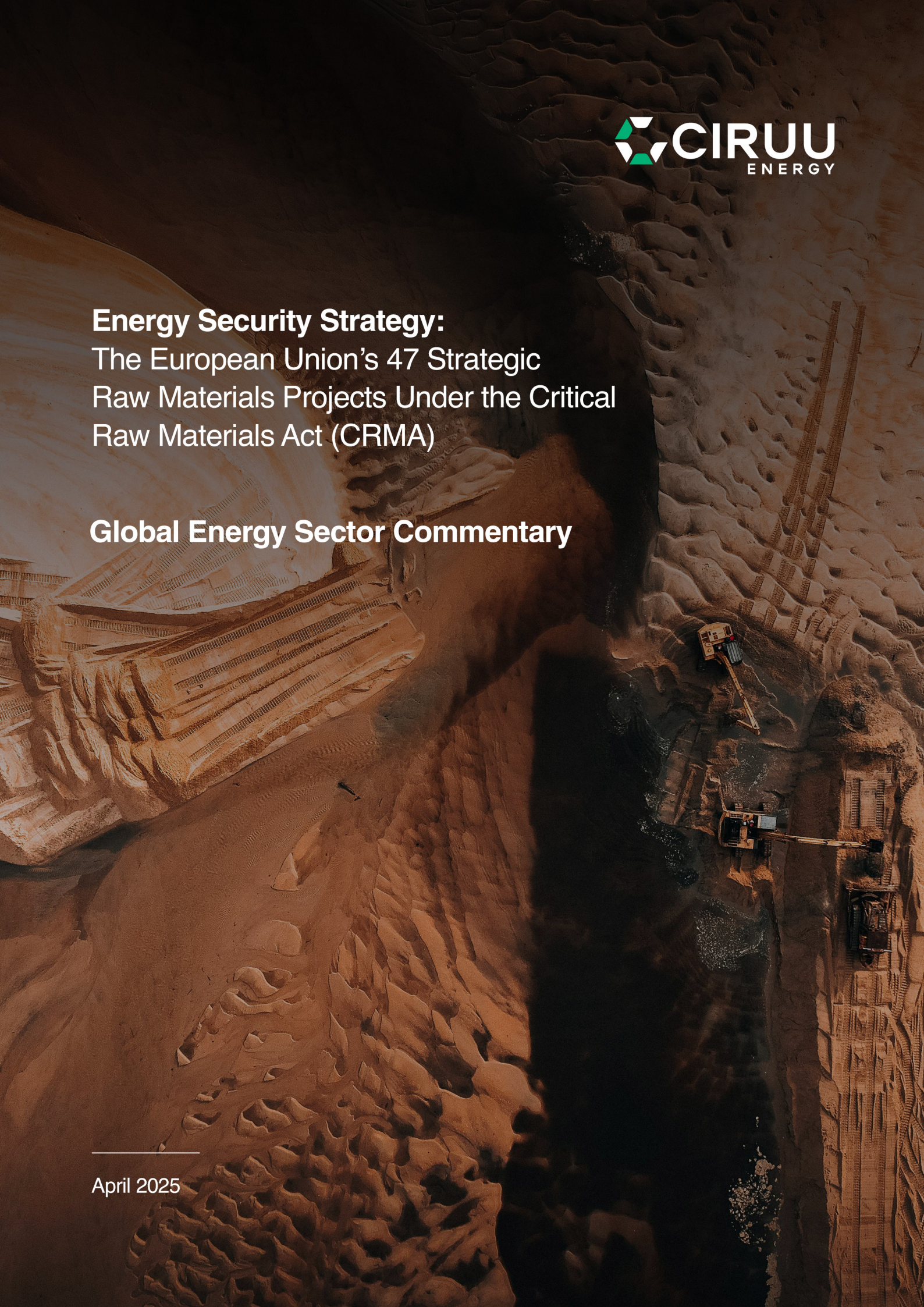


Energy Security Strategy:
The European Union's 47 Strategic Raw Materials Projects Under the Critical Raw Materials Act (CRMA)

Global Energy Sector Commentary

April 2025

Abstract

This CIRUU Energy commentary critically assesses the European Union's Critical Raw Materials Act (CRMA) and its 47 strategic projects aimed at enhancing energy security and reducing dependency on external suppliers. With a focus on key materials like lithium and cobalt, the initiative supports the EU's green transition but faces significant challenges in geopolitics, environmental sustainability, and industrial competitiveness. The commentary outlines these risks and offers strategic recommendations to strengthen the EU's raw materials resilience and long-term economic viability.

Commentary Overview

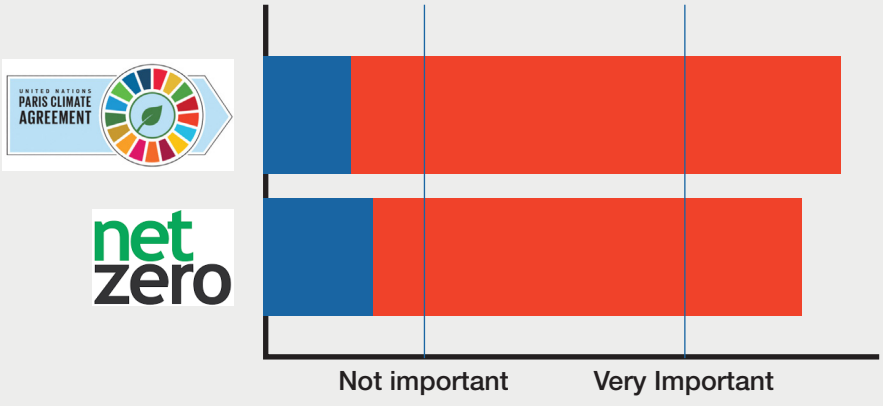
The implementation of the Paris Agreement, climate policies, and the European Union's (EU) net-zero target has elevated energy security as a top priority in Europe. Energy security needs a sustained supply of critical raw minerals/materials. Presently, there is a race to secure these key minerals, as evidenced by the current United States of America's foreign policy to secure these critical raw minerals. The EU's Critical Raw Materials Act (CRMA) has reinforced the economic importance of these raw materials. Energy security goals saw progress, as demonstrated by the 47 selected strategic projects. However, for the EU to achieve long-term energy security, the selection of projects must integrate sustainability for lasting economic growth. The EU has identified 47 strategic projects under the CRMA to secure and diversify access to key raw materials. These projects span 13 member states and focus on mining, processing, and recycling essential materials such as lithium, nickel, cobalt, and graphite. With a projected investment of €22.5 billion, the initiative aims to reduce reliance on external suppliers, particularly from China, while ensuring supply chain resilience for the green and digital transitions. This policy faces critical challenges in geopolitics, energy security, environmental sustainability, and long-term economic viability.

The Geopolitics of Energy Security

Climate commitments like the Paris Agreement and the EU's Net-Zero goal have made energy security a paramount concern in Europe. Ensuring a sustained supply of critical raw minerals and materials has emerged as a top priority in meeting the region's energy needs. As a result, there is a growing race to secure key minerals, with both the United States and the EU actively pursuing strategies to safeguard critical raw materials. At the forefront of this effort is the EU's Critical Raw Materials Act (CRMA), which plays a pivotal role in acknowledging the economic significance of these raw materials in achieving energy security goals. The CRMA has identified 47 Strategic Projects aimed at ensuring a stable supply of critical minerals while simultaneously promoting sustainable economic growth in the region. With global climate change challenges, the competition for critical raw minerals in Europe is heating up as the region strives to secure its energy future. The EU's proactive approach, through the CRMA and strategic projects, demonstrates its commitment to energy security and sustainable development. As the competition for critical raw materials continues, collaboration and innovation will be key to meeting Europe's energy needs while advancing towards a greener and more resilient future.

Thirteen EU Member States, including Belgium, France, Italy, Germany, and Spain, are among the hosts for the 47 new Strategic Projects aimed at bolstering the region's raw materials sector. These projects are diverse, encompassing activities such as extraction, processing, recycling, and substitution of raw materials across various segments of the value chain. Notably, the Strategic Projects have a comprehensive coverage, addressing fourteen out of the seventeen strategic raw materials listed in the CRMA (Critical Raw Materials List). The EU's focus on minerals like lithium, cobalt, graphite, nickel, and manganese underscores its commitment to meeting the 2030 targets set for the extraction, processing, and recycling of these critical materials. This strategic approach aims to enhance the EU's self-sufficiency in key raw materials, reduce dependency on external sources, and foster sustainable practices within the raw materials industry. The coordinated efforts across member states reflect a unified commitment towards securing the region's raw materials supply chain for a resilient and competitive future.

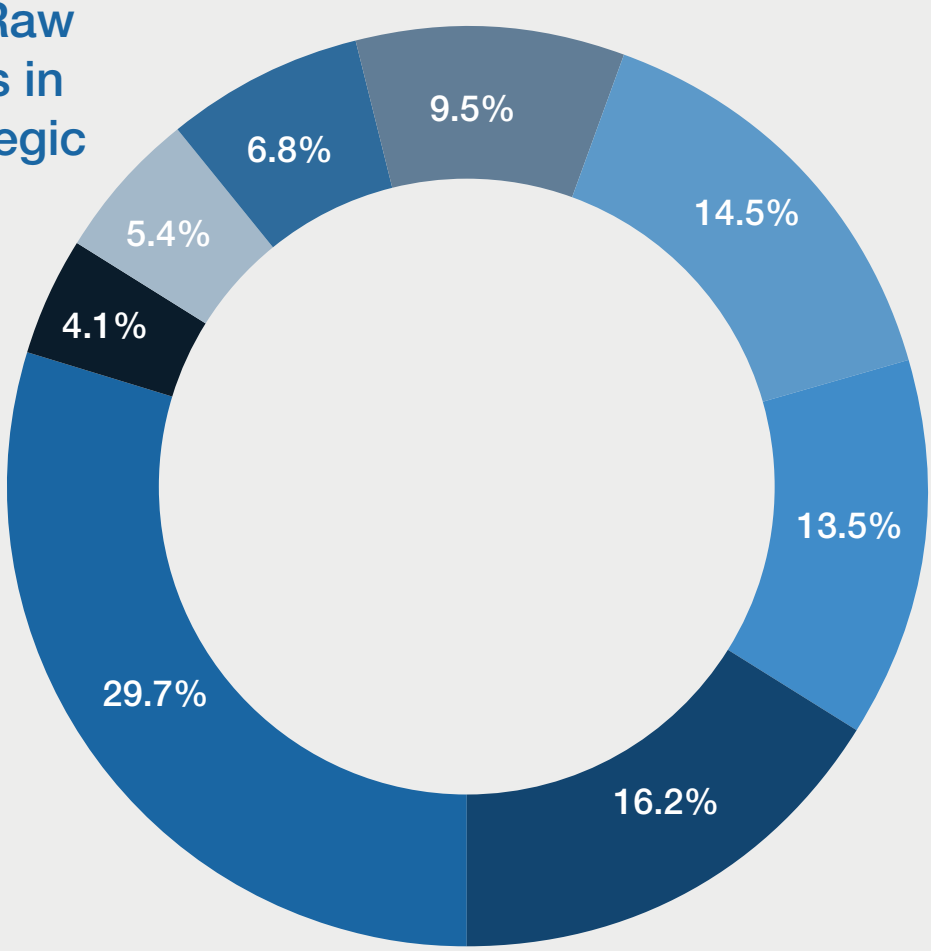
The EU is taking vital steps towards achieving long-term energy security through its emphasis on Strategic Projects and integrating sustainability measures. By



Concerns in Europe.

Climate commitments that have made energy security a paramount concern in Europe.

Most Relevant Critical Raw Materials in EU Strategic project



Lithium 29.7% Nickel 16.2% Cobalt 13.5% Graphite 14.5%
Manganese 9.5% Rare Earth 6.8% Copper 5.4% Aluminium 4.1%

investing in projects that address key raw material challenges, the EU is positioning itself to meet its energy goals while ensuring economic resilience and environmental sustainability. This strategic approach not only enhances energy security but also contributes to the EU's leadership in the global energy transition. Continued collaboration and innovation in the field of critical raw materials will be essential for the EU to maintain its competitive edge and drive further progress towards sustainable energy solutions. However, it is crucial to consider the potential emissions output resulting from the mining activities associated with raw material supply, highlighting the importance of ensuring environmentally responsible practices in pursuing energy security.

01 Geopolitical Considerations

The Critical Raw Materials Act (CRMA) is a strategic initiative by the European Union (EU) designed to address the EU's heavy reliance on third-country suppliers, especially China. China holds a dominant position in the global supply chain for many critical raw materials, posing a significant risk to the EU's economic and national security interests. The CRMA sets a target for the EU to diversify its sources of critical raw materials to prevent any single country from supplying over 65% of any strategic raw material.

This initiative highlights the EU's dedication to reducing its vulnerability to geopolitical disruptions and ensuring a secure supply of essential resources for its industries and economy. The European Union recognises the importance of securing access to critical raw materials for key industries such as automotive, electronics, and renewable energy. By diversifying its sources, the EU aims to strengthen its resilience and competitiveness in the global market. This strategic approach aligns with the EU's broader efforts to promote sustainable resource management and circular economy principles. The European Union is taking steps to secure its resources and lessen its dependence on a handful of suppliers. By fostering partnerships with a wider range of countries and promoting responsible sourcing practices, the EU is working towards a more sustainable and resilient raw materials supply chain. The CRMA reflects the EU's commitment to safeguarding its industrial base and economy by ensuring a diversified and secure supply of critical raw materials. This initiative not only mitigates risks associated with supply chain disruptions but also contributes to the EU's long-term sustainability goals.

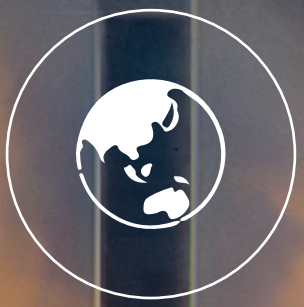
Challenges

- **Ongoing Dependence on Non-EU Suppliers:** While these projects enhance domestic supply, the EU will still rely on imports for refining and intermediate processing due to limited infrastructure.
- **Risk of Trade Retaliation:** China and other resource-rich nations may impose trade restrictions in response to the EU's strategic shift, complicating material access.
- **Geopolitical Instability:** Many external suppliers are in politically volatile regions, posing potential risks to supply chains.

Recommendations:

- **Partnerships:** Establish long-term strategic partnerships with resource-rich, stable nations like Canada, Australia, and Norway.
- **Alliances:** Develop EU-led industrial alliances to ensure a secure and diversified supply chain.
- **Policies:** Introduce trade policies that mitigate the risk of supply chain disruptions through diversified sourcing and investment in alternative suppliers.

Challenges



Dependence on Non-EU Suppliers

Risk of trade retaliation

Geopolitical Instability

Recommendations

Forge Strategic partnerships

Develop EU-Led Industrial Alliances

Diversity sourcing and Investment

02 Geopolitical Considerations

In today's rapidly evolving energy landscape, ensuring energy security and strategic resilience has become a top priority for governments and organisations around the world. A key aspect of this endeavour is the secure access to critical raw materials that are essential for producing renewable energy technologies. These materials are crucial components of technologies such as batteries, wind turbines, and electric vehicles, which play a significant role in the transition towards a more sustainable energy system.

Importance of Critical Raw Materials

Critical raw materials are indispensable for the development and deployment of renewable energy technologies. Lack of access to these materials would severely hamper production and scaling of technologies such as lithium-ion batteries for energy storage, rare earth metals for wind turbines, and cobalt for electric vehicles. As such, securing a stable and diversified supply of critical raw materials is vital for ensuring the resilience and sustainability of the energy sector.

Enhancing Domestic Extraction and Processing Capacity

In principle, one of the key strategies to enhance energy security and strategic resilience is to reduce reliance on external actors for critical raw materials. Boosting domestic extraction and processing capacity achieves this, thus reducing vulnerabilities to supply chain disruptions and geopolitical risks. By developing local sources of critical raw materials, countries can strengthen their energy independence and ensure a more stable and sustainable energy supply. Finally, we cannot overstate the importance of critical raw materials for renewable energy technologies. Enhancing domestic extraction within the EU and processing capacity is essential for reducing reliance on external actors and improving energy security and strategic resilience. By prioritising the development of a secure and sustainable supply chain for critical raw materials, countries can pave the way towards a more resilient and sustainable energy future.

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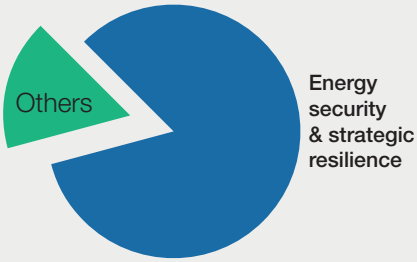
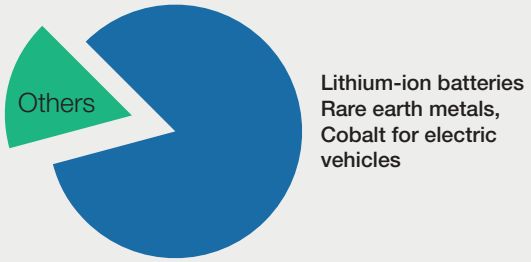


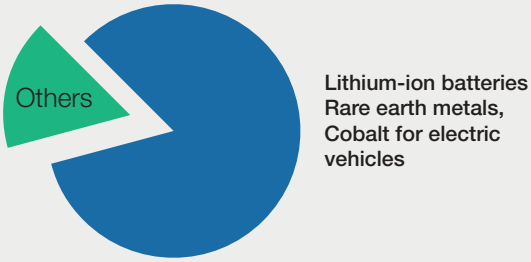
Top Priority Less Priority

Level of priority for Energy security and strategic resilience for governments and organisations around the world.



Indispensable Dispensable

Dispensable & Indispensable raw materials for the development and deployment of renewable energy technologies



More Important Less Important

The importance of critical raw materials for renewable energy technologies

Challenges

- **Processing and Refining Bottlenecks:** The EU lacks adequate infrastructure for refining materials, particularly compared to China's established dominance in this sector.
- **Slow Project Implementation:** Despite the CRMA's streamlined permitting process (27 months for mining, 15 months for processing), projects may still face delays because of environmental concerns and local opposition.
- **High Investment Costs:** The capital-intensive nature of these projects could deter private-sector involvement.

Recommendations:

- **Refining:** Invest in state-of-the-art refining facilities to ensure greater autonomy in processing critical materials.
- **Partnerships:** Create public-private partnerships to mobilise financing and accelerate project execution.
- **Technology:** Implement technology-driven solutions, such as AI-based exploration and processing optimisation, to improve efficiency and reduce costs.

Challenges

Dependence on Non-EU Suppliers

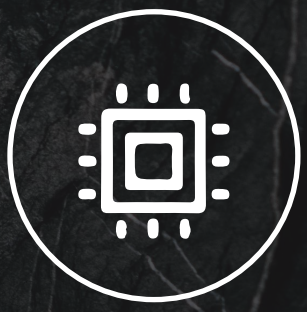
Risk of trade retaliation

Geopolitical Instability

Recommendations

Forge Strategic partnerships

Develop EU-Led Industrial Alliances



Diversity sourcing and Investment

03 Environmental Sustainability and Carbon Footprint

While securing critical raw materials is crucial, the EU must ensure that these projects align with its Green Deal objectives and maintain high environmental standards.

Challenges

- **High Carbon Footprint of Mining Operations:** Extracting and processing raw materials are energy-intensive processes that could increase emissions if not managed properly.
- **Biodiversity and Water Usage Concerns:** Many mining projects have adverse environmental impacts, including habitat destruction and water contamination.
- **Social License to Operate:** Local opposition due to environmental concerns could delay or derail projects.

Recommendations:

- **Renewables:** Mandate the use of renewable energy in mining and refining operations to minimise emissions.
- **Consultations:** Enforce rigorous Environmental Impact Assessments (EIAs) and stakeholder consultations before approving projects.
- **Circularity:** Promote a circular economy by scaling up EU-wide recycling initiatives to reduce dependence on extracted materials.

04 Economic Growth and Competitiveness

The Critical Raw Materials Act (CRMA) is a strategic initiative by the European Union (EU) designed to address the EU's heavy reliance on third-country suppliers, especially China. China holds a dominant position in the global supply chain for many critical raw materials, posing a significant risk to the EU's economic and national security interests. The CRMA sets a target for the EU to diversify its sources of critical raw materials to prevent any single country from supplying over 65% of any strategic raw material.

This initiative highlights the EU's dedication to reducing its vulnerability to geopolitical disruptions and ensuring a secure supply of essential resources for its industries and economy. The European Union recognises the importance of securing access to critical raw materials for key industries such as automotive, electronics, and renewable energy. By diversifying its sources, the EU aims to strengthen its resilience and competitiveness in the global market. This strategic approach aligns with the EU's broader efforts to promote sustainable resource management and circular economy principles. The European Union is taking steps to secure its resources and lessen its dependence on a handful of suppliers. By fostering partnerships with a wider range of countries and promoting responsible sourcing practices, the EU is working towards a more sustainable and resilient raw materials supply chain. The CRMA reflects the EU's commitment to safeguarding its industrial base and economy by ensuring a diversified and secure supply of critical raw materials. This initiative not only mitigates risks associated with supply chain disruptions but also contributes to the EU's long-term sustainability goals.

Challenges

- **High Production Costs:** Domestic mining and processing will likely be more expensive than sourcing from low-cost producers in China or Africa.
- **Global Market Competition:** Other economies, including the U.S. and China, are aggressively expanding their own raw materials strategies, heightening competition.
- **Regulatory and Investment Uncertainty:** Unclear long-term regulatory frameworks could discourage private investment.

Recommendations:

- **Financial Incentives:** Implement financial incentives, such as tax breaks and subsidies for companies investing in EU-based raw material projects.
- **EU-wide Strategy:** Develop an EU-wide industrial strategy focused on technology innovation in material processing.
- **Monitoring & Stockpiling:** Strengthen supply chain monitoring and strategic stockpiling to mitigate price volatility risks.

Challenges

High production costs for domestic mining and processing

Globgal market competition in raw material strategies

Regulatory and investment uncer-tainties

Recommendations

Financial incentives for EU-based projects

EU wide strategy for material stragefies

Monitoring & stockpiling

Conclusion and Policy Recommendations

The effective execution of the strategic projects undertaken by the European Commission's Critical Raw Materials Alliance (CRMA) has the potential to position the EU as a leading force in sustainable raw material supply chains. This strategic positioning not only ensures economic resilience but also strengthens energy security in the face of growing competition in the global market. The CRMA's Strategic Projects address the challenges faced by the EU in securing a sustainable and diversified supply of critical raw materials. By focusing on enhancing the efficiency and sustainability of raw material supply chains, the CRMA aims to reduce the EU's dependency on external sources, mitigate supply chain risks, and promote responsible sourcing practices. Through collaboration with industry stakeholders, research institutions, and policymakers, the CRMA is working towards developing innovative solutions to enhance the EU's competitiveness in the global raw materials market. By investing in research and development, promoting recycling and circular economy practices, and fostering partnerships with resource-rich countries, the CRMA aims to establish the EU as a hub for sustainable raw material supply chains. The CRMA's strategic projects could hold the key to unlocking the EU's potential as a global leader in sustainable raw material supply chains. By prioritizing economic resilience, energy security, and responsible sourcing practices, the EU can not only strengthen its position in the global market but also contribute to a more sustainable and secure future for generations to come.

Challenges

- **Diversify supply sources:** by strengthening trade and investment ties with geopolitically stable, resource-rich partners.
- **Enhance domestic refining and recycling capacity:** to reduce reliance on external processing hubs.
- **Implement strict ESG regulations:** to balance resource extraction with sustainability goals.

Recommendations:

- **Create economic incentives:** to attract private sector investment and promote technological innovation.
- **Develop resilient supply chains:** by establishing strategic stockpiles and refining infrastructure.
- **Foster international cooperation:** to coordinate strategic efforts, share best practices, and strengthen global resource governance.

The EU's 47 strategic projects under CRMA represents a significant step toward achieving energy and industrial security


Diversify supply sources
Enhance domestic refining and recycling capacity
Implement strict ESG regulations
Create economic incentives
Develop Resilient supply chains
Foster international cooperation

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