

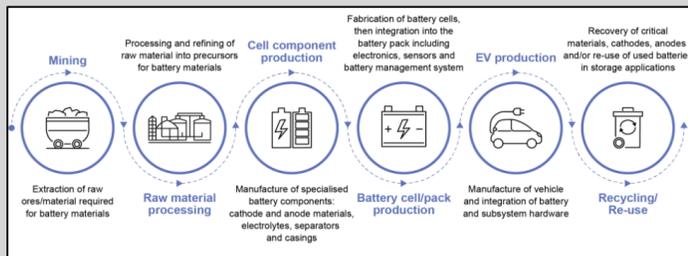
The Alignment of the European Union's Lithium Raw Material Policy

in the Context of Long-Term Renewable Energy Objectives

Leo ORLYGSSON

Introduction: Following the Paris Agreement, which accelerated global climate action, the European Union introduced the Green Deal, to reach net-zero emissions by 2050. Energy and transport are the largest sources of pollution, accelerating demand for high-capacity batteries for both electric vehicles (EVs) and renewable energy storage. The EU has implemented targeted policies, notably for raw materials, with lithium as the most critical, highlighting the importance of analyzing the EU's lithium raw material policy.

Theoretical Foundation and Methodology



Electric Vehicle Battery Supply Chain (International Energy Agency, 2022)

Critical or Strategic Raw Material

- “Critical” shifts with strategic priorities. Today it’s renewable energy needs.

Lithium Supply Chain

- The upstream is resource-reliant, the downstream capital-intensive.

Critical Raw Material Act (CRMA)

(European Commission, 2024)

- At least 10% of the EU’s annual consumption for extraction.

- At least 40% of the EU’s annual consumption for processing.

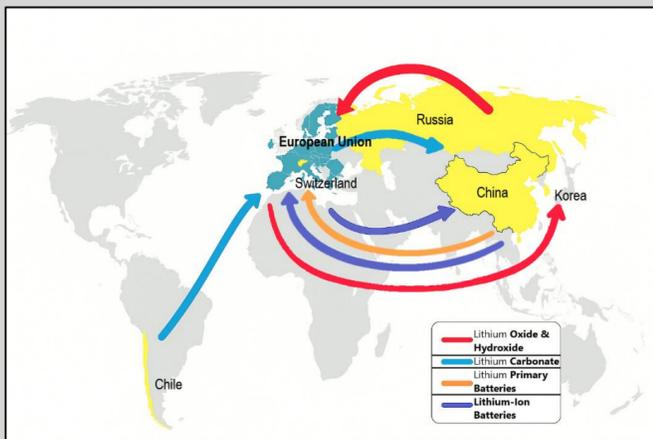
- At least 25% of the EU’s annual consumption for recycling.

- Less than 65% of the EU’s annual consumption from one third country

EU Long-Term Energy Policy

- The EU’s strategic objectives are to: meet all battery demand domestically, develop a full value chain, and reduce dependencies.

The European Union’s Total Lithium Trade Data



The European Union’s Main Lithium Trade Flows

Lithium Extraction

- Portugal supplies below 5 % of EU demand. No traceable trade data.

Lithium Processing/Refining

2004-2024 period

(Joint Research Centre, 2024)

- Consists of lithium oxide and hydroxide, and lithium carbonates.

- EU has no own lithium refining capacities in 2025.

- Refined lithium trade flows have not kept pace with rising demand.

Lithium End-Product

2012-2024 period

(United Nations, 2025)

- Consist of lithium primary batteries and lithium-ion batteries.

- Lithium-ion batteries had the largest import growth rate (33% yearly), and a strong and statistically significant external demand dynamic.

EU’s Lithium Dependencies

- Continued reliance on lithium carbonate imports from Chile (84%).
- Increasing reliance on China in lithium-ion batteries (82% in 2024).

Demand Projections

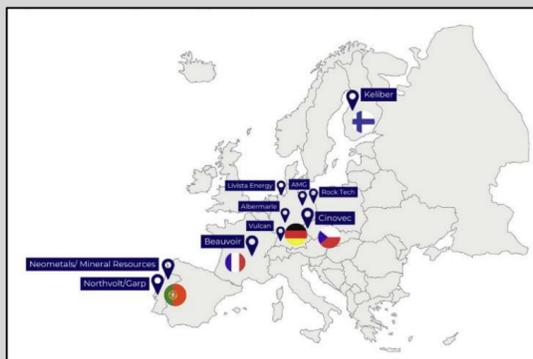
(International Energy Agency, 2021)

- Global lithium demand is projected to increase at least fourfold by 2030, 40 times by 2040, and up to 100 times by 2050.

Methodology

- Mixed-methods approach: trade analysis, and policy benchmarking

The European Union’s Policy Alignment



Lithium Processing Projects in the EU
(Adamas Intelligence, Tradium, Rawmaterials.net, 2024)

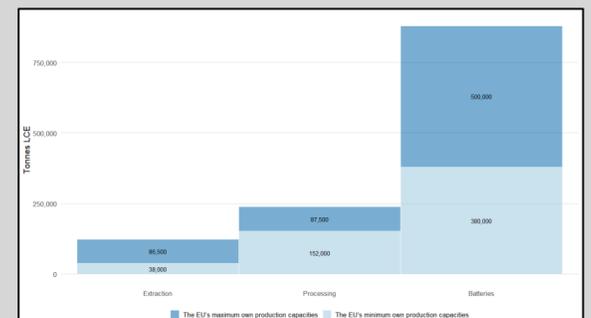
The CRMA, as the EU’s main raw materials policy, designates lithium as a strategic raw material. To meet its objectives, the EU has expanded its extraction and, above all, refining capacity. Nine lithium processing projects (6 on extraction) are currently in construction, with a potential of up to 239,500 kt lithium carbonate equivalent (LCE) in annual capacity by 2030. The analysis concludes that the EU is on track to meet its CRMA lithium objectives, even with potential project delays and disruptions.

The EU has taken initial steps to establish its upstream segment, shifting from importing downstream products to building its own value chain. The projected rising demand will make future supply shocks more damaging than currently. The importance of trade will further rise as the EU will remain import-reliant, to what extent depends on the 2030 demand levels. Concerns remain over economic viability:

European lithium industry lacks experience.

Shift to refined lithium trade, to at least four times current levels.

Depending on the 2030 evaluation of project performance, these factors will shape future EU raw materials policy.



The European Union’s Lithium Value Chain Scenarios in 2030

Conclusion: The CRMA, as the EU’s main raw materials policy, correctly identifies the key weaknesses in the current value chain. Its objectives focus on addressing these critical gaps first, while the planned projects have additional capacity growth potential to exceed the objectives. However, achieving these targets remains highly uncertain, with the main shortfall being the absence of an integrated trade policy to secure supply certainty.

Without the continuation of such a policy beyond 2030, the EU risks a fragile, import-dependent lithium supply chain, undermining its long-term renewable energy objectives.

Leo ORLYGSSON - The Alignment of the European Union’s Lithium Raw Material Policy in the Context of Long-Term Renewable Energy Objectives

August 2025
Karlsruhe, Germany

References

1. United Nations. (2025): UN Comtrade Database
2. Joint Research Centre. (2024): Raw Materials Information System
3. International Energy Agency. (2021): The Role of Critical Minerals in Clean Energy Transitions
4. European Commission. (2023): European Critical Raw Materials Act
5. International Energy Agency. (2022): Global Supply Chains of EV Batteries