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Cleantech: Reducing Europe's Strategic Dependence on China

At the intersection of economic security and industrial policy, Europe's access to CRMs has, in recent years, emerged as a central pillar of global geopolitics. In the cleantech realm, China's strategic intent to foster dependencies that strengthen its geopolitical leverage is no longer a secret: Beijing alone controls 70 percent of global production of the critical materials—including rare earth elements—that are essential to our decarbonization efforts.

While the United States has begun preparing for radical adjustments, Europe continues to lag behind, struggling to organize a coherent response and failing to swiftly identify the room for maneuver it still possesses. Even within local industrial production on European soil, China maintains a firm grip, relying exclusively on its own value chains rather than those of its international partners.

Japan and South Korea, having been alerted earlier, have adopted a meticulous, project-by-project, sector-by-sector approach that has enabled them to diversify their supply chains wherever possible. Pooling risks, developing our internal market in the face of an ultra-competitive—and heavily subsidized—Chinese supply strategy, and addressing the entire value chain, from extraction and refining to recycling, are among the key avenues explored in this paper. It also advocates using access to the European market as a political lever in relations with third countries.

In line with our previous work on extraterritoriality, the Inflation Reduction Act, and Europe's foreign economic policy, this study makes a clear case: Europe's excessive dependencies are not inevitable. In the years ahead, safeguarding our economic security must become the shared and serious preoccupation of all European policymakers.

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Institut Montaigne's Managing Director

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The European Union has set the goal of **achieving carbon neutrality by 2050**, a target enshrined in the European Climate Law. This ambition is unfolding in an unstable geopolitical context marked by the war in Ukraine and the return of Donald Trump, events that highlight Europe's **vulnerability due to its strategic dependencies**. This is particularly relevant regarding critical resources that are essential for the EU's energy transition goals.

To reduce these vulnerabilities while preserving its industrial base, the EU has adopted several key legislative frameworks, including the **Net-Zero Industry Act** and the **Critical Raw Materials Act**. These measures aim to boost European production and secure the supply of strategic materials. The **Clean Industrial Deal** complements this toolkit by seeking to connect decarbonization with industrial competitiveness, with the goal of strengthening key sectors of the European economy, particularly the cleantech industries that are essential for decarbonization.

This drive for greater autonomy comes from the demands of the carbon-neutral transition, which depends on the large-scale deployment of clean energy technologies. The development of these technologies—solar panels, wind turbines, electrolyzers, batteries, and electric vehicles—requires a shift from dependence on hydrocarbons to increased reliance on "critical" materials, along with a complete overhaul of value chains. To meet its climate targets, the EU—like the rest of the world—will therefore need to contend with a significant **increase in extraction needs by 2040 and a full reorganization of value chains, which currently often fail to benefit the European industrial fabric**. This anticipated rise in global and European demand raises pressing new geopolitical challenges, given that cleantech value chains are currently largely dominated by China.

This observation raises a fundamental question about the strategic choices the EU must make: **To what extent is the EU willing to depend on China for supplies that are essential to its energy transition?** This question, in turn, gives rise to other questions:

- *How much dependence can Europe tolerate in the development of its clean technologies?*
- *Can Europe accept a high concentration of critical raw material—resources that are also vital for strategic sectors such as defense—in the hands of any single supplier?*
- *Finally, to what extent is Europe willing to tie the success—including the financial viability—of its decarbonization efforts to China's industrial policy choices?*

These issues reveal a central dilemma in the context of a profound and costly transformation of energy infrastructures: **What role does Europe intend to play in the industrial value chains of tomorrow?**

To address this dilemma, it is essential to differentiate sectors based on their level of industrial maturity and their strategic importance to Europe. For certain emerging segments such as solar photovoltaics, Europe lacks a strong industrial base, while for other sectors, it could develop credible alternatives to China. In contrast, for foundational sectors such as batteries (for mobility and stationary storage) and electrolyzers (for the production of clean hydrogen, its derivatives, and for the chemical industry), **excessive dependence would be strategically risky**. These technologies determine the competitiveness of entire industries, including, in the long term, low-carbon chemical production.

In light of these challenges, two questions emerge as priorities for strengthening the EU's industrial sovereignty:

1. How can Europe secure the critical industrial sectors it aims to develop on its own territory (as identified in the Net-Zero Industry Act)?

2. How can it ensure access to the upstream segments of value chains—currently largely dominated by China—particularly regarding the extraction and refining of the critical raw materials needed for tomorrow's technologies?

THE STRATEGY BEHIND OUR DEPENDENCE TOWARD CHINA

Recent shocks, such as the COVID-19 pandemic and the war in Ukraine, have exposed the vulnerability of an EU that remains heavily dependent on China for access to most critical raw materials. Contrary to popular belief, China's dominance in this area is not based on geological advantage but rather on a long-term, coherent, and methodical industrial strategy that Beijing has been implementing for over two decades.

China has progressively secured the entire value chain, from extraction to refining, including processing, due to massive state support. The adoption of the Made in China 2025 plan marked a structural turning point by setting domestic content targets in many strategic sectors. This framework enabled the emergence of powerful vertically integrated national champions, capable of dominating future-oriented technological sectors such as batteries, solar panels, and electric vehicles.

To ensure a reliable supply of critical raw materials, Beijing combined the exploitation of its domestic resources—which are sometimes of low quality—with aggressive international expansion. Its state-owned enterprises, financed by major state banks, invested heavily in Africa, Latin America, and Asia, securing access to deposits while simultaneously strengthening China's geopolitical influence in these regions. This strategy relies on assertive economic diplomacy, often built around partnerships that link natural resources to infrastructure projects, notably within the framework of the Belt and Road Initiative.

China does not limit itself to controlling the upstream segment of the value chain. It also dominates the industrial processing stages, particularly refining, where it holds an almost hegemonic position. It currently controls a large share of the global processing of lithium, cobalt, and manganese, and its capacity for large-scale production allows it to set standards on the global market. However, this dynamic also creates certain vulnerabilities, such as overcapacity in specific segments.

Finally, Beijing uses critical raw materials as a lever of strategic influence. By manipulating exports—through quotas, taxes, or targeted bans—China directs global flows and shields its domestic industry. These measures, sometimes justified by national security concerns, strengthen its ability to assert power in international power dynamics. The continued dependence of other industrial powers on Chinese resources limits their room for maneuver despite the trade tensions generated by this approach.

Faced with this comprehensive strategy—combining industrial power, economic diplomacy, and resource control—the EU is compelled to fundamentally rethink its supply policies. The challenges Europe faces are similar to those encountered by other countries, including South Korea and Japan; the efforts already undertaken by these two nations offer valuable lessons.

JAPAN'S INDUSTRIAL STRATEGY

Japan was a pioneer in implementing a strategy to gain autonomy over critical minerals, initially for semiconductors and later for green technologies. The 2010 diplomatic standoff with China over the Senkaku/Diaoyu Islands incident marked a turning point, exposing Japan's vulnerability to Chinese restrictions on rare earth exports. After filing a complaint with the WTO and drawing lessons from the dispute, the Japanese government released its strategy for securing resource supply, identifying thirty strategic minerals.

Japan's Strategy	
Structuring Objectives	The goal is to ensure a stable, diversified, and secure supply for national value chains (batteries, semiconductors, and renewable energy) while supporting carbon neutrality by 2050. Japan specifically aims to achieve the following: • 80 percent self-sufficiency in certain base metals by 2030. • A reduction in dependence on any single supplier to below 50 percent. • The creation of strategic stockpiles covering sixty days of domestic consumption for thirty-four critical metals. • Up to 750 GWh of domestic battery production capacity (150 GWh for the domestic market, 600 GWh for export).
Institutional Frameworks and Public Instruments	The strategy is led by the Ministry of Economy, Trade and Industry (METI), in partnership with JOGMEC, which can co-invest in overseas mining projects and support Japanese companies through guarantees and subsidies. • Since 2022, a ¥100 billion fund has been deployed to subsidize up to 50 percent of CAPEX for strategic projects, provided that the materials transit through Japan.
Operational Pillars for Securing Supply	Japan relies on a combination of levers: • Direct foreign investments (e.g., lithium in Chile, nickel in Indonesia, and uranium in Kazakhstan) through major conglomerates such as Sumitomo, Mitsui, and Sojitz. • Development of recycling (e.g., rare earths recovered from electronic waste). • R&D focused on substituting critical materials with breakthrough technologies (e.g., ceramics, polymers, nanomaterials). • Establishment of strategic stockpiles for thirty-four minerals.
Bilateral Partnerships and Multilateral Alliances	Japan pursues an active diplomacy based on the following: • Strategic bilateral partnerships (with Australia, India, Vietnam, and Kazakhstan) focused on access to minerals and joint development of value chains. • Enhanced cooperation with the United States within the framework of the Inflation Reduction Act (IRA) and the Minerals Security Partnership (MSP). • Dialogue with the EU aimed at ensuring the interoperability of supply chains.

Despite significant progress—increased capacity, innovation, and partnerships—Japan remains highly dependent on China. This is particularly true for graphite, 90 percent of which is imported from China. Domestic mining remains underdeveloped, and the value chains are still vulnerable to geopolitical tensions. Japan's industrial expertise must continue to grow in order to ensure lasting autonomy in critical minerals.

SOUTH KOREA'S INDUSTRIAL STRATEGY

South Korea, an economy that is heavily industry-driven and export-oriented, is particularly vulnerable to disruptions in critical resource supply chains due to its massive reliance on imports—up to 95 percent—notably from China. Indeed, China supplies 33.4 percent of Korea's industrial raw materials. This dependency is especially sensitive in strategic sectors such as batteries, semiconductors, and other cleantech industries such as wind turbines and solar photovoltaics.

South Korea's Strategy	
Structuring Objectives	• Reduce dependence on any single supplier for critical minerals (lithium, cobalt, graphite) from 80 percent to 50 percent by 2030. • Secure supply chains for strategic sectors such as batteries, hydrogen, and nuclear energy. - Target of 30 percent share of nuclear power in the energy mix by 2030, including the development of small modular reactors (SMR). - Target of 30 percent share of renewable energies in the energy mix by 2030. • Reach a 30 percent share of nuclear power in the energy mix by 2030, including the development of Small Modular Reactors (SMRs). • Reach a 30 percent share of renewable energy in the national energy mix. • Maintain a geopolitical balance between China and the United States while meeting decarbonization imperatives.
Institutional Frameworks and Public Instruments	• Creation in 2021 of KOMIR, an organization dedicated to supporting overseas mining projects. • Implementation of an early warning system for thirty-three critical minerals. • Government-led recycling strategy, with a target of 20 percent recycling rate by 2030. • Tax credits, financial support, public guarantees, and investment incentives for domestic companies.

South Korea's Strategy	
Operational Pillars for Securing Supply	• Strengthening of strategic stockpiles, notably for lithium and cobalt. • Acceleration of domestic refining and recycling capacity development. • Planned government investment of ₩20 trillion (approximately €13.3 billion) in the electric vehicle sector, in cooperation with major national players such as LG Chem and LG Energy Solution. • Development of industrial projects led by private sector actors and supported by MOTIE and KOMIR (including precursors, cathodes, and solid-state batteries). • Financial support for the demonstration and domestic development of emerging technology sectors such as electrolysis and offshore wind, with a local content benchmark. • Growing integration of ESG standards to promote local content.
Bilateral Partnerships and Multilateral Alliances	• Agreement with Australia (2020, 2021). • MoU with Mongolia (2023). • Negotiations with Ecuador. • Industrial agreements with Canada (Avalon, Electra, Snow Lake). • Minilateral cooperation: Active participation in the Mineral Security Partnership (MSP), which South Korea now chairs following Donald Trump's return to the White House. • Bilateral cooperation with the EU and trilateral dialogue with the United States on critical minerals.

Nevertheless, South Korea remains exposed to several vulnerabilities. On the one hand, its structural dependence on China, particularly in the battery sector and intermediate goods, limits its diplomatic and economic room to maneuver, forcing it to adopt a cautious balancing act between Beijing and Washington. Additionally, the country faces long-term challenges: the slow scaling-up of electrolysis technologies, the complexity of international mining development, increasing competition over supply chains, and difficulties in forging partnerships as robust as those established by others, such as that of Japan with Australia. In this context, South Korea is striving to design a resilient energy and industrial strategy, but the success of this transition will depend on its ability to sustainably secure critical resources while maintaining its technological edge.

WHAT INDUSTRIAL STRATEGY FOR CLEANTECH IN EUROPE?

The analysis of China's strategy, along with the Japanese and South Korean responses, provides valuable insights to inform Europe's strategic thinking.

The European approach is primarily based on the Green Deal and the Net-Zero Industry Act, which reflect the ambition for the green transition to be driven by the domestic production of the technologies required for decarbonization. The agreement reached in May 2024 notably sets a target of **meeting 40 percent of the EU's annual net-zero technology needs by 2030** and **capturing 15 percent of global production value by 2040**. The agreement between the Council and the European Parliament also foresees a fourfold increase in renewable energy deployment and a fifteenfold increase in electric vehicle production in Europe by 2050. This objective is designed to address the "green development" component of the European Green Deal, which aims to align climate action with economic growth.

This momentum is reinforced by the Clean Industrial Deal, which proposes the use of financial, regulatory, and trade instruments to **support industrial investment in Europe, secure access to critical raw materials, and build resilient value chains**. The deal aims to address the vulnerabilities exposed by recent crises, including excessive dependence on third countries, fragmented innovation support, administrative complexity, and the competitive disadvantage of European industry due to high energy costs.

Despite this stated ambition, the implementation process reveals **a number of structural weaknesses**. Europe remains highly dependent on China, both for critical raw materials and for large parts of cleantech value chains. The EU now faces an existential dilemma: **Does it want to remain a mere customer of decarbonization or become a full-fledged industrial player?** A complete decoupling from China is neither realistic nor desirable, but China's dominance in cleantech

value chains raises serious questions about the long-term sustainability of such dependency.

This calls for a strategic reassessment—**achieving genuine industrial sovereignty requires securing access to critical resources, including those beyond the Continent, and moving beyond a model based solely on assembling imported components**.

Clean energy manufacturing capacity by country (2024)

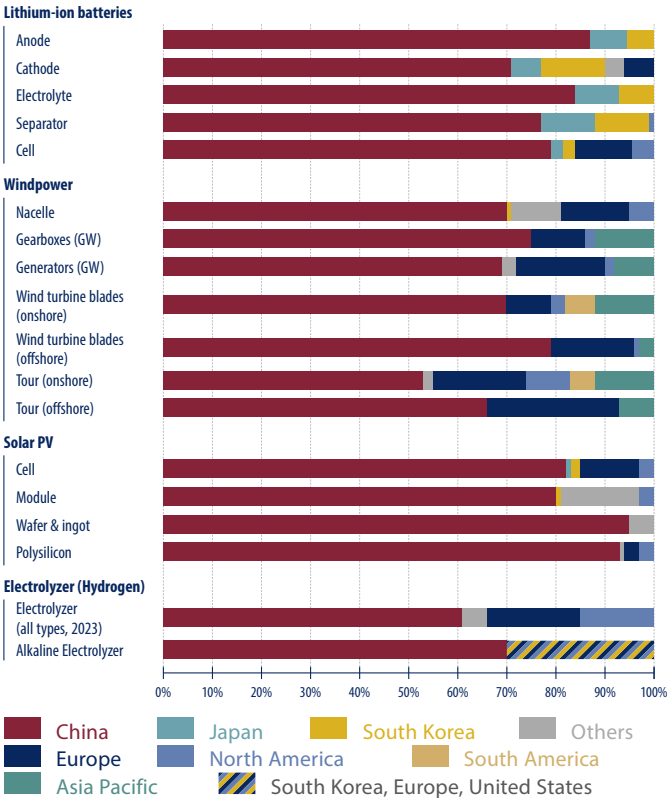


Chart based on data provided by MetaMarket Monitoring, the European Commission, Statista, Energy Trend, BNEF, Renewable Energy Institute, the International Energy Agency, Cheersonic, and through interviews.[1]

[1] *Meta Market Monitoring, "Material Supply," December 2024, https://metamarketmonitoring. de/en/materials/worldmap.php?&f2=0&f3=0&f4=1; S. Carrara et al., "Supply Chain Analysis and Material Demand Forecast in Strategic Technologies and Sectors in the EU – A Foresight Study," JRC Science for Policy Report, https://single-market-economy.ec.europa.eu/system/files/2023-03/Raw%20Materials%20Foresight%20Study%202023.pdf; Statista, "Global Wind Nacelle Manufacturing Shares By Region," 2024, https://www.statista.com/statistics/1475463/wind-turbine-nacelle-manufacturing-capacity-breakdown-countries-region; Energy Trend, "Global Distribution of Polysilicon Manufacturing," 2024, https://www.energytrend.com/news/20240407-46330.html; BNEF, "China Dominates Clean Technology Manufacturing Investment as Tariffs Begin to Reshape Trade Flows," BloombergNEF, April 28, 2025, https://about.bnef.com/insights/finance/china-dominates-clean-technology-manufacturing-investment-as-tariffs-begin-to-reshape-trade-flows-bloombergnef; Romain Zissler, Progress in Diversifying the Global Solar PV Supply Chain, Renewable Energy Institute 2024, https://www.renewable-ei.org/pdfdownload/activities/REI_SolarPVsupplychain2024_en.pdf; International Energy Agency (IEA), "Announced Electrolyser Manufacturing Capacity by Region and Manufacturing Capacity Needed in the Net Zero Scenario, 2021–2030," 2025, https://www.iea.org/data-and-statistics/charts/announced-electrolyser-manufacturing-capacity-by-region-and-manufacturing-capacity-needed-in-the-net-zero-scenario-2021-2030; Cheersonic, "2024 Electrolyzer Research Report," November 9, 2024, https://cheersonic-liquid.com/en/2024-electrolyzer-research-report.*

Comparison of import volumes from China and production capacity in the EU for green technologies (2023)

Green Technology Categories	Volume of Imports from China (in Billions of Euros)	EU Production Capacity	Share of Imports from China
Batteries for electric vehicles	21.4	70 GWh in 2022; could reach 520 GWh by 2025	43.8%
Wind turbines	0.137	220 GW	53%
Solar panels	15.6	260 GW	97%
Electrolyzers	Electrolyzers have not been the subject of trade between China and Europe. Currently, on both continents, the majority of stack components are supplied locally.	4.9 GWel	Europe currently ensures a large share of the production of key electrolyzer components locally. However, the main dependency in the value chain concerns iridium, 93 percent of which is mined and refined in South Africa and which is used in PEM electrolyzers. Europe is also dependent on Japanese companies such as Asahi Kasei and Toppan for the machinery needed to manufacture membranes.

Table based on data supplied by the Atlantic Council,[2] the European Court of Auditors,[3] Motor,[4] WindEurope,[5] Eurostat,[6] the European Commission,[7] TNO and The Hague Centre for Strategic Studies,[8] and on interviews.

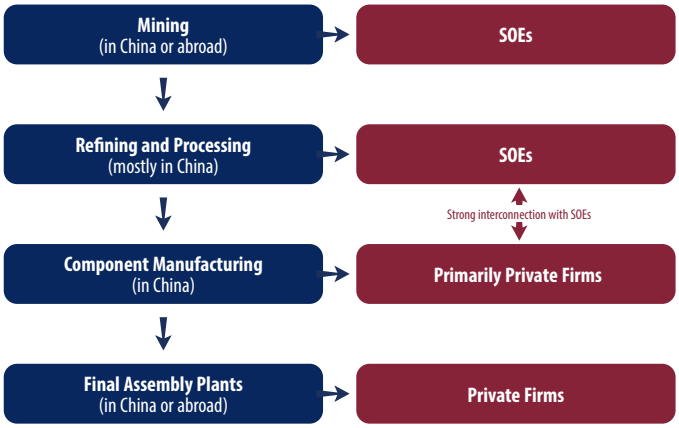
When it comes to critical raw materials, this structural dependency is largely due to a lack of domestic production capacity, technological expertise that is still under development, and a regulatory framework in Europe that is not conducive to mining. Although certain resources—such as lithium and rare earth elements—are present on European soil, the launch of mining projects is hindered by complex permitting procedures, environmental risks, and strong local opposition. Similarly, refining and recycling capacities—both essential to securing the value chain—remain limited due to their technical complexity and environmental impact.

In response to these challenges, the EU adopted the Critical Raw Materials Act (CRM Act) in 2024, which aims to structure an industrial strategy around critical materials. This legislation seeks to accelerate strategic industrial projects, support research and innovation, encourage private investment, and diversify supply sources through international partnerships. However, **the rise of protectionism in certain supplier countries**—such as Indonesia, Namibia, and Zimbabwe—**complicates the implementation of this strategy**. These states now require local processing of resources, often in partnership with Chinese companies that are already well established.

Meanwhile, China's industrial strategy—based on full vertical integration from extraction to finished product manufacturing—ensures Beijing's dominant position in clean technology value chains. **This dominance undermines European efforts toward industrial reshoring and deepens competitive imbalances**.

[2] *Joseph Webster, "Without Tariffs, the EU Faces a Flood of Chinese Imports of the 'New Three,'" Atlantic Council, May 23, 2024, https://www.atlanticcouncil.org/blogs/energysource/without-tariffs-the-eu-faces-a-flood-of-chinese-imports-of-the-new-three.*
[3] *European Court of Auditors, Special Report 15/2023, The EU's Industrial Policy on Batteries: New Strategic Impetus Needed, 2023, https://www.eca.europa.eu/ECAPublications/SR-2023-15/SR-2023-15_EN.pdf.*
[4] *Morningstar DBRS, "Dependence on Chinese Battery Supplies Might Become Achilles' Heel of European EV Manufacturing," motor.com, July 30, 2024, https://www.motor.com/2024/07/dependence-on-chinese-battery-supplies-might-become-achilles-heel-of-european-ev-manufacturing.*
[5] *"Press Release: EU starts investigation into Chinese wind turbines under new Foreign Subsidies Regulation," WindEurope, April 9, 2024, https://windeurope.org/newsroom/press-releases/eu-starts-investigation-into-chinese-wind-turbines-under-new-foreign-subsidies-regulation.*
[6] *Eurostat, "International trade in products related to green energy," 2024, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_in_products_related_to_green_energy.*
[7] *European Commission, "Solar Energy," 2023, https://energy.ec.europa.eu/topics/renewable-energy/solar-energy_en.*
[8] *TNO and The Hague Centre for Strategic Studies, "The EU's China Challenge: Rethinking Offshore Wind and Electrolysis Strategy," 2024, https://publications.tno.nl/publication/34642379/FD2Yc7/TNO-2024-R10732.pdf.*

Diagram of China's vertical industrial integration in cleantech and the role of state-owned enterprises (SOEs)



In light of Europe's ambitions to develop a clean technology industry, framed by the Net-Zero Industry Act, and given the limitations of the EU's current strategy to secure critical materials against the risks of disruption or manipulation of supply chains, Europe needs a strategy. This note proposes action along **three strategic lines for the EU**, starting with the upstream part of the value chains:

a. Using European Market Access as an Industrial Strategy

Recommendation 1
Leverage the European market in sectors where China is too dominant.

It is essential to **make access to the European market conditional on the local establishment of clean technology value chains**. This conditionality must be implemented through three levers:

- **Local content requirements:**
  - Set a threshold of **50 percent local content** for access to the European market (e.g., for EVs, which would include a significant proportion of critical vehicle components, including batteries).
- **Promote majority-European joint ventures:**
  - In sectors where Europe is lagging far behind (such as LFP batteries), priority should be given to **majority-European joint ventures**, with integration of local value chains to guarantee access to the European market.
- Impose local and progressive industrial integration by extending local content upstream in the chain:
  - **Moving beyond final assembly:** impose local integration of upstream components such as **precam materials** (PCAM) for batteries or permanent magnets for wind turbines and EVs.
  - **Couple this effort with the use of value chains in partner countries that have signed a Clean Trade and Investment Partnership (CTIP).**

Recommendation 2
Support this strategy with tools for industrial sovereignty.

If this strategy is to be effective, it must be accompanied by complementary industrial and social measures, in particular to ensure the security and competitiveness of European technologies, boost the skills of European workers, and combat forced technology transfers to China:

- **European industrial visa policy:**
  - Coordinate a visa policy with Member States to **limit the entry of Chinese engineers to the strict minimum number required**.
  - Require the **majority of engineers and technicians** in supported projects to be **locally recruited**.
- **Technological conditionality on production equipment:**
  - Require the use of **European assembly robots** in new cleantech factories. This would stimulate the local industrial equipment manufacturing ecosystem and strengthen European skills in these technologies.

b. Adapting European Rules to the Reality of Value Chains

Recommendation 3
Mobilize structured financial support to boost mining investment in Europe.

The EU must activate robust financial support to secure private investment in the extraction and refining of critical materials. This includes:

- The **widespread provision of public guarantees on bank loans by Member States**, enabling companies to conclude purchase contracts with industrial partners.
- The **inclusion of mining activities in the European taxonomy**, subject to compliance with strict environmental standards, is also essential to encourage a sustainable revival of the European mining sector.
- **The European Investment Bank (EIB) must play a leading role in financing these capital-intensive projects**. The EIB's statutes should **allow it to exceed 10 percent investment outside Europe if projects are deemed strategic for the EU**.

Recommendation 4
Accelerate and harmonize the recycling of critical materials in Europe.

- The EU needs to **set differentiated recycling targets for each critical material and cleantech sector** in order to monitor value chains requiring greater efforts.
- **Harmonization of regulations between Member States on the management of waste containing critical materials is also essential**, as is the introduction of a more efficient Europe-wide collection system.
- Waste transport remains a major obstacle to recycling due to restrictive national rules. It is imperative to **liberalize transport between Member States, with a view to pooling the mass of critical materials to be recycled and recovered on the Continent**.
- The EU should also launch a **process to harmonize recycling standards with its partners who have signed a CTIP**, in order to encourage quality improvement and joint circularity.
- Finally, the EU should **introduce strict export quotas for waste containing critical materials, differentiated by material and by components used (starting with permanent magnets and black mass)**, destined exclusively for countries that have not signed a CTIP with Europe.

Recommendation 5
Mobilize the EIB to finance strategic reserves of critical minerals.

- The EU should draw inspiration from the Japanese JOGMEC model by **mandating the EIB to finance the creation of strategic reserves of critical minerals**. This role could include support for upstream exploration and the development of new mining projects, filling the gaps left by private investors in segments deemed too risky but essential to the EU's industrial security.

c. Establishing Strategic Partnerships through Clean Trade and Investment Partnerships

Recommendation 6

Adopt a "risk syndication" approach with partners that have converging interests.

It is necessary to assume that certain states, as well as their public financing institutions (such as the EIB, JOGMEC, or KOMIR), and certain companies will act as "buyer-investors." A coalition of these players—from the EU, Japan, and Korea, for example—would enable upstream project risks to be pooled, with a view to risk syndication. The aim of this approach would be to support projects led by states that are "sellers-developers" of critical resources. Joint ventures are the central tool in this strategy of structuring co-investment.

Recommendation 7

Make access to the European market conditional on the integration of extraction and refining projects in Europe and among its CTIP partners.

One common feature of the various Japanese and Korean strategies is the close link between investment in the extraction and refining of critical materials and the development of clean technology projects. This is particularly evident in North America, where gigafactory projects led by Japanese or Korean players are systematically paired with extraction and refining projects, mostly located in Canada. This synergy has been made possible by the local content requirements introduced under the Inflation Reduction Act.

The EU would do well to follow suit by **making access to the European market (e.g., for batteries and EVs) conditional on the integration of strategic projects for the extraction and refining of critical materials located on its territory or that of a partner that has signed a Clean Trade and Investment Partnership**. This would create a powerful incentive for partners to sign a CTIP in order to integrate European value chains. **The introduction of a local content threshold for each section of the value chain** (e.g., 50 percent in batteries intended for the European market) would both secure the upstream part of the value chain and strengthen Europe's industrial competitiveness.

Recommendation 8

Deepen technological and regulatory cooperation between the EU, Japan, South Korea, Canada, and other CTIP partner countries.

- **This cooperation should focus more on innovation, through the pooling of resources** (particularly between public and private laboratories) and the **co-financing of joint research projects**. Joint efforts to develop **advanced recycling technologies and material efficiency solutions** would help build a resilient and competitive technological ecosystem, reducing vulnerabilities linked to dependence on a limited number of countries.

- Beyond disruptive technologies, there is also significant potential in **collaboration on refining and processing**. This lever is becoming strategic in the face of increasing export controls, not only on critical minerals but also potentially on the technologies themselves.

- Another priority area is the **traceability of materials throughout the value chain**. The interoperability of traceability systems between partners is essential to ensure the transparency, trust, and sustainability of supply chains. The systematic integration of ESG criteria into these traceability systems would be a key lever for strengthening security of

supply while promoting better integration of value chains between Europe, Asia, and North America.

Recommendation 9
Forge strategic industrial partnerships outside China.

Europe needs to rely on differentiated international alliances, both to secure supplies and to build robust industrial alternatives. In clean technology value chains, several areas of cooperation should be prioritized, depending on the sector:

- **Batteries:** strengthen cooperation with Japan and South Korea through joint ventures and the signing of CTIP-type agreements, facilitating the co-integration of value chains.
- **Electrolyzers:** form coalitions of interest with Japan and the United States, particularly for critical components such as electrode membranes.
- **Wind power:** develop cooperation on permanent magnets with countries facing similar dependence on China, with a shared strategy of diversifying supply sources.