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The Troubled Reorganization of Critical Raw Materials Value Chains

An Assessment of European De-risking Policies

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Center for Energy
and Climate

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Executive summary

With the demand for critical raw materials set to, at a minimum, double by 2030 in the context of the current energy transition policies, the concentration of critical raw materials (CRM) supplies and, even more, of refining capacities in a handful of countries has become one of the paramount issues in international, bilateral and national discussions. China's dominant position and successive export controls on critical raw materials (lately, germanium, gallium, rare earths processing technology, graphite, antimony) point to a trend of weaponizing critical dependencies. National security, strategic autonomy, improving the governance and sustainability of CRM supplies are the main driving forces in the Organization for Economic Co-operation and Development (OECD) import-dependent nations for the reorganization of supply chains.

These governments have been adopting a vast array of policies with different objectives, timelines of implementation and impacts. The European Union (EU) has seriously started to address these issues through legislation in 2023 via the Critical Raw Materials Act, with some Member states like France having raised the importance of the subject some years ago. The United States (US) under Trump made the first steps in 2017 through the Executive Order 13817, followed by the release of a list of 35 critical minerals in 2018, and the Biden administration has stepped up US action on CRM supply diversification. Japan was a pioneer in 2010.

The EU and the US are developing quite similar toolboxes to push for diversification, yet substantial differences remain. The US is leaning more towards national security (ex., Foreign Entity of Concern rules) and deploying consequential funding tools for the mining and refining industries domestically but also in partner countries, notably 412 million dollars of already deployed loans and equity investments via DFC for new supplies from emerging markets. Within the framework of the Green Deal, the EU is focused on sustainability (EU Battery Regulation, Corporate Sustainable Reporting Directive, Corporate Sustainable Due Diligence Directive etc.) and on boosting its strategic autonomy by tackling dependencies and vulnerabilities (i.e., Critical Raw Materials Act – CRMA, Net Zero Industry Act – NZIA etc.) via regulation, yet so far lacking robust and long-term funding schemes and a focus on the upstream segments in non-OECD countries. In this sense, no apparent funding has been disbursed so far via the Global Gateway or European Investment Bank frameworks, yet some Member States like France, Italy and Germany have put in place their metals investment funds in the past years.

Both the EU and the US have accelerated the pace of engaging in multilateral and bilateral CRM partnerships since 2021. In addition, the EU's Global Gateway and the US-led Partnership for Global Infrastructure and Investment are aiming at offering an alternative to the Belt and Road Initiative. Yet, to be truly effective, such initiatives must reach both speed and scale and deliver concrete positive benefits on the ground.

At the same time, Middle Eastern countries are increasingly eyeing a strong position in the CRM value chains as they are deploying strategies to diversify revenues away from fossil fuels. In developing, resource-rich countries, the trend is towards seeking to limit raw material exports to encourage processing and manufacturing locally and retain more value-added, create jobs and generate economic opportunities.

The EU's policy and regulatory work on CRM issues has made crucial advances in the past two years, delivering a clear vision of its ambitions and needs in the light of the green and digital transition while integrating critical minerals supply chains in the overall reflections around strategic autonomy and energy security. Nevertheless, so far, few concrete impacts are noticeable outside its borders, in the absence of substantial engagement on financing projects abroad, while other players like the US, Japan or Middle East countries are more ready to engage financially and, for some of them, potentially with fewer regards towards high ESG standards. The risk for Europe is that of missing its internal benchmarks on mining, processing and recycling due to insufficient funding, public acceptance, uncertain demand, volatile prices and unclear business cases, while also not being able to materialize its strategic CRM partnerships into a resilient and secure supply base.

Key building blocks going forward for the EU's action toward diversifying and boosting the resilience of CRM supply chains can be:

1. Attaching tangible benefits to the strategic projects selected by the EU Critical Raw Materials Board.
2. Delivering clear implementation guidelines, monitoring and verification mechanisms to enforce rules related to sustainability, circular economy and due diligence.
3. Prioritize cooperation with like-minded partners in the short term, explore midterm options, and build long-term partnerships.
4. Building partnership proposals around ecosystems of investments.
5. Ensuring a systematic follow-up on CRM partnerships and creating more concrete and agile opportunities for financing.
6. Working on convergence of transparency and sustainability criteria: include China, avoid multiplication of standards.
7. Boosting the circular economy, innovation and demand moderation.

Résumé

La demande de matières premières critiques devant, au minimum, doubler d'ici 2030 dans le contexte des politiques actuelles de transition énergétique, la concentration des approvisionnements en matières premières critiques (MPC) – et plus encore, des capacités de raffinage – dans une poignée de pays est devenue l'une des questions fondamentales au sein des discussions internationales, bilatérales et nationales. La position dominante de la Chine et les contrôles successifs des exportations de MPC (récemment le germanium, le gallium, les technologies de traitement des terres rares, l'antimoine) indiquent une tendance à l'instrumentalisation des dépendances critiques. La sécurité nationale, l'autonomie stratégique et l'amélioration de la gouvernance et de la durabilité des approvisionnements en MPC sont les principaux moteurs de la réorganisation des chaînes d'approvisionnement dans les pays de l'Organisation de coopération et de développement économiques (OCDE) qui dépendent des importations.

Ces gouvernements ont adopté un large éventail de politiques, avec des objectifs, des calendriers de mise en œuvre et des impacts différents. L'Union européenne (UE) a sérieusement commencé à aborder ces questions en 2023 par le biais d'une législation, le *Critical Raw Material Act*, certains États membres comme la France ayant déjà soulevé l'importance du sujet quelques années auparavant. Les États-Unis, sous la présidence Trump, ont ouvert la marche en 2017 avec l'*Executive Order 13817* qui a été suivi par la publication d'une liste de 35 minéraux critiques en 2018, tandis que l'administration Biden a intensifié l'action des États-Unis sur la diversification de l'approvisionnement en MPC. Le Japon a été un pionnier en 2010.

L'UE et les États-Unis développent des boîtes à outils assez similaires pour promouvoir la diversification, mais des différences substantielles demeurent. Les États-Unis s'appuient davantage sur la sécurité nationale (par exemple, les règles relatives aux entités étrangères préoccupantes) et déploient des outils de financement conséquents pour les industries minières et de raffinage au niveau national, mais aussi dans les pays partenaires, notamment avec 412 millions de dollars de prêts et d'investissements en capital déjà déployés par l'intermédiaire de la DFC pour de nouveaux approvisionnements en provenance des marchés émergents. Dans le cadre du *Green Deal*, l'UE se concentre sur la durabilité (règlement de l'UE sur les batteries, directive sur le reporting de durabilité des entreprises, directive sur le devoir de vigilance des entreprises en matière de durabilité, etc.) et sur le renforcement de son autonomie stratégique en s'attaquant aux dépendances et aux vulnérabilités par le biais de la réglementation (*Critical Raw Material Act*, *Net Zero Industry Act*, etc.), mais jusqu'à présent sans mécanismes de

financement assez solides et de long terme, et avec une attention insuffisante portée sur les segments en amont dans les pays non-membres de l'OCDE. En ce sens, aucun financement apparent n'a été déboursé jusqu'à présent dans le cadre du *Global Gateway* ou de la Banque européenne d'investissement (BEI), cependant certains États membres comme la France, l'Italie et l'Allemagne ont mis en place leurs fonds d'investissement dans le secteur des métaux durant ces dernières années.

L'UE et les États-Unis ont tous deux accéléré le rythme de leurs partenariats multilatéraux et bilatéraux dans le domaine de MPC depuis 2021. De plus, le *Global Gateway* européen et le *Partnership for Global Infrastructure and Investment* mené par les États-Unis visent à offrir une alternative à la *Belt and Road Initiative* chinoise. Cependant, pour être vraiment efficaces, ces initiatives doivent être rapides et d'envergure, et apporter des avantages concrets aux parties prenantes sur le terrain, notamment aux populations.

Dans le même temps, les pays du Moyen-Orient cherchent de plus en plus à occuper une position forte dans les chaînes de valeur des MPC, car ils déploient des stratégies visant à diversifier leurs revenus en s'éloignant des combustibles fossiles. Dans les pays en développement riches en ressources, la tendance est à la limitation des exportations de matières premières afin d'encourager leur transformation au niveau local, et ainsi de conserver davantage de valeur ajoutée, créer des emplois et générer des profits.

Le travail politique et réglementaire de l'UE sur les questions de gestion des matériaux critiques a fait d'importants progrès au cours des deux dernières années, offrant une vision claire de ses ambitions et de ses besoins dans le cadre de la transition verte et numérique, tout en intégrant les chaînes d'approvisionnement en minéraux critiques dans les réflexions globales autour de l'autonomie stratégique et de la sécurité énergétique. Néanmoins, jusqu'à présent, peu d'impacts concrets sont perceptibles en dehors de ses frontières en l'absence d'un engagement substantiel dans le financement de projets à l'étranger, alors que d'autres acteurs comme les États-Unis, le Japon ou les pays du Moyen-Orient sont plus disposés à s'engager financièrement et, pour certains d'entre eux, potentiellement avec moins d'égards pour les normes environnementales, sociales et de gouvernance (ESG). Le risque pour l'Europe est de ne pas atteindre ses objectifs internes en matière d'extraction, de traitement et de recyclage à cause d'un financement insuffisant, de l'acceptation du public, d'une demande incertaine, de prix volatils et d'analyses de rentabilité peu claires, tout en ne parvenant pas à concrétiser ses partenariats stratégiques en matière de MPC en une base d'approvisionnement résiliente et sûre.

Les éléments clés de l'action de l'UE visant à diversifier et à renforcer la résilience des chaînes d'approvisionnement en MPC pourraient être les suivants :

1. Attribuer des avantages tangibles aux projets stratégiques sélectionnés par le *Critical Raw Materials Board* de l'UE.
2. Fournir des lignes directrices claires pour la mise en œuvre et des mécanismes de suivi et de vérification pour assurer le respect du cadre législatif européen relatif à la durabilité, à l'économie circulaire et à la diligence raisonnable.
3. Donner la priorité dans le court terme à la coopération avec des Etats partageant les mêmes idées, explorer les options possibles à moyen terme, tout en renforçant les partenariats de long terme.
4. Élaborer des propositions de partenariat autour des écosystèmes d'investissement.
5. Assurer un suivi systématique des partenariats stratégiques sur les matières premières critiques et créer des opportunités de financement plus concrètes et agiles.
6. Travailler à la convergence des critères de transparence et de durabilité : inclure la Chine, éviter la multiplication des normes.
7. Stimuler l'économie circulaire, l'innovation et la modération de la demande.

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Introduction

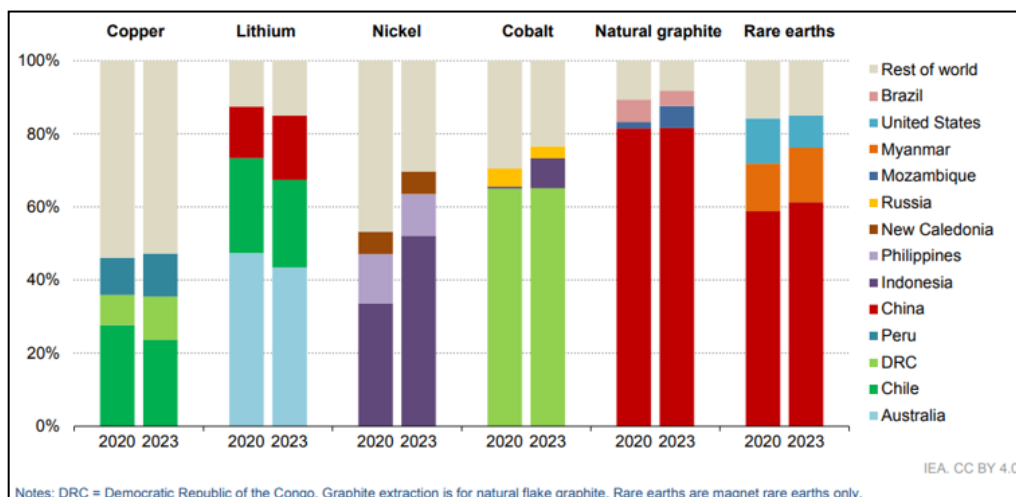
Critical raw materials (CRM) have entered the kingdom of mainstream policy discussions as, in the context of the energy and digital transformations, the stability and sustainability of their supply pose crucial political, social and economic challenges, requiring dedicated policies and action at the most strategic level. As predicted in our previous papers,¹ the world is entering a “metallic era” where the cost and availability of clean technologies for electricity generation, decarbonized mobility and low-carbon industrial production depend increasingly on the prices and availability of critical minerals in a refined form, such as copper, lithium, graphite, nickel, cobalt and rare earths elements (REE).

According to the International Energy Agency (IEA),² CRM demand for clean technologies is set to double by 2030 in the current policy settings and almost triple and quadruple by 2040 in a net-zero scenario (NZE), while their market value is set to grow from 325 billion dollars (bn\$) today to 770 bn\$ by 2040 in the NZE scenario. Despite the fall in CRM prices in 2023, investments in CRM supply are still growing (+10% in 2023), though at a slower pace (compared to +30% in 2022 vs. 2021). Exploration spending continues to increase (+15%), especially for lithium. Yet these trends do not seem to translate so far into a considerable diversification of supply sources, and overall investment remains subdued, not least hampered by higher interest rates, political risks, price volatility and demand uncertainties. Mining projects that could support diversification face slow development and are the first to be threatened by price volatility. New diversified supplies are often then concentrated again in the refinery segment. In the CRM refining sector, the share of the largest three producing countries has increased since 2020 and is expected to remain so in the IEA’s analysis: by 2030, 70-75% of the growth in refined lithium, nickel, cobalt and REE will originate in the existing top three producer countries and for battery-grade and synthetic graphite the number goes up to 95%.

1. V. Donnen, “Vers une ère métallisée : renforcer la résilience des industries par un mécanisme de stockage stratégique de métaux rares”, *Notes de l’Ifri*, Mai 2022

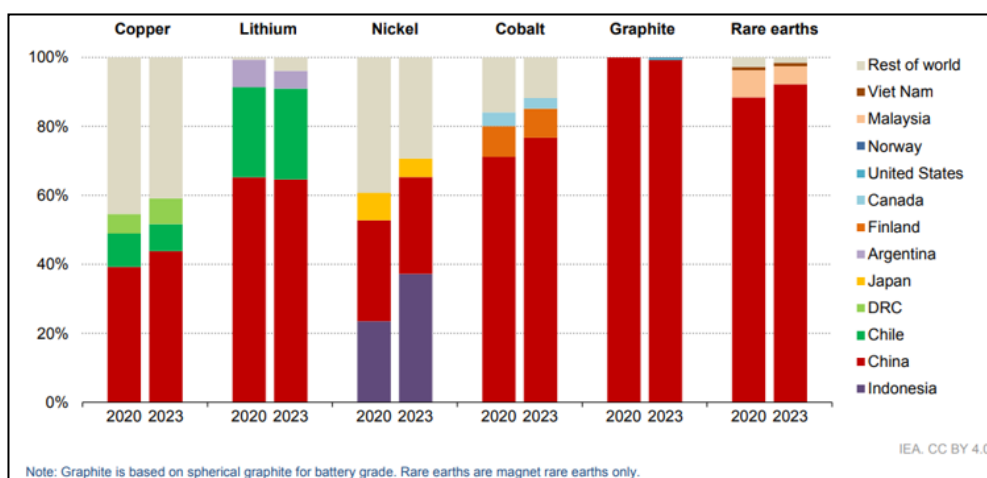
2. IEA, “Global Critical Minerals Outlook 2024”, Report, May 2024, available at: [iea.org](https://www.iea.org/publications/reports/global-critical-minerals-outlook-2024).

Figure 1. Share of mined or raw material production by country



Source: IEA, "Critical Minerals Outlook 2024".

Figure 2. Share of refined material production by country



Source: IEA, "Critical Minerals Outlook 2024".

The concentration of CRM supplies and, even more, of refining capacities, namely in China, as illustrated in the figures above, has now become one of the paramount issues in international, bilateral and national discussions, for several reasons.

First, this increases the vulnerability of supply chains and the risk of disruptions due to political decisions (e.g. export restrictions on CRM have multiplied by more than 5 times between 2010 and 2020,³ with Chinese export controls now in place for germanium, gallium, rare earth processing technologies and technology for permanent magnets production, graphite, antimony and more expected) or natural happenings with economic

3. OECD, "Raw Materials Critical for the Green Transition", *OECD Trade Policy Paper*, No. 269, April 2023.

consequences (e.g., COVID-19 crisis and the closure of Chinese ports and economy). These already impact available supplies and prices, which are going up for germanium and gallium, for example, which, on the one hand, is positive to trigger investments in alternatives but masks China's ability to decisively impact price volatility and, hence, business cases.

Second, such a concentration means unequal distribution of benefits among regions despite resource potential: for instance, according to the IEA, about 50% of the market value of refined materials is expected to be concentrated in China, which could further limit the producer countries potential to climb up the value chain and capture more value from their resources.

Thirdly, this market concentration comes with an increasingly well-documented climate, environmental and social impact on local communities and the sustainability of the energy transition. Indonesia is a case in point:⁴ the country has managed to become the world's largest nickel producer within just a few years, as its share in global nickel extraction grew from 5% in 2015 to 50% in 2023, yet this production is based on highly carbon-intensive energy (87% of the installed electricity generation is based on fossil fuels), while driving deforestation,⁵ sea pollution due to mining tailing disposals and human rights concerns (ex. Expropriations, etc.). While Europe has today the lowest carbon intensity of the electricity mix,⁶ even ahead of the United States (US), it represents only a small fraction of the global CRM production volumes: i.e., European Union (EU) represents only 2% of raw materials and 4% of processed materials needed for Li-ion battery production (EU lacks namely lithium and graphite refining capacity, but has a stronger position in cobalt refining with 8% of global capacity in 2020 and in battery-grade nickel refining with 10% of global capacity in 2021).⁷ According to CRM markets analysts⁸, when measuring the EU's performance against the Critical Raw Materials Act (CRMA) benchmarks, the EU is currently on track to meet the 10% threshold for lithium and nickel mining coming from domestic sources by 2030 but is expected to fall below the 40% benchmark for domestic processing for key battery materials, as well as below the 25% target for recycling (with nickel expected to reach the highest share, at about 9%). Nevertheless, currently planned projects in the EU, if realized, could put the EU on track to reach most of its benchmarks according to industry projections,⁹ albeit more mining projects would still be needed

4. T. Michel, "The Prospects of Indonesia's Nickel Boom Amidst a Systemic Challenge from Coal", *Ifri Papers*, Ifri, May 2024

5. See more at: <https://carbon-pulse.com>.

6. IEA, "Global Critical Minerals Outlook 2024", *op. cit.*

7. JRC, "Supply Chain Analysis and Material Demand Forecast in Strategic Technologies and Sectors in the EU – A Foresight Study", March 2023.

8. Benchmark Minerals Intelligence, "EU Forecast to Fall Short of 2030 CRMA Targets Without Ambitious Action", July 2024, available at: source.benchmarkminerals.com.

9. Eurometaux, "Raw Materials 2030: A Lasting Recipe for European Resilience", available at: <https://eurometaux.eu>.

for cobalt and aluminum, more processing facilities for manganese, rare earths and a doubling down on recycling of all critical materials. High energy prices and lack of concrete funding schemes for CRM projects across the value chain are, however, major stumbling blocks for European CRMA objectives. In addition, the EU will need to be able to count on diversified external partners, while supporting solutions to lower the emissions-intensity of mining and refining operations in third countries.

All these issues have prompted the EU and other governments to adopt a wide array of policies, with different objectives and timelines of implementation and impact. This raises the question of whether a reorganization of CRM supply chains is taking place, despite what seems today to be an entrenched situation of domination by a handful of supplier countries and China as a processing behemoth.

In the current new era of protectionism and various trade restrictions, and of geopolitical confrontation, the question is: where are these efforts going and is a reshaping of CRM supply chains taking place?

This paper aims to contribute to the debate by examining underlying forces and policies implemented by key players that may lead to a reconfiguration of supply chains.

National security, strategic autonomy and sustainability – the driving forces reshaping CRM value chains

Geopolitics and geoeconomics are at play in reshaping CRM markets. Major economic powerhouses aim to lower their dependency on China via a growing array of instruments, middle powers want to secure new markets and diversify their revenues and developing resource-rich countries try to leverage their central role to industrialize and diversify partners.

Since the COVID-19 crisis and the war in Ukraine (a case in point for the weaponization of strategic dependencies by Russia), G7 governments have progressively de facto broadened the concept of national security to include the security of strategic supply chains, comprising those related to CRM supplies. This evolution is portrayed by the US's Foreign Entity of Concern rules, which partly determine the eligibility to get access to Inflation Reduction Act EV tax credits related to battery components and raw materials origin. It is also apparent in Canada's move¹⁰ to demand from three Chinese players (Sinomine, Chengze Lithium and Zangge Mining Investment) to divest from Canadian companies active in the CRM value chains, on national security grounds. Looking at the US, the de-facto strategy of limiting the Chinese footprint in its CRM supply chains is part of a broader trend of technological de-coupling, which could be further reinforced in case of a Trump 2.0 presidency.

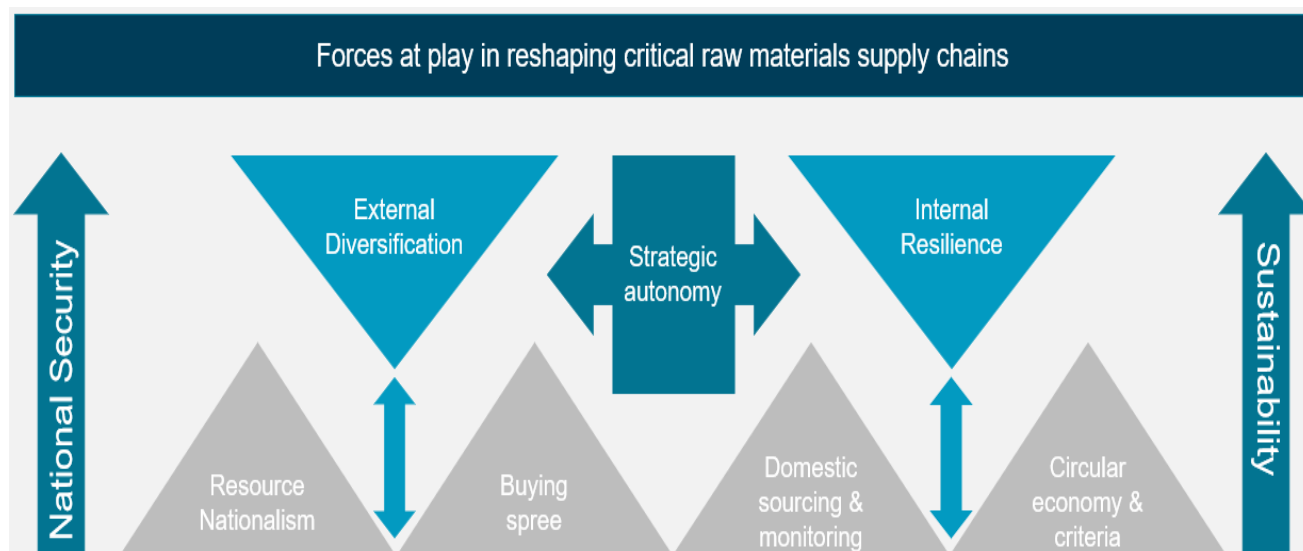
Next to a broader concept of national security, the concept of strategic autonomy has also grown central to reflections on CRM value chains. In the EU, this is understood as the EU's capacity to act in an autonomous manner in strategic policy areas, with an increased focus on de-risking supply chains from vulnerabilities. This has led to policy measures in the EU aimed at reinforcing resilience at home (ex., benchmarks on CRM extraction, processing, recycling; stress tests etc.) and diversifying partnerships abroad (ex., Strategic Partnerships on Sustainable Raw Materials Value Chains).

The corollary of the drive for diversification of supplies in Western resource-consumer countries is the enlargement of the panoply of actors in the CRM value chains. From this point of view, major trends are resource nationalism motivated by the objective of resource-rich countries climbing

10. D. Sevastopulo and E. White, "Canada Orders Companies to Divest Stakes in Lithium Mines", *Financial Times*, November 2022, available at: www.ft.com.

up the value chain and a buying spree of certain cash-rich countries looking to diversify their economies away from fossil fuel revenues.

Figure 3. Forces at play in reshaping the critical raw materials supply chains over the long term



Source: Author, Ifri.

Finally, given the increased evidence of negative impacts of mining and processing activities, the scrutiny on the environmental and social sustainability of transition minerals has increased. The EU is chiefly leading the push for better corporate due diligence and extra-financial reporting, but also establishing thresholds for CO₂ content in batteries and measures to encourage circular economy deployment, including through setting recycling and reincorporation targets on battery minerals. Among the producer countries, the push to focus on sustainability can be both a matter of survival (ex., Australia's nickel industry struggling to compete with Indonesian nickel) and of being able to scale up production by securing public acceptability. Whereas the London Metal Exchange is cooperating with Metalshub to allow market participants to specify metals attributes in terms of ESG criteria and carbon intensity,¹¹ overall no "green premium" scheme has emerged so far, partly due to the difficulty of defining "green" metals (impact on market liquidity), the uncertainty over how regulations will be implemented and verified (impacting demand for such minerals as well as supplies), constraints on competitiveness of final products or volatility of CRM prices. There is still a long road before ESG+ materials could be sufficiently liquid and in high demand and supply to become a proper index, possibly trading with a premium.

11. London Metal Exchange, Metalshub collaboration, available at: www.lme.com.

A widening toolbox for attempting to re-route CRM supply chains

Japan stands out as a pioneer when it comes to attempting to reduce its dependence on Chinese critical minerals supply, following the 2010 temporary Chinese ban on exports of rare earth minerals to Japan. Its strategy is based on several pillars, including recycling rare earths, developing and acquiring interests in mines abroad and, notably, the capacity to stockpile rare metals via the Japan Organization for Metals and Energy Security (JOGMEC), which is seen as a one-stop shop for Japan's efforts to diversify mineral supply chains.¹² South Korea has also stepped up its action on critical raw materials in the past few years, namely by creating the Korea Mine Rehabilitation and Mineral Resources Corporation (KOMIR) to invest in derisking projects abroad, by expanding its stockpiling from a duration of 54 days to 100 days of demand, increasing recycling capacities and establishing early warning system for supply chain risks, as well as partnerships with some resource-rich countries (ex., Australia, Canada, Indonesia...).¹³

Against the goal of securing their CRM value chains in an increasingly brutal and disrupted world, both the EU and the US have started placing intensive focus on boosting domestic supply (extraction, processing, recycling, manufacturing) and diversifying their foreign sources of supply and partnerships, yet with different tools and probable success rates. The US, through tools like the IRA or the Infrastructure, the Investment and Jobs Act, or the Defense Production Act, is mobilizing important amounts of public funding for the mining and processing industries in the US and abroad, which has already led to a boost in the number of projects seeking funding. Yet the concretization of these projects in the US is challenged by permitting procedures, risks of litigation and public acceptance, lack of a united domestic approach and complex interlinkages between the rights at federal, state and local levels.¹⁴ Conversely, the EU, through its Critical Raw Materials Act, has managed to create a comprehensive European framework, with clear

12. N. Seth, "How to Diversify Mineral Supply Chains – A Japanese Agency Has Lessons for All", New Security Beat, August 2024, available at: www.newsecuritybeat.org.

13. J. Bowen, "The Raw Materials of Economic Security: South Korea's Evolving Energy and Critical Minerals Policies in an Era of Disruption", Korea Economic Institute of America, January 2024, available at: <https://keia.org>.

14. R. Deberdt, "The United States Strategy for Securing Critical Minerals Supplies: Can It Meet the Needs of the IRA?", *Ifri Memos*, Ifri, April 9, 2024.

domestic supply benchmarks, pushing for a streamlining of permitting procedures, for better coordination (risk preparedness, strategic stocks, monitoring), giving a positive political signal to the industries, but lacking concrete funding tools to support projects. The lack of clarity on the tangible benefits for the EU projects designated as “strategic” under the CRMA is further deepening the attractiveness gap with the US, which, beyond OPEX and CAPEX support, has also lower energy prices – a crucial advantage for low-margin and high-energy use industries like mining and refining.

When it comes to diversifying external supplies, unlike the EU, it can be noted that the US is able to use its international development arm, the Development Finance Corporation, to provide funding to projects in the critical minerals field in low and lower-middle income countries, and the Defense Production Act to support projects in Canada (considered as “domestic source”) and potentially, in the future, in Australia.¹⁵ Based on DFC’s database of active projects,¹⁶ it currently supports 7 projects in the field of metals mining and refining (namely graphite, rare earths, nickel, cobalt, and bauxite), for a total of 412m\$ of loans and equity investments in countries like South Africa, Mozambique, Rwanda, Tanzania, Guinea and Brazil, while 250 million euros (m€) of funding is expected to be channeled via the Africa Finance Corporation to the development of the Lobito Corridor.¹⁷ In addition, US EXIM, the export credit agency of the US, is also involved in facilitating US action abroad in this area.¹⁸ The Global Gateway initiative, with a 300 bn€ investment ambition, including 150 bn€ for Africa, could help substantiate the EU’s strategic partnerships on CRM from the point of view of funding and investments and partially replicate the US’ action via its DFC. Nevertheless, as already pointed out in our previous analysis,¹⁹ no CRM directly related projects have been so far financed via the Global Gateway, and the EIB has been reluctant to engage in financing for the mining and refining industry outside Europe given ESG concerns. Some signs of change are emerging with EBRD getting involved in supporting junior mining companies, and individual countries like France, Italy and Germany creating their own metals funds.

More broadly, the EU and the US are increasingly cooperating towards building dedicated forums of discussion and action: for instance, the EU dropped its initiative of creating a CRM Club and instead became part of the Mineral Security Partnership initiated by the US, where it pushed for adding a complimentary and more inclusive instance, the Mineral Security

15. J. Majkut *et al.*, “Building Larger and More Diverse Supply Chains for Energy Minerals”, CSIS, July 19, 2023, available at: www.csis.org.

16. Available at: www.dfc.gov.

17. DFC, “DFC Announces New US Financing for Africa’s Lobito Corridor”, February 2024, available at: www.dfc.gov.

18. EXIM, “EXIM Support for Critical Minerals Transactions”, available at: www.exim.gov.

19. D.-P. Gherasim, “Global Gateway: Towards a European External Climate Security Strategy?”, *Ifri Memos*, Ifri, April 11 2024.

Partnership Forum (MSP Forum), comprising also developing resource-rich countries.

Table 1. Qualitative assessment of key CRM strategies and policies in the EU and US and their expected impact

Country	Existing key strategy & policies	Expected Impact	
USA	Boosting domestic supply & processing & manufacturing through financial incentives: IRA Qualifying Advanced Energy Credit Program; IRA Advanced Manufacturing Production Credit, IRA EV Tax Credit requirements (battery component origin criteria and raw materials origin criteria as of 2024, with ramp up to 100% respectively 80% by 2029), IJA grants (7.9 bn\$ for battery manufacturing, recycling, CRM supply), Defense Production Act (classification of Canada as a "domestic source", potentially Australia also in the future), DOE Loan Program Office	Boosted activity in domestic extractive and processing sectors (i.e. n° of applications) but difficulties: permitting, litigation, bureaucracy	7
	Systematically pushing out China on national and economic security grounds: Foreign Entity of Concern (entity owned by, controlled by, or subject to the jurisdiction or direction of a government of a covered nation - Iran, China, Russia, North Korea) rule: as of 2025, an EV containing battery components manufactured or assembled by a FEOC, or CRM extracted / processed / recycled by FEOC will be ineligible to IRA EV tax credit	- Short term: supply difficulties for EVs - Long term: Push for Chinese actors to divest & favoring other cash-rich investors	11
	Diversification of supplies and partnerships: International Development Finance Corporation (support restricted to projects in low and lower-middle income countries), Partnership for Global Infrastructure and Investment (ambition to mobilize 600bn\$, including for supply chains), Mineral Security Partnership, Supply Chain Ministerial Forum, Indo-Pacific Economic Framework for Prosperity, bilateral MoUs with producer countries (Tanzania, DRC, Zambia), CRM Agreement with Japan (another under negotiation with EU), US-EU Trade and Technology Council (WG3 on Secure Supply Chains)	- Political signaling to developing countries via indirect capital mobilization - Reinforced ties with close allies (Canada, Australia, Chile, Peru, Japan)	4
EU	Boosting domestic supply and monitoring: Critical Raw Material Act (CRMA) - benchmarks (10% extraction, 40% EU processing capacity of EU's annual strategic raw materials (SRM) consumption, exploration programs, streamlining permitting (duration, one stop shop), facilitate and coordinate funding (via the EU CRM Board); stress tests, risk preparedness, reporting and coordination of strategic stocks	Good political signal, boosting awareness, exploration. Realization of projects depends on funding, volatility public acceptance, energy supplies	4
	Improving circular economy: CRMA - recycling benchmark of 25% of EU's annual SRM consumption, recovery of CRM from extractive waste, increasing collection of e-waste, improving recyclability and recycling of permanent magnets. Batteries Regulation – collection of EV batteries, recycled content minimum percentages (i.e. as of August 2031 16% cobalt, 6% lithium, 6% nickel; ramp-up in 2036), targets on recycling efficiency (by end 2025, 65% of lithium batteries, by end 2027, 70%), targets on recovery of materials (by end 2027, 90% for cobalt, copper, nickel, lead and 50% for lithium)	Short-term: boosting business case for setting up recycling facilities & expertise Long-term: After 2040, key supply source for batteries if potential realized.	8
	Diversification of imports and raw materials diplomacy: CRMA - by 2030, no third country to provide more than 65% of EU's annual consumption of each SRM (at any relevant stage of processing); bilateral Strategic Partnerships between EU and third countries (so far with: Argentina, Australia, Canada, Chile, DRC, Greenland, Kazakhstan, Namibia, Norway, Rwanda, Ukraine, Zambia); multilateral cooperation (Mineral Security Partnership)	Emergence of a CRM diplomacy, but effectiveness challenged in absence of funding / investment and coherence with other external actions.	3
	Improving sustainability performance: CSDDD (due diligence on human rights & environmental impacts of own operations and suppliers), Batteries Regulation (requirement for a battery due diligence policy on CRM establishing chain of custody; carbon footprint declaration as of 2025, carbon footprint performance classes as of 2026, maximum life cycle CO2 footprint threshold as of 2028); CRMA (environmental footprint declaration); Strategic partnerships (provisions on sustainable and responsible production: due diligence, traceability, fight illegal trafficking of raw materials, alignment with ESG standards)	Restricting market access to CRM products with high carbon footprint. Pushing for creation of new markets for sustainable CRM & products. Improving practices in existing mines.	11
Legend		Political signal needing follow-up actions Substantial mid / long-term impact with some immediate effects (Nearly) Immediate impact with short & long-term business implications	
		1 2 3 4 5 6 7 8 9 10 11 12	

Source: Author, Ifri.

At the same time, the EU is rapidly deploying a series of bilateral agreements on CRM with producer countries, independent of any multilateral initiatives, which could act as a security net in case of a collapse of multilateral cooperation (for instance, a Trump 2.0 presidency taking an

isolationist turn against the EU). In parallel, the US has anchored the issue of supply chain resilience in forums where the EU is not directly part of, for instance, the Indo-Pacific Economic Framework for Prosperity, launched in 2022, which includes actions such as an early warning mechanism on supply chain disruptions, developing logistics and storage for critical goods, which are also topics of discussion in the QUAD format (bringing together the US, Japan, Australia and India). Finally, the EU and the US have not managed to conclude negotiations on the bilateral CRM Agreement, launched in July 2023, due to different views on the interpretation of national security exceptions, the scope of the materials included and notifications requirements regarding specific investments.²⁰

20. M. Szczepanski, “EU-US Critical Minerals Agreement: Building Stronger Supply Chains Together”, EPRS, November 2023, available at: www.europarl.europa.eu.

Multiplication of bilateral and multilateral cooperation formats on CRM supply chains led by the EU and the US

The table below gives an overview of the key bilateral and multilateral cooperation formats created namely by the EU and the US, going from broader approaches such as the overall issue of economic security and overall supply chain resiliency, towards ones more targeted on critical raw materials. While most of these formats are in the early stages and hence their effectiveness is difficult to gauge, namely in terms of their ability to de-risk investment and develop processing and manufacturing capacities away from China in the next years, they have the potential to enhance transparency, information sharing and resource mobilization on critical projects provided that political leadership and implementation work are continued.

In the case of the EU, while CRM Strategic Partnerships are a positive signal, there is a need for sustained follow-up actions, tools for coordination and investment, speedy work on the implementation of EU due diligence policies in order also to facilitate the task for downstream companies to better match the requirements related to transparency and corporate responsibility. It is worth noting that not all EU CRM Partnerships are created equal: albeit there is a common base to them all (integration of supply chains, ESG standards, capacity building and training, research and innovation), some of them seem to go much further in terms of depth of cooperation (namely with countries in the neighborhood, like Norway and Serbia) and of the broadness of scope (ex., Namibia and Kazakhstan included also renewable H₂ production). In addition, the need for creating local value added and participating in the industrialization and diversification of economies is a common thread among agreements signed with developing countries.

Other multilateral initiatives exist beyond the ones listed in the table below, namely the Critical Energy Transition Minerals' Panel²¹ launched by the United Nations in April 2024 in order to develop principles for a fair and transparent approach to CRM value chains, contributing to a fairer distribution of benefits and a just transition to a clean economy. Among other initiatives can be noted the Global Council for Responsible

21. United Nations, "Critical Energy Transition Minerals' Panel", April 2024, available at: www.un.org.

Transition Metals²² (an initiative of the Paris Peace Forum) and the Council for Critical Minerals Development in the Global South (created by Sustainable Energy for all, UC Davis, Swaniti Global). The OECD is also recognized as an established and trusted actor in the field of governance of CRM value chains, with standards such as the Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas being integrated in regulations across the world, and its annual OECD Forum on Responsible Mineral Supply Chains being attended by actors across the board.

Table 2. EU and US-led partnerships related to CRM supply chains (non-exhaustive)

Format	Membership	Scope	Results
Minerals Security Partnership (MSP) (launched at the initiative of the US, in June 2022) Mineral Security Forum (launched in April 2024, at the initiative of the EU, co-led by the EU and the US)	15 Members: Australia, Canada, Estonia, Finland, France, Germany, India, Italy, Japan, Norway, South Korea, Sweden, UK, US, EU Non-MSP members MSP Ministerial (Sept. 2022): Argentina, Brazil, Democratic Republic of Congo (DRC), Mongolia, Mozambique, Namibia, Tanzania, Zambia Convening on MSP ESG Principles (Febr. 2023): Angola, Botswana, DRC, South Africa, Tanzania, Uganda, Zambia MSP Forum: MSP members, Kazakhstan, Namibia, Ukraine, Uzbekistan	MSP objectives: - Diversifying and stabilizing global supply chains - Investment in supply chains - Promotion of high ESG standards in mining, processing, recycling - Increasing the recycling of critical minerals MSP Forum work strands: - Project group on supporting and accelerating the implementation of sustainable CRM projects - Policy dialogue on policies for boosting sustainable production and local capacities, regulatory cooperation on fair competition, transparency, predictability, promotion of high ESG standards	- Evolution towards a more inclusive setup thanks to the MSP Forum - Development of a set of MSP Principles for Responsible CRM Supply Chains ²³ - Launch of a MSP Finance Network in September 2024 among MSP countries to boost investment in sustainable CRM projects. ²⁴ - Work ongoing on 23 MSP projects: 16 in mining, 7 in processing, and 7 in recycling and recovery. CRM covered: cobalt, copper, gallium, germanium, graphite, lithium, manganese, nickel, and rare earth elements. Geographical span: 6 in the Americas, 5 in Europe, 13 in Africa, and 3 in the Asia-Pacific region.
Supply Chain Ministerial Forum (US-led initiative, established in July 2022)	- Australia - Brazil - Canada - Costa Rica - DRC - EU - France - Germany - India - Indonesia - Italy - Japan - Mexico - Netherlands - South Korea - Singapore - Spain	- Broader scope and more diverse membership than the MSP, aiming to include “historically underrepresented voices in the efforts to ensure strong supply chains” - Objective to reduce and end near-term supply chain disruptions and to cooperate to build long-term supply chain resiliency - Key principles: transparency (early warning systems about supply challenges), diversification (along with increasing infrastructure capacities), security, sustainability (labor rights, responsible corporate practices...)	- Political signaling to countries in South-East Asia and Latin America

22. Paris Peace Forum, “Launch of the Global Council for Responsible Transition Minerals”, November 2023, available at: <https://parispeaceforum.org>.

23. Minerals Security Partnership (MSP), “Principles for Responsible Critical Mineral Supply Chains”, available at: www.state.gov.

24. US Department of State, “Joint Statement on Establishment of the Minerals Security Partnership Finance Network”, September 2024, available at: www.state.gov.

	- UK - US		
Indo-Pacific Framework for Prosperity – IPEF (launched in May 2022, US led)	- Australia - Brunei - India - Indonesia - Japan - South Korea - Malaysia - New Zealand - Philippines - Singapore - Thailand - US - Vietnam	- Broad focus on making supply chains more resilient: better anticipate and prevent disruptions in supply chains, establish an early warning mechanism, mapping critical mineral supply chains, improve traceability, and coordinate diversification efforts. - Four key pillars: 1. Connected Economy (race to the top for workers through trade) 2. Resilient Economy (supply chains) 3. Clean Economy (climate targets - RES, EE, carbon removal, methane emissions) 4. Fair economy (effective tax, anti-money laundering, anti-bribery regimes)	- 14th November 2023 - signature of IPEF Supply Chain Agreement establishing an IPEF Supply Chain Council, IPEF Supply Chain Crisis Response Network, shared understanding of global supply chain risks via identification of critical sectors and goods, monitoring - 16 November 2023: Australia PM & IPEF Leaders announced the establishment of an IPEF Critical Minerals Dialogue, to strengthen regional CRM supply chains
Partnership for Global Infrastructure and Investment (launched in June 2022, G7 initiative)	G7 countries	- A de-facto alternative to China's Belt & Road Initiative, with a focus on values-based infrastructure development - Target: mobilize 600 bn\$ by 2027 for infrastructure investments in developing countries - Investment priorities: climate change & energy crisis; supply chain resilience; connectivity via digital and transport networks; sustainable health system; gender equality and equity.	- US claims to have mobilized 60 bn\$ since 2022, out of the 200 bn\$ objective for 2027²⁵ - Several of EU's Global Gateway projects are listed under PGI (ex., EU-Namibia Partnership on Sustainable Raw Materials and Renewable Hydrogen) - September 2023: announcement²⁶ of an India-Middle East-Europe Economic Corridor and EU-US collaboration on the expansion of the Lobito Corridor
US-EU Trade and Technology Council (launched in 2021)	- US - EU	- Broader forum of discussion to coordinate global trade, economic and technology issues between the US and the EU - WG 3 "Secure Supply Chains"	- Joint statement (5 Dec. 2022) recognizing the disruption risk posed by the concentration of resources and entering an administrative arrangement to implement an early warning system to address semiconductor supply chain disruptions.
MoU US EXIM – Tanzania (May 2023)	- US - Tanzania	- US EXIM to facilitate up to 500 m\$ in US export financing to Tanzania (infrastructure, transportation, digital, climate & energy security, power generation) - Facilitation of a strategic partnership between TechMet (US investment in TechMet via DFC) and Life Zone Metals (opening a processing facility for low-emission nickel in Tanzania)	- LifeZone Metals received the permit from the Tanzanian government for developing a processing plant for nickel, copper, cobalt.
MoU US-DRC-Zambia on new supply chain for	- US - Zambia - DRC	- Facilitate the development of an integrated value chain for the production of EV batteries in DRC and Zambia, ranging from raw materials extraction to processing, manufacturing and assembly.	- No clear follow-up

25. White House, "Fact Sheet: Partnership for Global Infrastructure and Investment at the G7 Summit", June 2024, available at: www.whitehouse.gov.

26. White House, "Fact Sheet: President Biden and Prime Minister Modi Host Leaders on the Partnership for Global Infrastructure and Investment", September 2023, available at: www.whitehouse.gov.

EV batteries (December 2022)		- Promotion of the DRC-Zambia EV Battery Initiative within the US private and investment sector - Supporting the construction of precursor plants in DRC and Zambia	
US-Japan Critical Minerals Agreement (March 2023)	- US - Japan	- Commitment not to restrict the import/export of CRM or impose export duties - Consult on potential domestic measures to address non-market policies of countries that affect CRM supply chains - Exchange best practices on the review of foreign investments in critical minerals sectors - Promote market-oriented conditions and competition - Work on international standards on labeling and recycling, improving domestic environmental protection laws for CRM, ensuring responsible sourcing - Evaluate the environmental impact of CRM projects, promoting circular economy - Enforcement actions relating to labor rights in CRM extraction and processing; collaborate to discourage the imports of goods containing CRM produced via forced labor.	- Issue of CMA being an executive agreement in the US, hence it can be terminated in 90 days of written notice, hence insufficiently stable framework for private sector
EU - Canada Strategic Partnership on Raw Materials (SPCRM) (June 2021)	- EU - Canada	- Three key objectives: 1. Integration of EU-Canada raw materials value chains 2. Collaboration on science, technology, innovation 3. Collaboration on ESG criteria and standards	No clear follow-up, yet Canada took several steps at national level, for instance: - Refundable tax credit equal to 30% of the cost of investments in new machinery and equipment used to manufacture or process key clean technologies, and extract, process, or recycle key critical minerals (estimated total budget 2024-2034 of 11.1 bn\$) - 2024 review of the Critical Minerals list, to add phosphorus (needed for LFP batteries), silicon metal, high-purity iron
EU – Ukraine SPCRM (July 2021)	- EU - Ukraine	- Three workstreams: 1. Harmonization of UA and EU regulatory mining frameworks and application of sustainable mining principles 2. Integration of CRM and battery value chains via JV and business opportunities 3. Closer collaboration in R&I using Horizon Europe and other EU programs related to raw materials and batteries	List of initial actions: - Low carbon strategy and a roadmap to decarbonize CRM mining, extraction and processing in UA - Strengthen sustainable and responsible sourcing - Digitalize and strengthen data management of UA mineral resources/reserves - Use of Earth-observation programs, remote sensing for resource exploration, operations, post-closure environmental management - JV projects for EU & UA industrial & investment actors Follow-up results: - EU allocated 750 000€ for technical assistance to support

			capacity building in CRM and batteries - November 2022: MoU between EBRD and the UA Geological Survey aimed to facilitate the modernization of geodata management
EU - Kazakhstan SPCRM (Nov. 2022)	- EU - Kazakhstan	- Scope going beyond CRM: 1. Developing a secure and sustainable supply of raw materials and refined materials 2. Renewable H2 development 3. Battery value chains to boost the green and digital transformation of both economies	May 2023 – Actions Roadmap announced: - Modernization and decarbonization of Kazakh mining industry - Technology transfer, support RES development - Integration of EU-Kazakhstan value chains - Joint investment projects - Cooperation on geological exploration, research and innovation - Skills, capacity building using EU Horizon Europe & other instruments
EU- Namibia Strategic Partnership on Raw Materials and Renewable Hydrogen (Nov. 2022)	- EU - Namibia	Two areas: 1. Sustainable Raw Materials Value Chains 2. Cooperation on Renewable Hydrogen Key objectives: - Integration of CRM / RES H2 value chains - Cooperation on ESG, aligning with international standards - Mobilization of funding for soft and hard infrastructure - Capacity building, training, skills development - Cooperation on R&I (mineral knowledge, circularity, H2) - Regulatory alignment: H2 definitions, standards, certification	No clear follow-up.
EU- Argentina SPCRM (June 2023)	- EU - Argentina	The standard five areas of cooperation: - Integration of sustainable raw materials value chains - Cooperation on R&I (incl. minimization of environmental and climate footprint, circular economy) - Cooperation on ESG and aligning with international standards - Deployment of hard & soft infrastructure for projects development, while minimizing their environmental and climate impact - Capacity building, training, skills Among the benefits sought is creating local value, local industrialization, quality jobs, increasing the competitiveness of Argentina's economy.	No concrete follow-up action but continued diplomatic engagement ²⁷
EU- Chile SPCRM (July 2023)	- EU - Chile	- The standard five areas of cooperation (see above) - Among the benefits pursued is the creation of local value added, economic and social development, domestic revenue mobilization, in	No clear follow-up action

27. Ministry of Foreign Affairs, International Trade and Worship, Argentine Republic, "In Brussels, Foreign Minister Mondino Ratified Argentina's Commitment to Deepening the Strategic Relationship with the EU and Its Member States", May 2024, available at: <https://cancilleria.gob.ar>.

		order to increase the competitiveness of Chile.	
EU-DRC SPCRM (Oct.2023)	- EU - DRC	- The standard five areas of cooperation	No clear follow-up action
MoU supporting the development of the Lobito Corridor	- EU - DRC - Zambia - Angola - USA - African Development Bank	- Extension of the Lobito corridor to connect the Southern part of DRC and the North-western part of Zambia to regional and global trade flows via the Port of Lobito in Angola - Focus on 3 areas: 1. Transport infrastructure investment 2. Measures to facilitate trade, economic development, transit 3. Support related sectors for inclusive and sustainable economic growth and capital investment in the long term	- January 2024: Financial Framework Partnership Agreement between EC and the African Development Group to invest in infrastructure in Africa. - February 2024: organization of the first PGI Private Sector Investment Forum in Lusaka, where US institutions made the first steps to commit 360 m\$ in loans (250m\$ for infrastructure development, 100m\$ for building the first battery grade cobalt sulfate plant in Africa; 10 m\$ for the food chain)²⁸
EU- Zambia SP CRM (Oct. 2023)	- EU - Zambia	- EU support for Zambia's ambition to develop local transformation capacities for battery minerals in cooperation with other African neighbors - Commitment to cooperate along mineral value chains to further the industrialization of Zambia - Objectives (similar to other MoUs): closer economic integration, security and sustainability of trade and investment, circular economy, alignment with ESG standards, skills, R&I	No clear follow-up action
EU-Greenland SPCRM (Nov. 2023)	- EU - Greenland	- The standard five areas of cooperation	March 2024: EC President visits to Greenland and promises to open an EU office there
EU-Rwanda SP CRM (February 2024)	- EU - Rwanda	- The standard five areas of cooperation	Signature of a CRM Investment Partnership between the European Investment Bank and Rwanda
EU-Norway Strategic Partnership on Sustainable Land-based Raw Materials and Battery Value chains (March 2024)	- EU - Norway	- Regular dialogue, with an early consultation process on key policies relevant - The standard five areas of cooperation - Support the development of InvestEU, European Raw Materials Alliance, European Battery Alliance towards becoming tools of matchmaking between project developers and investors, preliminary screening of proposals, increasing transparency and stakeholder development, de-risking, R&D financing	- A Partnership roadmap for 2024-2026 to be established, together with a dedicated WG to meet twice a year - An annual ministerial meeting to be organized. - Making use of existing formats: EU Raw Materials Supply Group, the EU Raw Materials Alliance, EU Battery Alliance
EU-Uzbekistan SP CRM (April 2024)	- EU - Uzbekistan	- Ensure a "strict implementation of the beneficiation strategy": direct benefits for citizens, quality jobs, economic diversification, prosperity - Beyond the standard five areas of cooperation, a sixth one is added on enhancing the transparency of	- A Roadmap of actions to be established, as well an WG that should meet once a year (not at ministerial level, unless mutual demand)

28. J. Anyanzwa, "US Commits \$360m to Lobito Corridor Project", February 2024, available at: www.theeastafrican.co.ke.

		measures related to investments, operations, exports, tackle distortions and disruptions.	
EU-Australia SP CRM (May 2024)	- EU - Australia	- Coordination in international fora to align international mineral pricing with ESG standards, strengthen supply chain transparency and promote market recognition for high ESG standards, strengthen opportunities for EU and Australian industrial players with strong responsible mining credentials - Three areas of cooperation: 1. Integration of sustainable raw materials value chains 2. Cooperation on R&I (ex. minerals knowledge, minimization of environmental and climate footprint) 3. Cooperation to promote high ESG criteria and policy alignment	- Establishment of a Critical and Strategic Minerals Dialogue (bilateral, if demanded by both parties, it can be at Ministerial level), of a Roadmap of actions
EU-Serbia SP CRM (July 2024)	- EU - Serbia	The standard five areas of cooperation are envisaged, with some particularities: - The development of a sustainable EV industrial ecosystem in Serbia is to be supported via this partnership - Industrial uptake of EU-Serbian innovations under Horizon Europe - Further strengthen sustainability by applying increased due diligence and traceability for the battery value chain - Further use of existing instruments (ERMA, EBA) for matchmaking, project screening, transparency, de-risking. - Participation of Serbian organizations in the European Battery Academy and European Raw Materials Academy	- Establish a Roadmap of actions, as well as a WG to monitor implementation - Regular annual meeting and ministerial level

Traditional and new players enhance their CRM strategies and actions towards more restrictions and resource nationalism

China's successive export controls on gallium and germanium (August 1st, 2023), high purity synthetic graphite and natural flake graphite (December 1st, 2023) and on REE refining technology and technology to make rare earth magnets (December 21st, 2023) and antimony (August 2024) point to a trend of progressive weaponization of critical dependencies by the country in reprisal for what it perceives as weaponization of trade by the US or the EU. This is taking place in a context where, according to IEA data, China dominates the graphite anode supply chain (accounts for more than 80% of graphite mining, more than 95% of graphite processing and anode material production) and the rare earths supply (60% of mining, around 90% of refining). In addition, China is responsible for the processing of over 50% of lithium and cobalt, produces two-thirds of the global EV production and has increased its market share across almost all the stages of the supply chain, with important over-capacities observed (cell production capacity is already two times more than what is needed for supplying its own demand).

China has also been investing in overseas mine acquisitions and has linked this strategy to its external economic and infrastructure development strategy, the Belt and Road initiative, with data showing that China reached the highest level of investment in the metals and mining sector related to the BRI, with 19.4bn\$ invested in 2023 (a +160% increase compared to 2022), resulting in 5 out of 7 lithium mines in Africa that are expected to go in production in 2027 being at least 50% owned by Chinese companies, while Chinese-owned producers in Indonesia represent 80% of the country's output. EU's Global Gateway strategy and the Partnership for Global Infrastructure and Investment (PGII) initiative led by the US are aiming at offering an alternative to the BRI, supporting infrastructure investment in developing countries while keeping up a value-added and principles-based approach, to distinguish themselves from the Chinese approach, criticized namely for its opacity, as well as negative environmental and social

impacts.²⁹ To be truly effective, such initiatives must reach both speed and scale and deliver concrete positive benefits for populations on the ground while taking an ecosystem investment approach (i.e. energy and water supply, local jobs creation etc.).³⁰

At the same time, the Middle East is increasingly eyeing a strong position in the CRM value chains. For instance, Saudi Arabia is deploying a strategy around diversifying its revenues and aims to position itself as a patient long-term investor in the CRM sector, acquiring a central role also given its strategic geopolitical position, with good ties both with developing countries and the Western world, and a massive investment potential. Saudi Arabia aims at multiplying by four its mining sector contribution to the GDP (from 17 bn\$ currently to 75 bn\$ by 2035).³¹ It has been estimated that the value of its untapped mineral resources accounts for 2.5 tr\$ based on exploration of 30% of the land.³² According to the government,³³ to encourage domestic mining, the Mining Investment Law streamlines the licensing process, the Saudi Industrial Development Fund plays its part in financing advanced exploration and mining projects, also providing financing for mid-tier and lower-end manufacturing, SME, digitalization efforts, RES projects and efforts to increase local content. The creation of the Saudi Mining Services Company (ESNAD) is meant to boost mining companies' adherence to environmental, health and safety standards while enhancing the monitoring of exploited resources. The Saudi Geological Survey is seeking to improve geological information on the Arabian Shield region, in order to attract investments in the Saudi mining sector. The country has also announced its intention to invest 15bn\$ in global mining stakes via the Manara Fund.³⁴ In parallel, the Saudi Fund for Development signed agreements with several countries in Africa (i.e., Mozambique, Tanzania, Angola, etc.),³⁵ further enhancing the prospects of economic and industrial cooperation, with foreign direct investment of Gulf Cooperation Council member states in Africa having reached records in 2022 and 2023, especially focusing on renewable energy.³⁶

29. S. Custer, A. Horigoshi and K. Marshall, "BRI from the Ground Up: Leaders from 129 Countries Evaluate a Decade of Beijing's Signature Initiative", AidData, March 2024, available at: <https://docs.aiddata.org>.

30. D.-P. Gherasim, "Global Gateway: Towards a European External Climate Security Strategy?", *Ifri Memos*, Ifri, April 11, 2024.

31. H. Dempsey and C. Cornish, "How Gulf States Are Putting Their Money into Mining", *Financial Times*, April 2024, available at: www.ft.com.

32. A. El Yaakoubi, "Saudi Arabia Earmarks \$182 mln for Minerals Exploration in Mining Push", Reuters, January 2024, available at: www.reuters.com.

33. Saudi Press Agency, "Saudi Arabia's Mining Boom: Expected Wealth to Top \$2.5 Trillion", April 2024, available at: www.spa.gov.sa.

34. L. Hook and H. Dempsey, "Saudi Arabia Launches Mining Fund in Effort to Reduce Oil Dependency", *Financial Times*, January 2023, available at: www.ft.com.

35. Saudi Fund for Development, "Saudi Fund for Development Provides over \$580 Million in Development Loans to African Countries for Key Vital Projects", November 2023, available at: www.sfd.gov.sa.

36. A. Irwin-Hunt, "FDI into Africa from GCC Hits New Heights", FDI Intelligence, February 2024.

United Arab Emirates³⁷ is also aiming at increasing its footprint in Africa's critical minerals sector, in a move to diversify future national revenues away from oil extraction and become part of the new clean economy. For instance, looking at infrastructure and logistics, Dubai Ports World and AD Ports are investing in ports in Somaliland, Tanzania, Senegal, Egypt, Algeria, Mozambique, and Nigeria, which are key for commodities trade. In 2022, Primera Gold was created as a joint venture between the UAE (55%) and the Democratic Republic of Congo (DRC) (45%) to export gold from DRC to the UAE. In 2023, International Resource Holding - IRH (Abu-Dhabi based and linked to the Emirati royal family) acquired a 51% share in the Mopani Copper Mine from the Zambian government. IRH failed in its attempt to acquire 80% of shares in the Lubambe Copper mine in Zambia, which were ultimately sold to the Chinese mining company JCHX.³⁸ Nevertheless, IRH is determined to expand its copper mining business in Zambia and is looking into acquiring a 30% stake in Konkola Copper Mines (KCM) from Vedanta.³⁹ For its part, Qatar uses its State Sovereign Fund to invest in the CRM sector, the Qatar Investment Authority being the second largest shareholder of Glencore, while its CEO has confirmed its strategy to invest in power generation, renewables, storage and the automotive sector.

Finally, India has the ambition to become part of clean energy supply chains, including the production of EVs, and has been active in developing its own CRM strategy. In 2023, it became part of the Mineral Security Partnership and signed a Critical Minerals Investment Partnership with Australia, being already part of a Supply Chain Resilience Initiative with Australia and Japan since 2021.⁴⁰ It is also pushing national companies to invest in mining abroad⁴¹ (ex., deals on lithium exploration signed in Argentina, projects are being considered in Chile and Bolivia, as well as in African countries) and pursue domestic mining (ex., via earmarking exploration projects to certain CRM like graphite, nickel, cobalt, lithium).

In developing resource-rich countries, the trend is towards seeking to limit raw material exports in order to encourage processing and manufacturing locally and hence retain more value-added, create jobs and economic opportunities. A series of measures validate this trend, which has been considerably growing over the past few years:

37. African Critical Minerals, "UAE Sets the Pace for Gulf Investments in Africa's Mining Sector", May 2024, available at: www.africancriticalminerals.org.

38. Reuters, "JCHX Closes in on Zambian Copper Mine Deal as China Tightens Africa Grip", June 2024, available at: www.mining.com.

39. Reuters, "Vedanta in Talks with IHC Unit, Investors for Zambian Copper Stake Sale", June 2024, available at: <https://gulfbusiness.com>.

40. FIIA, "India's Critical Minerals Strategy: Geopolitical Imperatives and Energy Transition Goals", *FIIA Briefing Paper*, No. 386, April 2024, available at: www.fiaa.fi.

41. Reuters, "India's State-owned KABIL Signs \$24mln Lithium Exploration Deal in Argentina", January 2024, available at: www.reuters.com.

- **Indonesia:** in 2020, it banned exports of unprocessed nickel, forcing foreign buyers to invest in local processing capacities (smelters). As of June 2023, an export ban on unprocessed bauxite has entered into force, while 12 bauxite smelters are partly built or in the pipeline.
- **Mexico:** in 2022, it has adopted a law that makes the exploration, exploitation, and use of lithium to be the exclusive right of the state.
- **Zimbabwe:** in 2023, has extended its 2022 ban on exports of raw lithium to all unprocessed 'base mineral' ore, hence forcing companies to process these locally.
- **Namibia:** in June 2023, has introduced a ban on exports of unprocessed lithium and other critical minerals.
- **Ghana:** in February 2024, a series of measures were taken to prohibit the export of raw bauxite, lithium and iron ore, to prioritize the Ghanaian investors in acquiring the Atlantic Lithium's Ewoyaa lithium project, to support the construction of a refinery dedicated to processing locally produced manganese
- **Chile:** A move towards nationalization of lithium production by restricting the issuing of future lithium licenses only as public-private partnerships where a dedicated national lithium company would have control.

Recommendations: enhancing EU's role in diversifying and rebalancing global CRM supply chains

The EU's policy and regulatory work on CRM issues has made crucial advances in the past two years, delivering a clear vision of its ambitions and needs in the light of the green and digital transition while integrating critical minerals supply chains in the overall reflections around strategic autonomy and energy security. Nevertheless, so far, few concrete impacts are noticeable outside its borders, in the absence of substantial engagement on financing projects abroad, while other players like the US, Japan or Middle East countries are more ready to engage financially and for some of them potentially with less regards towards high ESG standards. The risk for Europe remains that of missing its internal benchmarks on mining, processing and refining due to insufficient funding, public acceptance, uncertain demand, volatile prices and unclear business cases but also that of not being able to materialize its series of strategic CRM partnerships into a resilient and secure supply base.

Diversifying the global CRM supply chains is a desirable pursuit from a geopolitical, environmental and social point of view, and should be done in accordance with the objective of pricing negative externalities, increasing the recognition and value of sustainable practices, pursuing a just distribution of economic benefits and promoting inclusive international cooperation formats and cooperation on defining ESG standards and increasing the transparency of CRM markets.

EU needs to deploy next-level policies and actions, capitalizing on the industrial pillar of the EU Green Deal, with priorities being:

1. Attaching tangible benefits to the strategic projects selected by the EU Critical Raw Materials Board

The current CRMA provisions are a good instrument for creating a vision and more predictability (ex., on permitting deadlines) for the mining, processing and recycling industry, but compared to the US financing firepower, these are not enough. The EU needs to set out tangible benefits for those projects designated as strategic under the CRMA framework, including not only

CAPEX but also some level of OPEX support (for instance, via tax credits), knowing that energy is an important expenditure line, especially in processing industries. Abundant low-carbon and competitive energy is a *sine qua non* condition to the realization of CRMA ambitions.

In addition, particularly environmentally virtuous mines are more expensive (ex., an underground mine can be several times more expensive than an open mine yet has numerous benefits – reducing land and air pollution, avoiding deforestation, etc.), and volatility of market prices can be especially prejudicial to their business model, hence impacting diversification objectives. To this extent, “resilience” contracts for difference (as done for low-carbon hydrogen via carbon contracts for difference) could be a tangible benefit to be given to EU strategic projects, based on a common joint financing facility for CRM which could also be linked to a dynamic EU stockpiling mechanism. At the very least, the EU should establish a joint funding scheme able to support those companies which are deploying projects in countries where there is no national support scheme, to make sure that no European potential is lost due to unequal financial firepower among member states.

Finally, it is key to strengthen the middle value chain (precursors and cathode and anode materials production) in the EU, to guarantee the uptake of European mined and refined CRM. These are also key for building up the resilience of the EV value chain and mitigating new vulnerabilities emerging at different levels. Building integrated partnerships with European players in all stages of the EV value chain is key, with a view in particular to rapidly securing a certain number of CAM and PCAM production capacities, and supporting innovation in battery chemistry,.

2. Delivering clear implementation guidelines, monitoring and verification mechanisms to enforce rules related to sustainability, circular economy and due diligence

EU’s legislative framework on corporate sustainable reporting and diligence, on circular economy (ex., CRM recycling and reincorporation targets in the EVs) or sustainability (CO₂ footprint, etc.) can be a gamechanger in terms of restructuring supply chains towards denying market access to CRM supplies with the most negative externalities. Yet, the fact that no “green” premium has emerged so far could be an indicator of market actors being in a “wait and see” mode, as it is not clear to them how the framework will be implemented and enforced. The EU needs to deliver not only on the secondary legislation implementing these different provisions, but also on clear mechanisms of monitoring, verification and reporting that are credible and easy to enforce.

3. Prioritizing cooperation with likeminded partners in the short term, and explore midterm options, while building long-term partnerships

EU's strategic autonomy on CRM can be improved in the long term thanks to domestic action, circular economy, and a new set of international partnerships, all of which must be pursued for a sizable change in terms of CRM value chain reorganization over the long term. Yet, given the low chances for a major change in CRM supply chain configuration by 2030, the EU could prioritize cooperation with countries like Canada, Australia, the US, and Japan, which have key mining, refining, stockpiling, or recycling of CRM. This could imply establishing a transparency mechanism on CRM supplies and prices (one option could be under a variable format at the World Trade Organization – WTO), catalyzing investments in mutually interesting projects (for instance, in the framework of the PGII or MSP) and streamlining requirements for “resilience” contracts for difference. Over the mid-term, collaboration with countries in the Middle East could also be explored based on the assessment that these players aim to secure a share of revenues in the global mining and refining economy, they have readily available capital to mobilize in new projects, and a new wave of investments in this sector should take into account the resilience, sustainability and governance criteria put forward by the EU, as a major consumer.

4. Building partnership proposals around ecosystems of investments

The EU and its like-minded partners (i.e., MSP members) must be effective in supporting and accompanying resource-holding countries to increase processing and downstream value addition, potentially seeking a regional dimension to build such facilities to reach economies of scale and strengthen cross-border economic integration (especially on the African continent). From this point of view, initiatives such as the African Continental Free Trade Area are key to provide economies of scale and increase the share of value creation retained in resource holding countries. At the same time, investment proposals must go beyond the CRM projects themselves and take an ecosystem view by deploying clean energy sources, grids, transport infrastructures, sanitation and water infrastructures, favoring access to training, women and young people employment, while doing the utmost to protect natural and cultural landscapes.

Finally, such partnerships should allow oriented economic growth towards low-carbon industries and services to support resource-holding countries in securing market shares in the clean tech economy, implying the use of low-carbon solutions in the production processes. The EU must be crystal clear: such eco-system investment is supported but can only be

delivered if the investment framework is suitable, which in too many countries is not the case.

For the EU and like-minded partners, the willingness of producer countries to climb the CRM value chains presents the opportunity of engaging with governments in resource rich countries to increase the sustainability of mining and processing practices, to reduce environmental, social and governance risks and elevate the global discussion towards a race to the top on ESG implementation and standardization.

5. Ensuring a systematic follow-up on CRM partnerships and creating more concrete and agile opportunities for financing

The EU has stepped up its external engagement on CRM supply chains via its two-pronged approach (i.e., bilateral partnerships and multilateral engagement via the MSP and its Forum). At the same time, it has launched the Global Gateway and became part of the PGI, which is focused on infrastructure development around the world. Yet, it is still unclear what are concretely the deliverables expected from each of these initiatives, the key performance indicators to be followed, what are the mechanisms that the EU can activate, for instance, in case of weaponization of CRM supplies, to which extent these different frameworks have a real security dimension with firm engagements from partner countries, and how exposed all these actions are to change of governments and policy direction in third countries. Albeit the Global Gateway is understood to be one of the key tools for channeling investments to mutually beneficial projects in third countries to develop sustainable infrastructures, the EU still needs to articulate the complementarity between its engagements under the CRM Strategic Partnerships, the Global Gateway and the multilateral forums like the Mineral Security Partnership.

Within the Team Europe approach, the EU could ensure that a systematic and sustained follow-up is done on the CRM partnerships signed, as so far it is difficult to see the concrete actions and potential results that have been delivered. For instance, partnering with Australia on establishing differentiated pricing for sustainable minerals is a concrete work stream that should be invested with utmost urgency, to also facilitate market discovery for EU battery and automotive players that are submitted to EU Battery Regulation, CSRD and CSDDD.

In the same vein, the EU should build on the steps taken by France, Germany and Italy, which have put in place CRM investment funds of up to 2 bn€ in the case of France (with a 500 m€ contribution from the national

budget),⁴² 1.1 bn€ for Germany⁴³ (involving the KfW, Germany's development bank) and 1 bn€ under the Italian scheme "Made in Italy".⁴⁴ The EBA Strategic Battery Materials Fund of 500 m€, launched by EIT InnoEnergy and Demeter Investment Managers, as well as the joint facility between EBRD and the EU of 100 m€ targeted at financing junior mining companies⁴⁵ (present at the exploration stage) are a good step further in supporting CRM projects with the highest environmental standards. The EU needs to further mobilize all different tools available (Global Gateway, EIB) to channel funding towards exploration, supporting the improvement of ESG standards in existing mines, derisking new projects, and needs to be much more helpful to support the small mining companies in their risky exploration efforts. All possible and available forms of EIB support for mining and refining projects outside Europe should be mobilized, taking inspiration from other actors in the field where relevant (ex. DFC, US EXIM, Untied Loan program of the German Export Credit Agency).

With respect to the Global Gateway, as discussed in our previous papers, it needs to be enshrined in a clear institutional structure, its framework and functioning must be consolidated by adding a single contact point for private and civil society partners to refer to, improving the accessibility of funding and the speed of delivery, establishing performance indicators to track global impact, etc. Ultimately, Global Gateway should also become the tool for coordinating and boosting synergies between the EU's different initiatives related to sustainable development (Just Energy Transition Partnerships, Net Zero Strategic Partnerships, Critical Raw Materials partnerships...) to match partner countries' need for comprehensive investment strategies.

6. Work on transparency and sustainability: include China, avoid multiplication of standards

China's entrenched central position in the CRM value chains must be acknowledged also when it comes to working on international sustainability standards for the mining and refining industry. EU has the potential to use its market power as a consumer through the requirements in the EU Battery Regulation, CSRD and CSDDD to raise the bar on the governance and sustainability of mining and refining industry at home and abroad. The newly

42. French Government communiqué, "France 2030: le Gouvernement annonce le lancement d'un fonds d'investissement dédié aux minerais et métaux critiques", May 2023, available at : www.ecologie.gouv.fr.

43. "Germany Launches Raw Materials Fund to Strengthen Supply Chains", Mining.com, September 2024, available at: www.mining.com.

44. Global Trade Alert "Italy: Introduction of EUR 1 billion National Strategic Fund of Made in Italy", May 2023, available at: www.globaltradealert.org.

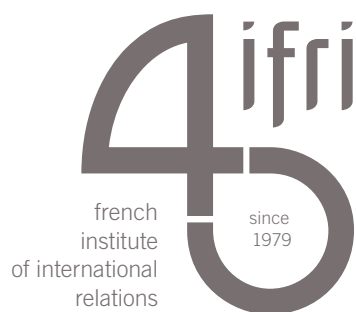
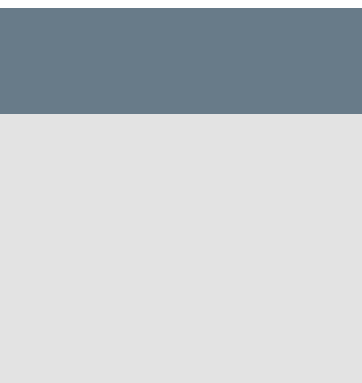
45. The projects to be financed must be based in EU Member States where EBRD has a mandate to invest (Bulgaria, Croatia, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia), and a number of countries outside the EU that are covered by the Horizon Europe program (Albania, Armenia, Bosnia and Herzegovina, Georgia, Kosovo, Moldova, Montenegro, North Macedonia, Serbia, Tunisia, Türkiye and Ukraine). More information is available at: www.ebrd.com.

created UN Critical Energy Transition Minerals' Panel, together with the OECD, are well-placed institutional actors to drive the transparency and standardization efforts, with potential involvement from WTO, ITC and ISO. As companies are already taking steps towards ensuring compliance with existing schemes such as IRMA, an equivalence framework could be established. To boost confidence in the sector's compliance with the given standards, it's necessary to establish an international monitoring and verification authority. Finally, the EU should push G7 countries to adopt similar CSDDD/CSRD type due diligence standards as in Europe, and to do its outmost to enforce its environmental and sustainability standards on imports, to make sure EU companies are not at disadvantage. The EU should also support an international push for differentiated pricing of low carbon sustainably produced raw materials, joining efforts with Australia and even the US on this issue, as well as taking action on creating lead markets for sustainable raw materials, starting with public procurement.

7. Boosting circular economy, innovation and demand moderation

As shown in one of our previous research papers,⁴⁶ towards 2040, recycling could become a key lever in the security of the supply of critical raw materials, as it could potentially cover up to 80% to 85% of the French CRM needs and about 50% of EU's CRM needs for the EV sector, depending on the metal envisaged. Hence, supporting the deployment of recycling projects in the EU but also in partner countries should be one of the key priorities for the EU to act on, not only in the EV sector but also in the solar panel or wind sectors. Innovation will be needed to improve recycling techniques and collection systems, but also mining and refining practices to reduce the overall impact on the environment. At the same time, the EU should become a global advocate for demand moderation, for instance in the EV sector by promoting smaller batteries, but also in the digital sector.

46. M.-A. Eyl-Mazzega, D.-P. Gherasim, C. Vannier and A. Contu, "How to Meet the Industrial Challenge of Electric Mobility in France and in Europe", *Notes de l'Ifri*, November 2023.



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