CEPS YOUNG THINKERS

TOWARDS AN ENVIRONMENTALLY AND SOCIALLY RESPONSIBLE EU RAW MATERIALS MINING

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Summary

To move towards a low-carbon and digital society, the EU is planning to adapt its industry, labour market and economic models. Against the background of recent international geopolitical events, a global energy crisis and ever-worsening climate change, the EU has adapted by implementing new frameworks to increase the production of raw materials.

Given that the mining sector must expand rapidly in the coming years to meet future demand for materials needed for the energy transition, many questions remain about the unintended consequences of this rapid change. On one hand, it is not yet clear how to make heavy mining practices environmentally sustainable while still meeting demand. On the other hand, the EU mining sector is struggling with a continuous loss of skilled labour and has a long way to go before its staffing approach becomes more gender-open.

This brief makes three recommendations on how to ensure sustainable mining in the EU from both an environmental and employment perspective.

(1) Firstly, a clearer definition of sustainable mining is needed, with a focus on reducing absolute raw material consumption.

(2) Secondly, more environmentally ambitious mining legislation must be adopted using certification schemes that better account for the impacts of mining and include all stakeholders.

(3) Thirdly, the raw material mining sector should address the problem of skill shortages by reskilling workers from the fossil fuel industry and incentivizing women and young people to work in the sector.

This Policy Brief was drafted through the CEPS Young Thinkers Initiative. This an innovative forum driven by and for youth to build essential professional and leadership skills and elevate youth voices from diverse backgrounds so that they may participate in forward-looking European policy debates of crucial importance.

The demand for raw materials **is expected to skyrocket** globally, especially for those needed for the low-carbon and digital transitions. When it comes to supply, however, the processing of raw materials is concentrated to just a handful of top suppliers. China is currently the global leader of rare earth materials, carrying out 60 % of mining and 85 % of refining processes, while the Democratic Republic of the Congo (DRC) is the global leader in cobalt extraction.

The EU is thus heavily reliant on imports, with 98 % of its refined rare earth materials coming from China, and 85 % of its refined niobium originating from Brazil. Due to supply chain disruptions caused by Covid-19 and geopolitical tensions triggered by the Russian invasion of Ukraine, the EU's Critical Raw Materials (CRMs) dependency on only a handful of countries has become a core security question. Moreover, most of these CRMs are metals that are absolutely necessary for the EU to fulfil its low-carbon transition and net-zero emissions ambitions by 2050.

The European Commission first outlined its decisive shift towards acquiring CRMs by stressing that 'access to raw materials is of strategic importance' in its **European Green Deal**, adopted in 2020. In the same year, it set out its **Critical Raw Materials Resilience** **Action Plan**, which sets the framework for the domestic mining, refining, and recycling of CRMs. Meanwhile, the Covid-related supply chain disruptions fuelled a **deeper analysis of dependencies**, especially on raw materials needed for strategic technologies such as chips, batteries, or hydrogen.

Today, **China continues to be the EU's main supplier**, providing the bloc with 24 of its 34 CRMs [1], at both the mining and refining stage. The EU thus finds itself in a position where it is vulnerable to supply chain disruptions, rendering access to CRMs a crucial strategic policy goal for the EU. This shift in political priorities was highlighted in the 2022 **report on the state of the energy union**: *"Reducing the EU's dependency on raw materials, making more efforts on the circular economy, and overcoming the shortage of skilled workforce will shape the more resilient, independent, secure and affordable energy system needed [for Europe]."*

[1] Rare earths only count for two, when the category contains a total of 17 chemical elements (eight 'light' and nine 'heavy') that can have quite different applications.

The Commission responded to this issue of dependency by introducing a comprehensive proposal, the **Critical Raw Materials Act (CRM Act)**, to ensure a secure and sustainable supply of CRMs. This includes a plan to significantly increase domestic mining projects and bring processing activities into the EU (i.e. 'homeshoring').

This Policy Brief critically analyses some of the key social and environmental challenges the EU will face as it seeks to secure more of its raw materials supply domestically, by delving into the implications of the current framework in place under the CRM Act and its associated issues.

Most importantly, it offers **three specific recommendations** on how the EU could secure its domestic raw material supply sustainably both from an environmental and social lens.

A short tale of EU raw material policies

A slow European de-globalization of mining

Until the early 1990s, the European mining industry represented only a small percentage of the EU's GDP, but provided materials for a significant share of global demand. Around 50 % of raw materials were refined in La Rochelle, France, but this plant closed by the end of the 1990's due to intense Chinese competition and less stringent environmental standards [2]. Since then, the EU's refining capacity decreased, **while elsewhere in the world, this continued to increase. At the same time**, mining capacity remained low and stable, and exploration activities stopped almost entirely.

China soon became the global leader of mining and refining many metals (including, notably, rare earth elements) necessary for low-carbon and digital technologies. In parallel, the need to increase its competitiveness and preserve growth and jobs led the EU to take action.

[2] See the book "The Rare Metals War: The Dark Side of Clean Energy and Digital Technologies", Guillaume Pitron, 2018

The **Raw Materials Initiative** (2008) thus aimed to secure access to raw materials crucial for the EU's energy needs, and is based on three pillars of fair and sustainable global trade, **sustainable supply** of raw materials from EU sources, reduced demand/consumption. One of the outcomes of the initiative was the establishment of a list of materials characterised by both a high supply risk and high economic importance, i.e. critical raw materials.

At the same time, the EU reinforced its circular economy legislation, e.g., through the 2008 '**Waste Hierarchy**', and the 2015 **Circular Economy Action Plan**, helping to build a path towards using waste as a resource and reducing the need for mining raw materials.

Towards a real EU mining framework

The **CRM Act**, launched in March 2023, is a part of the **Green Deal Industrial Plan**, which aims to foster a more energy- and technologically-independent EU. The Commission is trying to carefully balance the need for coordinated industrial policy across Member States to tackle the transition's challenges, and the limited legislative competence given by the treaties on the subject.

The CRM Act is expected to reduce future dependence on CRMs by firstly setting out a definition for **'Strategic Raw Materials'** (SRM). SRMs are defined as being: (i) of strategic importance, (ii) expected to have a significant gap between demand and supply, (iii) materials whose increase in production is relatively difficult. It then proposes to set a target (non-binding) **benchmark for the annual EU average consumption of SRMs in 2030** for extracting (10 %), processing (40 %), and recycling (15 %) on EU soil, and a cap on import reliance from a single country (65 %). These should be clearly defined in the future as many ways could be used for accounting them.

Under the CRM Act, the Commission would be supported by its own and Member State experts through a CRM Board to put appropriate measures in place to support production capacities and achieve the aforementioned benchmarks. To build capacities along the value chain, the regulation also introduces the concept of 'Strategic Projects', with a streamlined and accelerated permit-granting process and the implementation of **national 'one stop shops'.** Furthermore, the Board can advise on access to financing, facilitated by the European Investment Bank and state aids. The Board would also assess the relevance of bilateral non-binding Strategic Partnerships between Member States and a third country, whilst also coordinating it.

While the Commission will **monitor progress and mitigate supply risks**, Member States are expected to report all necessary information to the Board to assess SRM supply risks and benchmark attainment, together with monitoring strategic stocks carried out on a national level.

On the **sustainability angle**, the Act mandates Member States to adopt collection and recycling polices, as well as labelling and recycling targets for permanent magnets containing products for private companies, and report back to the Board. The sustainability of mining sites and extractive waste should be analysed and reported to the Board. Both types of resources/waste could be re-extracted at a later stage. To ensure production sustainability, Strategic Projects should meet the requirements set by **Commission-approved certification schemes**, which should encompass a broad range of sustainability aspects such as environmental protection and human rights.

Finally, unless other legislation requires it, the Commission can establish and request the calculation of the **highest environmental footprint** (carbon footprint, water use, eutrophication potential etc.), if necessary to achieve the EU's climate or environment objectives. This last point may be difficult to implement, as the Commission would have to account for international partnerships, relevant stakeholders, and the Board to complete these calculations.

Outside the scope of the CRM Act, the **Commission plans** to **create large-scale partnerships on CRMs** including private and public actors, specifically for training and initial education (under the 2020 EU Pact for Skills). A Raw Materials Academy is set to offer reskilling and upskilling programmes.

While the CRM Act is a significant step forward, concerns have been raised, e.g. regarding the streamlining of permitting procedures, which according to some, risks **reducing environmental safeguards.** Indeed, **multiple voices have raised concerns** about Europe's new mining policy. It has been openly questioned as to whether the EU can fulfil its climate and digital ambitions without reducing material demand or at the cost of significant environmental trade-offs.

Security of supply and ecological damage dilemma

Towards a sustainable mining definition

The mining industry is often associated with **high levels of environmental damage** such as **dam breaking**, the toxicity of the **tailings and sludge** (ores processing wastes), major landscape transformation (especially in open-pit mines), as well as **human rights issues** concerning indigenous land. In 2020, waste from mining and quarrying represented around 23 % of total **waste generated** in the EU, a figure that is likely to increase throughout the low-carbon and digital transitions.

Though the extraction industry has recently gained a **green reputation** (especially when the minerals extracted are essential for renewables), **opposition to mining projects is on the rise** in **Spain**, **Portugal**, **Sweden**, and **Norway**, largely due to the perceived risk of contaminating the water supply, soil, and biodiversity, disrupting local livelihoods, and undermining (indigenous) people's rights. Moreover, despite the various EU Nature Directives, legislation that seeks to safeguard nature loss in 'Natura 2000' areas, **mining activities** can still be permitted in these protected areas.

Mining for the low-carbon and digital transition is 'old wine in new bottles', when it comes to both external dependence as well as legislation and permits. Historically, in Europe, mining has a long pattern of **benefitting from exemptions** from environmental legislations; and to date, the EU Taxonomy for Sustainable Activities doesn't contain a definition of sustainable mining. Initially, some **experts group considered it was too complex to assess** on a short notice. The call to have a definition by the **new Raw Materials Strategy in 2020** has also gone unanswered.

There is thus no framework in place to define the standards of 'sustainable mining', whether globally or within the EU. Though certification schemes exist, these can **widely differ in contents and expectations**. The question today, and the political debate, is more focused on the economic and manufacturing feasibility of mining in the context of the energy transition's pressing timeframe.

The overarching issues within existing EU frameworks

Despite its adverse impacts, there is no denying that minimising, let alone eliminating, mining from the low-carbon and digital transition is an impossible task.

To address this, the Commission has undertaken some steps towards a **sustainable European supply of raw materials.** There are frameworks in place and several proposals that are expected to run in parallel with the CRM Act, such us the existing EIA or the Conflict Minerals Regulation, and the upcoming Ecodesign for Sustainable Products Regulation (ESPR). However, there are still overarching in the frameworks that might make it difficult to mediate between protecting the environment while simultaneously ramping up extraction projects. **Addressing these shortcomings is therefore crucial if the EU plans to source its raw materials domestically and in a sustainable way.**

First, the CRM Act proposal fails to address the actual **root cause of the problem – overconsumption**. The security issue at the heart of the EU's fear over security of supply derives from the fact that EU's heavy dependency on other countries for resources is due to its own unsustainable consumption pattern. The EU's material footprint has **exceeded beyond double the planetary boundary.** Continuing this pattern through heavy-impact extraction projects is likely to exert more pressure on the environment. The CRM Act proposal comes with the age-old assumption of 'sustainable growth', that we can grow indefinitely while striving for sustainability. While, of course, a certain number of materials are inevitably needed, the EU must acknowledge that limiting demand with the aim of eventual **reduction is necessary through binding targets.** This could partially be addressed in the ESPR by mandating **recycled contents in new products**.

Second, some have raised concerns about the EU's **excessive use of certification schemes**. Under the CRM Act proposal, for instance, companies seeking the 'Strategic Project' label would only have to 'attest compliance' if there is evidence that the project is certified by a recognised Commission scheme.

This mechanism is similar for the Conflict Minerals Regulation (but based on OECD schemes). The issue is however that third-party audits pose impartiality challenges, as auditors receive compensation from the company undergoing the audit.

Also, auditors often rely on **evidence provided by the company**, rather than other stakeholders. Of course, audits are important as they are a way for companies to provide information about their practices to regulators, investors, and customers. However, relying solely on them is insufficient. Audits should only be one piece of a broader puzzle. To ensure credibility, certification schemes should only be implemented in the context of **multi-stakeholder governance and independent audits**, while **enforcing due diligence verifications**.

Third, the acceleration of raw materials sourcing might result in **regulatory oversight for environmental and social standards**. The acceleration of permitting proposed in the CRM Act is concerning, particularly in regard to its actual efficacy and sustainability. Strategic projects may, on a case-by-case basis, be designated as projects 'overriding public interest', allowing for **authorisation despite concerns** about their environmental impact. It is worth noting that an EIA is not mandatory for strategic projects, as the regulation mentions that the preliminary screening determines if a full assessment is needed. Even within the EIA itself, there are frequent instances where EIA conducting **bodies underestimate the range** of environmental harm in assessment or neglect socio-ecological variables. Many national authorities accept and approve EIA reports with false data or misleading conclusions, often under political pressure to secure investments.

The accelerated permitting process also puts pressure on local communities and their potential acceptance of such projects. There are time limitations for how long a permitting process should take. The permitting process for extractive Strategic Projects must not exceed 24 months, and if there is a concern stemming from the environmental impact assessment report, public consultation must not be longer than 90 days (and 30 days minimum). This gives a very limited window for local communities to voice their concerns or prepare a defence. It also means the public may have less knowledge than the mining companies themselves about the projects, given the tight timeline. This is despite the fact that 'public acceptance' is often mentioned in the proposal as being key to mining projects, precisely because there is a bottleneck in communication. In short, there is a need to strengthen the social aspect within the upcoming CRM Act, especially in regard to the consent of local communities.

Employment and gender perspectives in the European mining industry

A lack of skilled workers

The yet-uncertain future of the mining industry raises important questions about the changes (and challenges) its workforce will have to face, even more so in Europe – where climate regulation is expected to become increasingly stricter to achieve the **Paris Agreement goals**.

Overall, the number of people employed in the mining sector has been declining steadily over the past few decades; this is particularly true for coal mining, one of Europe's largest mining subsectors [3]. The fact that employment rates started to already decline at the beginning of the 1990s has allowed a large number of coalmining regions (e.g. Upper Silesia, Małopolska, Saxony) to smooth out the impact of such a decrease, **with only 380 000 people currently working in the mining and quarrying sector across the continent in 2020** – **equivalent to roughly 0.3 %** of all persons employed in the non-service economy.

This figure leads to two kinds of considerations. Firstly, today's low number of EU workers involved in mining and quarrying might pose severe challenges to the development of Europe's future CRMs industry – one of the main goals set out by the Commission. Secondly, a possible **mismatch between mining workers' geographical location** (e.g., Germany and Poland) and potential areas rich in CRMs (e.g. Portugal and Sweden) could emerge.

The transition from a carbon-intensive to a material-intensive economy, with the introduction of new technologies, could become **safer, increase salaries and lead to a better quality of life** – the question is whether there are enough skilled workers to work in the industry. Risks related to the possible **lack of skilled workers** in the mining industry have been raised for some years now. Recently, **technological and digital transformation** has taken a leading role in the development of the mining industry.

[3] As an example, 410 000 jobs in coal mining were lost between 1990 and 2000 in the Czech Republic, Germany, and Poland – and another 86 000 (representing more than half of the total number of jobs in this sector) 'were at high risk of being lost after 2020 due to the potential closure of uncompetitive mines'.

This resulted in a **change of skills needed to work in the sector** and because specific focus has been put on digital skills, the needs and requirements for employees have changed.

The **desire for new digital skills** has advanced the mining industry, and since manual/physical skills are becoming less important, the sector has grown to be **more accessible to all sexes**. The industry has also become **safer**, eliminating many of the previous risks which came from physical labour. This transformation has thus attracted new professional profiles, such as data scientists or engineers.

Challenges of reskilling and attracting young talent

Nevertheless, even though the transformation of the industry has had positive effects, getting the right skills has still been a major struggle. Specifically, providing current employees with new technological skills has been difficult. Currently, EU Member States and companies do not offer accessible training to nurture and provide the needed skills for the industry. This would be most important for those already working in the mining industry who are not currently prepared for the sector's digital transformation. This lack of training has led workers to become **uninterested in working in the mining** and raw materials industry.

The sustainable and digital transformation of the industry may be of interest to the younger generation; however, there needs to be adequate communication about this transformation. Young people are much more aware of the effects of climate change and the importance of sustainability measures taken by individuals. **Gen-Z is one of the groups to whom environmental, social, and governance (ESG) values matter** – currently, **one in three Gen-Z workers rejects** job offers because their potential employers do not meet their ESG values.

As the mining sector has already experienced a shortage of skilled workers, to attract new ones, especially the younger generation, **ESG values must thus be considered to ensure more holistic growth of the sector.** Besides raising awareness about the push towards sustainable mining, young people need to be informed about the current transformation of the industry and about the skills needed to enter the field.

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The current lack of emphasis on digital and engineering skills does not allow young people to have a clear view of the industry and thus do not consider it as a possible career path. With adequate communication, emphasizing how the mining industry has transformed and become more sustainable, and more emphasis on engineering, data science and IT skills, young people may be more tempted to enter the field.

However, in order the minimize the shortage of workers in the mining industry, the focus should also be put on **reskilling current employees** – this would both ensure that the 'leaving no one behind' agenda is upkept and current workers in the mining industry are attracted by new opportunities.

The **proposed CRM Act** and the communication published alongside it aim to upskill workers in the energy industry, primarily focusing on upskilling employees currently working in the oil, gas and coal sectors and transitioning them to critical raw materials mining. The Commission has envisioned a 'Raw Materials Academy' to ensure that workers possess the necessary skills for the sector to succeed. It would enlist various European universities to participate in providing Master and PhD programmes which cover topics ranging from engineering and entrepreneurship to sustainability and recycling in the field of raw materials. It also offers online teaching and a variety of training courses.

The shortage of skilled workers in the mining industry also puts pressure on the sector to change for the better. Upskilling and reskilling must be a top EU priority. The importance that young people place on sustainability should also ensure that attention is focused on making mining for critical raw materials more environmentally friendly, and that it upholds all ESG and European Green Deal targets.

New employment opportunities by promoting female workforce in the mining industry

Concerns about whether there will be enough workers in the mining industry to meet Europe's growing demand for critical raw materials simultaneously raises questions about who is currently employed in the large-scale mining sector, especially considering today's debate about gender equality. The mining sector remains a male-dominated industry worldwide – according to **Eurostat**, **women accounted for only approximately 14 % of the total mining workforce in the EU during the fourth quarter of 2022.**

Studies have shown that the overall low representation of women in the mining industry is due to several factors. These factors can vary from mining area to mining area and need to be analysed through case studies. Understanding the specific factors at play is, therefore, essential to implementing effective policies.

For instance, the failure to recruit women may be due to cultural norms, educational traditions, insufficiently defined maternity rights and incompatible working hours with child-rearing. Moreover, some of the reasons for women leaving the mining industry include a lack of intellectual stimulus and the perception of fewer opportunities for promotion compared to their male colleagues. In this context, a global survey by McKinsey & Company found that **women in higher positions are more likely to stay in the mining industry than women in lower positions**.

Additionally, particularly in certain Swedish mining regions, it has been observed that young people, especially women, tend to leave the rural mining areas where they were raised. This further complicates the recruitment of women. Nevertheless, some mining companies have already **successfully implemented policies to address gender challenges**, such as family-friendly working conditions and systematic measures to prevent harassment of women workers.

Policy Recommendations

To transition towards a greener and more sustainable energy system, key pieces of the European legislative puzzle are missing, and must be further developed. Moreover, the EU needs to take concrete steps to ensure that it has the workers it needs to carry out such a large-scale transition. To help pave the way forward, this policy brief offers three key recommendations:

1

Define sustainable mining and set targets to reduce absolute consumption of raw materials

The most obvious place to start is to **define sustainable mining within the EU Taxonomy regulation through an evidence-based approach that considers the actual and potential environmental, social, and economic factors of mining for minerals,** and subsequently excludes certain practices from the sector and appropriately drives public and private finance towards sustainability.

Demand reduction is the direct hit approach to the EU security of supply question. More focus needs to be put on an absolute materials reduction target, even for CRMs, in which demand is likely to significantly increase over the coming years. The EU must **set out what the expected rising demand is likely to be and define its trajectory towards an eventual reduction**.

Additionally, setting specific binding targets that would reduce materials consumption would also help through approaches such as prioritizing public transport instead of individual electric car production, planning solar or wind energy fields in the most efficient locations, and reducing overall energy consumption. On top of this to reduce future primary raw materials demand in the economy, the **EU must strengthen and (financially) incentivize the current industrial framework and coordinate on reuse, collection, and recycling**. Finally, **recycled materials used to create new products should be at the core of the upcoming ESPR** and its subsequent secondary legislations.

2 Establish a more ambitious environmental and governance mining framework

The CRM Act's recognition scheme should utilize the EU's own in-house evaluation system. Instead of allowing companies to rely exclusively on third-party certification schemes, the legislation should provide the authority and resources to conduct an evaluation through the EU's own institutions. This process should take a broad indicator into account which includes mandatory consultation with stakeholders at every stage of the project.

Additionally, **a third-party certification scheme used in the in-house evaluation process should have high sustainability ambitions (like IRMA**, which takes place at facility-level as opposed to company-level, and is governed through a multi-stakeholder leadership of private sector and civil societies with equal power). There should be a periodical evaluation and revocation mechanism of the Strategic Project label for companies that no longer meet the sustainability requirements. Furthermore, **the EIA should be broadened**, and following the same principles, ensure **multi-stakeholder governance and independent audits**, while **enforcing due diligence verifications.**

Finally, for ensuring coherence between the existing framework and the future CRM regulation, the Commission could, for instance, make **voluntary principles for sustainable raw materials** binding through the CRM Act at the same level of OECD guidelines. Furthermore, it could also include a ban on a set of **ten environmentally harmful mining practices**, at least in Natura 2000 areas. This way, **the coherent revision and enforcement of the existing frameworks would naturally foster better environmental and social governance** while empowering real communication and dialogue between all stakeholders around new mining sites. It is very likely that this would additionally foster regulatory certainty for companies and the acceptance of mining projects as a key element in the transition towards a more low-carbon and digital future and attract more talent as a result.

3 **Address the lack of skilled workers through new employment opportunities, reskilling, and examining reasons for leaving the industry.**

To tackle the shortage of skilled workers in the mining industry, **the employment of women and young people should be promoted.** This is especially necessary because more and more men are leaving the mining industry and the younger generation is simply not interested in joining it.

A sustained communications campaign should be undertaken to inform and educate potential applicants to the mining industry about the **digital skills required and sustainable mining practices** in order to attract new employees, particularly women and the younger generation.

Workers currently employed in the oil, gas and coal sectors should be retrained to work in the raw materials industry, which would ensure their future job security. Given the labour shortage and the need to develop evidence-based policy, the EU should focus on examining why men have been exiting the mining sector over recent years. The reskilling of workers and understanding why many of them leave the industry is crucial not only for further development of the sector but also its very survival in Europe.

In a nutshell, although the EU mining industry has been lagging after being forgotten by public authorities, many opportunities arise. There is a need of a coordinated approach to ensure a 360° sustainable implementation of the expected increased mining capacity. Indeed, there are positive feedback loops between defining sustainable mining and implementing multistakeholder governance supports the attractiveness of the industry for young and skilled talents. This will have to be coordinated with the rest of the Union's industrial policy, especially on products (containing recycled metals) and focusing on urban and territorial planning for "no regret" uses of those rare minerals.

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