

## **IENE Briefing Note No.14**



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**Contributed by IENE Research Team** 

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#### Introduction

As Europe seeks ways to end its need for Russian oil and gas, officials in Brussels hope some of the answers lie on home soil — or, rather, under it. The European Commission wants to boost output of its own raw materials needed for green energy. Its plans, which are still in their infancy, would lower regulatory barriers to mining and production of critical materials, such as lithium, cobalt and graphite, needed for wind farms, solar panels and electric vehicles. (1)

However, the global market of rare earths is highly concentrated and has a clear dominance: China. Although it has only about one-third of the world's rare earth reserves, China now accounts for 60% of global rare earth mined production, 85% of rare earth processing capacity, and over 90% of high-strength rare earth permanent magnets manufactured.

It will take years for Europe to develop such an industrial area. Furthermore, having raw products alone is not enough to reduce Europe's dependence. It does not make sense if Europe just takes it out and ships it to China. Thus, the continent has to focus on the whole value chain, from mining to processing, separation and development of magnets, for example, or other technical elements. To strengthen its protection, the European Commission proposes to recover inter-European resources through their extraction and recycling. For instance, the European Union recycles barely 1% of the rare earths.

#### About Rare Earths

Even before Russia's war on Ukraine created the risk of a total shutdown of Russian gas exports to the EU, the European Commission, which wants to sharply increase renewables use, was sounding the alarm about the risks of being too reliant on imported raw materials.

By 2030, EU demand for rare earth materials for wind turbines will increase fivefold, according to the European Commission, but global supply is only projected to

double. Demand for lithium is likely to be almost 60 times as high as current consumption by 2050, according to the EU's Joint Research Centre. The need for cobalt and graphite could be nearly 15 times higher. This would require an "open debate" about more mining, processing, refining and recycling in Europe. "We prefer to import from third countries and close our eyes on the environmental and social impact there, let alone the carbon footprint of importing. But mining in Europe does not have to be a dirty business", EU Commissioner for Internal Market Thierry Breton recently said.

Map 1: Mining Developments Remain Concentrated in Portugal, the Balkans and Scandinavia



Sources: S&P Global, Financial Times

Efforts to unearth big reserves of lithium in Portugal suggest how difficult it will be for the EU to attain its goal, however. A potential cornerstone of Europe's green energy transition, the Barroso mine in north-eastern Portugal was expected to begin producing lithium for electric vehicle batteries in 2020. But Savannah Resources, the London-listed owner, has been forced to push the start date back several times as it awaits environmental approval. In July 2022, Portugal's regulator added a phase to the process, causing Savannah to reset its production launch again, this time to 2026.

Faced with hurdles like those in Portugal, which has not licensed a large mining project for 30 years, the Commission is working on a proposed Raw Materials Act aimed at stimulating EU production. Among the ideas are provisions to designate key strategic projects for accelerated permitting, creating a one-stop shop for project authorisations, or measures to speed up national legal processes when there are challenges. They draw on EU regulations that have expedited permitting for electricity infrastructure. A 2021 JRC report (2) said Europe's potential resources were underexplored, with the lowest investment in mining activities of any big region, while data on the EU's reserves is hazy.



#### Figure 1: The EU Lacks Share of Critical Raw Mineral Production

Sources: European Commission, Joint Research Centre, Financial Times

Meanwhile, demand is growing. The EU target is for renewables to produce 32% of the bloc's energy by 2030, but that could increase to 40% or even 45% if the European parliament gets its way in negotiations. In 2020, about 22% of the EU's power generation came from renewable sources, according to the Commission.

Dries Acke, policy director at SolarPower Europe, said the industry body expected EU installations of photovoltaic cells to reach an all-time high of 34 GW this year, up from 28 GW in 2021. But he said that supply of raw and processed materials would determine the availability of solar products. Brussels has been working on plans to improve "circularity" of products, such as old mobile phone batteries, so their rare metals are reused.

However, Cillian Totterdell, climate and energy policy lead at consultancy FleishmanHillard, said the EU would also have to improve its import or extraction of fresh supply. "It's a huge issue securing resources," he said. "We have not thought about this nearly enough. From an EU perspective it's crazy that circularity has been the only answer, when more resources are needed than circularity can deliver in the short to medium term." As things stand, Europe produces less than 1% of the world's lithium ion cells compared with China's 66%, according to the JRC.

Still, not all EU governments believe large-scale homegrown production of critical raw materials is realistic or desirable. "We live in Europe, not China," said one EU diplomat, pointing to the legal challenges and environmental opposition to mining projects. "There's a question mark over the extent to which we can actually pull this off, and whether it's not preferable to do this with countries [outside the EU] that we trust."

While EU Commissioner Breton has been pushing hard to bolster domestic production — following a "strategic autonomy" agenda similar to those seen in areas including hydrogen and semiconductors — other Commission officials emphasise the need for better trade links outside the EU. Valdis Dombrovskis, EU Trade Commissioner, said in July 2022 that geopolitical pressures were "shifting our

perspective on trade policy" and that the bloc needed to land more deals with "likeminded partners" to bolster its economic resilience. His goals include a deal with Chile — a key source of lithium — before the end of the year and an agreement with Australia in the first half of 2023. Still, Savannah's Ferguson said the EU could not expect all the answers to come from overseas. "We need to get some of these projects through and into production as soon as we reasonably can," he said.

#### EU's Critical Raw Material Act

European Commission President Ursula von der Leyen recently announced a new legislative proposal, i.e. the Critical Raw Material Act, to tackle the evolving dependency on China when it comes to raw materials and ensure more resilient supply chains. The proposal was announced as part of von der Leyen's annual State of the Union address on September 14, 2022. (3)

While the Commission already noted on several occasions that it is working on a legislative proposal to boost autonomy and resilience in the area of raw materials, it is the first time that the main pillars of the new approach were outlined. "We must avoid becoming dependent again, as we did with oil and gas. [...] We will identify strategic projects all along the supply chain, from extraction to refining, from processing to recycling. And we will build up strategic reserves where supply is at risk. This is why today I am announcing a European Critical Raw Materials Act," she added.

#### Chinese dependency

While von der Leyen did not mention China directly in her speech, the message was clear. "The not-so-good news is – one country dominates the market," she said. Many of the raw materials that the European Commission deems critical are primarily mined in China. This holds especially true for rare earths, where the supply risk is considered by the Commission to be the highest.

Around 90% of these rare earth metals are currently mined by China – rendering the EU largely dependent on the Asian giant regarding this essential resource. "Lithium and rare earths will soon be more important than oil and gas," von der Leyen emphasised. Due to the green and digital transition, the demand for critical raw materials is expected to rise dramatically. According to the Commission, demand will increase by 500% by 2030. Other projections by the World Bank suggest that the global demand will also increase 5-fold by 2050. (4)

#### **Tackling dependencies**

Some of the measures, aimed at tackling existing dependencies and ensuring diversification of supply chains, will be modelled after a legislative proposal that dealt with similar problems: the Chips Act, which seeks to boost semiconductor production capacities for the EU. "We now need to replicate [the Chips Act's] success," von der Leyen said. This could entail the relaxation of some of the state aid rules under its main subsidy scheme, the Important Projects of Common European Interests (IPCEI), to increase investment in the mining sector – something that has already been proposed for the Chips Act.

To boost investment, von der Leyen also announced an increase in the financial participation of the IPCEI and the creation of a new European Sovereignty Fund. However, the upcoming Critical Raw Material Act will not only deal with securing supplies. It also aims to lessen the dependency on China when it comes to refining raw materials.

One case in point is lithium, which is a key component of batteries and thus essential for the green transition. While only around 9% of the world's lithium is mined in China, around 60% is refined there, leaving the EU largely dependent on China even in areas where there is a multitude of suppliers of the raw material itself. "We will identify strategic projects all along the supply chain, from extraction to refining, from processing to recycling. And we will build up strategic reserves where supply is at risk," von der Leyen stated.

#### Securing supply chains through trade

Another pillar of the Commission's approach to secure supply chains is through means of trade with like-minded democracies like Chile, Mexico, New Zealand, Australia and India. This emphasis on diversification of supply chains instead of pushing for a more protectionist approach was especially welcomed by experts.

"I find it telling that von der Leyen placed a strong emphasis on the role of trade relationships and expanding the portfolio of strategic partnerships," André Wolf, divisional head at the Centre for European Policy recently said. "This could perhaps be interpreted as an indication that the Commission is moving a bit away from the idea of renationalising the commodity sector as a risk hedging tool," he noted.

#### **Plans for EU's Rare Earths Production**

Belgian chemicals group Solvay plans to create the second European site producing rare earths vital for the energy transition, as the continent rushes to break China's dominance over the hard to extract elements. The company recently announced that its La Rochelle plant in France would be upgraded to separate a larger range of the 17 rare earths to include neodymium and praseodymium, which are crucial in the production of magnets for electric vehicles and wind turbines. (5)

Disruption to gas supplies in the wake of Russia's invasion of Ukraine has sharpened EU officials' minds on the risks of relying on one country for materials needed for the transition to a lower-carbon economy. "Lithium and rare earths will soon be more important than oil and gas," EU Commissioner Breton recently said.

The 78-year-old La Rochelle plant, which supplies rare earths for automotive catalytic converter and semiconductor production, will help bolster Europe's autonomy over the rare earth supply chain. It will join Neo Performance Materials, which has a separation site in Estonia, in producing the rare earths needed for electric cars and wind turbines. The UK has a rare earths separation project under construction through London-listed Pensana. "Rare earths are essential to ensure

the green energy transition," said Ilham Kadri, chief executive of Solvay, which recently settled a longstanding dispute with an activist investor. "Our investments in the magnets' value chain will help Europe power its new economy."

However, the rare earth supply chain involves many steps including turning separated rare earth oxides into metals and magnet production that analysts say are required to loosen Beijing's control over the flow of critical materials and components. "It's a good step forwards," said David Merriman, rare earths research director at Wood Mackenzie. "For automotive manufacturers, there are a few stages that need to be filled in to make it directly contact their supply chain."

Europe imports about 16,000 tonnes a year of rare earth permanent magnets from China, meeting approximately 98% of EU demand, according to a report by the European Raw Materials Alliance (6). Under the proposed EU Critical Raw Materials Act, permitting will be streamlined, funding will be allocated to strategic projects and strategic stockpiles of materials will be built. The EU has been much slower to build raw material supply chain resilience than countries such as Japan, which financed what is now the largest western rare earths producer Lynas, after China unofficially banned rare earth exports to the country a decade ago over a geopolitical dispute.

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