The European way out - securing raw materials for European industry

By **Bernd Schäfer***

We are living in what can only be described as an epochal time in modern history. We cannot underestimate the unprecedented nature of the volume of raw materials needed to build the wind turbines, fuel cells, solar panels, heat pumps, batteries, and more - just to replace the EU's imported 155 billion cubic metres of Russian natural gas. The Russian invasion of Ukraine, soaring energy prices, Europe's lack of resilience with regard to its growing metals needs, and the ever-present possibility of metals and minerals supply shortage, has put us at a worrying disadvantage.

Europe aims to become the first carbon neutral continent, driven by the ambitions of the European Green Deal which will require unprecedented quantities of raw materials. In fact, the World Bank has found, that meeting clean energy targets would increase demand for many metals by 500 to 1,000 percent by 2050. (The World Bank Group, 2020 Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition)

To lead Europe out of this dilemma, European capacities must be promoted and built immediately without hesitation. This must be done with a long-term strategy with political support in place to trigger investments in primary and secondary raw materials production.

For Europe to remain economically successful and globally competitive, while becoming increasingly resilient to external geopolitical factors, it must stimulate a responsible raw materials sector by establishing sustainable, competitive value chains of raw materials and advanced materials, and building up robust secondary raw materials capacities through recycling, for the circular economy.

Urgent and tangible action is needed. Momentum cannot be allowed to slip. We must build on all positive opportunities, such as the recent launch of the European Commission's Critical Raw Materials Act 'Call for Evidence and Open Public Consultation.' This will remain open until 25 November 2022 and marks a significant and welcome milestone for the European raw materials sector. It provides a vital platform through which we in the sector can contribute to this crucial legislation. EIT RawMaterials, as Europe's largest raw materials consortium, as a connector and intermediary of industry, academia, RTOS, NGOs and government, will ensure the critical voices of the European raw materials sector are heard in this consultation process.

Magnesium: Evidence of the Urgent Need for European Raw Material Autonomy

The recent magnesium issue is just one example of the urgency of action required on the building of a sustainable, secure, and reliable supply of raw materials for Europe.

While the global magnesium market itself is relatively small, with about 1.2 million tonnes of annual production, compared to 67 million tonnes of aluminium, it plays a vital role in giving compressed strength to a wide range of products. Items we rely on in everyday life, from the aluminium beverage can to the wings of a modern Airbus airliner, would not exist without magnesium. The European Commission is worried that any fall in shipments from China which supplies over 90% of magnesium to Europe, could curb production of auto parts, airplane parts, and other products that depend on the mineral.

As we all know, magnesium supplies from China fell late last year, igniting prices in Europe and focusing the EU on efforts to secure domestic supplies. Now, the recent energy crisis and soaring energy costs are causing significant shifts to the raw materials supply-and-demand landscape of the aluminium sector. The electricity prices in Europe have triggered cuts in the energy-intensive production of aluminium and other industries. Europe's

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primary aluminium output capacity has fallen considerably, with further output under threat as new curtailments continue to be announced, due to the power crisis.

In Germany for example, the German Aluminium Association showed that nine out of 10 companies said they were not able to switch to another energy source if gas was no longer available in the short term. Reducing the gas supply by 30% would already bring production to a standstill for half of the companies.

What we are now witnessing is a mad scramble for mineral resources, in conjunction with this unprecedented energy crisis, which is causing a global geopolitical shift in the raw material sector.

The problem is that Europe currently imports a staggering amount of its most critical raw materials from abroad and from single economies, putting it at high risk. Europe, for example, imports 98% of rare earths and 93% of magnesium from China, 98% of Borates from Turkey and South Africa provides 71% of the EU's needs for platinum.

China has established a significant presence across the entire clean energy supply chain which has been done through state-subsidised overcapacities, tax exemptions and under-pricing. This is all to be seen in context of the very successful One Belt One Road (OBOR) initiative, which comprises 65 countries, 900 projects, and a total planned investment volume of $850 billion (approx. €859 billion).

Sustainability and Diversification of Raw Materials Supply

So, what is the solution? The time has come to rapidly build highly innovative and sustainable raw materials supply chains between member states and like-minded international partners to take full advantage of Europe's single market opportunities. Because, irrelevant of the current energy supply crisis which urgently needs a reliable solution, Europe's mission is to decarbonise industry, to be the first climate neutral continent by 2050.

There are several factors that must be urgently put in motion to make this a reality. We need a level playing field in which Europe can compete. Investment must be stepped-up without delay to build and strengthen a highly reliable critical raw material supply chain, and we must scale-up innovative and relevant education and re-skill and upskill the workforce.

We need industry-wide commitment to the highest environmental, social, and governance practices (ESG) because by importing materials from states with values far different from our own, we are supporting deficient ESG practices. We need a sustainable primary and secondary raw material industry to enable the transition to renewable energy, which means we must build up domestic reserves of raw materials and enhance our recycling capacities.

And Europe must diversify supply also with partnerships beyond our own borders to promote competitiveness, a key driver for innovation. We must forge robust raw materials strategic partnerships with like-minded nations, whose shared values with Europe are rigorously upheld.

The good news is that this process is underway. EIT RawMaterials, along with the European Commission, is working to strengthen our relationships now with governments and markets in Ukraine, Greenland, Australia, Africa, Norway, Latin America, Canada, and the US to secure the supply of critical raw materials and to help catalyse investment for strategic opportunities.

As a result of this work, we have several projects in progress which are addressing diversification of supply. For example, for rare earths, we now work with a Canadian company with expertise across the rare earth value chain, one of the few outside of China. Their planned facilities in Estonia can provide over 10% of Europe's needs, in terms of both rare earth metals and magnets.

Europe's Great Innovation Opportunity

The great potential for Europe to produce and recycle more of the raw materials needed for the energy transition is significant. Domestic production and recycling of raw materials is beginning to take hold across the continent. At EIT RawMaterials, we are bringing together leaders in academia, research, and business/industry to collaborate and innovate together to accelerate this transition.

Right now, mine sites across Europe are not only modernising, but becoming increasingly safe and sustainable thanks to advances and innovations in robotics, Artificial Intelligence (AI), virtual reality, and electrification. In Spain, for example, we are supporting one of our partners to launch a fully electrified underground mine which is expected to contribute to 13% of the copper mines output of Spain and deliver copper with a 90% lower carbon footprint compared to existing standards.

There are challenges of course, but momentum is building, with, for example, the construction of a silver-zinc-lead project in Bosnia, and the decision of the Greek government to permit a copper project in Greece, which alone is expected to start an annual average production of 40,000 tonnes of copper in 2025.

In Finland, one of our EIT RawMaterials partners has just secured a permit approval for a lithium plant, and a significant investment of €500 million, with the aim to produce high-purity, sustainable lithium for Europe.

Another partner of ours in Spain is planning to extend its existing processing capacity of high-purity copper, zinc, lead and silver. This is a technologically advanced operation that has achieved a remarkable low environmental footprint in terms of water use and emissions.

We also now support three projects that deal with the production of tungsten, which is critical for the aerospace and defence industries. This has the potential to supply almost 60% of the EU's needs for tungsten.

Contextualising Aluminium in Europe's Raw Materials Mission

By galvanising this immense innovation potential, we can continue to rebuild the aluminium sector in Europe. If we look at the market potential itself - the primary aluminium market here in Europe, will be about nine million tonnes per year by 2050, versus a projected global production of 107 million tonnes. (https://www.european-aluminium.eu/vision-2050)

The sector is one of Europe's most complete value chains in the raw materials sector and offers widespread energy transition uses. Since 2008 however, Europe has lost more than 30% of its primary aluminium production, and with the current energy crisis, this is expected to increase substantially. (https://www.european-aluminium.eu/activity-report-2021-2022/market-overview/)

There is a drive now across Europe to restart domestic output of magnesium, used in aluminium and steel products, which places a new emphasis on magnesium and cutting dependence on China.

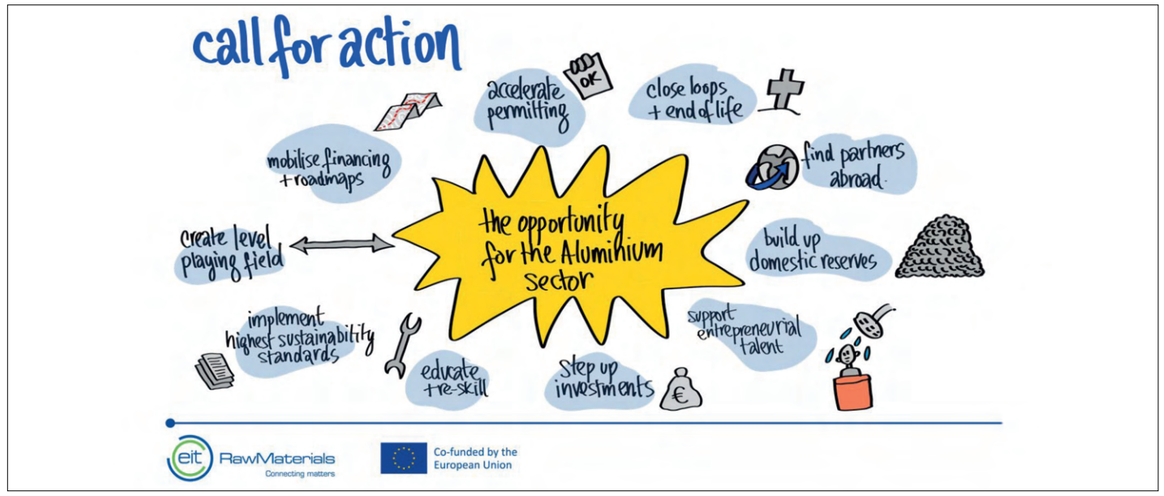
EIT RawMaterials is also working to support the securing of Europe's domestic magnesium supplies with at least three firms, two in Romania and one in Bosnia. One of these projects is forecast to produce more than 18,000 tonnes per annum of magnesium covering 13.5% of EU magnesium demand from 2026-2035. The total development potential is close to self-sufficiency.

In Conclusion

We have the innovation know-how, the technological leadership in Europe, and with EIT RawMaterials' education and start-up investment, there is a sound foundation to really strengthen the sector and to seize the opportunities that are opening up.

To really return primary and secondary production of aluminium in Europe, action is needed, and it is needed today.

Creating incentives to enable more end-of-life products to be recycled in Europe also is necessary in the immediate future. This can lend Europe a distinct advantage in its domestic supply of sustainable raw materials. And, to repeat my earlier point, Europe's long-term resilience, competitiveness, and secure access to raw materials relies on urgent measures that will enable a level playing field, major strategic investment, scaled-up education and re-skilling, commitments to ESG, and diversification of our raw materials supply through partnerships with nations who share European values and European ambitions for climate-neutrality. ■



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