The **European Commission** launched its Critical Raw Materials Act last month, aiming to secure Europe's supply of the resources essential for the green and digital transitions. A big focus has been the materials needed for electric vehicle (EV) batteries, with concerns rising that Europe could replace its fossil fuel dependency on Russia with a raw material dependency on China.

Mining companies like Anglo-Australian Rio Tinto are urging Europe to extract more at home, while also increasing recycling of old materials. However, critics say the need for raw materials is being overblown in an effort to bypass public opposition to new mining in Europe, such as the furore over Rio Tinto's proposed new lithium mine in **Serbia**. Lithium is an essential element of EV batteries.

Energy Monitor spoke with Colin Mackey, Rio Tinto's head of European operations, about how the company views the critical raw materials situation in Europe.

How central will raw materials be for the green energy transition, and is the EU getting the regulatory framework right to ensure their supply?

As an industry, we absolutely welcome the Critical Raw Materials Act. It's a step in the right direction for Europe, but the key here is that it's the start of an essential journey. How it ends up at the end, we're somewhat cautious about.

The green and digital transitions cannot happen without critical raw materials. The **EU** has very ambitious policy about moving away from the internal combustion engine. The automobile industry needs four times as much critical raw materials for every EV than for a conventional counterpart. EVs need batteries and batteries need lithium. So we cannot reduce emissions from people's mobility unless there are critical raw materials.

Right now, Europe is almost entirely dependent on continuing to import raw materials to feed the automobile industry, as well as every other industry that needs critical raw materials. That poses a problem. If you're relying on imports, you're not going to be competitive in the long term.

Europe needs to do more recycling, but what you can recycle in ten years' time is what you see on the streets now. That just isn't enough; the task is bigger. What people don't always realise is we need to be more competitive in our own backyard. There are a number of resources that could be mined [in the EU] but aren't. To develop a mine, from discovery to operation, takes 10–15 years. That's a lot of work, so in that period we need to have stability and certainty so we can secure those new mining operations moving forward.

Rio Tinto has struck several partnerships recently with automakers for supply of materials like copper and aluminium. How critical will these materials be in the

ramp-up of EV production?

The end user wants to be able to see that what they're driving around in has credible sustainability and that they're contributing to the green transition. You cannot do that easily at the moment. So we're asking, how can we look at the materials in a different way so we can create materials supplied to automakers that are green and sustainable and have a low carbon footprint?

An example of that is **ELYSIS**, our partnership with [US aluminium company] Alcoa and Apple. Even if you use all the most sustainable materials to feed into aluminium [production], it still has a carbon footprint because the anodes [in smelters] are made of carbon. ELYSIS is a transformational way of making aluminium so it emits oxygen rather than carbon as part of the production. That creates an opportunity to supply automakers [with] a reduced carbon footprint for their EVs. For example, a partnership with BMW is about how to use low-carbon aluminium to reduce their footprint.

But it's not just about that; it's about how we invest in an innovative battery supply. We have an investment into the Slovakian battery company InoBat. We're not experts in batteries, but we want to support the battery industry. Our partnership with Nano One in Canada is for exactly that same reason. We're also working with Salzgitter Steel in Germany to optimise their green steel production, and we're working with the University of Nottingham to create more biomass to convert iron into metallic iron.

Partnerships are about a sustainable value chain from beginning to end – whether it's about batteries, EVs or anything else. Blockchain technology can be used to trace that low-carbon aluminium all the way through [through a technology called START], so you can scan the barcode and get a full breakdown of where it comes from and what the product is.

We're also looking in our backyard [for] mining [opportunities]. In the past, we've very much treated mine waste as rust. Now we're changing that, asking what we can do differently. More broadly, in partnership with OZ Minerals and Boliden, we are looking at how to reimagine mining, and particularly processing, to eliminate and fund new uses for mining waste.

Many technologies that are going to create sustainable mining and industry, and ultimately the green and digital transitions, are still being invented. So having a European environment that creates a stable and competitive platform that allows industry to partner and invest in innovation and R&D is a key component.

Raw materials extraction can be an emissions-heavy process. Can carbon capture and storage (CCS) decarbonise it?

Mining has been around for a very long time, and quite often we've been part of the

problem. Mining is changing and it needs to continue to change to move forward. So investing in new technologies, new innovations and new ways of working so we can be more sustainable and responsible is absolutely key.
One of those components is about really working with communities so we can minimise environmental and social impacts, and maximise benefits. There are some very genuine environmental concerns out there, which we need to listen to, that we need to address, but without mining there are no critical raw materials, and without critical raw materials there is no digital and green transition. However, it can be done sustainably and to minimise the impact.
Where there are opportunities for **CCS**, we can look at that, but carbon storage requires a certain kind of mineral. Unfortunately, not every mine has a material in it that can be used for carbon capture at the same time.
In Rio Tinto we're already a large user of green energy; 75% of the electricity in our operations comes from renewable energy. We've said we will have a 15% reduction by 2025 and a 50% reduction by 2030 [in our scope 1 and 2 greenhouse gas emissions]. It's nice to have targets, but the difference is we're putting our money where our mouth is. We're investing $7.5bn in decarbonisation. Our operations in Pilbara, Australia, are installing solar. We've struck a number of partnerships in in Australia and Canada for more green energy.
There has been local opposition to increased mining in Europe, such as the backlash against Rio Tinto's proposed lithium mine in Serbia. Could this be a roadblock to Europe's goal of increased self-sufficiency for critical raw materials?
This is not unique to Europe; it's a global concern. People do not want a mine right next door, but I think what's changing is our approach, and this is really key. There is an opportunity to engage and consult early, building a relationship based on trust and credibility. We need to listen and explain things better. Particularly in Europe, what people think about mining is very different from what mining actually looks like, especially underground mining where there is minimal waste and a low footprint on the surface.
This project in **Serbia** is a phenomenal project. It's an underground lithium mine that has [the same] small industrial footprint on the surface that you see all over Europe. It has underground [operations] coexisting with agriculture on the surface. It has great sustainability statistics, with the highest environmental standards that are available, but right now we do not have permits. So, while this is a fabulous project, and we continue to engage with stakeholders and we are a large landholder, ultimately it will be the Serbian people and government that decide whether we have a path forward or not.

Is there a risk that Europe's dependence on Russia for fossil fuels could transition to a dependence on China for raw materials used in clean energy and transport?
The EU Critical Raw Materials Act indicates that policymakers understand the risks, and that Europe must extract its own resources to safeguard supply, but it's not just about extracting resources, it's about doing it sustainably. It's also about recycling, partnerships with Canada and South American countries, also Serbia perhaps, and continuing to import. It's a mixture of all three of those. We cannot do one or the other, it's not enough; we need to do all three. **We need to mine our own materials sustainabl**y, continue to import and increase recycling, and we need to listen to the communities, because societies remain sceptical about mining, particularly in Europe.
For many decades we have outsourced our supply. We need to change that, so we don't become dependent on one or the other and we remain competitive.

Source: Energy Monitor