Critical Raw Materials Act

TRANSPORT & ENVIRONMENT

T&E recommendations on Commission's draft

Summary

- T&E supports Strategic Projects across the critical metals value chain, notably in *processing, recycling & mining from waste*. T&E analysis shows there can be sufficient processing capacity in lithium, cobalt and (with a push) nickel to meet Europe's 2030 goals.
- *Environmental & social safeguards cannot be compromise*d, and should be strengthened in the area of indigenous peoples' rights and waste management.
- *Certification schemes* can only be used where these have multi-stakeholder governance & independent audits; they should not be the sole indicator of compliance.
- The regulation should support companies to *scale industrial recycling* in Europe, including efforts to keep batteries' waste ("black mass") in Europe.

Context & CRM Act proposal

The fight against climate change is a race against the clock. Transitioning to renewable energy, electric vehicles and smart grids rapidly and at unprecedented scale is essential but will require significant volumes of critical metals such as copper, lithium and nickel.

Europe is neither first nor alone in its efforts to secure those. China began as far back as the 1980s and today refines 85% of rare earths found in electric cars and wind turbines, and 65% of all lithium found in batteries. Chinese companies control much of cobalt in the DRC, lithium in Chile and nickel in Indonesia.

Meanwhile, the US Inflation Reduction Act is a game changer in industrial policy. Only electric cars with batteries and raw materials procured in North America or friendly countries will get tax credits. This has unleashed a wave of domestic investment announcements and geopolitical supply chain shifts. The risk for Europe is that companies will now prioritise

the US market over Europe's and some of Europe's nascent projects get delayed or disrupted.

The EU Critical Raw Materials (CRM) Act is part of the answer to the metals supply challenge in Europe. The Commission proposal is a good start and strikes a balance between securing supply of critical metals on the one hand and preserving environmental safeguards on the other.

For this to work, the Act must tackle the problems in line with European values: this means *resilience alongside uncompromised compliance with high social & environmental standards* with local communities on board. This balance key to keep in co-decision.

However, requirements around strategic projects, industry schemes and environmental footprint reporting should be strengthened.

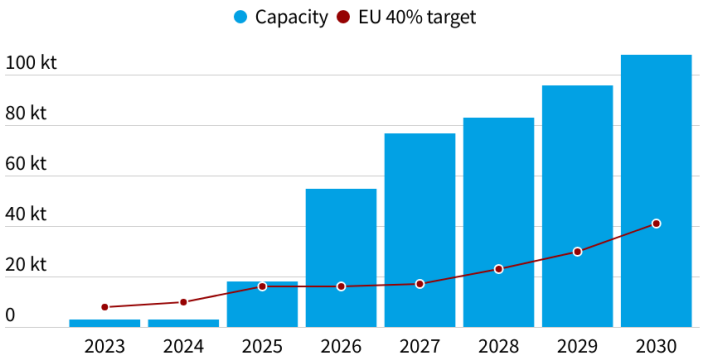
European metals potential

The CRM Act introduces self-sufficiency goals, including processing, extraction and recycling. T&E believes Europe can in particular onshore refining and processing of critical metals, as well as recycling given the size of our consumer market.

T&E's analysis of the latest project pipeline in key battery metals - lithium, nickel and cobalt - shows significant potential.

Lithium: Although Europe currently relies entirely on imported lithium to meet the demands of the battery sector, various domestic projects have been announced in the past few years. These have the potential to almost completely reduce the region's dependence on imports.

Europe's potential for refined lithium



EU 40% target compared to T&E's regulatory demand scenario. This scenario is based on car and van CO2 standards, higher truck CO2 standards and estimated energy storage needs.
Source: T&E analysis, company reports

T&E tracks a pipeline of 24 lithium refining projects in the EU and the UK, as either integrated with mining or stand-alone plants. These are in various stages of development, with a combined theoretical capacity of 108 kt Li by 2030, or more than

100%[1] of the demand in the regulatory scenario (102 kt Li in 2030)[2].

If the Serbian project by Rio Tinto is included, this rises to almost 120 kt. Excluding projects that currently encounter opposition from local communities, the combined capacity could amount to 93 kt Li, or over 90% of the demand.

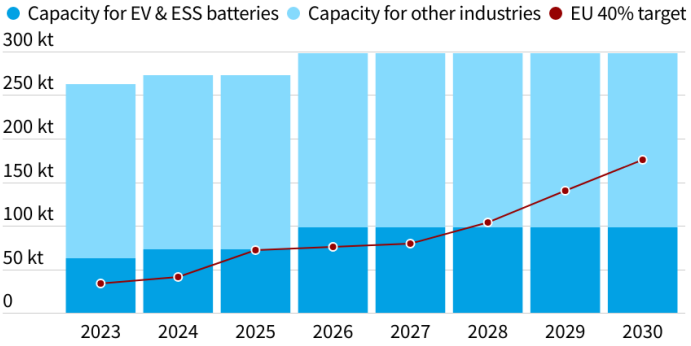
The actual production output at plants is often lower than their nameplate capacity, as they may not operate at full capacity continuously. However, the pipeline shows that the Union's objective of 40% is more than feasible for lithium.

Nickel: Europe already has mature refining nickel capability, however a significant part of the output is in the form of high purity metal, typically used in applications such as stainless steel or alloys, rather than batteries.

Today, the total capacity stands at over 260 kt Ni, of which only around a quarter is dedicated to batteries. Announced capacity expansions by Nornickel in Finland could additionally bring online up to 35 kt Ni by 2030. If these plans go ahead, the total volumes in Europe would account for 22% of the demand from electric vehicles and energy storage applications in 2030 (440 kt Ni). Excluding the expansion, however, Europe's battery-allocated capacity would cover 14% of the demand.

It is technically feasible to convert nickel metal into nickel sulphate, which is the chemical compound used for battery cathodes. But companies would need to adapt their processes and change their established customer base.

Europe's potential for refined nickel

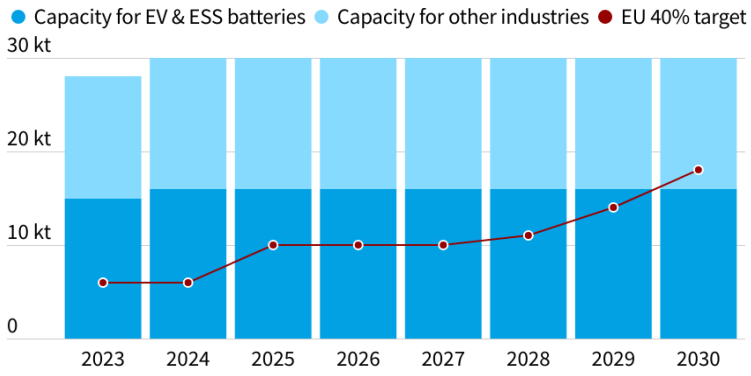


EU 40% target compared to T&E's regulatory demand scenario. This scenario is based on car and van CO2 standards, higher truck CO2 standards and estimated energy storage needs.
Source: T&E analysis, company reports

[1] The list of projects is available in the Annex.
[2] T&E developed several demand scenarios for lithium, nickel and cobalt from electric vehicles and energy storage applications. The regulatory scenario aligns with the EU regulations on car and van CO2 standards (i.e. petrol and diesel phase out by 2035) and higher HDV CO2 standards, as well as demand from energy storage systems and smaller applications such as maritime.

Cobalt: Similarly, cobalt is already being refined in Europe to some extent, but a part of the output has been traditionally dedicated to applications such as superalloys, hard metals and catalysts.

Europe's potential for refined cobalt

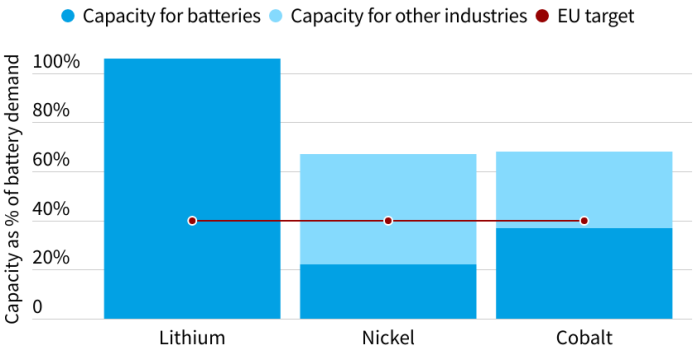


EU 40% target compared to T&E's regulatory demand scenario. This scenario is based on car and van CO2 standards, higher truck CO2 standards and estimated energy storage needs.
Source: T&E analysis, Wood Mackenzie, company reports

Around 17 kt of the roughly 30 kt total capacity is expected to serve the electric vehicles and energy storage market, which would cover 37%[3] of the demand in 2030 (estimated at around 45 kt of cobalt). This shows that potential, notably in lithium and cobalt (which is close or above the EU target of 40% processing self-sufficiency) exists. With strong industrial policy and financial support, more investments can follow in Europe. Refining plants take a few years to scale up, so it is reasonable to assume that a lot more can come online before 2030.

However, securing feedstock - lithium, nickel and cobalt raw materials themselves - will remain an issue if separate processing plants are built. On top of sustainably developing local resources (that will take time), it is therefore paramount that Europe builds partnerships with resource-rich countries and co-invests in mining projects abroad, including Indonesia, Australia, Canada and African nations. This should be built with high standards in mind, i.e. meeting the global IRMA standard requirements and helping the Global South countries with economic development and technology transfer.

Europe's potential for refined lithium, nickel and cobalt by 2030



T&E's regulatory demand scenario based on expected car and van CO2 standards, higher truck CO2 standards and estimated energy storage needs.
Source: T&E analysis, company reports, Wood Mackenzie (selected cobalt data)

[3] We revised the figures upwards compared to previous reports, due to potential production streams based on powder dissolution into cobalt sulphate.

Recycling: With millions of electric cars entering the fleet each year from 2020 (and a lot more spent batteries available from consumers), the potential from end-of-life products will be significant from at least 2030 onwards. Pre-2030, manufacturing scrap from the many battery factories setting up shop in Europe will also be available for recycling.

Especially in a large consumer market like Europe, recycling can play a crucial role in filling the gap between supply and demand. It can also cushion against high prices on spot markets when the supply is tight.

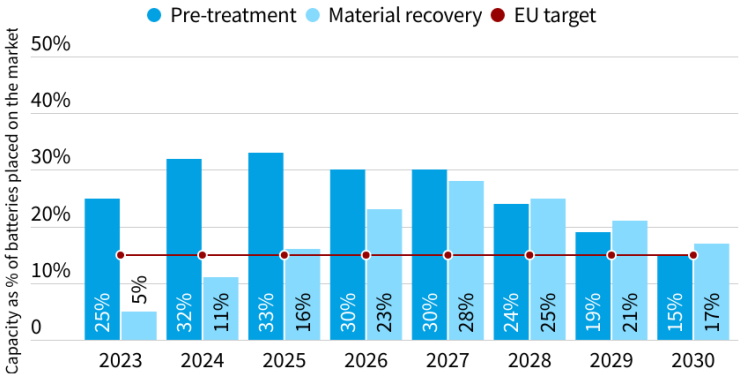
We estimate that up to 13% of the demand for lithium, nickel and cobalt (in GWh)[4] can come from EV and storage battery recycling alone by 2030.

In terms of recycling capacity, according to Circular Energy Storage (CES), today there is a misalignment between pre-processing (or pre-treatment like shredding & burning) into "black mass" and material recovery from that into battery grade metals themselves. Pre-treatment capacities account for 25% of all lithium-ion batteries placed on the European market, while material recovery capacity is only 5%, or 5 times less. This means Europe is missing the biggest value add from recycling, with black mass going to Asia instead.

However, the projections by CES show these to increase to 15-17% by 2030, without new policies. Expansions will come from Europe-based Umicore, Revolt and BASF, Korea-based Sungeel and USA-based Redwood Materials and Ascend Elements.

This means that, with effort, Europe can even go above the current objective of 15%, which should be raised to drive ambition.

Europe's potential for battery recycling



Capacities and batteries placed on the market calculated originally in tonnes of batteries.
Batteries placed on the market include all Li-ion battery applications (electric vehicles, energy storage systems, industrial, maritime, uninterruptible power supply systems, personal mobility and portable electronics).
Source: T&E analysis, Circular Energy Storage

[4] Assuming 100% collection rate; 20 years electric vehicle battery lifespan, with a portion of batteries being reused for another 5 years; 10 years energy storage battery battery lifespan; 5-7% of production scrap generated by gigafactories as they reach maturity by 2030.

T&E recommendations

1. EU Strategic projects

T&E supports the idea of having Strategic Projects, which - provided that 1) they adhere fully to EU's social and environmental standards and 2) have local communities on board - should benefit from faster permitting and financial support. What is needed is a *stronger link between the EU's self-sufficiency goals and the selection of strategic projects*, prioritising (e.g. in processing or recycling) in accordance with the EU strengths.

The environmental safeguards should, without exception, include *water* management (in line with the EU's Water Framework Directive), *waste tailings* management (in line with best practice such as IRMA or Safety First as Europe's framework is outdated), *biodiversity* (such as the EU Habitats Directive), as well as *emissions* control. All extraction projects should undergo an Environmental Impact Assessment.

Time is of essence, so once the project has shown adherence with the necessary criteria in Article 5 and the Annex, it must be supported and approved quickly. T&E supports the proposed permitting deadlines, provided the environmental safeguards are not compromised and the administrative and capacity issues are targeted instead.

2. Certification and environmental footprint

2. 1 Certification Schemes

For a project to be recognised as strategic, the Commission proposes that the company may demonstrate compliance with the project requirements listed in Annex III either by "attesting compliance" with a "recognised" mining and minerals certification scheme or by committing to achieve such recognition.

T&E believes that voluntary initiatives can play a role in the CRM Act. However, considering that not all certification schemes are created and managed equally, the criteria for such certification schemes that is laid out in Annex IV should be strengthened.

Beyond being objective and independent, the requirements should include:

- The scheme should have multi-stakeholder governance, which gives an equal voice to industry, communities, workers and civil society;
- Clear disclosure rules must be put in place to assess any conflicts of interest between auditing firms and the audited company;
- Audit reports should be made available in a transparent manner, and with detail (not a summary);

- The audit methodology should require consultation with and adequate participation of local communities and other stakeholders.

Crucially, the Commission (and the Critical Raw Materials Board) should not rely on certification as the sole indicator of compliance, and conduct its own broader analysis of the project. On top of audit reports and certifications, this could include results of consultation with communities, workers and civil society organisations. This is aligned with an OECD's recent study that shows that company's responsible conduct cannot be guaranteed even by most rigorous initiatives, and must be considered as one piece within a broader set of risk-based indicators.

Finally, no project should receive the "strategic" status before the third-party certification is completed, so second point 4 (b) in Annex III should be deleted. One of the key aims of certification schemes and audits is to help companies identify and address risks in their operations. Therefore granting a strategic project status without knowing the result does not guarantee environmental or social safeguards.

2.2 Environmental Footprint

T&E welcomes the intention in Article 30 to establish rules for the calculation and verification of the environmental footprint of different critical raw materials via a delegated act. As shown in T&E research, the way raw materials are sourced can have a positive (or negative) impact on the climate and on the environment.

However, the text is currently vague and does not commit the legislator to any deadlines. The CRM Act should commit to developing a clear methodology to calculate the raw materials' environmental footprint, focusing first on the most salient issues, notably carbon intensity in the case of nickel and copper supply; and water usage linked to lithium extraction. Co-legislators should require the Commission to propose such Delegated Acts no later than 2025.

3. Circularity & recycling

3.1 Black Mass (aka battery recycling)

Scaling recycling expertise, capacity and skills in Europe today is a no regrets industrial strategy and key to the bloc's supply resilience. Data by CES (above) shows that while there is enough pre-processing capacity of end-of-life and scrapped batteries to turn them into waste feedstock, or "black mass", the capacity to recover materials such as lithium and nickel themselves from black mass is missing.

As a result of this mismatch, the valuable black mass often leaves Europe for Chinese and South Korean facilities to be recycled and turned into new batteries there. This is a serious *critical metals drain* that Europe should stop.

One solution is to scale up material recovery capacities in Europe, via funding support and the Strategic Projects framework.

In addition, based on experience with other waste streams, a technical solution would be to designate lithium-ion batteries and black mass as "waste" (or even "hazardous waste") under the European List of Waste Codes. This will mean that companies will have to meet certain criteria to recycle such waste abroad, giving an advantage to recyclers in Europe.

The Commission, in its accompanying communication, proposes to start this process in 2024. Given the EU elections, this is likely to slip. T&E believes this can be **brought forward and mandated via the CRM Act directly** already in 2023.

3. 2 Remining

Another key source of critical raw materials can come directly from extracting metals from the existing (or abandoned) mining waste sites, which is also called "remining". In Europe, latest analysis shows potential for up to 1 kt of cobalt, 0.1 kt of natural graphite & rare earths such as gallium (2 kt). Additionally, one project in the Czech Republic is expected to recover manganese from tailings (20% of the projected 2030 European demand), while another one in Sweden aims at re-mining rare earths (30% of today's European demand).

T&E welcomes the inclusion of a dedicated article on this (Art. 26), mandating member states to map and evaluate the quantities and concentrations of raw materials available in given waste streams. If viable, the recovery of the raw materials from extractive waste must be prioritised under the Strategic Projects framework. Such projects would also be fast to operationalise.

Nevertheless, it is important that key environmental safeguards are also upheld in the case of remining, especially with regards to potential chemical spills, and an appropriate community consultation process must be followed.

Overall, Europe should do a lot more to *reduce its own demand for critical metals* via ambitious product efficiency policies, on top of the CRM Act. This includes putting in place measures for small and efficient battery electric cars (to dis-incentivise SUVs), and all manner of eco design requirements for products containing critical metals.

4. Governance

Finally, someone needs to be responsible for making all this happen. The Commission stopped short of setting up a dedicated authority, and has instead proposed a Critical Raw Materials Board. However, building on world class best practice, this should be transparent and of multi-disciplinary and multistakeholder nature, with the right expertise represented. In particular, this should include civil society and representatives of local communities (including from third countries where relevant) in its deliberations.

5. Global dimension

Even if the end game is circularity, Europe will rely on global imports for a long time. Europe's critical metals strategy should

push for transparent and diverse markets, as well as create a framework for the public and private investment into projects abroad provided high environmental and social criteria are guaranteed (regardless of the strictness of the rules in the foreign country in question).

T&E supports Strategic Projects outside the EU, but the criteria in Annex III should be beefed up. First, the *UN Declaration on the Rights of Indigenous Peoples* as well as the International Labour Organization's Convention giving Indigenous Peoples the right to *Free, Prior and Informed Consent (FPIC)* should be added to the list of frameworks. Second, performing an IRMA audit could be a requirement for mining and refining projects that benefit from EU funding.

Many countries in the Global South from Indonesia to Zimbabwe want to extract more value from their resources and move up the value chain, building expertise in their own territories and eventually moving away from China's dominance in the mid-stream supply chains. Here, the EU can play a role via its development and trade policy supporting and collaborating on such efforts. Supply chains whereby metals are responsibly extracted, purchased and processed in - eg an African country - and then transported straight to Europe for precursor, cathode & battery production are a win-win from the development and sustainability perspectives as shorter supply chains also mean less carbon pollution.

Raw Materials Club

The EU will soon require a "battery passport" that traces where and under what conditions battery minerals were produced. As part of its new "Raw Materials Club" the EU should work with countries such the US, Japan and Australia to extend this across some of the largest electric vehicle markets. This will bring scale to better sourcing practices globally. This should also be part of the current US-EU negotiations as part of the US IRA requirements.

Last thought

The CRM Act does not set new European or global sustainability requirements, instead it is based on compliance with what is already out there. However, Europe's current framework on waste management (the 2006 Extractive Waste Directive) is below the global best practice, and should be updated without delay. Crucially, ensuring strong environmental and social safeguards in all manner of extraction and processing projects, whether in Europe or abroad, will rely on the not yet agreed Corporate Sustainability Due Diligence Directive (CSDDD). This law aims to ensure that businesses, including the extractive sector, respect human rights, the environment and the climate globally, but some negotiators want to weaken the requirements. Failure to put in place strong horizontal due diligence will mean consumers, local communities

and civil society will not trust the “Strategic Project " label, delaying and protesting the very aims of Europe’s critical metals strategy.

Further information

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Annex: lithium refining projects[5]

Country	Company	Type	Capacity (kt Li)	Capacity (kt LCE)
Germany	AMG Lithium	Refinery	3 kt	18 kt
Portugal	Bondalti Chemicals & Neometals	Refinery	4 kt	22 kt
UK	British Lithium	Integrated	4 kt	21 kt
UK	Cornish Lithium	Integrated	1 kt	7 kt
UK	Cornish Lithium & Geothermal Engineering	Integrated	0.2 kt	1 kt
Germany	Deutsche Lithium	Integrated	2 kt	11 kt
France	Eramet & Electricite de Strasbourg	Integrated	2 kt	10 kt
Austria	European Lithium	Integrated	2 kt	9 kt
Czech Republic	European Metals & CEZ Group	Integrated	5 kt	26 kt
UK	Green Lithium	Refinery	8 kt	44 kt
France	Imerys	Integrated	6 kt	30 kt
Spain	Infinity Lithium Corp. & Valoriza Mineria	Integrated	3 kt	17 kt
Finland	Keliber Oy	Integrated	2 kt	13 kt
France	Lithium de France	Integrated	6 kt	32 kt
Spain	Lithium Iberia	Integrated	9 kt	46 kt
UK	Livista Energy	Refinery	6 kt	30 kt
Portugal	LusoRecursos	Integrated	4 kt	19 kt
UK	Northern Lithium	Integrated	1 kt	7 kt
Portugal	Northvolt & Galp	Refinery	6 kt	31 kt
Serbia	*Rio Tinto (on hold)*	*Integrated*	*11 kt*	*58 kt*
Germany	RockTech Lithium - Guben	Refinery	4 kt	21 kt
Romania	RockTech Lithium	Refinery	4 kt	21 kt
UK	Tees Valley Lithium	Refinery	16 kt	84 kt
France	Viridian Lithium	Refinery	4 kt	22 kt
Germany	Vulcan Energy Resources	Integrated	7 kt	35 kt

[5] Based on public announcements as of mid-April 2023