



SUMMARY - MAY 2024

Summary for policymakers: An industrial blueprint for batteries in Europe

From T&E's report on how Europe can successfully build a sustainable battery value chain



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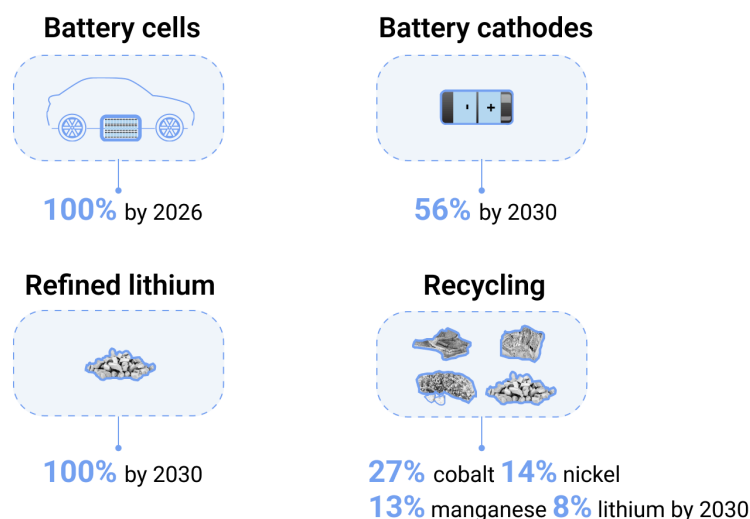
This summary is from T&E's [report](#), *An industrial blueprint for batteries in Europe*.

1 European potential exists

Decarbonisation of the economy is not possible without a massive scale-up of green technologies and their resilient supply chains. Within the global race to onshore the future green supply chains, the battery value chain stands out as one of the most valuable. Over half of the investments into key cleantech globally today - including solar, wind and hydrogen - goes into batteries. By 2030, the investment needs into batteries are more than three-quarters of the EUR 90 bln overall cleantech needs by 2030 according to Commission's own estimates for the Net Zero Industry Act. This places the battery supply chain at the top of the global cleantech race, explaining the fierce competition between China, US, Europe and many others.

A significant potential to onshore best-in-class factories and responsible minerals supply exists across Europe: all of our battery cells can be produced domestically from 2026, over half of cathode active materials - the most valuable battery compound - can be manufactured in the EU, and 100% of lithium itself can be sourced locally.

The potential for Made in Europe EV battery value chain



Source: Transport & Environment, 2024. The analysis includes EU, UK, Switzerland and Norway.



Figure 35: The potential for Made in Europe EV battery value chain

What's more, doing this locally can also be a good environmental policy. Local manufacturing means Europe can set and enforce environmental and social standards, as well as stipulate the effective and meaningful engagement of local communities. The sourcing rules in the new EU



Battery regulation mean that not only batteries and materials produced in Europe, but any lithium, nickel, cobalt and graphite from anywhere in the world have to be sourced responsibly.

From a purely climate perspective, manufacturing some of the more energy intensive and valuable materials in Europe can also slash their carbon emissions. Compared to the cathode active material currently produced in China, European material would come with a reduced carbon footprint of 12%. Local sources of nickel would be 85-95% lower in emissions than the current supply from Indonesia, while lithium will come with an up to 50% improvement to Australian ore processed in China or even reach negative values in the case of DLE. Overall, if all batteries and cathodes were made in Europe rather than imported from Asia, and the local minerals potential was fully exploited, CO2 emissions in the order of 133 Mtonnes can be saved by 2030, comparable to the emissions produced by entire Chile or the Czech Republic in 2022 [1].

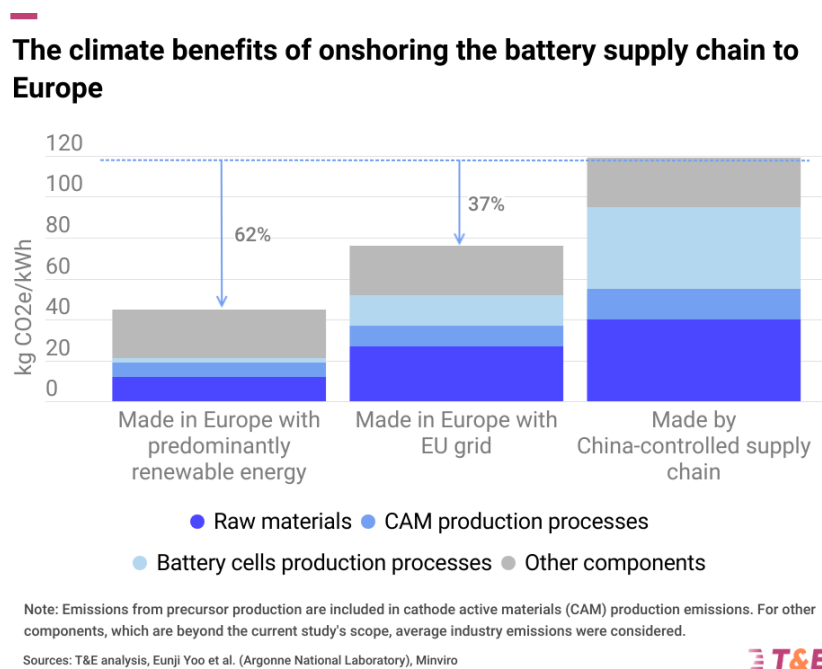


Figure 36: GHG emissions from raw materials, cathode and battery production

But reaping these benefits will not be easy. On the one hand, significant challenges in scaling this potential exist ranging from building new expertise and skilled workforce, securing the raw materials needed for all these battery facilities and providing sufficient but proportionate funding support. On the other hand, Europe is not doing any of this in a vacuum but at the time of heightened geopolitical rifts and a fierce “battery arms race” across the world. A year on since we started our risk assessment index, an estimated 54% of battery plans in Europe are still at risk of either being delayed or cancelled due to the better conditions abroad.

2 How can Europe make it happen?

Europe does not have the cash bazooka of the US IRA, nor the command capitalism of China. So what are those strengths that we do have that can help us succeed?

Ironically, the West once had a lead in battery technology in the 1970s and 1980s. But the interest in clean tech subsided as the oil price fell, just as China started to acquire the technological knowhow. Fast forward to today and China has an unprecedented lead following decades of ambitious policy and long-term investment agenda. The first lesson is that this is a long haul game and should not be undermined by short-term politics or election plays.

Some attempts to rebuild were also seen in the US in the early 2000s when Obama's Recovery Act supported battery, solar and other green start-ups. But no ambitious climate policy meant that no local demand was in sight. So the second lesson is that this cannot be built on subsidies alone, important as financial support is, but requires a market pull. So to build this sector, an ambitious and stable green policy framework, notably the 2025 - 2035 car CO2 framework in the EU and the ZEV mandate in the UK, is paramount.

Today Europe is home to the world's largest consumer block and market. 38 million electric vehicles will be necessary by 2030 to meet the car emissions goals. The EU will need over 1 TWh of batteries in the same timeframe, making the region an excellent business case for any investor. All this is in large part thanks to forward-looking policies, such as the European Green Deal and the 2035 zero emission car goal, that create a monumental green business opportunity and investor certainty.

But this decarbonisation push cannot result in deindustrialisation. This means that electric cars, battery cells and minerals that go into them are -to at least a sufficient share - produced in Europe by all manner of companies bringing local jobs and growth.

Europe therefore needs to create a clear business case to invest locally.

For more than a year since T&E and many others called for this, there has been some progress. A number of helpful policy frameworks have been agreed, notably the Net Zero Industry Act designed to accelerate battery factories and other cleantech industries across Europe, and the Critical Raw Materials Act set to secure responsible supply of critical metals, including recycling. The relaxation of state aid rules have also helped to avoid some of the battery investments, notably Northvolt's plans in Germany, from being delayed in favour of the US but mostly benefits companies in Germany and France. Overall, 58% of Europe's battery demand is already supplied locally.

But the risks remain manyfold. First, the imports of Chinese-made electric cars are posing an immediate risk to the very survival of Europe's automotive giants. 1 in 5 electric cars sold across the EU last year was built in China, with the shipments of BYD, MG and other Chinese brands growing quickly. Second, no fresh EU-wide investment on the scale of the US IRA is so far in sight, while some carmakers have started to ask for the upcoming 2025 car CO2 goal to be relaxed. This risks undermining the key pull to invest into electrification across the European market. Third, while some progress has been made on battery cells, huge gaps in the

midstream, notably cathode materials, remain. With most expertise and lower costs in China, the question is how can Europe quickly ramp up these often low margin high volume industries?

Ultimately, the EU is just at the start of its journey to onshore the supply chain with most of the battery and materials factories yet to start operating commercially, and most of the supply chains yet to be secured. The task ahead is monumental, but it can be done.

3 T&E's blueprint on industrial strategy (recommendations)

Clear policy

Clear long-term policy is paramount to investment certainty. Europe's recently announced 2040 climate framework, aiming for -90% carbon reduction, makes the case for scaling clean tech in Europe and decarbonising transport even faster than foreseen under the EU Green Deal. Given the global race, Europe cannot afford to spend another 5 years reviewing its Car CO2 standards and debating the long-term trajectory. Instead, governments and companies across the continent should double down on fast implementation and delivery.

As such, it is critical to:

- **Keep the 2025-2035 car CO2 regulation unchanged** and not review or weaken the targets, alongside other key Fitfor55 transport policies;
- Without delay, put in place additional measures to meet the 2040 -90% climate target in road transport, including **faster corporate fleet electrification** and measures to phase-out fossil cars from the existing cars fleet, such as scrappage;
- Keep regulations ambitious, **technology smart** and simple (no "climate neutrality" confusion) to provide a clear push for investors and the market to timely invest into the EV value chain.

Made in EU

Decarbonisation of Europe's transport system cannot result in deindustrialisation. EV value chain from charging networks to battery and chemical production offers many new business and job opportunities that will more than compensate for the jobs lost in fossil fuel industries. It is critical that electric cars, battery cells and most materials that go into them are produced in Europe. What matters is location, not the ownership of companies.

The climate policies therefore need to be accompanied by measures to reward local manufacturing. But this should not result in protectionism from meaningful competition or slowing down of the EV uptake; instead any policy to reward Made in EU should be accompanied by accelerated EV production plans.

European Commission and national governments should:

- Build **resilience aspects** into various public procurement and subsidy rules around electric cars and battery value chain manufacturing, such as the NZIA provisions allowing for local bids to be prioritised. E.g. loans under the European Investment Bank

to EV or battery manufacturers and EU grants under the EU Innovation Fund should require firm offtake agreements for locally sourced components and materials.

- Reward more **sustainable local manufacturing** (carbon emissions, environmental stewardship and responsible business conduct). This can be done via ambitious battery carbon footprint rules that should be proposed without delay. Similarly, national EV subsidies or clean manufacturing contracts can be used, as is currently done in France with its “eco score” concept. This should be based on a harmonised EU-wide methodology on how to calculate the performance to uphold the single market.
- Add **conditions on local labour** engagement and upskilling into the national subsidies given to the EV battery supply chain facilities under the state aid rules.

Another issue is the growing electric car and battery cell production overcapacity in China. While in the short run European consumers stand to gain from cheaper EVs, they may be left with less choice in the long run, as Chinese (and American) carmakers gain huge market power. Foreign battery cells and components flooding the EU market can also severely disrupt European industry and could put thousands of existing and future jobs on the line. The political and economic impacts of this could be dangerous.

This means Europe should also revamp its **trade policy** to fit its industrial strategy objectives. This means:

- Bringing the announced anti-subsidy probe into Chinese EVs to an effective conclusion and, if unfair subsidies are found, **increasing the EV import tariffs** to at least 25%. T&E estimates this will bring between EUR 3 and 6 billion [93] in additional revenue to EU and national budgets.
- In the absence of stronger Made in EU measures, increasing **import tariffs on battery cells** might be the last resort to help the local capacity scale on time.

Funding

The European Green Deal needs to be beefed up by a sizable investment package at EU level to help scale the technologies and create the business case to invest in Europe. This includes:

- Introducing a EUR 400 billion **Green Industry Fund** between 2025-2034, with priority investment to de-risk and scale manufacturing of clean battery value chain technologies, notably cathode active material and battery recycling. The Fund should boost the resources of already existing and scalable EU financing instruments: the EU Innovation Fund and the InvestEU Fund.
- Quickly operationalise the **EU Battery Fund** (under the EU Innovation Fund) to ensure the first auction is up and running no later than Q4 2024, that best-in-class cleanest projects are rewarded and focusing on the OPEX to bridge the cost gap and the midstream of the battery supply chain.
- The **InvestEU Fund** should focus on projects facing economic or technological risks, enabling public banks (National Promotional Banks and the EIB Group) to take higher risks and scale up the manufacturing of battery cells and key components. This should include support to both Capex and Opex with predictable and upfront support via

production loans. InvestEU should also crowd in private investments, similar to the recent support scheme to Northvolt [94].

- The **European Investment Bank** (EIB) should enhance its support to best-in-class projects in the EV batteries value chain. The bank should step up support to critical raw materials, including refining and recycling. The EIB should ensure complementarity with national funds set up in France (Critical Metals Fund) and Germany to support raw materials and provide co-financing and risk-sharing instruments (like first loss guarantees to mitigate the risks for investors under the national schemes). The EIB Group should provide guarantees and counter-guarantees to commercial banks for investments across the EV value chain to de-risk private investments contributing to the green industrialisation of the EU.
- Focus the research and innovation funding on affordable, scalable and sustainable alternatives to batteries, eg resource-light chemistries.

Building the supply chain

Focus in the next few years has to shift from regulatory frameworks to their effective implementation, i.e. execution of the battery supply chain projects in Europe. This means:

- Sharp **focus** on cathode active materials and minerals processing, in order to scale the announced projects in Europe. CRMA's Strategic Projects should be selected in line with the 2030 benchmarks: at least 40% should be in the area of minerals processing. The EU financial arms, notably EIB, should be brought in to ensure the successful scale up of the selected projects. Investments should go into fossil-free sustainable processes from the outset, e.g. bioheap leaching in the case of nickel or direct lithium extraction in the case of lithium.
- European downstream players, notably automotive, battery and renewables companies should work closer with local players in the supply chain, providing **firm long-term offtake** guarantees and investing/co-partnering to scale nascent companies.
- High ESG criteria should be built into the European private investment framework to give local manufacturers an upper hand, e.g. via smart **taxonomy** rules around minerals processing and refining.
- Building out large scale renewables capacity should go hand in hand with scaling the battery value chain in Europe to enable companies to decarbonise all manner of industrial processes.

When it comes to battery **raw materials** themselves, a mixed strategy of local and international is key. Locally,

- Europe should double-down on scaling **recycling** and metallurgical recovery capacities to ensure valuable battery waste is turned into new battery cells locally and not exported to Asia. This means prioritising integrated recyclers as strategic projects under CRMA, and limiting end-of-life battery and black mass exports outside of Europe.
- Prioritising innovative technologies with less impact, notably repurposing tailings from the existing mining sites, or **"remining"** (as is planned in Czechia) as part of CRMA's implementation.

Internationally,

- Turning the **Strategic Partnerships** into a pipeline of responsible global projects with secured offtake for EU downstream companies and increased value to the resource-rich countries. Focus should be on de-risking investments in resource-rich countries, e.g. Argentina in South America, the Philippines in Asia and African nations. The European Commission and the member states should consider buying stakes (equity) in the most strategic projects globally and investing into the transport and energy infrastructure to enable those as part of Europe's Global Gateway programme.
- Building a diverse supply chain and transparent market for raw materials, notably via the EU's involvement in the **Minerals Security Partnership** and similar initiatives.

Do it all, sustainably

Sustainability in its broadest sense - as higher social and environmental stewardship, responsible business conduct and respect of local communities and Indigenous Peoples - is one of Europe's USPs and should be the leitmotif of this entire transformation.

This includes:

- Quick and ambitious implementation of the human rights and environmental **due diligence** provisions under the EU Battery Regulation, with a positive spillover effect globally. This should result in downstream companies engaging to improve the conditions on the ground, not cancelling problematic suppliers out.
- Bringing Europe's own mining laws in line with global best practice, notably upgrading the EU Extractive Waste Directive to require filtered tailings and better tailings categorisation, monitoring and management.
- Requiring companies to operate in accordance with highest standards globally, implementing the OECD's guidelines for responsible business as a minimum. Particular attention should be given to better biodiversity practices, including requiring companies to conduct baseline assessment of habitats, to be able to better monitor and mitigate their impact. Further, mining companies operating globally should be assessed against the Initiative for Responsible Mining Assurance (IRMA) standard to guarantee higher standards and greater transparency.
- The fastest way to secure permits is to do things right, which means early and meaningful engagement of local communities and Indigenous Peoples, following the principles of Free, Prior and Informed Consent (FPIC). Grievance mechanisms and access to remedy schemes should also be put in place, to also ensure greater accountability.