TRANSPORT & ENVIRONMENT

Executive Summary

Pedal to the metal: How prepared are European carmakers for EV value chain transformation?

Europe is the second largest electric car market after China, with most major carmakers (OEMs) planning to fully electrify their sales in the region by 2030. Whether or not OEMs will be able to achieve those in large part depends on the ability to secure battery cells and critical minerals that go into them. But they need to act fast amidst an intensifying global race. As geopolitical tensions and sustainability concerns rise, the value of resilient and responsible supply chains is now higher than ever. To understand how well Europe's legacy carmakers are prepared T&E analysed their battery and raw material[1] strategies to 2030 and compared that to global players such as Tesla and BYD.

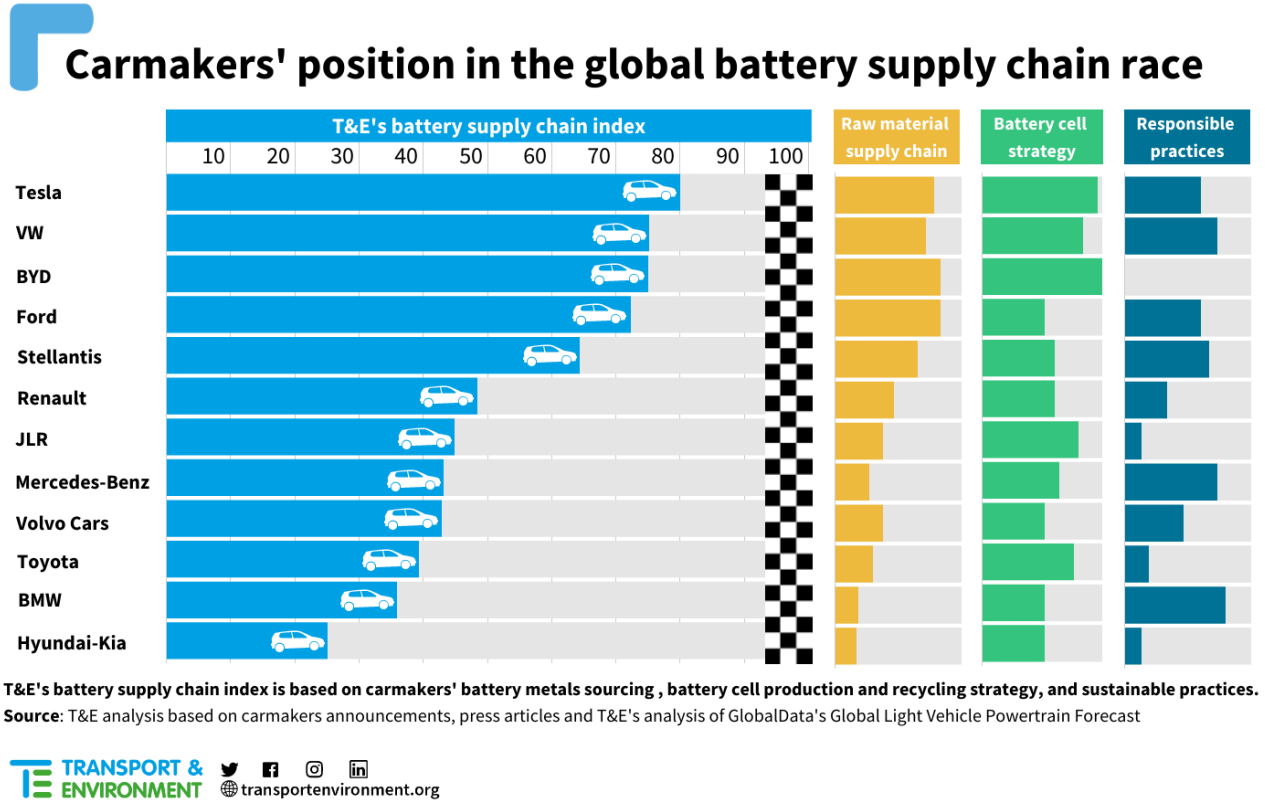
Key findings include:

- **While more progress has been achieved on batteries, this year's ranking shows that European carmakers are faring less well on securing the battery minerals that are needed to reach their 2030 electrification goals. Less than a fifth of the estimated demand for cobalt, lithium and nickel has been secured based on publicly disclosed contracts. Six carmakers - VW, Ford, Renault, Stellantis, BYD and Tesla - have long-term contracts for each of the metals or a substitution strategy.**
- **The level of preparedness among the carmakers (OEMs) varies widely: while Tesla leads the overall ranking (and BYD tops the minerals supply part), VW is the only legacy carmaker to score above 70 points (out of 100). Ford andStellantis are relatively well prepared, scoring above 60 points each. But the majority of OEMs have scored less than 50 points: Renault, JLR, Mercedes-Benz, Volvo Cars, Toyota and BMW, with Hyundai-Kia at the bottom of the table.**
- **The critical minerals supply today is highly concentrated in Asia, posing risks both to carmakers' resilience and Europe's strategic autonomy. As Europe aims to onshore parts of the value chain, T&E has added an additional analysis of carmakers' resilience**

[1] Cobalt, lithium and nickel are included in this analysis; other materials will be added in the future

in Europe in particular. This shows that VW, Stellantis and Mercedes-Benz are the most involved in the EU battery supply chain, while international competitors Tesla, Toyota, Ford and Hyundai-Kia are not supporting the EU industrial ecosystem. Four automakers - Mercedes, Renault, Stellantis and VW - are directly involved with Europe-based suppliers of processed materials or battery components.

- **T&E also analysed the sustainability of automaker sourcing practices, which is critical for long-term resilience and consumer acceptance. European carmakers have a clear lead here with the three German brands having the highest scores, while BYD scored zero.**



Carmarkers have a long way to go to secure battery raw materials

Since T&E's previous OEM EV readiness ranking in 2021, OEMs have made progress on their strategies around BEV manufacturing, sales and charging thanks to the pull from the EU car CO_2 standards. However, the biggest gap today is in securing the minerals and metals necessary to build all those electric cars and their batteries and doing this responsibly. While progress is being made on securing battery cell supply - most carmakers have at least

12 points out of 15 - the “great raw materials disconnect”[2] is happening further midstream and upstream as carmakers are waking up to the challenge.

While BYD and Tesla are a lot more prepared than others in Europe, overall, only 14% of the lithium demand, 17% of the nickel demand and 10% of the cobalt demand are secured by the 12 carmakers by 2030. To quantify this, T&E relied on the publicly disclosed data, as well as allowing all carmakers to give feedback on the findings. Aggregating the three metals, 16% of the raw material demand in 2030 is secured, or less than a fifth of what is required. Given that roughly 10-20% of the metals needed are often secured on spot markets to hedge risks, this is a very low number for what would have been expected on long-term contracts.

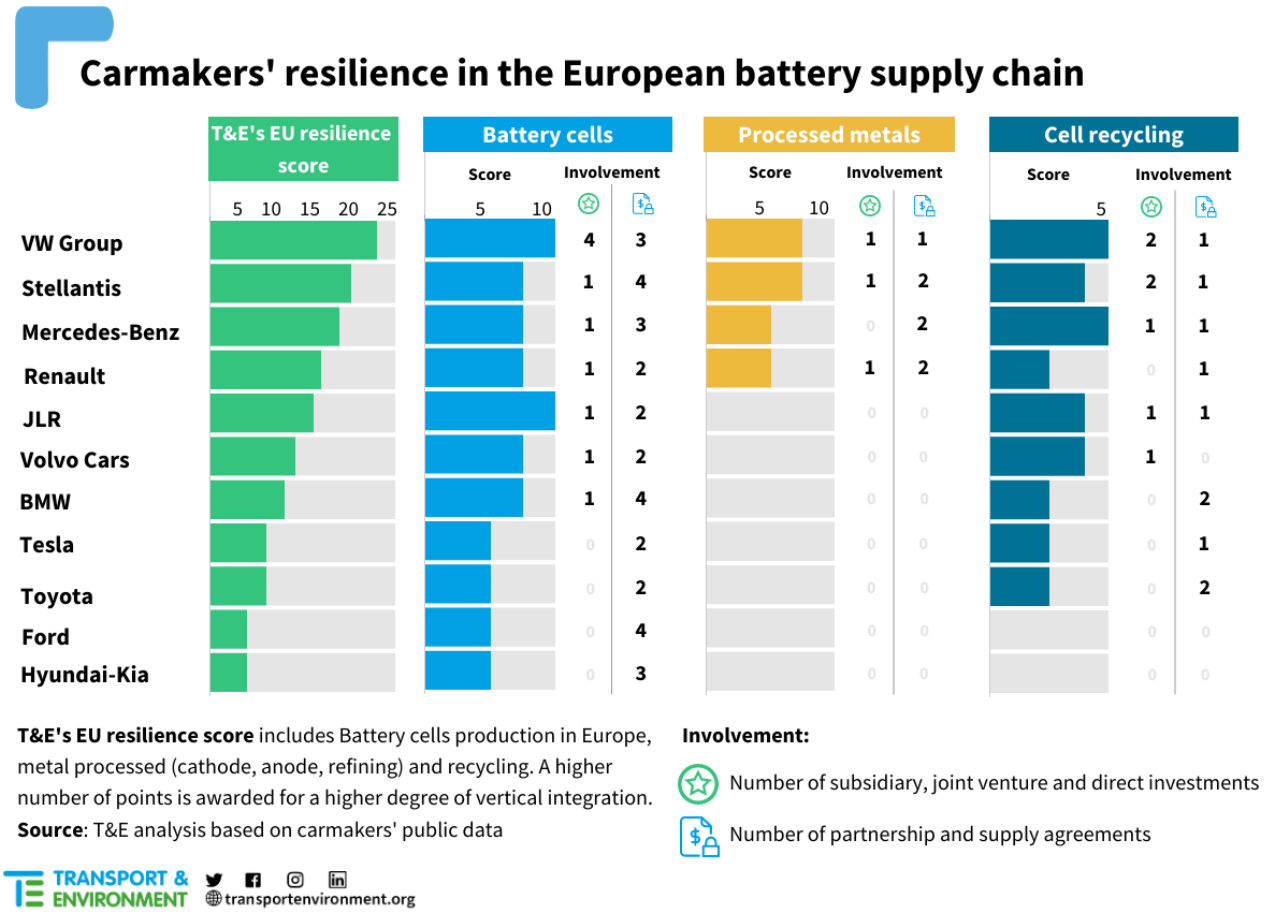
Carmakers can deploy different strategies to secure raw materials. Directly procuring supplies, either via long-term contracts or equity stakes with miners and recyclers, will ensure the materials are available to deliver on their BEV strategies on time, volume and budget. But resource efficiency and innovation are equally effective. E.g. BYD relies on a type of lithium-ion batteries that does not require cobalt or nickel, Tesla is investing in cobalt-free chemistries, while compact battery models planned by Stellantis, Renault and others will help them slush their demand for minerals.

Carmakers can help Europe onshore critical minerals supply

As fierce global competition between global automakers to secure battery metals is intensifying, another key message from T&E’s analysis is that European OEMs should do more to help Europe’s efforts to scale domestic supply chains. Only four carmakers (Mercedes, Renault, Stellantis & VW) currently support nascent EU start-ups in battery components and minerals processing.

Automakers - given their size, resources and large project management skills - can help the nascent minerals industry in Europe scale effectively. Supporting local refining and battery component factories - via vertical integration (e.g. in-house recycling) or investing into start-ups - is also critical to their own resilience and supply security, as well as Europe’s strategic autonomy agenda. This part of T&E’s analysis shows German and French carmakers to be leading, with international brands a lot less involved.

[2] As coined by Benchmark Minerals Intelligence



Carmakers must ensure that the materials they secure are extracted responsibly & resiliently

A key differentiating factor between carmakers will be the adoption of responsible supply chain practices and the support of low-carbon raw material streams, which will unlock both lower carbon footprint for batteries and better Environmental, Social, and Governance (ESG) rating for carmakers. Our ranking shows German carmakers - BMW, Mercedes-Benz and Volkswagen - to be leading here.

While BYD scored zero in the part of the ranking, most major carmakers are making steady progress. Bar Toyota and Hyundai-Kia, most now track their supply chains, have either joined the global Initiative for Responsible Mining Assurance (IRMA) or have responsible mining practices in their supplier codes of conduct. Where many including Tesla, Stellantis and VW can improve on is in stronger policies to engage with local and indigenous communities.

Carmakers' supply chain strategies can make or break the EV transition in Europe

Carmakers still have a long way to go and must accelerate their transition, support the creation of the European EV ecosystem and secure the raw materials they need sustainably. Otherwise, faced with the competition from well established Chinese and American pure play EV makers, they risk losing market share in Europe, and their standing in global markets. In the next few years carmakers' industrial and supply chain strategies will make or break the EV transition in Europe, and render some obsolete.

Key recommendations

1	Policymakers should lock-in the 2035 combustion engine phase-out for EV supply chain investment certainty, and move to implement the onshoring goals recently agreed under both the net zero and critical raw materials acts.
2	Industrial and fiscal policies at both EU and national levels should encourage faster scale-up of battery and EV manufacturing in Europe. EV subsidy and support schemes should reward local manufacturing, compact models and innovative clean technologies.
3	European carmakers should accelerate their involvement into midstream and upstream battery supply chains, invest into resource light battery chemistries and efficiency. They should engage into global efforts, e.g. EU Strategic Partnerships with resource-rich countries and the Minerals Security Partnership to support minerals projects with EU offtake.
4	Product sustainability rules, such as the EU Battery regulation, must be swiftly implemented to accelerate sustainable battery cell manufacturing in Europe. Higher social and environmental standards within mineral supply chains should be ensured through an ambitious agreement on the Corporate Sustainability Due Diligence Directive (CSDDD) and a quicker adoption of best-in-class global standards (such as IRMA).
5	The EU must develop a comprehensive green industrial policy focused on robust sustainability regulations, streamlined permitting, smart trade strategies and adequate EU-level funding to expand midstream and upstream supply chain manufacturing locally. Priority should be on minerals processing, notably cathodes, anodes and precursors.

Further information: **Full report**
Yoann Gimbert
Emobility Analyst
yoann.gimbert@transportenvironment.org