T&E

REPORT

High stakes: how much EV investment is at risk across Europe

The industrial opportunity cost of proposals to weaken EU car CO2 targets

Report published: 12 May 2026
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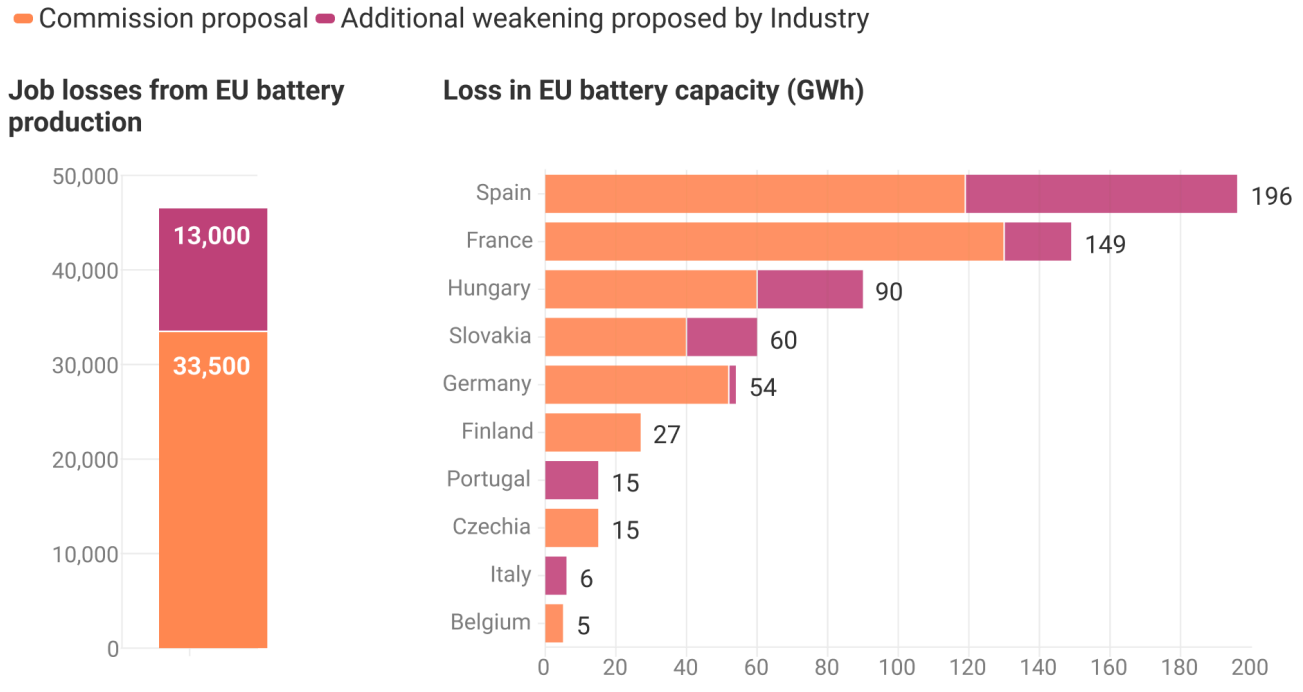
Executive Summary

Spurred by the growing electric car market, much investment into EV production, batteries and components has been announced. But this is now at risk as the EU debates its car CO2 rules that will define the size of the market. This report looks into the industrial opportunity cost of various car CO2 proposals on the table.

From China to Chile, battery electric vehicles (BEVs) are now the growth engine of the global automotive industry, accounting for the vast majority of new investment, innovation and model launches. If Europe anchors BEV manufacturing - including batteries, power electronics, and critical components - within its borders, it can rebuild its industrial base, increase its domestic gross value added (GVA) and secure growth and jobs.

But **the risk today is industrial decline through strategic hesitation**. Despite much investment announced and affordable mass-market BEVs finally hitting showrooms, the EU is once again proposing to revise its 2030-2035 car CO2 rules (which define the size of the EV market). Compared to the current regulation, the new Commission proposal weakens both the 2030 and 2035 targets, while the auto industry wants to reduce that ambition even more.

Weakening CO2 Standards could lose over 600GWh in EU battery production and 46,500 jobs by 2030



Source: T&E risk assessment of EU battery manufacturing plants in 2030

This report estimates the industrial opportunity costs for BEV production, as well as battery and its value chain investment from these proposals. To do so, T&E uses three scenarios: the current CO2 regulation (REF), the Commission proposal (EU) and the auto industry position (LOW). Aside from the car emission rules, the industrial policy - notably the recently proposed Industrial Accelerator Act (IAA) is critical to ensure the EV market brings a local manufacturing base.

Key findings

01	**BEV production will halve compared to today's projections in 2030 if the auto industry amendments are adopted.** The BEV production will reduce from 7.4 million to 3.7 million in 2030 in the LOW scenario, while the Commission proposal will result in a cut of 23% down to 5.7 million units.
02	**The auto industry amendments will reduce BEV production in 2035 by over 7 mln units.** While Europe would produce around 15 million BEVs with current policies in 2035, the Commission proposal would reduce this to 10 million BEVs, while the industry amendments would cut it to 7 million.
03	**Over 34 Northvolt-sized battery factories will not be built in 2030 if the auto industry amendments are adopted, resulting in up to 47k jobs lost.** The current name-plate capacity of all battery plants will reduce by 56% - to 632 GWh - in 2030 under the Commission's proposal scenario, equivalent to 21 Northvolt-sized factories. Only 29% of the announced factories will come online in the industry scenario, a significant loss of 1,024 GWh.
04	**Significant reductions in 2030 capacity are seen throughout the battery value chain.** E.g. local manufacturing of cathodes, battery's most valuable component, could cover over two-thirds of local needs by 2030 if strong car CO2 rules and industrial policy is in place. If the auto industry amendments go ahead, only 5 projects are likely to remain, covering just over 10% of the projected 2030 demand.
05	**€50 billion could be wasted on oil imports if industry amendments are adopted.** Over 2 bln barrels of oil can be avoided by 2035 with ambitious Car CO2 targets, while the battery dependency is a mere 7% compared to the 96% for oil, as industrial policies make it possible to produce batteries and recycle their materials domestically.

This shows that the 2030 Car CO2 target is critical to EV cleantech investment certainty across Europe. Put bluntly, 5-year averaging as proposed by automakers would kill the business case for batteries and their critical components. To ensure factories are built and critical technology is onshored, the EU should keep the 2030-2035 targets unchanged. In addition, strong local content requirements without loopholes (no small BEV should be called Made in EU if it uses a Chinese battery) must be swiftly adopted in the IAA.

EU car CO2 standards as the investment pillar

Battery electric cars (BEV) are the future of the global auto industry, and without scaling domestic production Europe risks accelerating its loss of market share and industrial capacity both within the EU and in emerging economies. Strong EU CO_2 standards are essential to anchor demand and investment: coupled with local content requirements, electrification offers a major "Made in Europe" opportunity to increase economic value and strengthen supply chain resilience.

48%	Reduction in number of battery electric vehicle production by 2030 as a result of the auto industry weakening of the EU car CO2 rules
€96 billion	Loss in Gross Value Added if we move from the Current CO2 standards to the industry's proposal
1 million	The number of BEVs France could produce by 2035

1.1 Strategic context: electrification is no longer optional

The global automotive market has passed the point where electrification is a niche technology. Battery electric vehicles (BEVs) are now the growth engine of the global industry, accounting for the vast majority of new investment, innovation and model launches. In China, 36% of new car sales were already electric in Q4 2025; in France and Germany, BEV shares exceeded 20%; and every major carmaker has committed tens of billions of euros to new models and production lines.

The direction of travel is clear: within the next decade, BEVs will become the dominant drivetrain in all major markets (with the possible exception of the US). If European manufacturers fail to

scale competitive BEV production domestically, they will not preserve a profitable internal combustion engine (ICE) niche - they will instead lose global market share altogether. Consumers in Europe, China and increasingly North America will not revert to ICE vehicles if European firms lag behind, they will purchase electric models from competitors.

The risk is not "moving too fast" on electrification. The real risk is industrial decline through strategic hesitation. Europe has already seen a steady erosion of its global automotive market share over the past decade. Without a strong domestic BEV industry, this trend will accelerate.

At the same time, electrification represents a once-in-a-generation industrial opportunity. If Europe anchors BEV manufacturing - including batteries, power electronics, and critical components - within its borders, it can increase its domestic gross value added (GVA) through higher local content in next-generation vehicles, reduce strategic dependencies on third countries for batteries and key inputs, and strengthen its supply chain resilience in a geopolitically volatile environment.

Europe has two powerful levers to seize this opportunity. Strong and predictable CO_2 standards, mandating emission reduction targets for cars sold in Europe, spur BEV investment and create a guaranteed market for related cleantech. Targeted industrial policy, including local content requirements under a European Industrial Accelerator Act (IAA), ensures that BEV value chains are built in Europe and there is no loss of value towards competitor countries.

Together, these tools can both secure climate objectives and maximise industrial gains.

1.2 Car CO_2 standards and our scenarios

CO_2 standards are not merely environmental regulation - they are industrial policy. They create regulatory certainty, shape investment decisions and determine where capital flows. The current EU CO_2 trajectory provides manufacturers with a clear signal: the European market will be zero-emission by 2035. This clarity has already triggered large-scale announcements of gigafactories, dedicated BEV platforms and battery supply chains across the continent. But it is now at risk of being reversed as pressure from conservative governments and industry representatives threatens to weaken the regulation in favour of internal combustion engines (ICEs).

To illustrate the industrial stakes, we look into three scenarios in this report.

Policy scenarios

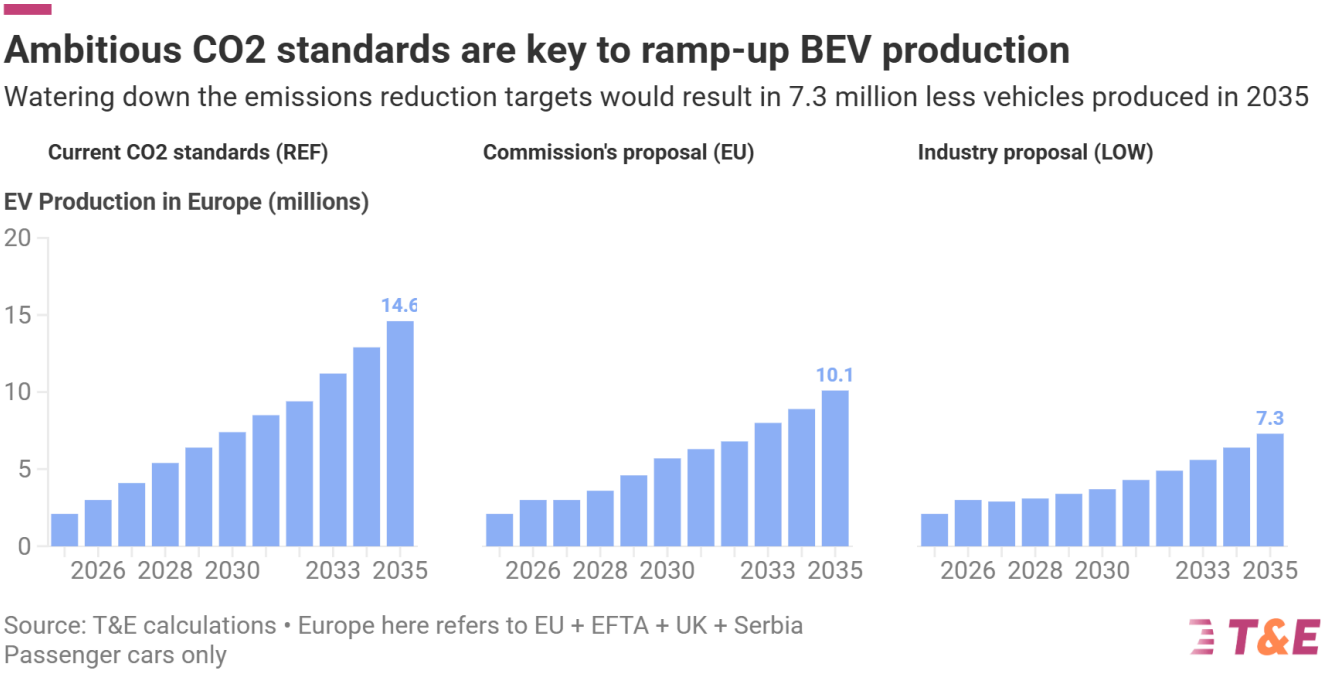
The analysis in this report is built around three core scenarios. Starting from EU CO_2 standards, **we calculate vehicle sales, production, industry revenue and gross value added (GVA) for the EU, UK and Serbia**.

This data serves as a baseline to estimate production of EV components like e-motors and transmission systems, and most importantly to assess which investments in the battery value chain will be realised under different conditions.

- **Current CO_2 standards (REF scenario):** 55% emissions reduction in 2030, 100% reduction in 2035.
- **Commission's proposal (EU scenario):** 3-year averaging of the 2030 target, 90% emissions reduction in 2035.
- **Industry proposal (LOW scenario):** 5-year averaging of the 2030 target, 80% emissions reduction in 2035.

1.3 European EV production falls sharply if CO_2 standards are watered down

Under current CO_2 standards, we forecast 14.6 million EVs will be produced in Europe by 2035. The figure below shows if targets are weakened, production will reduce by 31% to 10.1 million under the Commission's proposal (EU). If the Industry proposal (LOW) is adopted, European EV production will collapse, approximately halving to 7.3 million.



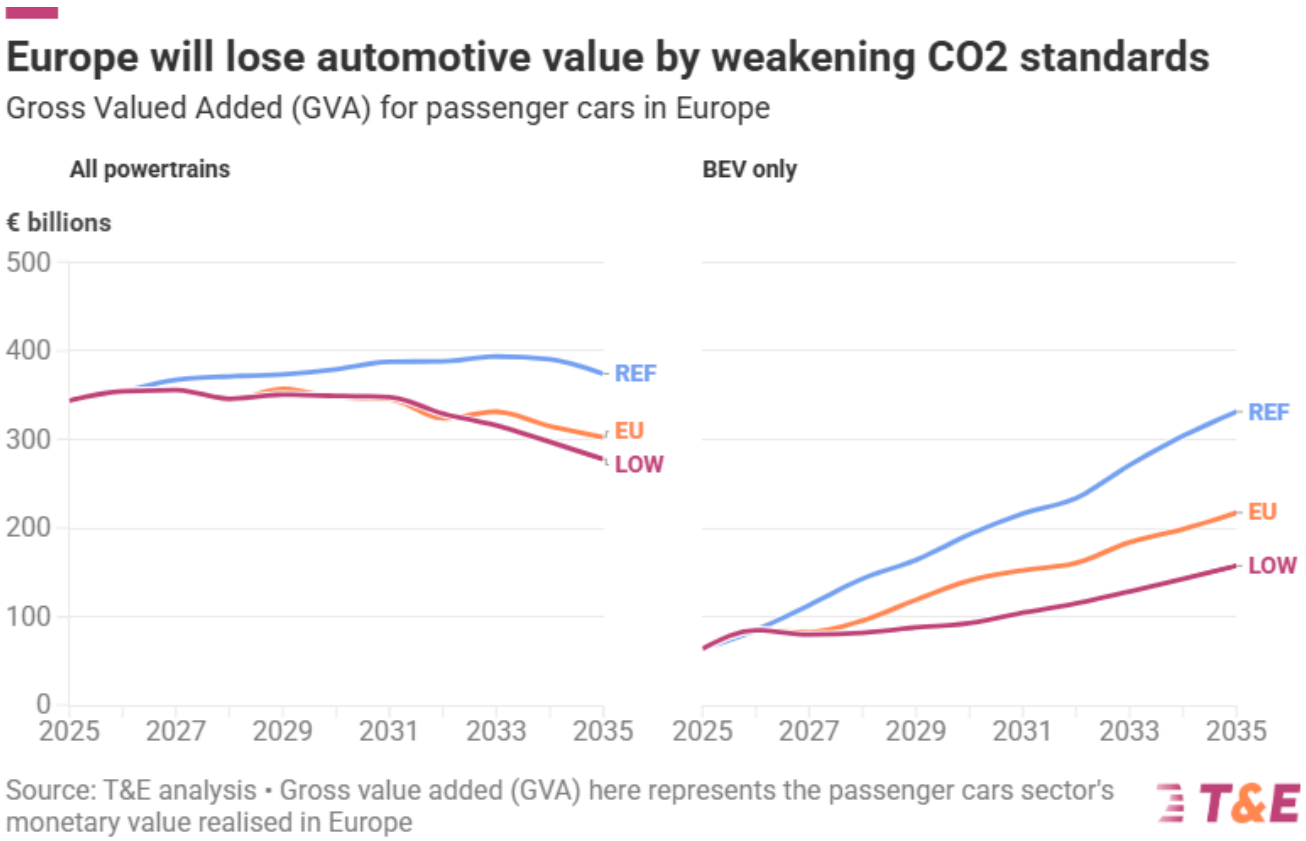
This loss of BEV production is caused by the so-called '2030 averaging' – a regulatory trick to spread compliance to the 2030 CO_2 reduction target.

Weakening CO_2 standards significantly undermines the business case for BEV production based in Europe. We forecast EV sales in Europe would drop by 3.3 million in 2030 under the LOW scenario and it would become much harder for investors to commit to producing EVs in Europe. Maintaining CO_2 standards is essential to foster EV growth and secure investment for European production.

1.4 Securing EV production is essential to build value in Europe

Value will drain out of Europe's automotive sector if CO_2 standards are weakened. The figure below shows that the Gross Value Added (GVA) of passenger cars in Europe will reduce by EUR 41 and 61 billion under the EU and LOW scenarios respectively by 2035. GVA will contract by 19% by 2035 under the Industry's proposal compared to 2025.

Under current policies, we forecast GVA to increase from €345 to €380 billion by 2035. Europe can exceed this forecast by accelerating European production of batteries, electric drivetrains, power electronics and software, which increasingly drive value in the automotive sector.



Source: T&E analysis • Gross value added (GVA) here represents the passenger cars sector's monetary value realised in Europe

2. Scaling up gigafactories is the key challenge to 2030

Building a European battery powerhouse

Car CO2 standards are not just about BEV production - they are a critical investment lever for related cleantech. Crucially, this includes battery cells, components and minerals. This section shows how weakening the car emission rules undermines building out and onshoring this critical cleantech infrastructure.

1,445 GWh	Capacity Europe can reach by 2030 if all projects are realised
56%-71%	Reduction of capacity under the Commission and industry proposals in 2030
34	The number of Northvolt sized plants that will not go ahead by 2030 under the Industry Proposal.

2.1 Outlook for battery gigafactories by 2030

Europe already hosts a significant number of operational battery gigafactories, as well as additional projects announced or under development. But the business case hinges on both credible, predictable demand for BEVs and a policy environment that rewards localising value chains. When regulation becomes uncertain (or is weakened), investment is delayed, resized or relocated.

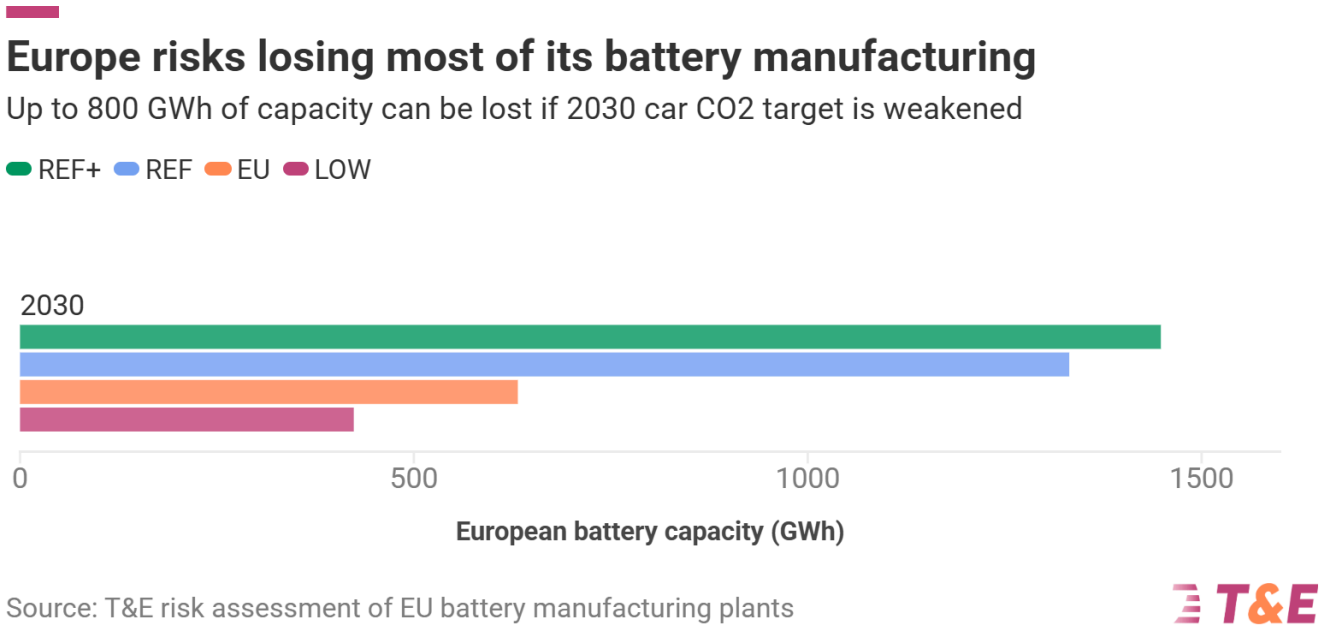
To incorporate the impact of additional industrial policies, e.g. ambitious EU content requirements, we added a fourth sensitivity scenario for the battery value chain.

- **Industrial policy (REF+ scenario):** same CO_2 standards as the REF scenario, plus EU local content rules for batteries and key components, such as cathodes.

While the total capacity of all the announced projects in Europe could reach up to 1,445 GWh nameplate capacity in 2030, this will only be realised under the current CO_2 regulation scenario as the local demand will be there. Adding EU local content rules (REG+) would ensure BEVs do use this local battery capacity, therefore securing the local business case.

We project this to reduce to 632 GWh of nameplate capacity under the Commission's proposal scenario. This is a loss of 56% compared to Europe's 2030 potential, or 21 Northvolt sized factories (30 GWh - Skelleftea plant planned capacity).

However, if EV regulations get watered down, only lower risk projects are likely to materialise. In the Industry scenario, we anticipate only 29% of this to be secured and come online by 2030. This is a significant loss of 1,024 GWh, equivalent to 34 Northvolt-sized factories. This means Europe would fall short of meeting its internal demand, and certainly would miss out on European companies mastering the technology in favour of Asian players only.



Source: T&E risk assessment of EU battery manufacturing plants

Battery cells are where Europe faces a major industrial opportunity. If all currently announced projects come to fruition, domestic actual production capacity - when accounting for ramp-up

and scrap rates - could reach up to 820 GWh by 2030. This is sufficient to supply the battery cells required for Europe's BEV market in 2030, even assuming scrap rates remain close to today's levels of around 50% during ramp-up. Clear regulation gives project investors reassuring signals and allows them to complete their plans. The more investment, the quicker production reaches scale, becomes efficient and competitive against foreign peers.

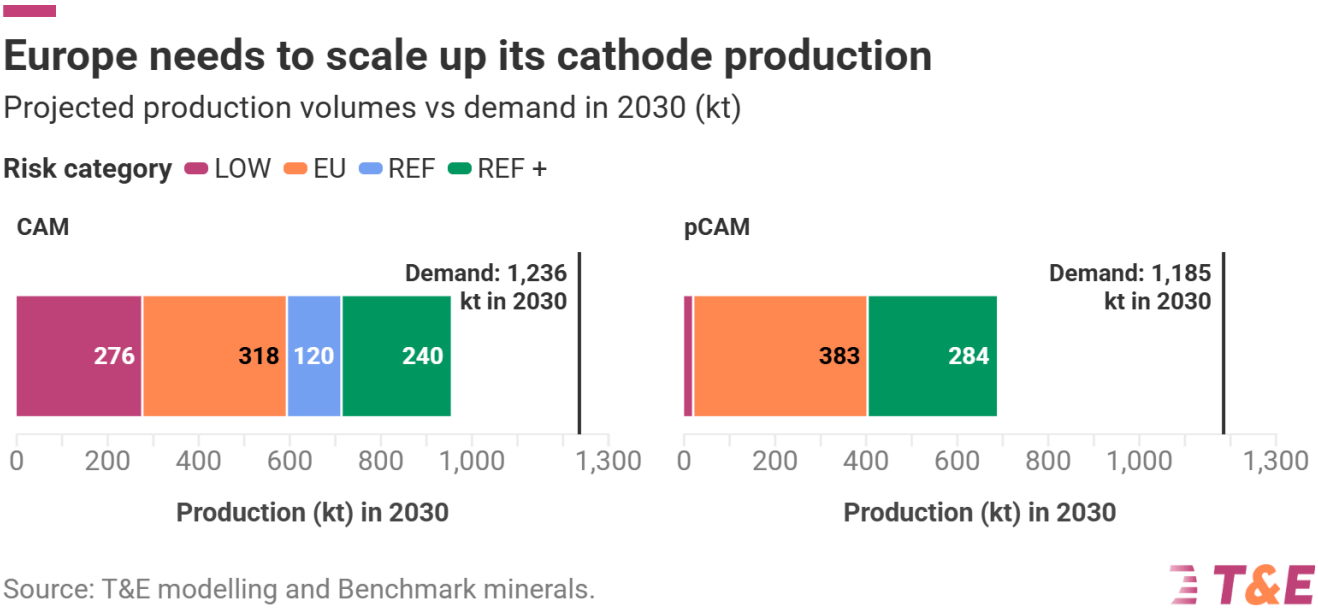
Batteries are one of the largest single value components in a BEV; localising cells increases domestic value added rather than importing it, pushing economic growth for workers and investors. Autonomy does not only make us richer, but also safer and more resilient: battery cells are not only for cars. Europe also needs them for energy storage systems to integrate renewables and stabilise the grid, and for many defence applications. Europe cannot rely on foreign countries for this critical energy infrastructure. And the current Middle East crisis is exposing the danger of relying on oil and gas imports, underscoring that the same cannot happen in batteries: the EU must be able to master the technology and own sufficient production capacities to cushion against future geopolitical shocks.

CO_2 standards provide the demand certainty; local-content and other industrial policies determine how much of the value chain is captured in Europe. Without both, many "pipeline" projects won't reach scale - and Europe risks losing not just automotive competitiveness, but also a foundational capability for the broader energy transition.

2.2 Cathode materials and precursors (CAM and pCAM)

Cathode active materials (CAM) and precursor cathode active materials (pCAM) represent one of the most strategic segments of the battery value chain - both in terms of economic value and technological leverage. Cathodes account for one third to a half of total cell cost and determine performance characteristics such as energy density, durability and safety. As a result, control over CAM and pCAM production is not merely an upstream industrial consideration; it is central to Europe's ability to anchor high-value battery manufacturing on its territory.

Europe has a clear strategic opportunity to localise this segment. 24 CAM and pCAM projects have been announced across the EU and UK, totaling 1,640 kt capacity in 2030. If realised at scale, these investments could cover 68% of materials demand by end of decade, significantly increasing domestic value added, reducing reliance on Asian refining hubs, and strengthening integration between raw materials processing, cell manufacturing and recycling. A strong European CAM/pCAM base would also enhance resilience by shortening supply chains and mitigating exposure to trade disruptions or export restrictions.



Source: T&E modelling and Benchmark minerals.

However, this opportunity is highly sensitive to demand certainty. CAM and pCAM facilities require large, stable offtake agreements with European cell producers, which in turn depend on a robust and predictable BEV market.

If the EU car CO2 standards are maintained, this will stimulate the business case for planned cathode investments. Under our REF scenario we estimate that 1640 kt of capacity can be realised and thus meeting 67% of demand by 2030. Under the EU scenario, this drops down to 1000 kt. Finally, we predict that under the Low scenario, this would further decrease to 300 kt, representing just 12% of our total demand in 2030.

In short, where policies lead to Europe failing to scale up CAM and pCAM production, a significant share of announced projects risks being downsized, postponed or relocated outside Europe - leading to a loss not only of industrial investment, but of strategic control over one of the most critical components of the battery ecosystem.

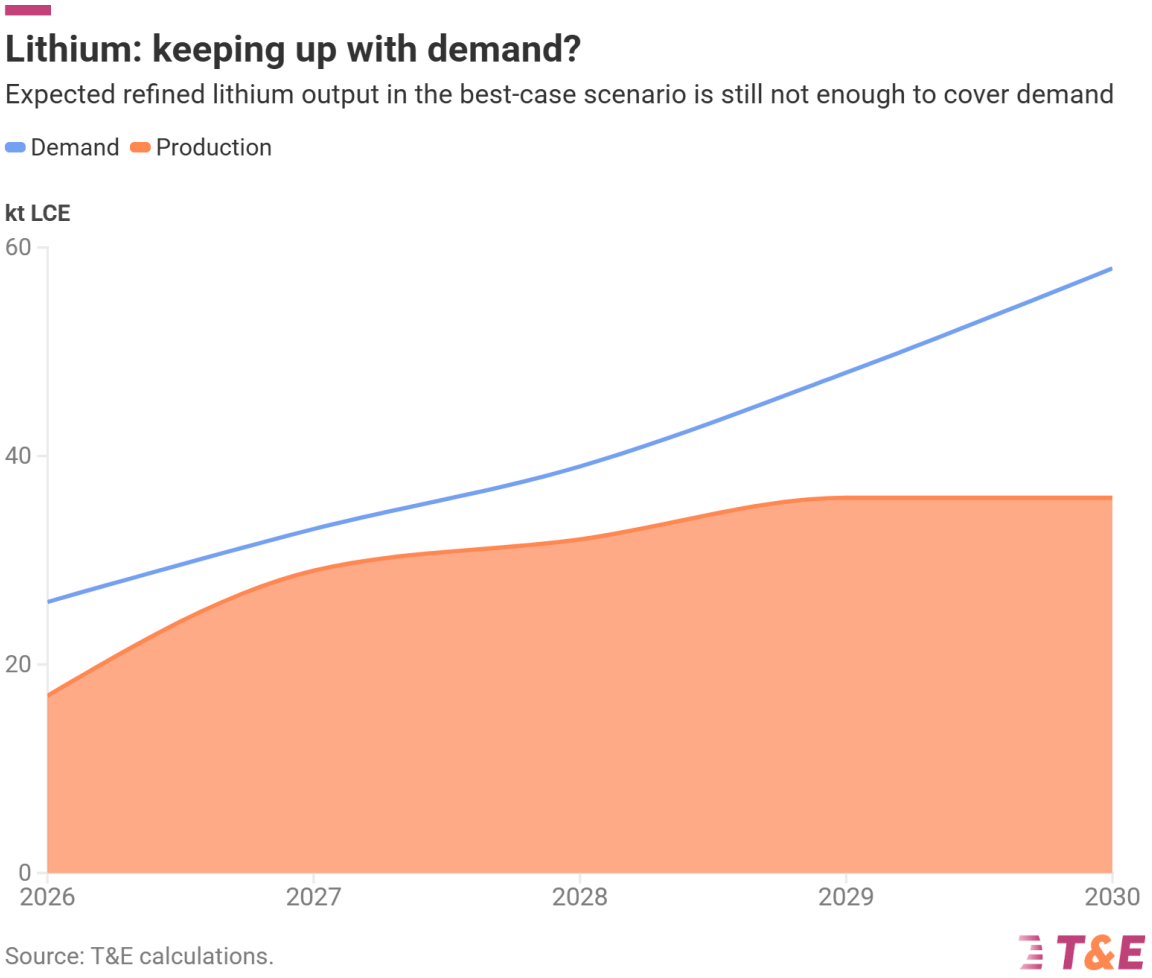
2.3 Lithium

Despite continued advances in battery chemistries, lithium will remain essential for the vast majority of EV batteries for decades to come. As electrification gathers pace, European demand for lithium chemicals is expected to rise sharply - from around 110 kt of lithium carbonate equivalent (LCE) today to approximately 310 kt by 2030.

Yet Europe's domestic lithium value chain remains severely underdeveloped. Only three lithium refineries are currently operational - AMG Lithium in Bitterfeld-Wolfen (Germany), LevertonHELM (UK) and Keliber in Central Ostrobothnia (Finland) - with combined output of roughly 24 kt LCE in

2026 including Keliber's new capacity While the opening of Keliber's integrated facility is positive news, Europe continues to rely heavily on imported lithium chemicals.

While around 20 additional projects - including standalone refineries and integrated extraction-and-refining facilities - have been announced, most remain at an early stage of development or lack firm financial and regulatory commitments. 91% of planned capacity can be classified as medium or high risk in terms of delivery. Without stronger policy certainty and clearer market signals, a large share of this pipeline may not materialise.



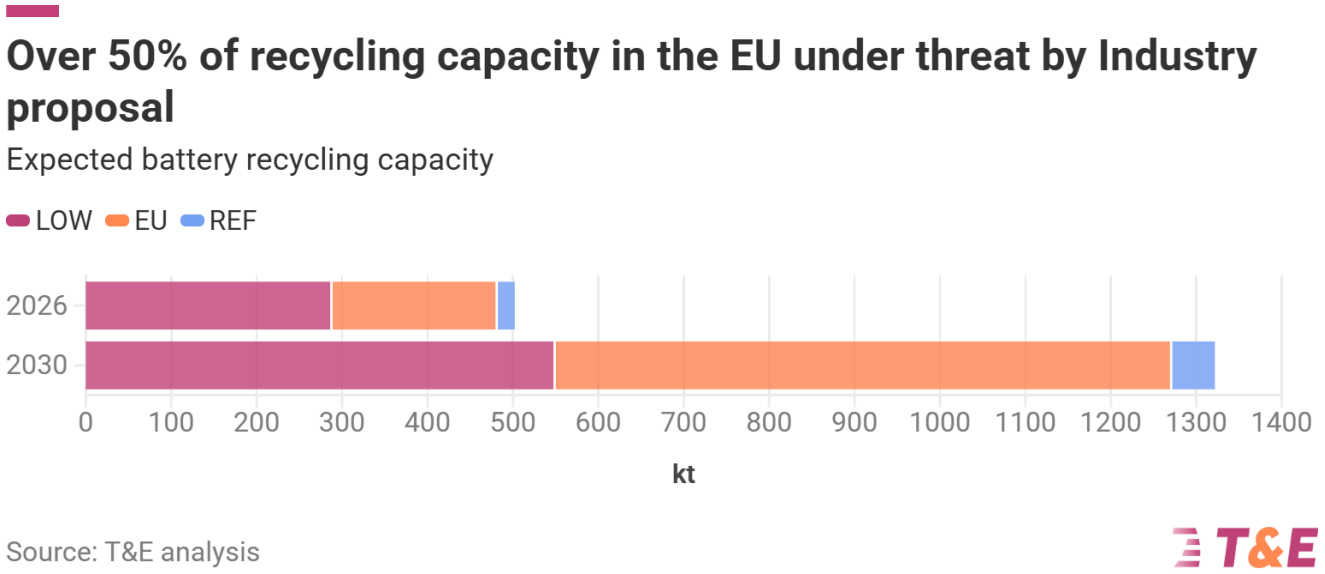
Under the Commission's scenario, 28 kt could be added additionally on top of the 17 kt expected to be realised under the Industry scenario., This is expected to rise by 149 kt under the REF scenario, potentially bringing total domestic refining capacity to roughly 194 kt. This is equivalent to around 58% of projected 2030 demand under a strong industrial policy scenario. However, these projects face substantial hurdles related to financing, permitting and long-term offtake security.

Stable and ambitious CO_2 standards, combined with targeted industrial support, will be critical to translating announced investments into operational capacity.

2.4 Battery recycling

Given Europe's constrained domestic supply of critical raw materials, scaling up recycling is essential both for strengthening strategic autonomy and reducing the carbon footprint of batteries. The EU Batteries Regulation sets ambitious collection and recycling targets for end-of-life EV batteries, alongside mandatory minimum levels of recycled content in new cells placed on the EU market. Together, these measures - if coupled with local content rules for recycled content - will significantly expand Europe's secondary materials base over the coming decade.

Beyond end-of-life batteries, production scrap from gigafactories represents an additional and immediate source of recoverable material. Fully seizing this opportunity requires rapid investment across the recycling value chain - from pre-processing capacity (including shredding, sorting and sieving) to, crucially, advanced downstream recovery facilities using hydrometallurgical or pyrometallurgical processes to convert waste streams into battery-grade inputs.



A total of 93 projects have been tracked, of which 39 are already operational. Under the REG scenario we anticipate the rest of the projects to come online, which will be able to process around 1,320 kt of battery materials in 2030.

Achieving Made in Europe Components

"Made in Europe" BEV components are key to build supply chain resilience and local value.

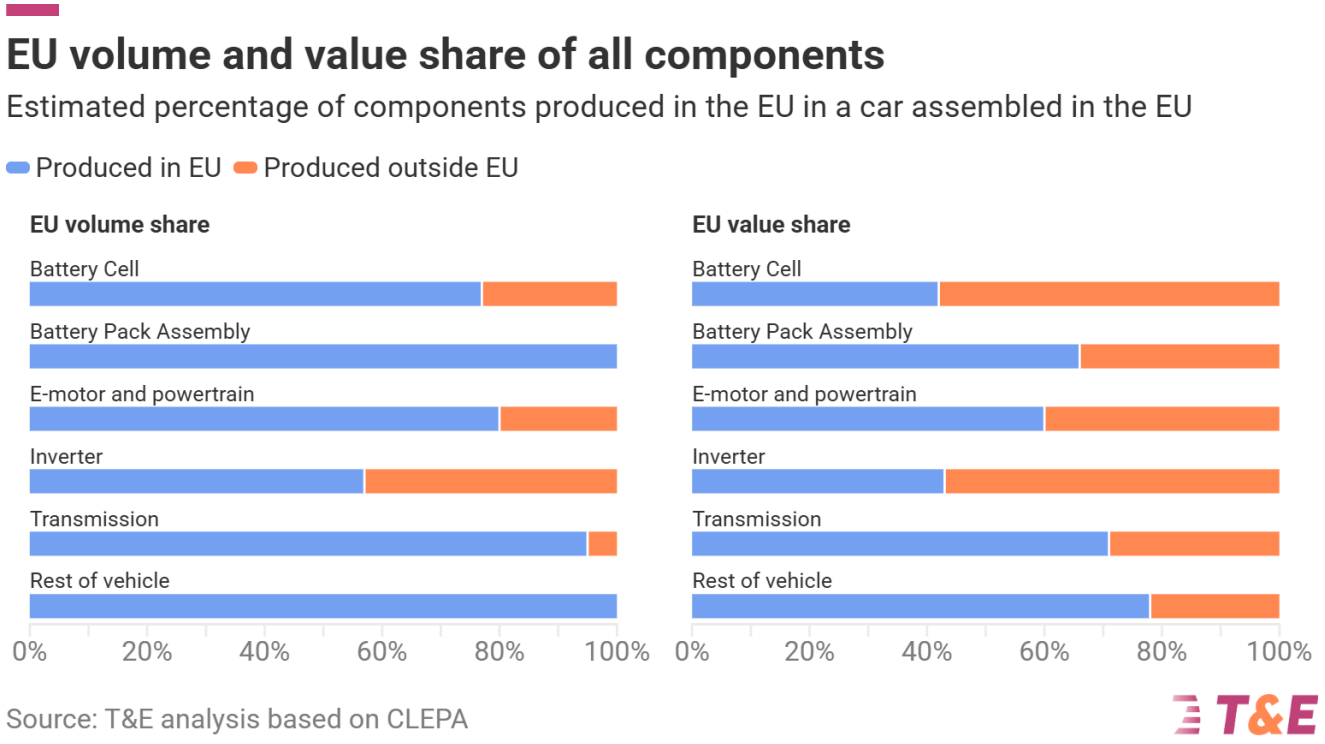
3.1 Made in Europe or assembled in Europe?

While the EU has taken steps to limit the rapid expansion of Chinese BEV imports through tariffs, the issue of imported components within vehicles assembled in Europe remains largely unaddressed. Current trade measures primarily target fully imported vehicles, but there is no comparable control on key electric vehicle components entering the European market.

A significant share of the BEV value chain is sourced from abroad even when the final vehicle assembly takes place within the EU, limiting the economic return to the local economy. This applies to Chinese manufacturers establishing production in Europe as well as EU carmakers, which rely on imported components for cheaper or more readily available alternatives.

3.2 Where does Europe stand with the rest of the vehicle components?

For EU assembled BEVs, OEMs rely on imports for 40% of the component value, as shown below.



Source: T&E analysis based on CLEPA

Approximately 80% of electric traction motor (e-motor) volume is produced locally in 2025. However, these components rely on rare earth elements such as neodymium, praseodymium, dysprosium and terbium, almost entirely imported into Europe. This means that a substantial portion of the e-motors value (around 40%) is still coming from outside Europe.

Inverters depend on advanced semiconductor materials such as silicon carbide and gallium-based compounds. While the quantities used are relatively small, supply chains for these materials are highly concentrated globally, creating a moderate level of dependency for Europe and a considerable loss of value. Europe currently produces only 57% of its inverter demand volume internally. Coupled with a similar local added value than that of e-motors (75%), the result is that just 43% of an average inverter's value in a car made in Europe stays in the continent, leaving the majority abroad.

EV transmissions rely primarily on conventional industrial metals such as steel, aluminium and copper. These materials are widely available and partly produced in Europe, meaning they have relatively low exposure to hard-to-source raw materials and foreign competition. It is not by chance that Europe already produces 95% of its BEV transmission systems internally. As its value added share is around 75%, the resulting 71% value added per car is much higher than that of other components.

Battery Management Systems (BMS) are in a similar position as the inverters. They rely mainly on semiconductors, copper-based electronics and small quantities of critical semiconductor materials such as gallium. Europe already has a developed automotive electronics industry capable of producing BMS hardware in 11 countries, although dependence on global semiconductor supply chains still creates a moderate level of strategic risk. BMS production for vehicles in Europe was worth over €2.5 billion in 2025 ($3 billion), and it is forecasted to grow to over €12 billion by 2031.

Securing energy security

Electrification is the solution to wean Europe's road transport off oil. Strong EU CO_2 standards are vital in driving this shift, which will secure Europe's energy security. Whilst many say going electric will replace a dependency on oil with a dependency on batteries, this section shows how this is not the case.

Key data points

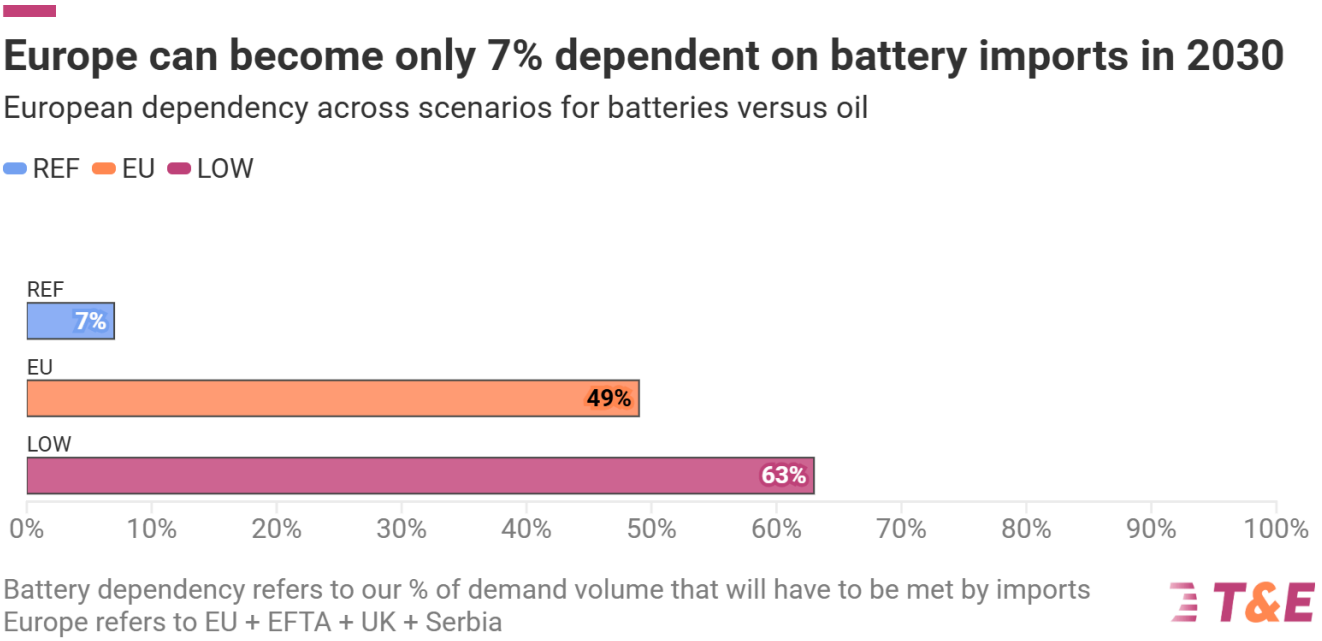
7%	European battery dependency under high electrification and industrial policy scenario, compared to 96% dependency for oil today.
2.2 billion	barrels of oil imported over the next decade could be avoided with ambitious Car CO_2 targets.
49kg	newly mined materials needed for an EV battery, compared to 12,400L of petrol consumed during the lifetime of a hybrid vehicle.

4.1 Electrification is the key to breaking free from Europe's oil dependency

The EU is highly dependent on the import of fossil fuels. In the context of the war in Iran, the emerging energy crisis serves as a reminder that true energy security and sovereignty can only be achieved with clean power and electrification.

Cars consume around 1 billion barrels of imported oil annually, making road transport the largest driver of Europe's oil dependency. Electric vehicles allow us to replace a dependency on imported oil, with locally produced, clean electricity. By combining ambitious Car CO_2 targets and industrial policies, Europe can decrease its dependency on the volume battery imports to only 7%, as shown in the chart below. This contrasts with the EU's current 96% dependency on oil imports. However, by weakening these targets, this dependency increases. The new Commission's proposal (EU) would create a dependency of 49% as fewer local battery projects materialise, and

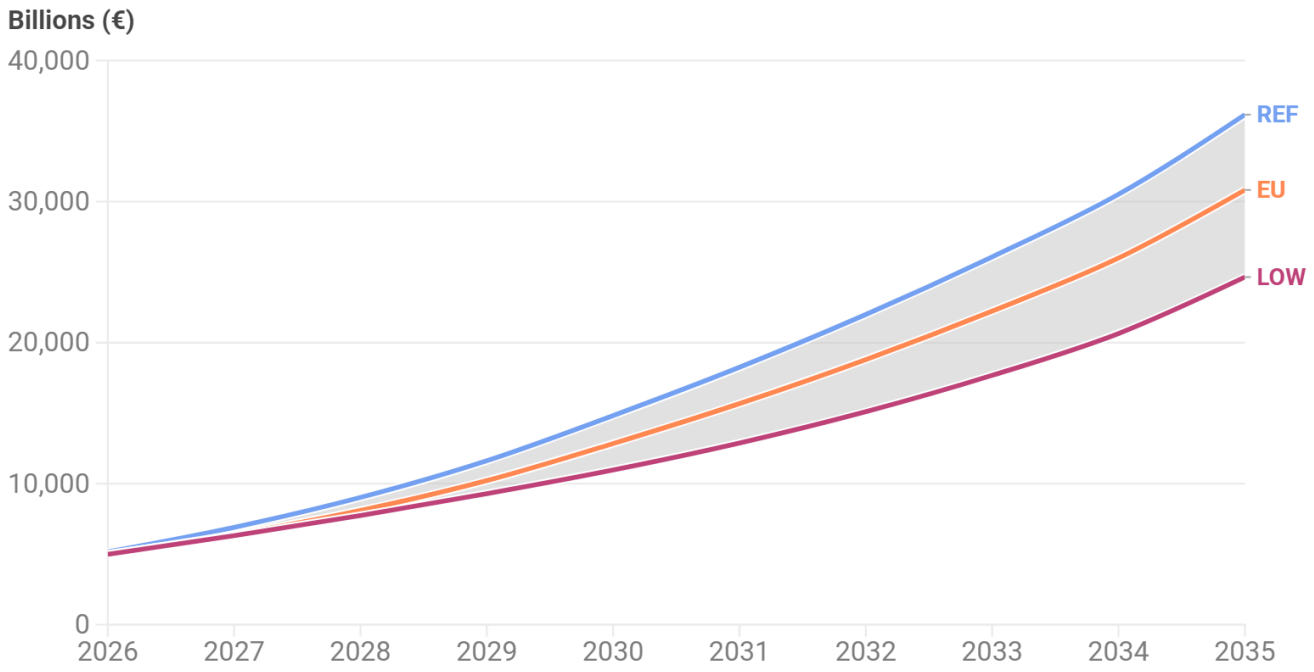
under further weakened industry proposals (LOW), this increases to a dependency of 63%. These contrast to a 96% dependency on oil imports for Europe today.



If the EU car CO_2 standards are maintained (REF), nearly 2.2 billion barrels of oil imports over the next decade could be avoided, saving around €180 billion in fuel costs. Whereas, weakening CO_2 standards would decrease oil saved by the BEV fleet by 610 million barrels between 2026 and 2035 compared to the REF scenario. This is equivalent to €50 billion in oil import expenses if prices remain similar to the 2021-2025 period.

Protecting car CO2 regulation would save €50 billion over a decade compared to delaying

Yearly cost savings from oil imports due to accelerated EV uptake by scenario



Source: T&E modelling based on €82/barrel (average crude oil price over 2021-2025)

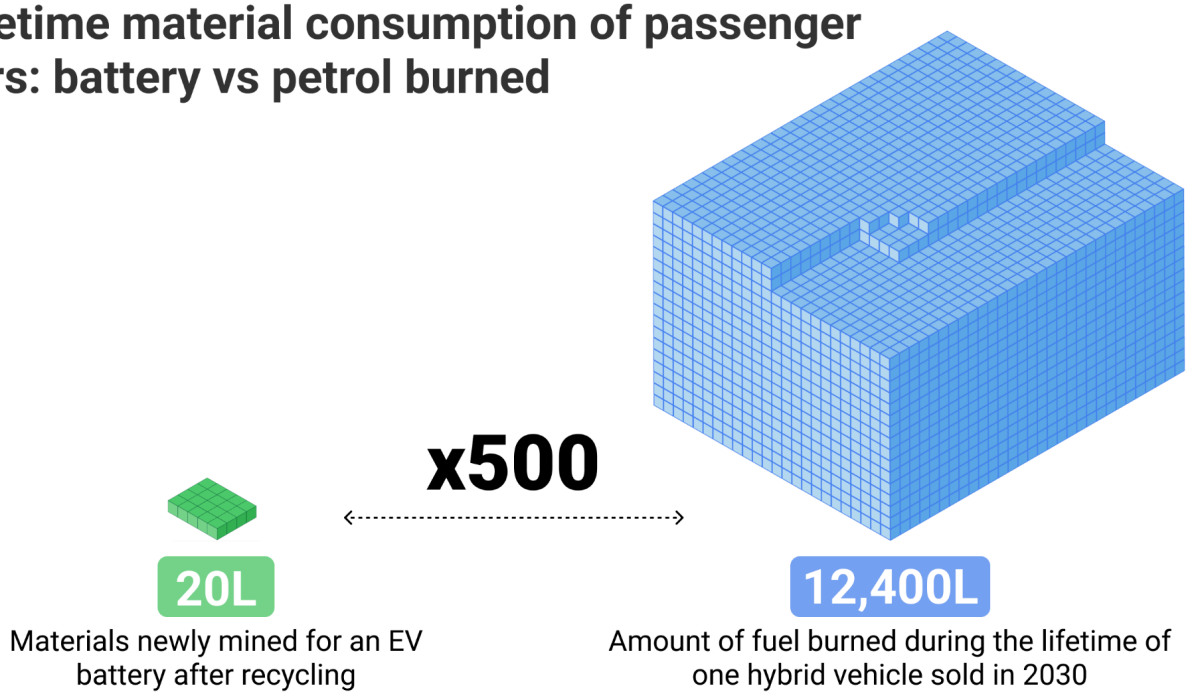
4.2 Oil vs batteries: two very different cases

It is clear that accelerating vehicle electrification is key to cutting Europe's oil dependence. However, are we replacing one dependency with another? Many say going electric will replace a dependency on oil, with a dependency on batteries or minerals they need.

The two are structurally different, with oil similar to business running costs, while batteries - capital costs. Oil is extracted, imported and endlessly burned, used up with every car journey. When there is no oil or prices sky rocket, our ability to drive is impacted. In contrast, EV batteries are fundamentally different. Materials are mined once and then used to produce a battery, which can then be driven for years on end, powered by local, clean energy. The materials are also then locked into the system and can be re-used and recycled constantly.

This means a lot less new materials are needed to power electric vehicles, compared to the amount of fuel burned in combustion engines. With only 49kg of newly mined materials needed for an EV battery, compared to 12,400L of fuel consumed during the lifetime of a hybrid vehicle, the dependency on oil is on another scale. As more and more materials are locked into the system, the already smaller battery dependency will only reduce further.

Lifetime material consumption of passenger cars: battery vs petrol burned



Source: T&E analysis

Importantly, oil is concentrated in a few specific regions, such as the Middle East and the US. This means Europe becomes dependent on these individual regions; a dependency which can be weaponised. Unlike oil, battery grade materials (whereby the raw material is processed into the right high quality) can be produced anywhere. Raw materials themselves - from lithium to nickel and beyond - are found across the world, including in Europe, and there is much scope for substitution. And whilst China currently dominates a lot of the supply chain, particularly when it comes to refining and processing these materials, with the right market and policy conditions in place, this can be done anywhere else and is not geology specific.

National deep-dives

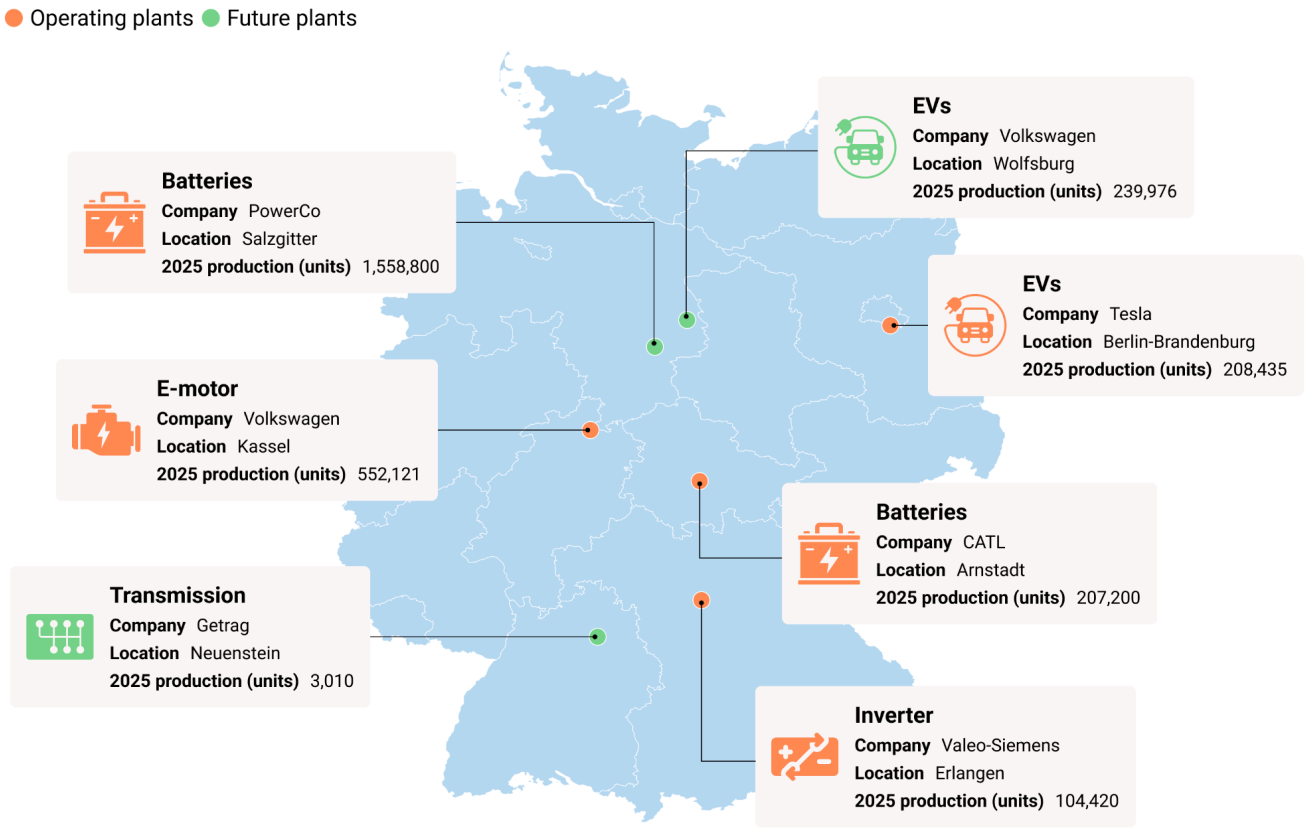
On top of the EU market averages, this section looks into a select number of key European countries: Germany, France, Spain, Italy, Poland and the UK.

5.1 Germany

Germany has long been the heart of Europe's automotive industry and is now positioning itself at the forefront of the electric transition. In 2025, it produced nearly 1.2 million BEVs - accounting for more than half of total European output. Alongside vehicle assembly, Germany's long-standing car industrial ecosystem led to important existing and planned facilities to localise key components, spanning the entire electric value chain. With ambitious CO_2 standards and a robust industrial strategy, domestic BEV production could rise to around 5.4 million units by 2035.

Current battery nameplate capacity stands at roughly 36 GWh across six gigafactories: BorgWarner in Darmstadt, CATL in Arnstadt, IONCOR in Kirchardt, Leclanché in Willstätt, and Porsche/Varta in Ellwangen. While this remains modest relative to future demand, expansion plans are substantial and could lift capacity to around 125 GWh by 2030. However, many of these projects are considered high risk, and some face potential cancellation. The trajectory of EU regulation will therefore play a decisive role in determining whether Germany consolidates its position as a battery manufacturing hub or sees investment shift elsewhere.

Main EV Value chain plants



Source: T&E

In component manufacturing, Germany mirrors its strength in vehicle assembly. It maintains a comparable share of European e-motor production and dominates inverter manufacturing, supplying around 86% of units installed in European-made electric cars. It also accounts for 68% of transmission systems. As BEV sales expand, further capacity is expected to come online, reinforcing Germany's role across core electric driveline technologies. The country is also one of the few in Europe with domestic production of battery management systems (BMS), enhancing resilience in the face of geopolitical tensions or supply disruptions.

Looking at the broader economic picture, including both electric and combustion vehicles, the total value of German car production stood at approximately €135 billion in 2035 terms. By contrast, weakening CO_2 standards would carry significant costs. Less stringent targets could reduce industry revenues by around 10% (EU scenario) over the next decade, while a worst-case scenario would see a decline of 25% (LOW scenario), amounting to a cumulative loss of €283 billion compared with the current policies.

5.2 Spain

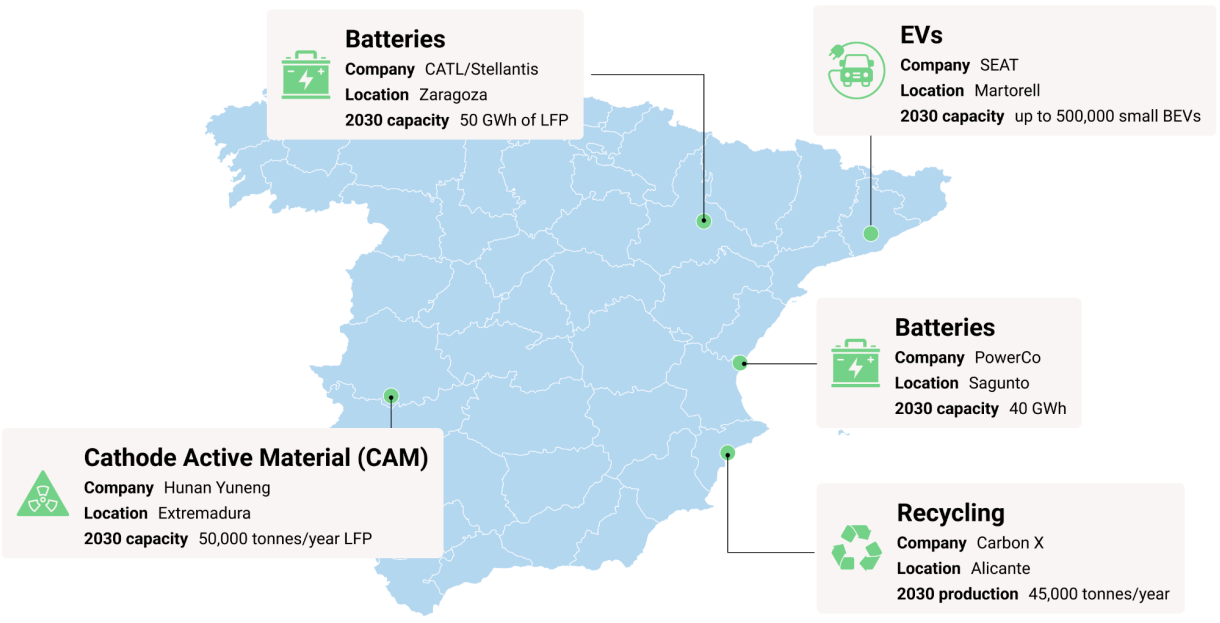
Spain has positioned itself relatively early in the transition to electric mobility, with significant investments in BEV production, placing the country on a solid path to become one of Europe's key players in the electric automotive industry. This early engagement with electrification has allowed Spain to attract new industrial projects and strengthen its role within the European automotive ecosystem, particularly as manufacturers look for competitive locations to expand EV production.

If the transition proceeds under ambitious regulatory conditions, the economic benefits for Spain could be substantial. In a scenario combining strong CO_2 standards with supportive industrial policy, overall automotive industry revenues could grow by around 13% over the coming decade. If the current regulatory ambition remains, revenues would still increase by about 10%. By contrast, weaker policy signals significantly reduce the potential gains: the European Commission's new proposal would deliver only around 5% growth, while the lowest-ambition industry scenario would effectively result in stagnation, with no meaningful increase in industry revenue.

Spain is already building a solid position in battery manufacturing, which will be one of the most valuable segments of the EV value chain. Current installed capacity remains modest, at around 2 GWh, but the investment pipeline is extremely ambitious. If all planned projects are realised, Spain could reach roughly 228 GWh of battery manufacturing capacity by 2030, producing close to 20% of all battery cells manufactured in the European Union.

However, if only the lowest-risk investments move forward, capacity will be limited to around 82 GWh by 2030 - almost a third of its potential. The main plants at low risk are PowerCo's in Sagunto (20 GWh capacity in 2030 according to low risk categorisation of the phases and 40 GWh regardless of risk levels), and Envision AESC in Navalmoral de la Mata (10 GWh). The ambitious 50 GWh LFP battery project from the CATL-Stellantis joint venture in Zaragoza announced groundbreaking in November 2025.

Main EV Value chain plants



Source: T&E

In other parts of the electric drivetrain, Spain's industrial footprint is more limited. Production of electric motors, for instance, remains relatively small compared with the country's BEV assembly volumes. However, this does not necessarily represent a structural weakness. One of the strengths of the European automotive industry is its integrated supply chain, where components can be efficiently sourced across borders. As long as Spain remains well connected to this European manufacturing network, it can focus on its competitive advantages in vehicle assembly and batteries while relying on suppliers elsewhere in Europe for certain components.

Overall, Spain's early move into electrification has created a strong foundation for future growth. With sustained regulatory ambition and successful delivery of battery investments, the country has the potential to become one of Europe's central EV production hubs while significantly increasing the economic value generated by its automotive industry.

5.3 Poland

T&E's forecast shows the opportunity for Poland to scale up its electric car industry and gain substantial economic growth. The country's car industry was worth around €9.5 billion in 2025 and could reach €11.4 bln by 2035, a 19% increase in the REF scenario with an expected

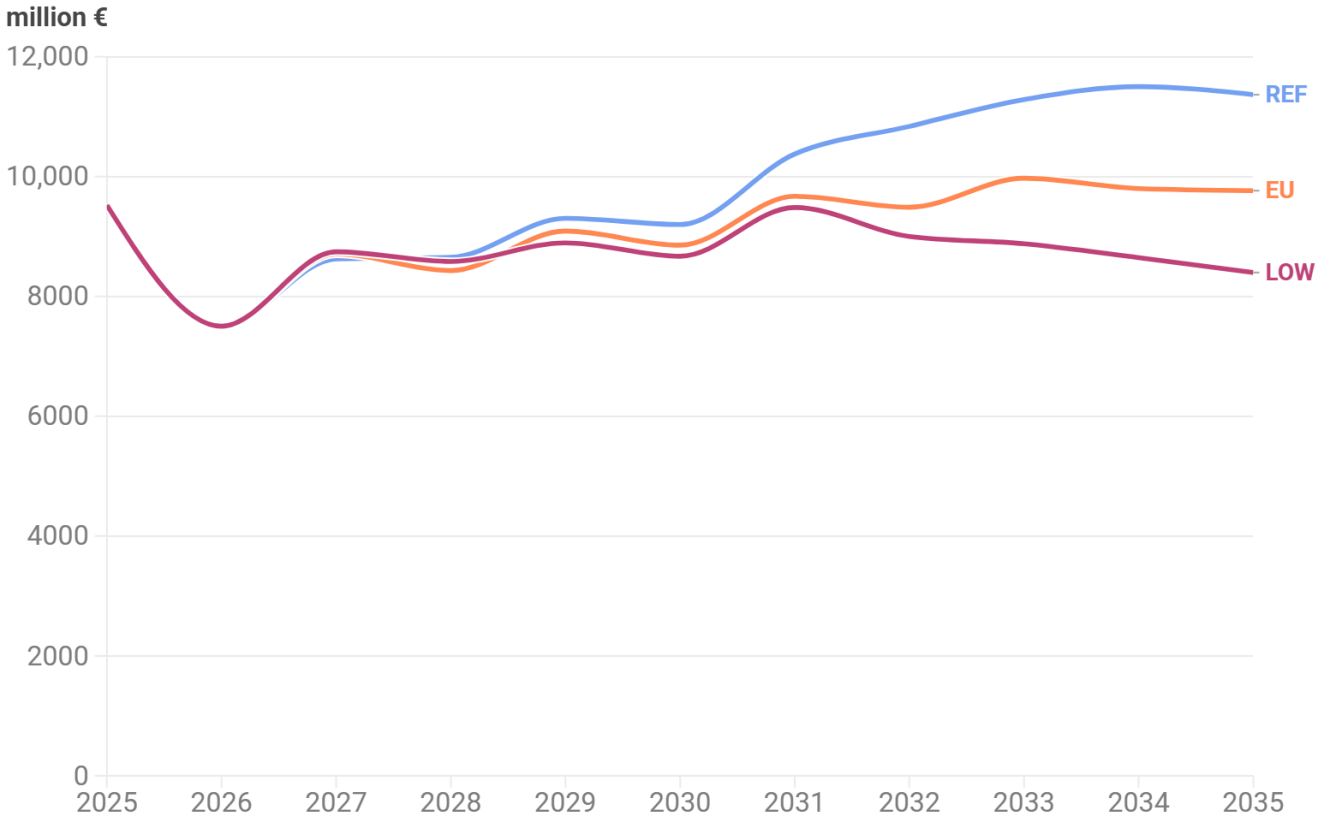
production of 334,000 BEVs. As Poland's automotive industry has historically specialised in the production of ICE components, electrification also presents a structural challenge. BEVs require fewer mechanical components, meaning that parts of Poland's traditional supplier base could face declining demand as the transition accelerates.

However, Poland also holds several strategic advantages that position it well to capture the economic opportunities of the electric transition. The country moved early into the battery value chain and hosts the largest battery gigafactory in Europe - LG plant in Wroclaw, with 115 GWh nameplate capacity - while developing a growing ecosystem around battery manufacturing.

This early-mover advantage could translate into a strong industrial foothold if properly scaled. Current plans suggest that Poland could account for roughly 45% of European cathode and precursor material production by 2035, while also expanding into battery materials recycling. These segments are among the highest value-added parts of the battery supply chain and will become increasingly important as EV production grows and recycling volumes rise.

Car manufacturing revenue, Poland

In a best case scenario, we estimate a 31% growth in the next decade, while production value will plummet to -12% if regulatory ambition is weakened



Soure: T&E calculations.

Beyond batteries, electrification also opens the door for Poland to diversify into new EV components. Production of electric motors, transmission systems, power electronics and battery management systems is currently limited, but these technologies represent natural adjacent industries for the country's well-developed automotive supplier base, and a new business opportunity for the IT and electrical components industries. With targeted investment and supportive industrial policy, Poland could gradually shift from ICE-focused manufacturing to a broader role across the electric drivetrain ecosystem.

Importantly, Poland enters this transition with a structural advantage compared with some other European countries: the automotive sector, while important, does not dominate its economy. This allows Poland, with the right policy framework, to turn the transition into an opportunity for industrial upgrading rather than a source of disruption. A recent T&E report helps better understand this situation.

Maintaining leadership in batteries will require clear market signals, stable demand for electric vehicles and strong industrial policies that support the expansion of the entire battery value chain. Without this, Poland risks losing part of its early advantage as new gigafactories and material plants emerge elsewhere in Europe.

The economic stakes are considerable. Weak climate ambition and slower electrification would reduce the scale of the EV market and undermine the business case for many of these investments. The result would be a missed growth opportunity under the new Commission's proposal (just 3% growth in 10 years) or even a large loss in case regulation is watered down further: -12% revenue in 2035 and a cumulative loss of €16 billion.

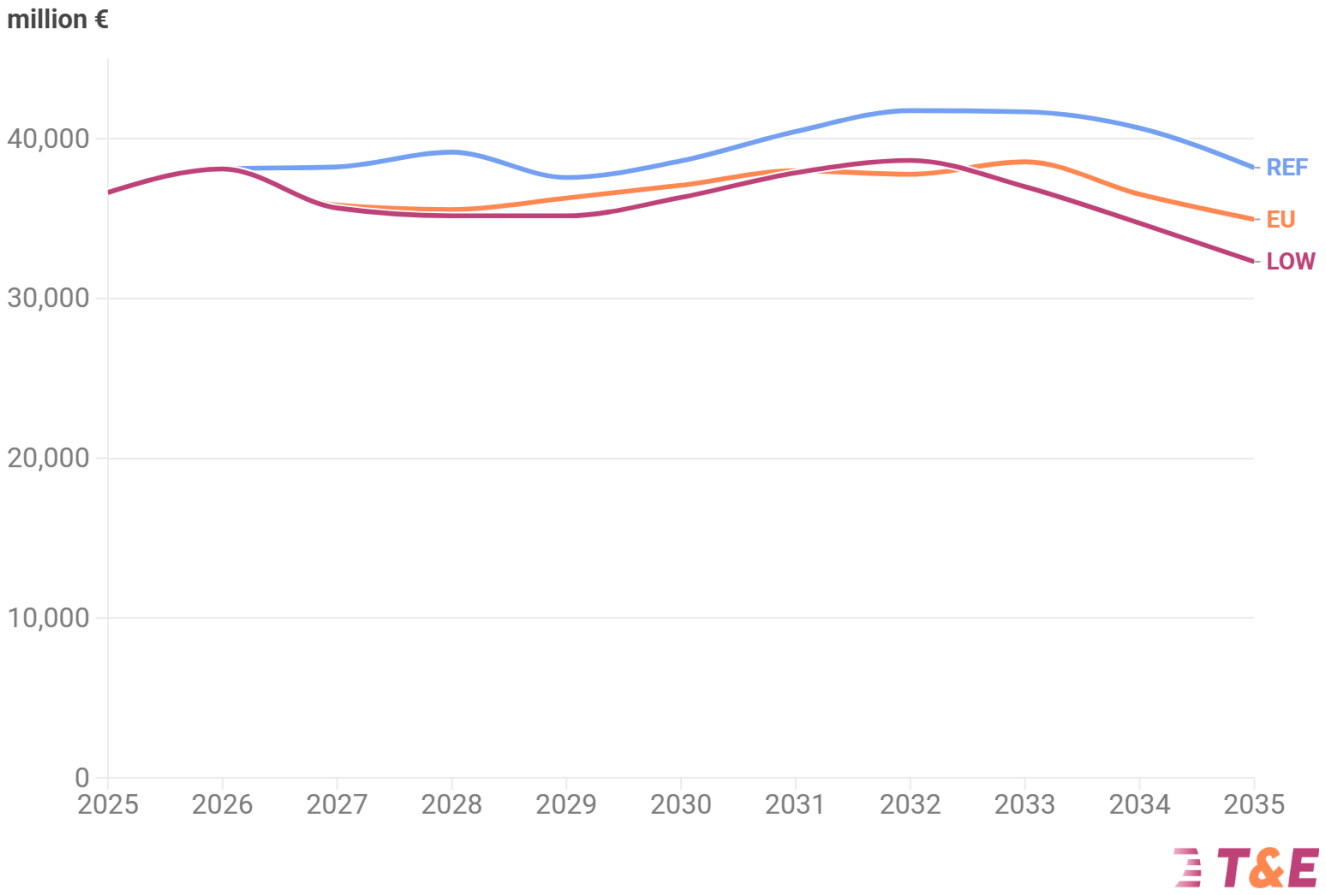
5.4 France

France produced approximately 260,000 BEVs in 2025, making it the second-largest electric car manufacturer in Europe. With coordinated action across the value chain, its prospects under a full decarbonisation pathway are strong. In a high-ambition scenario, France could effectively replace its combustion engine output with electric vehicles, reaching around 1 million BEVs by 2035 while maintaining overall production volumes and increasing industry revenues by roughly 4%.

France's well-developed component manufacturing base supports its growth trajectory. The country already produces more e-motors and transmission systems than are required for its domestically assembled BEVs, underscoring its role as a key supplier within the wider European electric vehicle ecosystem, not merely a national assembler. In the most ambitious scenario, production could reach 4.4 million electric motors and 3.8 million transmission systems by 2035, strengthening France's position in key electric drivetrain technologies. Scaling up this manufacturing capacity would not only support the European BEV industry but also generate substantial domestic economic value - the two industries combined could be worth €3.85 billion, an almost four-fold increase from €1 billion today.

Car manufacturing revenue, France

Auto industry potentially growing 8% by 2035, but could lose 12% if the transition to BEV doesn't occur fast enough



On batteries, the scale of ambition is even greater. While output in 2026 is expected to remain below 4 GWh, planned private investment of around €20 billion over the next five years could lift installed capacity to approximately 187 GWh by 2030. France aims to underpin this expansion by strengthening upstream and midstream segments of the battery value chain, particularly cathode production, lithium refining and materials recycling.

However, the sharp gap between current and projected capacity also illustrates the risks. If CO_2 standards are weakened and no sufficient industrial policy is introduced, France could find itself stranded mid-transition - retaining excess combustion engine capacity while failing to secure competitiveness in BEVs. Under such conditions, investors may scale back or cancel commitments across the battery ecosystem, forfeiting a rare opportunity to anchor the industries of the future domestically.

A clear illustration is ACC's plant in Douvrin. The facility currently operates with a nameplate capacity of around 2 GWh and plans to expand by a further 55 GWh by the end of the decade through an investment of €8.9 billion. However, at the time of writing only a limited portion of this expansion is underway, while the remaining phases have been put on hold amid uncertainty over future demand.

Under the new Commission's proposal, the automotive industry's value would decline by around 5%. A further weakening of targets could deepen this contraction to 12% in total, resulting in a cumulative loss of approximately €43 billion over the next decade.

5.5 Italy

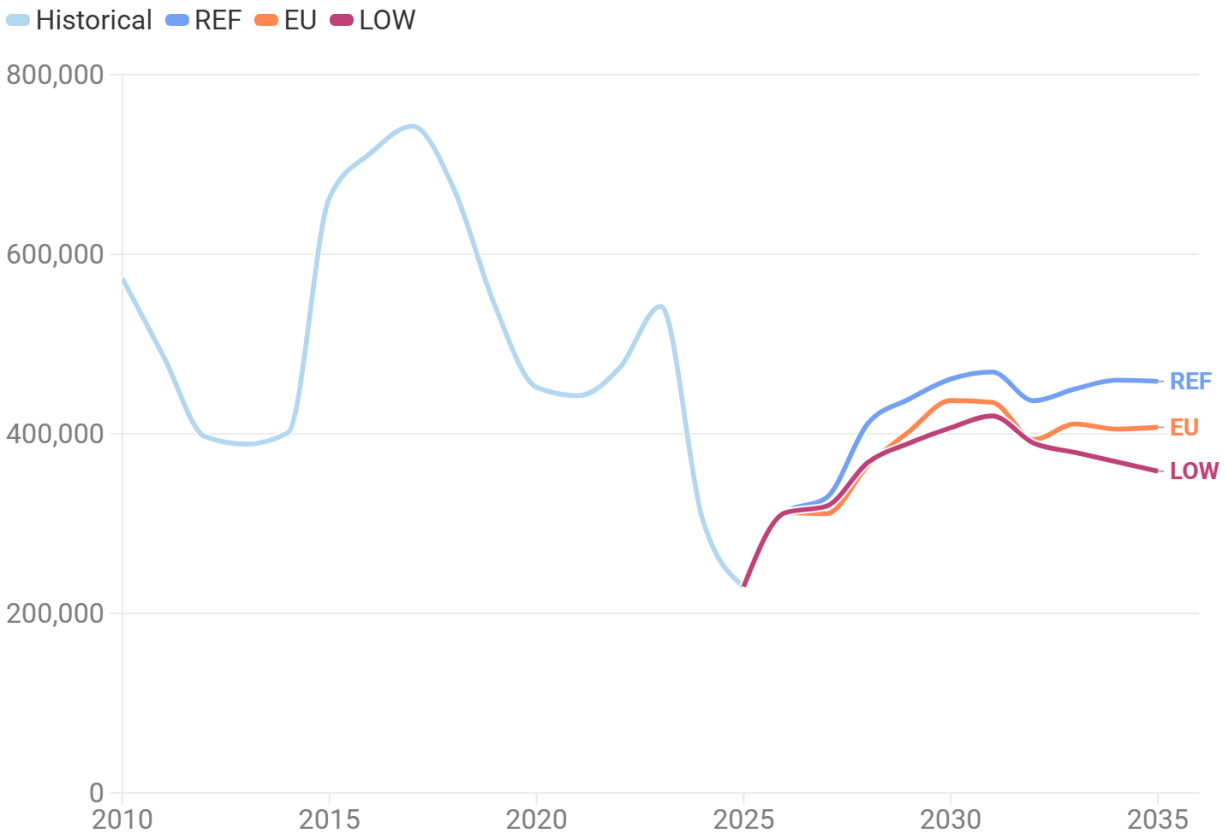
Italy was one of Europe's leading car manufacturing countries, producing almost 750,000 vehicles in 2017. Since then, however, production has fallen sharply, reaching roughly 230,000 units in 2025. A combination of factors contributed to this decline, including global supply chain disruptions, the impact of the COVID-19 pandemic, higher energy costs and a slow and uncertain national response to the industry's shift toward electrification. While several European countries moved quickly to attract EV investments and develop new supply chains, Italy has struggled to position itself within the emerging electric vehicle ecosystem.

The transition to electric mobility nevertheless offers a real opportunity for Italy to revive its automotive sector. Under a strong electrification pathway, domestic vehicle production could recover to around 412,000 units by 2035. This compares to the industry's lower-ambition trajectory of roughly 350,000 vehicles. In other words, embracing the EV transition could allow Italy to reverse part of the production decline experienced over the past decade and place the sector on a path of renewed growth. Doubling production, car production value would more than double (+109%, from the current €7.5 billion) in the next ten years if robust industrial policies are put in place on top of CO_2 standards.

Despite this opportunity, the political debate in Italy has increasingly framed electric vehicles as a threat rather than as an industrial opportunity (even if the industrial decline started well before and is not related to EVs). This approach risks creating unnecessary political resistance to EV deployment at a time when global markets are rapidly shifting toward electric vehicles. While policies favouring internal combustion engine vehicles might provide a short-term boost to production in the next few years, they do not address the structural changes taking place in the global automotive market. As demand for BEVs expands across Europe and other major markets, manufacturers that fail to scale competitive electric models will struggle to survive.

Italy can recover its car production

Ambitious electrification plans will result in 150,000 more vehicles produced in 2035 compared to the Industry scenario



Source: T&E calculations.

T&E

Italy's position in the automotive value chain also shapes the challenge. The country is relatively weak in batteries and key Tier-1 EV components such as e-motors, transmissions, inverters and battery management systems. However, it has a strong industrial base in Tier-2 components, particularly in electronics, specialised mechanical parts and precision manufacturing. The components industry was worth over €50 billion in 2023. This supplier network represents a valuable foundation that could be redirected toward EV-oriented production as the European electric vehicle market grows.

The development of a strong European EV industry therefore presents a significant opportunity for Italian suppliers if a supportive national strategy is put in place. Italy's EV value chain could be reinforced by three strategic projects identified under the EU Critical Raw Material Act (CRMA): the Portovesme CRM Hub (battery recycling/materials), INSPIREE (rare earths for motors), and RECOVER-IT (copper/nickel for batteries/systems). These projects could strengthen Italy's position across key segments of the EV value chain, from critical raw materials to advanced manufacturing. As BEV production increases across the continent, components have potential to grow substantially. Some Italian companies already possess the technical capabilities required to

adapt their production to electric drivetrains, power electronics and battery-related technologies. With supportive policies and clear market signals, these firms could successfully reposition themselves within the emerging EV supply chain.

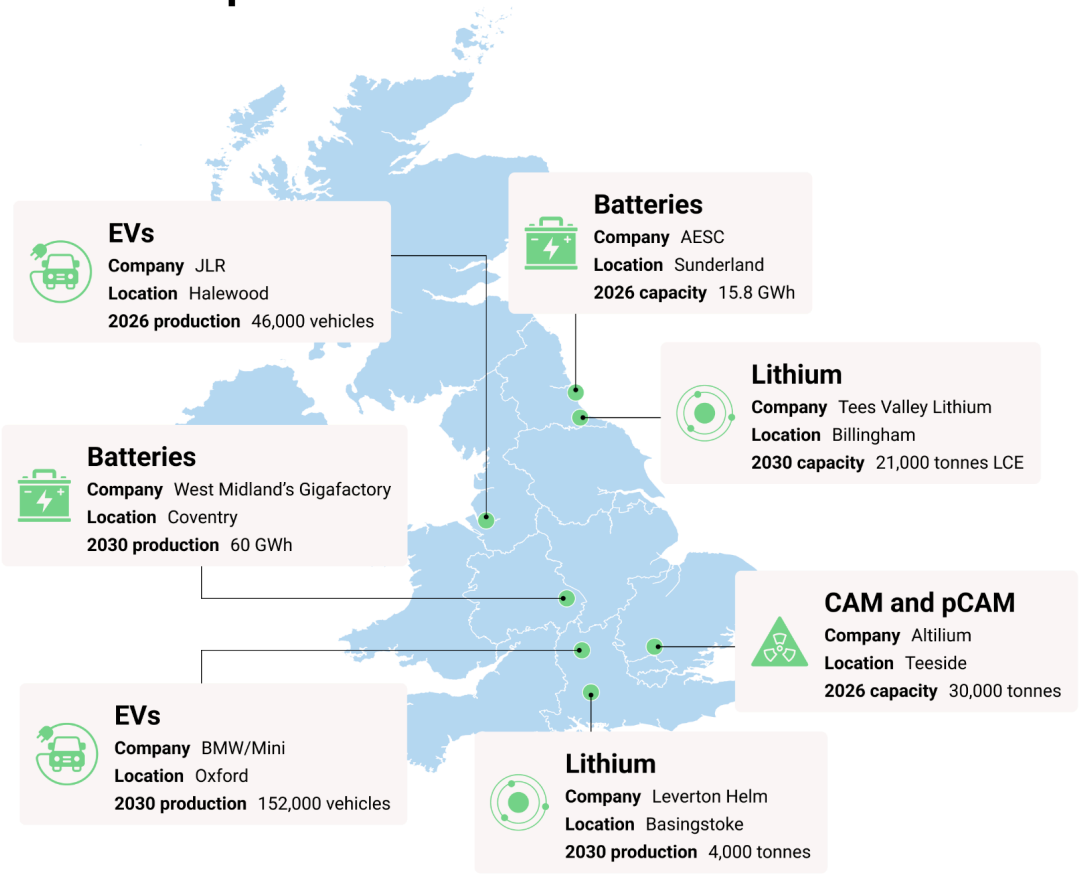
On the contrary, the EU abandoning its CO_2 standards would fuel national political resistance to electrification and risk delaying this transition and discouraging new investment. The industry would lose €24 billion in the next ten years if the 2035 target were lowered to 80%.

5.6 United Kingdom

The United Kingdom has made significant progress in the deployment of electric vehicles, with BEV sales already exceeding the requirements of the country's Zero Emission Vehicle (ZEV) mandate. The challenge now is not demand, but production. Without a strong domestic manufacturing base, the rapid growth in EV sales risks being met primarily through imports rather than locally produced vehicles. Ensuring that the UK captures the industrial value of the transition will therefore depend on scaling domestic BEV production in parallel with market growth.

This objective is within reach. Under a high-ambition scenario combining strong regulation with supportive industrial policy, the UK could produce around 1.3 million BEVs annually by 2035. Such an expansion would significantly strengthen the country's automotive sector and generate substantial economic benefits. In this best-case scenario, the value of UK automotive production could increase by roughly 85% by 2035. By contrast, a low-ambition pathway would deliver only marginal growth of around 4%. Over the next decade, the gap between these two trajectories would amount to nearly €100 billion in cumulative lost industrial value if the transition is not fully embraced.

Main EV Value chain plants



Source: T&E

The UK already has a relatively solid foundation in battery manufacturing. The Envision AESC gigafactory in Sunderland, currently operating with a capacity of around 15.8 GWh, represents the core of the country's existing battery production base. In addition, new technologies are emerging, such as LionVolt's planned solid-state battery facility in Thurso. Several large-scale expansion projects are also under consideration. Notably, the Tata/JLR gigafactory planned in Bridgwater and the West Midlands Gigafactory project in Coventry together represent around 120 GWh of potential battery capacity, although these investments are currently classified as medium to high risk and will require strong market signals to proceed.

Beyond cell production, the UK is also developing capabilities in key battery materials. By 2030, the country could process up to 60 kt of cathode and precursor cathode active materials (CAM/pCAM), as well as around 65 kt of lithium chemicals. These activities would strengthen the domestic battery value chain and reduce dependence on imported refined materials, but are contingent on strong policy - not least the EU-UK Trade and Cooperation Agreement remaining in place.

However, the UK still faces gaps in other parts of the EV supply chain. In particular, domestic production of electric motors remains limited. Current capacity is estimated to cover less than 20% of the e-motors required for vehicles assembled in the UK. Scaling up manufacturing in this

segment - along with other electric drivetrain components - will be essential to ensure that the country captures the full economic value of the electrification shift rather than relying heavily on imported components.

Overall, the UK's EV transition presents a major industrial opportunity. Strong consumer demand thanks to supportive regulatory frameworks have already created a favourable market environment. These, notably the UK ZEV mandate, must remain in place and not be watered down.

The next step is to convert this demand into domestic manufacturing growth. With continued investment in batteries, materials processing and electric drivetrain components, the UK could significantly expand its automotive sector and secure a leading position in the European EV industry. Failure to do so would not stop electrification, but it would mean that a large share of the economic value created by the transition is captured elsewhere.

To deliver, the Government must develop a credible Industrial Strategy for the sector which sets out not only the overall vision for automotive manufacturing in the UK but also delivers credible policies to anchor EV manufacturing and the associated supply chain in the UK. In this regard the UK is significantly behind the EU which has both the Automotive Action Plan published in early 2025 as well as the Industrial Accelerator Act, a draft of which was published by the Commission earlier this year. To accelerate progress in this area, the UK should establish dedicated leadership by appointing a Secretary of State responsible for overseeing the automotive sector and driving its strategic development forward.

Recommendations

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01 Reject any weakening of the 2030 target ambition to ensure continued investment certainty into BEV manufacturing and related cleantech such as battery cells. In particular, the compliance with the 2030 target should not be averaged over several years.

02 Support the 100% zero emissions cars and vans target by 2035 to ensure that the regulation remains aligned with the EU's climate and industrial objectives.

03 Remove the fuel credit mechanism and reject any mechanism that rewards biofuels under the car CO_2 law. Ensure that low-carbon steel credits should be limited to "Made-in-Europe" green (fossil fuel free) steel.

04 Secure ambitious and consistent Made-in-EU requirements for batteries under the Industrial Accelerator Act. These requirements should exclude broad FTA equivalence, be enforceable (by closing flexibility loopholes) and required for all transport, energy and military applications. Requirements should cover the full battery value chain, including PCAM and recycled materials.

05 Mandate that eligibility for tax incentives or supercredits in the car CO_2 standards requires both EU-based battery production and vehicle assembly for small EVs, removing loopholes that allow compliance via non-EU batteries.

06 Ensure EU and national (State aid) support schemes enable simple, output-based production aid for batteries (e.g. €/kWh), offering predictable support to drive the industrial ramp-up of European projects.

07 Make wider use of trade defence mechanisms, extending the current EU BEV tariffs to battery cells and their critical components, while working with

like-minded partners on sustainable and diversified upstream critical mineral supply globally.

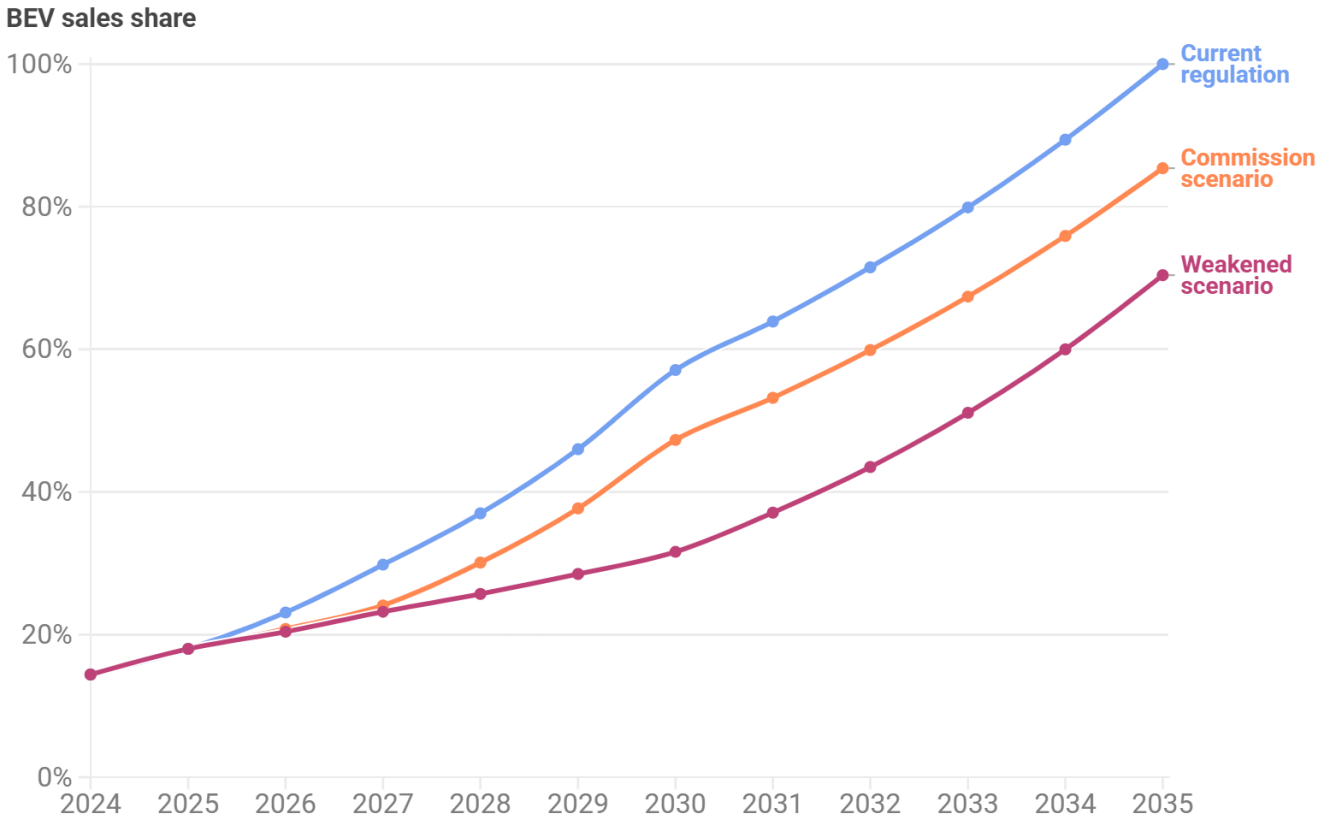
08 Ensure strict foreign direct investment conditions for batteries and their critical components, especially around process and equipment, skills and suppliers, accompanied by effective EU-wide enforcement.

Annex

I.1 Production and sales

The first step is calculating vehicle sales by powertrain type. The three policy scenarios presented in T&E's analysis of the Commission proposal are expressed as the minimum BEV sales shares to comply with the EU and UK CO_2 standards, and fed into our EUTRM model to calculate total sales.

Further weakening of the EC proposal leads to 70% BEV share in 2035



Source: T&E modelling

Total vehicle production data for 2020-2032 in EU+UK+EFTA+Serbia comes from GlobalData. We only consider personal cars, excluding commercial vehicles. The forecast years are

adjusted following the same growth trajectories as in our 2025 report, with updated target values in 2035 - targets are shown in section 1.
From our previous report, we obtained a ratio between BEV sales share and production share between 105-112% - i.e. 105-112 BEV sold every 100 BEV produced. Applying this ratio to the BEV sales share, we obtain BEV production share in each scenario and hence number of BEV produced.

I.2 Industry revenue and GVA

Once we have the complete production forecast per powertrain, it is possible to calculate the Gross Value Added (GVA). The first measure needed is the revenue in the car sector, obtained by multiplying the number of cars for their price. In the report text we often talk about industry GDP or revenue interchangeably. Technically, none is fully correct. What we show is the total value of production, i.e. the industry revenue if all production was sold within the year. So our value is a theoretical expression of the concepts above.

BEV and non-BEV prices today and until 2035 come from T&E internal modelling, based on BloombergNEF among other sources. The final price includes all production and delivery costs, e.g. raw materials, batteries, labour, transportation, cost of capital, etc, so the revenue and the resulting GVA cover only the upstream value chain.

The share of added value realised in Europe for each BEV component is obtained crossing T&E's data with McKinsey and CLEPA. For each component, we calculate the share produced in Europe, the value realised in Europe and its relative weight in an average vehicle's cost. Below the resulting values for each scenario, as well as a breakdown of the values for 2025 and how they are obtained. For non-BEV vehicles, the 90% European value added share calculated by McKinsey is assumed constant for all periods.

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
REG+	74%	74%	74%	74%	74%	79%	79%	79%	84%	84%	84%
REG	74%	74%	74%	74%	74%	79%	79%	79%	79%	79%	79%
COM	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
IND	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%

Component	Produced in Europe	Value in Europe for produced in Europe	Value in Europe	Relative weight (* might not add up due to rounding)	Source
Battery cell	77%	54%	42%		
Battery pack	99%	66%	66%	21%	T&E based on BNEF
E-motor and powertrain	80%	75%	60%	7%	T&E based on GlobalData, CLEPA
Inverter	57%	75%	43%	2%	T&E based on GlobalData, CLEPA
Transmission	95%	75%	71%	1%	T&E based on GlobalData, CLEPA
Rest of vehicle	100%	78%	78%	70%	T&E based on McKinsey

I.3 Gigafactories

Data on gigafactories (including capacity, net production and all the quantitative information on each project) comes from T&E's internal database collecting both already existing and planned factories, based on multiple sources including BNEF, Benchmark minerals and official statements from battery producers themselves since February 2026. Given the database size of around 110 projects, we could estimate some missing information on investment and jobs. T&E took the average capacity/investment and capacity/jobs ratios per country and applied to the projects with missing data.

The parameters used for the risk assessment are the following.

Funding secured	Location defined	Construction status	Investment from EU OEms/EU institutions	Score
Yes	Yes	Operating	Yes	0
			Possibly	1
Partly	To be confirmed	Under construction	No	1
	No	Not started		2
No		On hold		3

Projects scoring 2 or less are considered at low risk, medium risk between 2 and 6, 7 is classified as medium-to-high risk and 8 is high risk. All the projects that are current;y on hold were categorized as high risk.

I.4 Battery value chain

Data on critical minerals sourcing and refining plants come from CRU, Benchmark minerals, and from official company reports. The latter two were also used for CAM, pCAM and recycling projects. As they contain their own risk assessment, we adopt theirs.

I.5 Strategic autonomy

To calculate the share of demand that can be covered by domestic production in 2030, we took the ratio of expected production (or capacity, depending on availability) and demand in the REG+ scenario. Demand comes from T&E internal modelling, calculated as explained in the Industrial Blueprint report (see the Annex). The same model was used to update the demand figures to represent the REG+ scenario.

I.6 Oil savings

We estimate the uptake of BEVs in the EU27 passenger car fleet based on the projected BEV sales in each policy scenario using a simplified turnover model. We then assume that each BEV replaces a new combustion engine car sales, taking into account the real-world fuel consumption of an average vehicle. This average includes conventional petrol and diesel cars and hybrid electric vehicles, but excludes plug-in hybrid electric vehicles. We project that the average fuel consumption of new ICE vehicles would decrease by 1.1% per year between 2025 and 2034. The average annual mileage is 12,000 km, and the modelling includes a mileage change depending on the age of the car on the road, with an average reduction of 3% per year. We consider a refining efficiency of 93% to derive the quantity of crude oil from the total fuel consumed. To derive the total oil import savings, we have considered a conservative price of €82 per barrel, based on the average of the past five years (2021–2025).