BRIEFING - March 2026

The falling cost gap between EU and Chinese batteries

Why Made-in-EU requirements are a sovereignty premium worth paying

Summary

As the European Union is debating whether to set "Made-in-EU" criteria for public funding in the Industrial Accelerator Act, new analysis shows how scale will reduce the current cost advantage of Asian battery makers. Only with Made-in-EU criteria can the industry in Europe scale and learn, which is the critical factor in reducing the cost gap.

Access to batteries, their components and critical minerals is essential for Europe's economic security and resilience. Battery materials are vulnerable to the same trade weaponisation as witnessed with rare earths, Europe must be prepared.

Without significant action on battery production support or trade defense, using Union Content criteria in the Industrial Accelerator Act (IAA) as a lever for public support is the only option on the table for building a resilient and local battery industry across Europe. This will determine whether homegrown battery makers, such as ACC, Powerco and Verkor, can remain competitive.

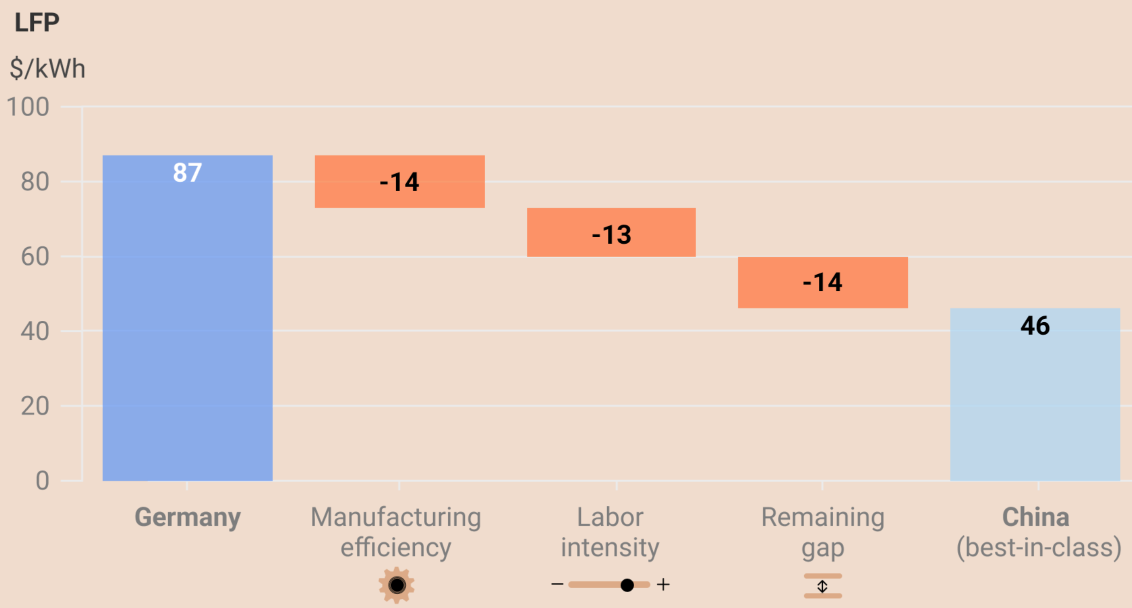
Despite the weight of the resilience argument, some in the automotive industry claim that this would make batteries more expensive and undermine their competitiveness.

To address this, T&E has looked at the key cost components of an electric vehicle (EV) and how battery costs would develop were they to be manufactured at scale locally based on IEA and BloombergNEF cost models.

The results show that:

- A substantial share of an EV value chain is already local, with 45% to 70% of the value from key components occurring in Europe.
- Batteries account for the lion's share of these production costs, ranging from 83% to 86% depending on the carmaker. If these were to be onshored, they would represent over 90% of the additional cost increase, underscoring the central role of batteries.
- While European battery cells are on average 17% more expensive than those produced in the US and 90% more expensive than in China, this gap largely reflects limited economies of scale rather than structural disadvantage.
- With scale-up thanks to policy, the temporary cost differential can be expected to narrow significantly: improved manufacturing efficiency (notably lower scrap rates) and labour proficiency and automation would cut the costs by almost a third. This translates into **a cost gap of around $14/kWh** for both NMC and LFP chemistries by 2030 from $41-43/kWh today (before incorporating financial aid or tariffs).

Efficiency and automation can reduce the cell production cost gap between Europe and China in 2030



Source: T&E calculations based on BNEF's BattMan model and IEA. Manufacturing efficiency refers to scraps and (un)planned production line downtime; Labour intensity relates to level of automation and worker know-how

- This would translate into an average **additional cost for an electric vehicle of €500** in 2030, ranging from €300 to €750 depending on the carmaker. (The impact on the final price may be less due to public incentives.) It should be considered as a sovereignty premium, acting as an insurance policy shielding Europe from geopolitical volatility and supply chain disruptions.

However, the battery cost gap reduction would only happen if consistent Union Content requirements for batteries are introduced. These should only cover strategic sectors at risk of supply chain weaponisation, including upstream components such as precursor materials and attached to all public incentive schemes including existing corporate car taxation. Resilience and security, especially on a continent-wide level, are core tasks for governments, not industry.

1. Introduction

Access to batteries, their components, and the critical raw materials they require, is increasingly determinant for Europe's security, both economic and military. The battery sector is a cornerstone of the EU's industrial strategy.

So far, the Commission has not signalled it is planning significant action on battery production support or trade defense. This is why using local content criteria in the Industrial Accelerator Act (IAA) as a lever for public support is the *only* option on the table today for building up a resilient and local battery industry across Europe. Many in the industry want it to take the form of Made-in-EU requirements: 19 companies and associations shaping the European battery value chain called for Union content criteria in the IAA.

Rewarding Made-in-EU EVs, batteries, key components and materials is necessary to create a clear business case and attract private capital. This act will determine whether homegrown battery makers, such as ACC, Powerco and Verkor, can remain competitive. But some in the automotive industry claim that this would undermine the EU's competitiveness and force carmakers to buy expensive batteries increasing the costs of electric cars.

This briefing is based on the external battery cost models developed by the BloombergNEF and the International Energy Agency, and looks at the potential of battery cost reductions in Europe by 2030.

2. EV cost composition for European carmakers

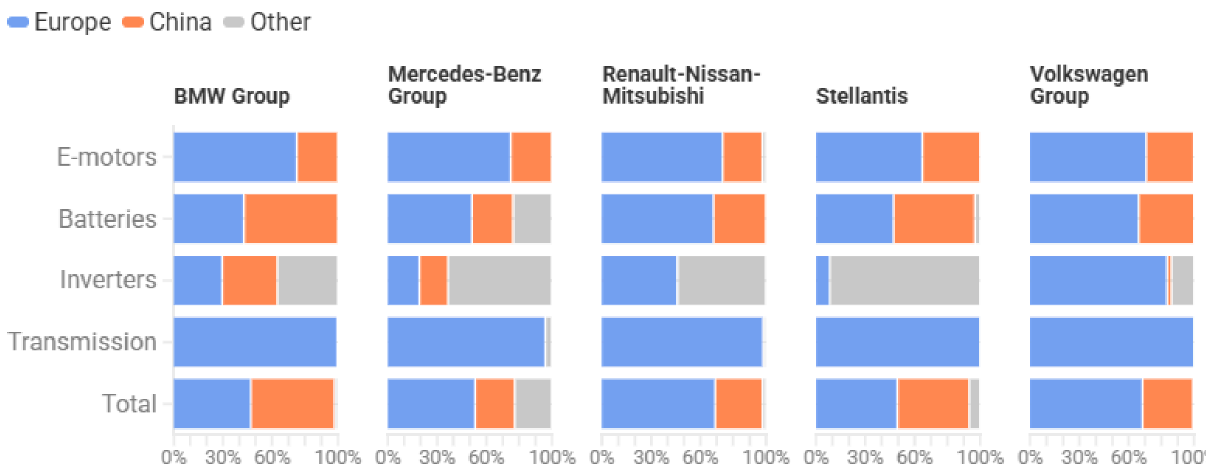
To assess the cost implications of onshoring battery cells, T&E has first analysed the current cost composition of key EV components: e-motors, batteries, inverters and transmissions. We then extrapolated the battery cell costs to 2030 to understand how it would develop were they to be manufactured at scale locally. The methodology is explained in the Annex.

Our analysis shows that **between 45% and 70% of the value of European carmakers' key BEV components is already in Europe**. But it also highlights the major footprint of China: in almost every case where Europe is not the primary region where costs are incurred, China is the clear second, dominating the value chain for most components except inverters.

The geographical distribution is highly uneven across components. Transmission is almost always currently produced in Europe. Similarly, e-motors are typically produced in Europe in-house, although a significant share of their value is generated abroad. By contrast, inverters are largely offshored today, with the exception of the Volkswagen

Group. For batteries, the share of the value captured in Europe varies significantly among carmakers, ranging from 43% to 68%.

45-70% of the value of European carmakers' key BEV components is captured in Europe

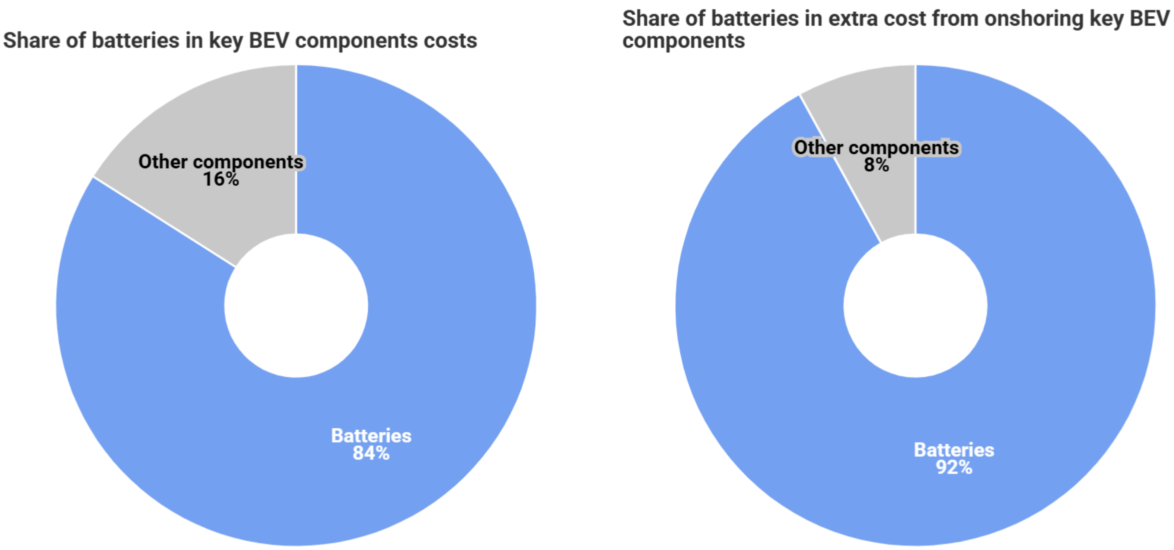


Source: T&E calculations based on GlobalData, ICCT, and BNEF.
Scope limited to personal vehicles sold in Europe.

T&E

Among the key EV components, **batteries make a major part of the total current manufacturing costs, ranging from 83% to 86% depending on the carmaker**. When onshoring their production, the relative increase in cost across components is unequally distributed. While e-motors and transmission costs remain largely unaffected as they are already mainly produced locally, batteries are by far the primary driver of manufacturing cost increases in an onshoring scenario, representing 91-92% of the total extra cost.

Batteries are the primary driver of cost increases from onshoring key BEV components



Source: T&E calculations based on GlobalData, ICCT, and BNEF.
Scope limited to personal vehicles sold in Europe. Onshoring scenario in 2025.

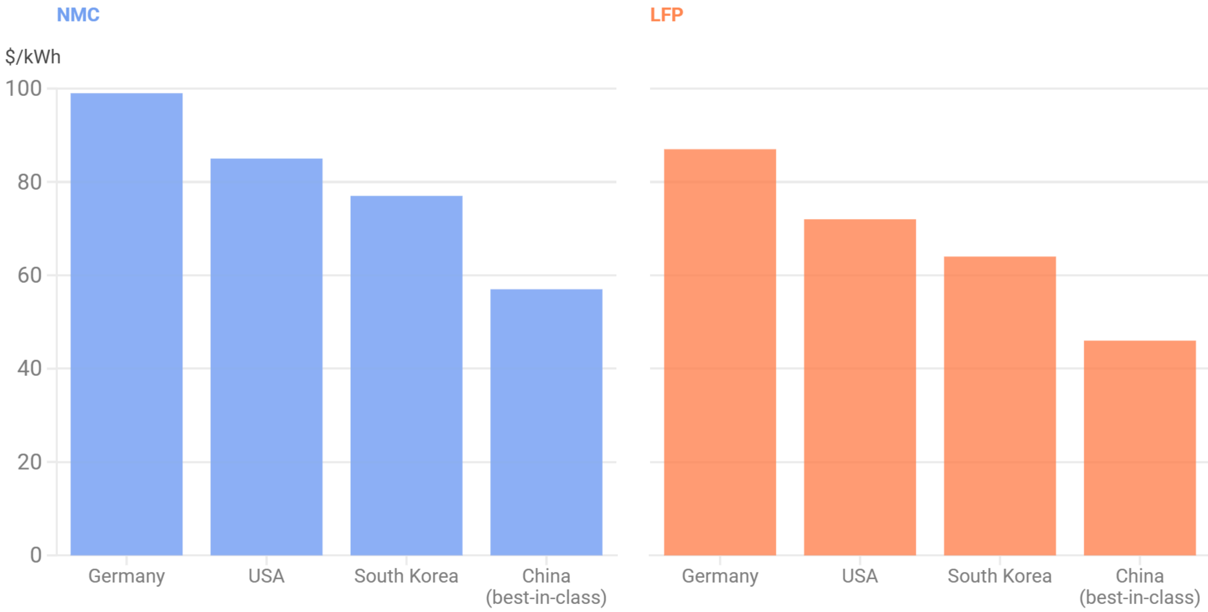
While onshoring batteries is critical for Europe's strategic autonomy and resilience, reducing the costs of local battery manufacturing is key to keeping EV costs increases in check.

3. Costs from onshoring battery manufacturing

Analyses from BloombergNEF, BCG and the International Energy Agency (IEA) indicate that battery cells produced today in Europe are more expensive compared to other main producing regions, including China, South Korea and the US.

The graph below shows how battery cell manufacturing in Germany, as an example, compares to the other three countries. The nickel-rich NMC chemistry is 30% more expensive to manufacture in Germany ($99/kWh) than in South Korea ($77/kWh), increasing to 75% when compared to Chinese best-in-class players ($57/kWh). Similarly, the difference for cheaper LFP chemistry, increasingly used in affordable EV models in the EU, is 35% compared to South Korea and 90% compared to China.

European battery cell production remains the most expensive among main producing regions

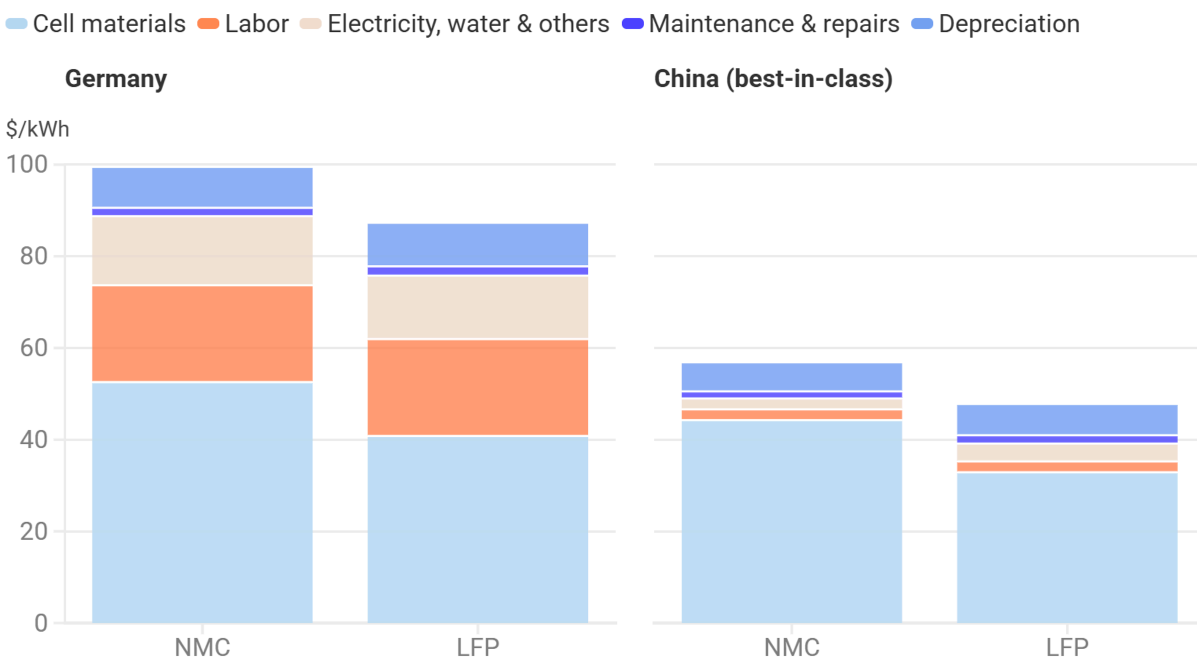


Source: T&E calculations based on BNEF's BattMan model and IEA.

A closer look into the actual assumptions behind these analyses reveals that the lack of scale and experience of the industry in Europe is the most important explanatory variable:

- In Europe an average of 125 workers are used to produce a GWh of battery in Europe vs 35 in China. This is explained by the smaller scale and, with it, lower automation and higher scrap levels in European factories, underlining the potential of scaling.
- Electricity costs, explained by higher prices and lower efficiency. Despite all efforts to reduce power prices and decouple them from gas prices, it is hard to foresee a situation in which European power prices would approximate Chinese levels. However, the power *efficiency* of European factories is also notably below that of their Chinese counterparts. Again, larger scale and reducing factory scrap rates has big potential to improve the situation.

Labor and electricity contribute the most to the Germany-China cell production cost gap



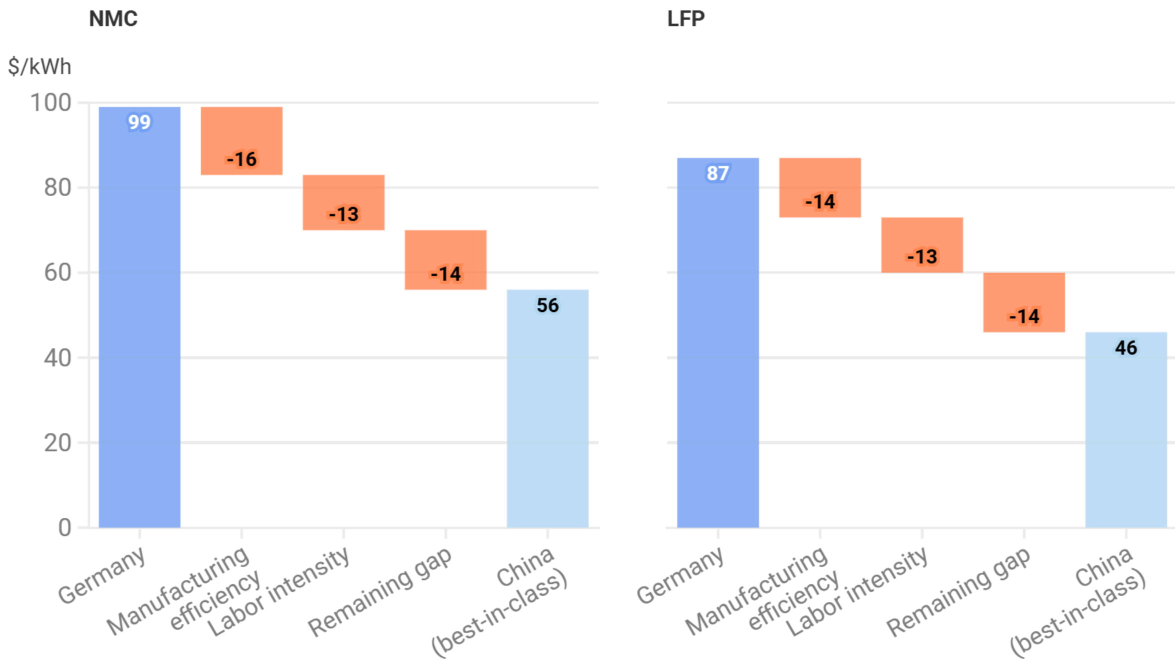
Source: T&E calculations based on BNEF's BattMan model and IEA (2025).

In summary, the battery cost gap is neither static nor unavoidable, but it represents the current situation of limited economies of scale in battery manufacturing in Europe. Made-in-EU requirements will drive more capital into local manufacturing, ensuring both investment certainty for battery makers and firm offtake from auto manufacturers. This will drive scale, and reduce costs accordingly.

Our analysis is based on modelling by the IEA and BloombergNEF, and assumes that if battery manufacturing in Europe scaled thanks to policies such as Made-in-EU requirements, both production efficiency and automation in European gigafactories can reach that of Chinese factories.

Manufacturing efficiency, notably lower scrap rates, could reduce the relative cost disadvantage by 28-30 percentage points, with labour proficiency and automation reducing this further by 24-29pp. This could significantly reduce the cost gap by 2030, dropping from $41-43/kWh today to $14/kWh for both NMC and LFP chemistries. This is roughly a 25-30% cost disadvantage, before incorporating the investment support or trade defence impacts.

Efficiency and automation can reduce the cell production cost gap between Europe and China in 2030

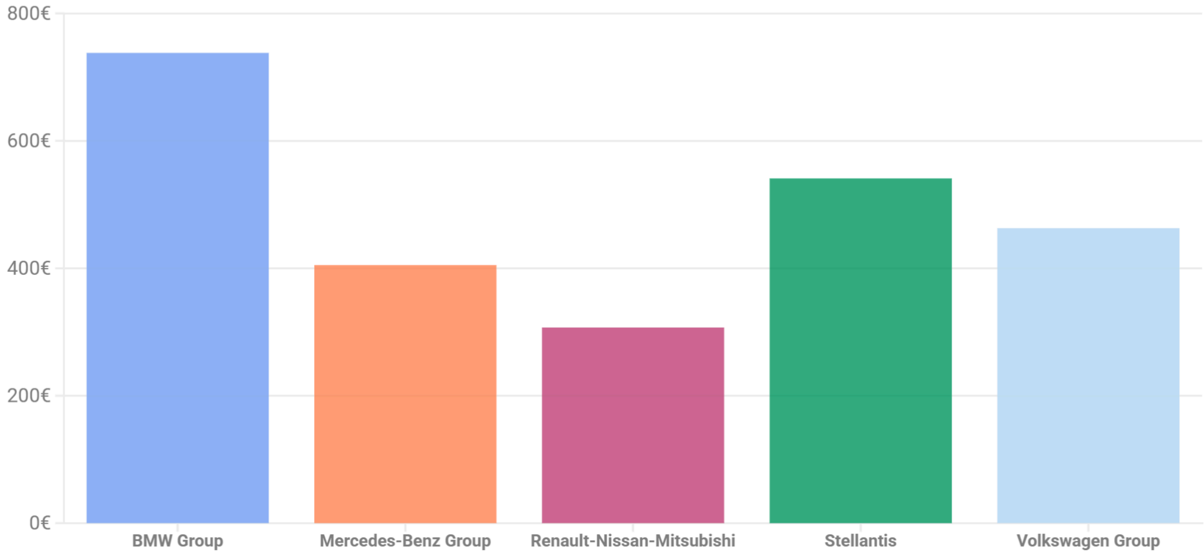


Source: T&E calculations based on BNEF's BattMan model and IEA.
Manufacturing efficiency refers to scraps and (un)planned production line downtime; Labour intensity relates to level of automation and worker know-how.

However, given that an important share of battery cells are already produced in Europe, carmakers could not face such high cost increases if all cell production were to be onshored. They are likely to be much smaller: we estimate that, at pack-level - in which cells represent around 70% of the value - they would translate into a 5-9% cost increase depending on the carmaker. This represents an average extra cost of ~€500 per vehicle in 2030, ranging between €300 for Renault and €750 for BMW.

If, as proposed by T&E in a report, a 60% localisation threshold is enforced for cathode active materials, this could raise this cost disadvantage to 8-12%, or ~€750 per vehicle on average.

The residual battery cost gap by 2030 could translate into an extra 300-750€ per vehicle



Source: T&E calculations based on GlobalData, ICCT, and BNEF.
Scope limited to personal vehicles sold in Europe.

This is a small premium to pay for the EU's resilience and strategic autonomy. Industry players have natural incentives to maximise profits, not resilience. In contrast, resilience and security, especially on a continent-wide level, are core tasks for governments.

Crucially, this vehicle cost increase needs to be seen in comparison with the level of public support already granted to cars, notably the corporate channel accounting for the majority of new car sales across Europe. In 2025, a C-segment electric company car in the EU received on average around €8,400 in subsidies over a four-year ownership period. This mainly comes from VAT deductions and depreciation write-offs that reduce corporate tax bills — benefits that private buyers do not have — and, in some countries, additional purchase grants. In countries with more generous tax treatment, such as Germany, the total support can reach around €14,000 per vehicle.

The battery cost gap with Asian battery cells can be further reduced with investment support such as battery production aid, access to lower-cost supplies of critical minerals and battery components, as well as potential trade defence measures on batteries such as tariffs.

While these additional tools are unlikely to be sufficient to bridge the cost gap with China by 2030, the reduction in the cost disadvantage could reach a threshold that no longer poses a major threat to European carmakers' competitiveness. This residual cost gap should be considered as a sovereignty premium, acting as an insurance policy shielding Europe from geopolitical volatility and supply chain disruptions.

3. Conclusions & policy recommendations

In the absence of cleantech production support or trade defense, using local content criteria in the IAA as a lever for public support is the only option on the table today for building up a resilient and local battery industry across Europe. Resilience and strategic autonomy often seem costly but in hindsight. But even if some higher costs are expected to be incurred in the short term, as battery production capacity increases to reach economies of scale, the costs are expected to come down by 29-31% by 2030.

But this will only happen if the IAA is designed effectively. This means:

1. While not a restriction to market access, clear Union content criteria should be set as conditions to receive public funding (e.g., EV subsidies). This will guarantee a more strategic and impactful use of scarce public resources. This would also mirror practices already used by countries like the US, India and Indonesia.
2. A good balance would be a gradual approach, based on broad friendshoring upstream and stricter EU-EEA focus downstream. Trusted partners should be agreed on a case by case basis, not in primary legislation - giving an additional leverage to the EU.
3. Not everything is strategic or at risk of weaponization, so the Union Content requirements on the overall vehicle (incl. things like tyres or wheels) are not needed.
4. The battery component-based approach should include cathode precursor and recycled materials, which are critical to building the local battery industrial value chain.
5. One set of battery content criteria should be applied (not four), and all new and existing public support schemes for vehicles should be covered. Public support schemes should explicitly include EV tax rebates for EV owners, as well as for employers and employees in corporate car schemes.
6. Keeping the current 2030-2035 vehicle CO_2 standards in place is critical for the overall investment certainty into giga-scale manufacturing of battery cells in the EU.

Union content requirements are a key signal for private investors and banks when assessing the investability of cleantech manufacturing in Europe, especially in sectors competing directly with Chinese firms. Without credible Made-in-EU criteria, the business case for clean manufacturing capacity in the EU will continue to be doubted and more companies will delay or cancel their investment.

Further information

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Annex – methodology

Components manufacturing location, technical information and production volumes are taken from GlobalData's 2025 dataset, with cost data from BloombergNEF's BattMan 3.2.0 model for batteries (Bottom-Up Battery Cost Model), and ICCT and UBS reports for other components.

The BattMan model provides chemistry and country-specific cost data for cell production. European countries and China use manufacturing efficiency and workforce assumptions from the IEA, which reflects best-in-class European and Chinese manufacturers. However, for the European 2025 baseline, we adjust the manufacturing scrap rate to 20% (instead of the 15% used by the IEA) to better align with available data for the current European ramp-up phase. European average cost is a capacity-weighted average of the five top producing countries based on T&E research. The cost reduction potential for Europe by 2030 is based on the assumption that European manufacturers will reach China's current levels of efficiency and automation by that time. This notably implies that European cell producers reach sufficient effective production volumes, although this level was not quantified in our analysis, and that the additional progress of Chinese players will remain limited.

For batteries whose cells are currently produced in Europe, we estimate only 68% of the value is effectively generated locally**.** While this figure accounts for 100% local labor and manufacturing, it reflects that only 31% of cathodes are sourced within Europe, and less than 5% for other cell materials, while the remainder is generated mainly in China.

Regarding other components, in the absence of country-specific cost data, European and Chinese costs are determined by applying the Europe-to-China cost ratio observed in cell production to the available baseline data. For e-motors, which are reported as being produced in Europe in Globaldata's database, we assume only 75% of their value was actually generated domestically, based on data on overall BEV value.

Under the 100% Made-in-Europe scenario, every component is assumed to be produced domestically at the corresponding costs. Since batteries whose cells are currently produced locally hold a large value share outside of Europe, localising is modeled under two scenarios: one with localising only cell production, and another also localising a fraction of other upstream steps (e.g. to reach 60% of cathode active materials production within Europe). Due to lack of cost data on these other upstream steps, we use cell production cost ratios to model cost increases.

The total costs for carmakers in different world regions are calculated across the different components by multiplying their unitary costs (region-dependent) by the number of components per vehicle and their respective production volumes in Europe.