UK Gigafactory Commission

Britain's Battery Future

'Batteries are no longer just a tech issue or an energy issue – they are a national strategic imperative. The UK cannot afford to remain dependent on foreign supply chains for such a vital component of our economic and energy future.'

Lord Hutton of Furness
Chair of the UK Gigafactory Commission

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Battery assembly, Nissan Sunderland

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Foreword

The United Kingdom is at a critical stage in its pursuit of global leadership in automotive and battery manufacturing. The evidence before this Commission demonstrates that other regions, including Europe, United States and Asia, are moving to attract investment with considerable purpose and speed. Unless firm and coordinated action is taken, the UK risks falling behind its international competitors.

Set against these challenges, however, lies a significant opportunity: to establish a new, green manufacturing industry, to create thousands of skilled jobs and to secure the long-term future of the UK's world-class automotive sector.

The UK Gigafactory Commission was established with the purpose of assessing the UK's current position and setting out, as clearly as possible, the steps required to secure further UK gigafactory investment and strengthen the UK's battery supply chain. The Commission's remit has been to determine key priorities for further policy action with a view to ensuring that the UK is competitive, resilient and prepared to seize the economic growth opportunities.

The Commission brings together expertise from across industry, policy, academia and public service. The recommendations contained herein are intended for His Majesty's Government, for industry leaders, for investors and for all those concerned with the future direction of this vital sector. The findings of the Commission are based on analysis of industry data, consultation with stakeholders and a thorough review of international trends. At all times, the Commission has sought to ensure that its conclusions are supported by evidence and presented with due impartiality and rigour.

Substantial progress has been made through the UK Battery Strategy and a series of investments in gigafactory infrastructure. The UK's Modern Industrial Strategy and Advanced Manufacturing Sector plan demonstrate the UK's commitment to attracting investment for economic growth by supporting eight high-growth sectors, including batteries and electric vehicles (EVs) as frontier technologies. Investments include, DRIVE35, a programme for capital and R&D funding for the automotive industry as well as the Battery Innovation Programme, set up to convert UK battery science and innovation into industrial and economic advantage, aligned with government's plan for growth and net zero goals.

However, the plain fact is that the UK's current attractiveness to investors is not yet sufficiently competitive. It must move faster. The Commission is persuaded that the best prospect for success lies in attracting a major global (incumbent or new to the UK) automotive original equipment manufacturer (OEM) to manufacture EVs in the UK. This would require proactive and sustained engagement by senior ministers with a select group of global partners. Attracting such a partner is, in the Commission's judgment, the critical next step. If structured effectively, it could bring with it world-class battery manufacturing capabilities and unlock wider supply chain investment.

Battery cells on a production line

Proactive, decisive and central leadership anchored at the heart of government will be vital, shifting the UK from a passive open-for-business stance to an active deal-making approach.

Persistent supply chain gaps, particularly in cathode active materials (CAM) and anode active materials (AAM), must also be addressed. The presence of a domestic CAM producer is, in the Commission's view, essential to building a secure, fully integrated and investable supply chain.

Proactive, decisive and central leadership anchored at the heart of government will be vital, shifting the UK from a passive open-for-business stance to an active deal-making approach, securing the UK's future as an EV powerhouse. A Cabinet-level minister should be identified and given personal accountability to the PM and Chancellor for delivering simultaneous investment in a new EV manufacturing centre, a new battery gigafactory, and a new UK active materials supply chain. The identified minister should be expected to spend a significant proportion of time proactively securing the required investments, supported by a small team or secretariat (including at least one secondee from the Office for Investment). The minister should chair a newly established Cabinet sub-committee with authority to convene departments, remove barriers to the potential investments and resolve inter-departmental conflicts.

The Commission also recognises that energy costs remain a significant barrier to competitiveness in battery manufacturing. While recent government action is welcomed, current support schemes do not yet go far enough to close the competitiveness gap. Likewise, the zero emission vehicle (ZEV) mandate should, in the Commission's view, be recalibrated to align with EU levels, which would also ensure it better reflects UK market adoption. Shifting the mandate from a system of penalties towards positive incentives would also reduce the risk of UK automotive manufacturing drifting offshore. Site readiness encompassing land, grid, transport and planning must also be assured if these aims are to be met.

It must be emphasised that none of these measures can succeed in isolation. Industry and government must work in concert and with the requisite urgency and determination if these shared objectives are to be realised.

The Commission wishes to record its gratitude to the Faraday Institution for serving as secretariat, providing support and coordination throughout this process. We are also indebted to the many stakeholders, officials and experts whose contributions have informed our work.

It is therefore our hope that this report, the product of collective industry and policy expertise, will inform decisive and effective action for the future of battery manufacturing in the UK.

Rt Hon Lord John Hutton
(Chair of the Commission)

Rt Hon Lord John Hutton (Chair)
Rt Hon Greg Clark
Dr Isobel Sheldon OBE
Rt Hon Baroness Lindsay Northover
Rt Hon Sir Oliver Letwin
Dr Ian Constance

With secretariat support from the Faraday Institution.

Battery module assembly at WMG, University of Warwick

1 Executive summary

Achieving the energy transition and securing the UK's automotive industry demands urgent and coordinated action to expand domestic battery manufacturing.

The automotive sector employs over 800,000 people and contributes £22 billion in value added output, but it is under strain. UK production has fallen by more than a third over the past decade as investment has shifted to competitor countries offering cheaper energy, faster permitting and larger incentives. New EU Rules of Origin (RoO) and recycled content requirements will also soon expose UK exporters to costly tariffs unless a domestic supply chain is established.

UK battery demand could exceed 100 GWh as soon as the early 2030s but only one major plant is operating currently, with another scheduled to open in 2027. The majority of battery demand will come from EVs in the automotive industry, but batteries also have wider applications in grid storage, aviation, rail, marine, heavy goods vehicles and the defence sector.

Without accelerated investment, the UK faces a supply gap that would leave automotive OEMs dependent on imports, exposed to higher costs and at risk of lost competitiveness. Other major economies including the US, EU and China are investing heavily at scale, creating an environment where the UK risks being left behind. Unless a coordinated national strategy is put in place to accelerate gigafactory investment and supply chain development, the UK could see a sharp erosion of its automotive base and a loss of competitiveness in global markets.

The Commission has examined the UK's position in detail, and its findings demonstrate both the risks of inaction as well as the opportunities for decisive intervention. Given the scale of the automotive industry, the stakes for the UK economy are considerable. Gigafactories should be recognised not merely as discrete industrial projects but as elements of strategic national infrastructure. Government intervention in their development represents an essential investment in national resilience, energy security, protection of exports and the establishment of a competitive position in the global battery market.

Other countries are moving more quickly, with substantial incentives, lower energy prices and streamlined planning regimes already securing investments. By comparison, the UK's approach remains fragmented with higher costs and limited policy certainty reducing its attractiveness to inward investors.

A comprehensive and coordinated approach is therefore required, delivered through a whole-of-government approach across departments, regions and local authorities. Attracting investment must be supported by a clear offer to investors that combines financial incentives with readily developable sites, competitive and predictable energy prices and a skilled labour force. Coordination of policy across trade, energy, planning and skills is essential if the UK is to deliver quickly, keep pace with international competitors and ensure long-term energy resilience. Delivering this strategy will require a more interventionist mindset than the UK has traditionally adopted, moving beyond a passive stance to active deal-making and brokering investments.

The overall strategy comprises three principal strategic objectives:

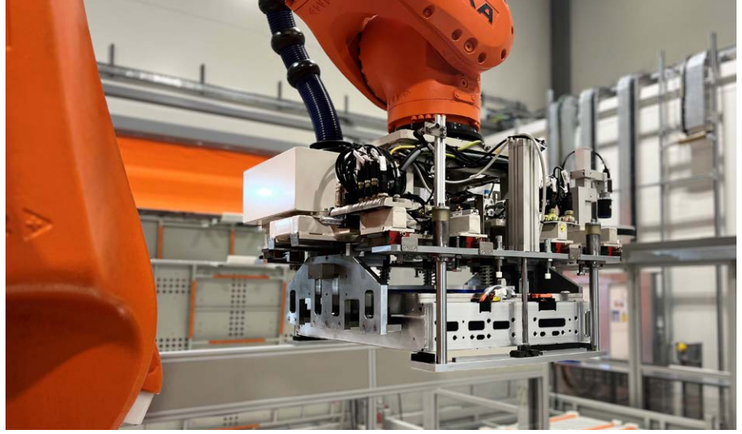
- Attracting a major global (incumbent or new to the UK) automotive OEM to manufacture EVs in the UK and drive battery investment;
- Accelerating development of the next UK gigafactory to close the demand-supply gap; and
- Building domestic capability in the manufacture of cathode (and anode) active materials.

The strategy also seeks to protect existing UK automotive capacity by extending competitiveness incentives to incumbent OEMs and existing battery plants.

The strategic objectives are underpinned by action in the following critical areas:

- Strengthen central delivery and accountability to secure UK inward investment.
- Improve competitiveness through lower energy costs, sites and skills.
- Reform the Zero Emission Vehicle mandate and RoO policies to support investment and protect exports.
- Drive innovation and research to secure competitiveness in next-generation technology.

Strengthening central delivery is particularly important, as it ensures that action across these critical areas is coordinated and aligned with the three strategic objectives. Failure to act would accelerate the erosion of the UK automotive base and weaken the country's position in global export markets. In contrast, decisive action would signal to global investors that the UK is serious about securing the next wave of electrification, positioning it not only as a manufacturer but as a long-term innovation hub for advanced batteries.



Robot arm facilitating battery module assembly, AESC Sunderland, December 2025

Solar panels on the roof of a gigafactory

1.1 Attract a global automotive OEM to encourage UK gigafactory investment

The most effective route to securing additional UK gigafactory capacity is not through standalone battery projects but by securing investment from a major global automotive OEM with near-term EV production plans. This could be achieved by attracting a global automotive OEM without an existing UK footprint, or by providing the necessary support for an automotive OEM with an existing UK plant to commit to future EV production in the UK. A committed OEM would provide the essential demand signal for new gigafactories, lowering the risk for investors, strengthening credibility and accelerating supply-chain development. Whilst global battery manufacturing markets face overcapacity, particularly in China, there is still an opportunity for the UK to compete and secure a battery manufacturer to supply UK EV production and potentially export to the European market.

Securing such an investment must be driven from the centre with a Cabinet minister given clear responsibility. The minister should be expected to spend a significant proportion of time proactively securing the required investments and supported by a small core team, including at least one secondee from the Office for Investment, to coordinate across government and remove obstacles. Ministerial engagement should focus on a shortlist of high-potential global EV producers, particularly Asian manufacturers expanding into Europe. The UK should be positioned as a strategic bridgehead into the European market, offering tariff advantages, skilled labour and rapid site mobilisation. Sustained ministerial engagement with targeted OEMs is required to shift discussions from exploration to negotiation.

Financial support should be agreed case-by-case and negotiated privately, led at a senior level with a clear and competitive UK offer worked out in advance, so that negotiations can proceed quickly and give investors the confidence to proceed. The UK already has the key funding tools available such as grants, low-cost finance and selective equity, but the difference will lie in deployment through senior-led deal-by-deal negotiations. This represents a move from a passive investment posture towards a more assertive deal-making strategy that actively competes for global projects. Any incentives to non-UK firms, and particularly Chinese and Asian firms, must be tied to measurable outcomes in vehicle assembly, battery production, local supply-chain expenditure and skills development to protect taxpayers.

Existing automotive sites and brownfield locations offer an opportunity to accelerate development timelines. Pre-permitted zones with secured access to utilities, business rates relief and Local Development Orders would create investable propositions while reducing delivery risk. Integration of UK R&D and skills provision via the UK Battery Industrialisation Centre (UKBIC), the Advanced Propulsion Centre and apprenticeship programmes should form part of the offer.

1.2 Accelerate investment in the next UK gigafactory

Closing the 2030 supply gap will require the announcement of at least one additional large-scale plant as a new investment by the end of 2026. Commercial viability of such an investment will depend on a secure offtake agreement from an automotive OEM, competitive energy prices, grid connections and shovel-ready sites. Attracting such a gigafactory will be easier if government pursues a tripartite approach that aims to bring together an automotive OEM as the demand anchor, a cell manufacturer as the plant operator and a CAM producer to strengthen the UK supply chain.

Gigafactory funding should be bespoke and settled on a case-by-case basis. The UK should have a clear 'benchmarked offer' worked out in advance to be able to move quickly and give investors the confidence that the UK is a serious player in this market. Public funding should focus on de-risking early stages and providing confidence to investors, with support from the UK Infrastructure Bank, National Wealth Fund or Automotive Transformation Fund (ATF).

While no single battery chemistry should be prioritised, substantial UK opportunities exist in lithium iron phosphate (LFP) given this is a fast-growing segment for mass-market and lower-cost EVs and that the UK currently lacks substantial manufacturing capability in this field. However, there is also scope for further lithium nickel manganese cobalt oxide (NMC)-based gigafactories building on the UK's existing supply chain strengths. Electrification will also create opportunities for UK-made batteries outside the automotive sector, with significant growth expected in off-highway vehicles, aerospace, defence and grid-scale stationary storage.

Energy costs will be a particularly critical determinant of commercial viability for any gigafactory investment. Competitive energy costs are essential to bring the UK into line, or better, with European competitors, while long-term relief schemes are also needed to provide predictability and give investors confidence over lifetime operating costs.

Reducing delivery risk also requires sites and infrastructure to be prepared in advance. Pre-permitted land with secured grid, water, waste and transport connections should form the core of the UK's offer.

Energy costs will be a particularly critical determinant of commercial viability for any gigafactory investment.

1.3 Build a domestic supply chain for cathode and anode materials

Domestic CAM, AAM and precursor production will be essential to close critical supply chain gaps, reduce import dependence and ensure UK-produced cells comply with post-2027 RoO thresholds. This is important because China already controls most of the battery supply chain, from processing critical minerals through to the production of both active cathode and anode materials. Clarification of product-specific RoO requirements relating to CAM supply is also needed to enable UK-based OEMs to assess how post-2027 thresholds can be met.

Securing a committed CAM and AAM investor to establish a large-scale UK facility represents both an export opportunity into the EU and a supply chain necessity to improve the competitiveness and security of UK battery manufacturing. Commercial viability of CAM and AAM manufacturing will, like gigafactories, depend on offtake agreements, competitive energy costs, reliable grid connections and shovel-ready sites. Securing such investment would also be more likely if it is pursued as part of a tripartite approach that aims to bring together an OEM as the demand anchor, a cell manufacturer as the plant operator and both CAM and AAM producers.

CAM plants typically serve multiple gigafactories, meaning securing multi-buyer offtake agreements for CAM would be crucial to support investment. This should be pursued in parallel with the efforts to secure OEM and cell plant inward investment, including possible cross-border arrangements with EU gigafactories for CAM supply, which would position the UK as a strategic hub for advanced battery materials in the wider European market. A chemistry-neutral stance is required with financial support guided by market demand and investor appetite rather than favouring the manufacture of cathode materials for either LFP or NMC batteries. While direct job creation is limited, CAM has high strategic value as a supply chain anchor and should be supported on that basis. CAM supply should also be developed alongside AAM supply recognising their combined role in RoO compliance and long-term competitiveness.

Expansion of precursor refining capacity in lithium, nickel and cobalt should be aligned with the UK Critical Minerals Strategy. Projects with credible feedstock, strong ESG (environmental, social and governance) traceability and compliance with UK/EU standards should receive priority support. Recycling-led supply chains for CAM also have the potential to be strengthened through investment in black-mass processing, hydrometallurgical recovery and closed-loop recycling into UK plants to help reach RoO compliance in the future.

As the number of EV batteries coming to the end of their first life increases sharply from the mid-2030s, recycling will become a key source of critical materials. Developing domestic recycling capacity is therefore essential to reduce reliance on imports and strengthen resilience against supply shocks. Investment in advanced recovery technologies, second-life applications and design-for-recycling standards is strategically vital to ensure recycled materials can meet demand for future battery production. Targeted support for facilities and SMEs can help scale these capabilities, lower lifecycle emissions and embed circularity within the UK battery industry.

Expansion of precursor refining capacity in lithium, nickel and cobalt should be aligned with the UK Critical Minerals Strategy.

1.4 Reduce competitiveness barriers through lower energy costs, sites and skills

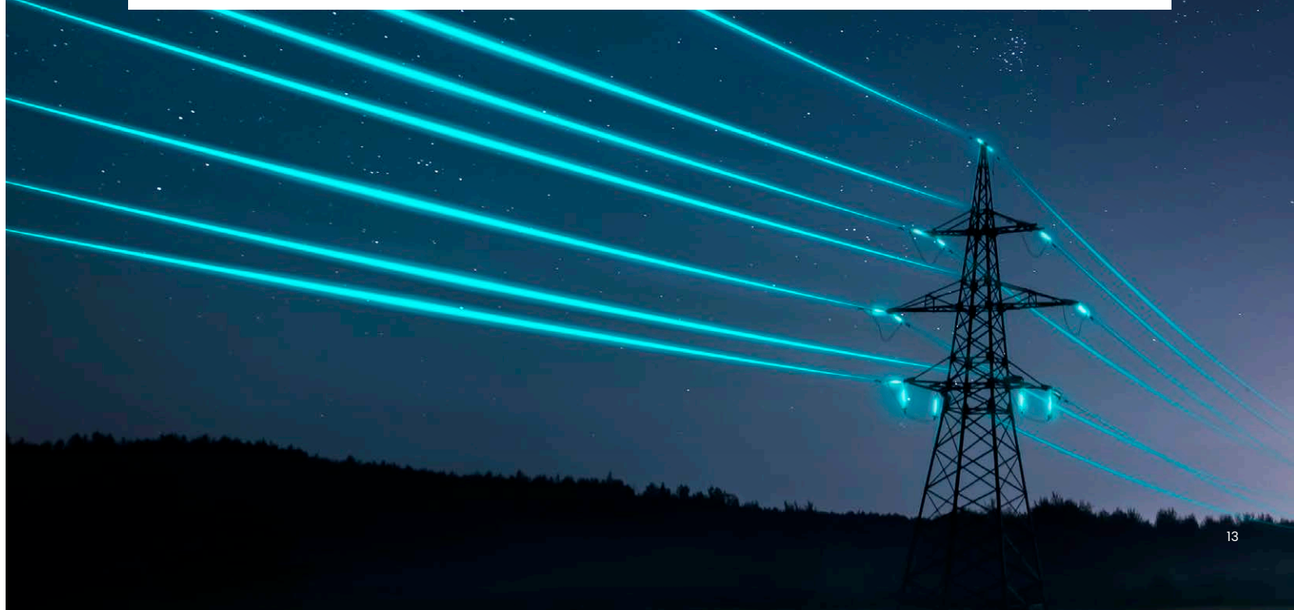
High industrial energy costs, limited site readiness and skills shortages continue to undermine the UK investment case.

Energy costs

High industrial energy costs remain a major constraint on the competitiveness of UK manufacturing and a significant barrier to securing investment in EV, battery and CAM production. UK energy costs are consistently higher than in competitor economies (around double the EU average in 2024). For energy-intensive processes such as battery manufacture, this differential materially affects operating margins and reduces the UK's attractiveness at the initial investment screening stage.

Recent measures, such as the British Industry Supercharger and efforts outlined in the UK's Modern Industrial Strategy, represent progress in narrowing relative costs. However, current relief is partial and appears to be short-term in nature. To strengthen the credibility of the UK's offer, the level of relief for Energy Intensive Industries (EIIs) should be increased and formalised as a predictable feature of investment support giving investors greater confidence that costs will remain competitive over time. This would help bring UK industrial energy costs into closer alignment with relevant EU peers.

Energy cost relief should ultimately be linked to a programme of market reform that addresses structural disadvantages across the whole UK energy market. This dual approach of immediate relief to reduce energy costs combined with long-term market reform would demonstrate to investors that the UK is committed to addressing one of the most significant barriers to competitiveness. Efforts should be made to clearly communicate to prospective investors how current measures apply across different customer segments and contract types and summarise existing support mechanisms and exemptions to ensure a consistent and complete understanding for investors.



Sites

The availability of fully serviced and pre-permitted shovel-ready sites is a decisive factor in securing automotive, gigafactory and CAM projects. International competitors such as Hungary, Turkey and the US provide investors with land packages that include utilities, transport links and environmental permits, enabling faster investment decisions and project initiation. By contrast, UK projects have been slowed by lengthy grid queues, land divided among multiple owners that makes site assembly more complex and uncertainty over water and waste provision.

The Strategic Sites Accelerator will be crucial to bringing priority plots to market more quickly, with early funding for land remediation, substation build-out, grid and water corridors and permit pre-clearance. To shorten due diligence and provide credible connection dates, government and local authorities should publish a transparent pipeline of shovel-ready, investible sites using standardised contracts, timetables and milestones. Each priority site should also be supported by supplier-readiness and workforce plans, ensuring that operational ecosystems are in place from day one.

Skills

A shortage of skilled labour is a global challenge for battery manufacturing. European countries face similar pressures, but the UK has an opportunity to position itself ahead of competitors by moving faster to expand training and skills development. Battery and CAM production require specialist expertise in electrode coating, formation, automation and safety systems, alongside large numbers of operators, technicians and maintenance staff. Meeting this demand will require phased recruitment of hundreds to thousands of workers in line with gigafactory development that cannot be met through existing workforce pipelines alone.

A high-profile national campaign modelled on the 'Destination Nuclear' initiative should be launched to attract workers into the sector and raise awareness of long-term career prospects. This should be complemented by a coordinated set of training and education measures, including:

- Apprenticeship standards for battery manufacturing and modular training programmes to enable rapid reskilling from adjacent industries such as aerospace, chemicals and advanced manufacturing;
- Curriculum reform in universities and colleges to embed process engineering, battery safety and digital skills; and
- Vendor-led training programmes and structured international knowledge transfer agreements to bring proven skills into the UK market.

Early engagement with local training providers, selective use of skilled migration for specialist roles and clear career progression will also be essential to ensure the workforce is in place at the right scale and time.

AESC gigafactory, Sunderland, 2022

1.5 Policy and regulatory reform

Ensuring a stable and competitive policy framework is essential to secure long-term investment.

ZEV mandate

The current Zero Emission Vehicle (ZEV) mandate sets legally binding targets for the phase-out of internal combustion engine vehicles. By 2030, 80% of new cars and 70% of vans sold in Great Britain must be zero emission, rising to 100% by 2035. While this ambition is welcomed, UK-based OEMs have been clear in stakeholder interviews that the current approach is discouraging investment and that reform is required if they are to commit new model production to the UK. The present structure risks running ahead of underlying consumer demand and introduces compliance penalties that not only make operations loss-making but increase the risk that new models are not allocated to UK plants.

To support investment in the UK, the ZEV mandate should be recalibrated to reflect the pace of market adoption and align with the European Union trajectory, while retaining a clear commitment to the 2035 phase-out. The mandate should seek to balance efforts to drive ZEV demand while avoiding the penalties and disincentives for growth facing automotive OEMs in the UK and those considering further investment in the UK. Resetting the 2030 requirement towards 50% to 60% of new car sales would lower compliance costs and strengthen the case for new model allocation to UK plants, resulting in a reduced risk that existing levels of UK production moves offshore. Allowing sales of hybrids until 2035, alongside targeted demand measures such as fleet incentives and VAT parity between home and public charging, would ease affordability pressures and maintain consumer confidence.

Stellantis Citroën e-Berlingo van made at Ellesmere Port

Rules of Origin

RoO requirements under the UK-EU Trade and Cooperation Agreement (TCA) present a material barrier from 2027, when tighter thresholds on domestic content take effect. Battery cells will need to incorporate originating CAM or ensure that non-originating content is below 35% of cell value to comply with regulations for tariff-free trading. Without UK or EU CAM production, UK-assembled vehicles risk facing a 10% tariff on exports to the EU, undermining competitiveness and discouraging investment.

To safeguard tariff-free access and sustain investment, the UK should advocate for a deferral or phased transition of the 2027 RoO deadlines. This would recognise the limited near-term availability of cathode and anode material capacity in either the UK or Europe and provide flexibility for recycling inputs and precursor refining to develop and count towards compliance.

Planned EU recycled content requirements enforced through the Battery Passport system risk creating compliance challenges for UK exporters given the limited availability of recycled materials across the EU and the UK. Without a much faster scale-up of the UK recycling industry, manufacturers may need to rely on imported black mass inputs from outside the EU and the UK to meet the mandated thresholds.

In parallel, any recycled content obligations applied to UK production for the UK market should be phased to encourage progress without deterring investment, aligned with the pace at which UK recycling capacity develops. In other words, compliance with EU Battery Regulation standards should be required only for exports to the EU, with proportionate flexibility for the UK and other global markets to avoid unnecessary costs for domestic producers.

International relationships

China plays a central role in global EV and battery supply chains, with Chinese and other Asian OEMs and cell makers dominating cost-competitive production and expanding into Europe. With EU tariffs likely to constrain some Asian manufacturers, the UK can position itself as a strategic base for their European expansion. The UK should take a pragmatic and open stance on Chinese investment, in line with the approach taken by other European nations, while relying on the National Security and Investment (NSI) Act to provide case-by-case safeguards. The UK also benefits from a lower tariff than the EU when exporting to the US. With the US restricting imports of Chinese-made cells, the UK could therefore provide a compliant route for Asian manufacturers to serve US demand.

The priority is to balance access to scale and innovation against the risks of over-dependence, recognising that the more material risks relate to industrial capacity and machine tools rather than battery chemistry or software. The Commission advocates a policy of 'Conditional Collaboration' with China; a pragmatic business relationship supported by safeguards around traceability, reporting and the mandated use of the UK supply chain. Improvements to the clarity and timeliness of NSI processes would further support any joint working without weakening security.

1.6 Innovation and research

Long-term competitiveness depends on sustained investment in innovation and the ability to demonstrate new technologies at scale. The UK must continue to establish itself as a credible location for next-generation chemistries and advanced manufacturing processes, both to attract global investors and to sustain competitiveness beyond the current lithium-ion technology.

Activities should continue to focus on moving promising technologies such as sodium-ion, solid-state and lithium-sulfur from the laboratory into production, alongside innovations in advanced anodes, cathodes and manufacturing processes such as dry coating, to help the UK leapfrog competitors. Public funding for innovation is already supporting practical challenges such as reducing costs, improving consistency and developing processes that can be scaled. This approach depends on close links between research bodies, demonstration facilities and industrial partners. Programmes run by the Faraday Institution already place emphasis on commercialisation and together with the wider Battery Innovation Programme are linked to UKBIC pilot lines and scale-up facilities. Such an approach allows research discoveries to be tested and proven under manufacturing conditions, with future funding likely to require a stronger focus on scale-up activity to enable technologies to move closer to market.

Innovation must be coupled with skills. Expanding the UK's pool of students, researchers, technicians and engineers with expertise in electrochemistry, materials science and advanced manufacturing processes is essential. Apprenticeships, training programmes and specialist courses are being developed alongside R&D initiatives and facilities. International collaboration and knowledge transfer agreements can further embed global expertise and help UK researchers and SMEs remain at the forefront of battery innovation.

1.7 Strengthen central delivery and accountability

Fragmented responsibilities, slow decisions and risk aversion continue to weaken the UK's position in attracting battery gigafactory and EV manufacturing investment. Government should anchor leadership at the centre by giving a Cabinet minister personal accountability for delivering the required investments.

Rather than waiting for inbound approaches, the minister's role should be to prospect actively for a qualifying EV manufacturer, a battery manufacturer and an active materials manufacturer willing to invest simultaneously in the UK. A clear benchmarked opening offer should be developed with flexibility to negotiate on a deal-by-deal basis. All offers should carry conditions on UK production, milestones, transparency and clawback to safeguard taxpayer value.

The minister should chair a newly established Cabinet sub-committee with authority to convene departments, resolve inter-departmental conflicts, and remove barriers to the potential investments (e.g., in relation to the national grid, and planning issues). The minister will need to be supported by a small secretariat and at least one member of the minister's secretariat should be a secondee from the Office for Investment with an explicit remit to liaise between the new secretariat and that Office.

Continuity could also be strengthened by embedding at least one industry secondee in the minister's secretariat and by appointing a small advisory panel to maintain momentum across political cycles. Transparency should be reinforced through a published delivery plan setting out milestones and a broad pitch to potential investors.

Electrode coating at UKBIC

1.8 A new interventionist mindset is needed

The delivery timetable is critical. Key decisions on site preparation and energy cost relief together with advanced negotiations on the attraction of OEM investment must be made within the next 12-18 months to secure projects in the 2027-2028 window. Global firms are already committing capital in Europe and North America and any delay risks manufacturing plants being built elsewhere. The strategy must therefore be implemented with urgency and clear accountability across government to sustain momentum.

Delivering this strategy requires an interventionist approach where government is in a far more directive and hands-on role than in the past. Global competitors are providing financial support, energy cost incentives and large-scale industrial strategies. The UK must respond with equal determination by brokering strategic investments and offering a competitive incentives package. Failure to act risks the erosion of the UK's automotive base. Decisive intervention would secure the gigafactories and supply chains essential for the UK automotive industry, net zero, energy security and long-term industrial competitiveness.

Box 1.1: Summary of recommendations

The Commission sets out ten priority recommendations that together build on existing policy interventions and form a coordinated strategy to secure UK gigafactory investment, strengthen supply chains and protect automotive competitiveness. Recommendations 1, 2 and 3 set out the overarching actions and key objectives, while the subsequent recommendations outline supporting measures that help to achieve them.

To secure long-term automotive competitiveness and energy security, the UK must adopt an interventionist mindset, acting decisively with financial incentives and proactive engagement. A tripartite strategy focused on OEM, battery plants and active material investment is central to achieving this.

Recommendation 1
Attract an OEM

Prioritise attracting a major global OEM with near-term EV expansion plans as the anchor for new UK gigafactories, recognising that standalone battery projects are unlikely to succeed without an OEM demand base. This should be achieved through senior ministerial engagement, tailored incentives and fast-track sites.

Recommendation 2
Accelerate gigafactory delivery

Develop a benchmarked opening offer package of incentives to enable rapid senior-led negotiation with global battery manufacturers covering energy costs, sites, grants and financial incentives. Prioritise attraction of established battery manufacturers alongside the encouragement of investment by an OEM.

Recommendation 3
Build domestic CAM/AAM

Launch a programme for attracting investment in cathode and anode materials manufacturing plants, supported by energy cost relief and precursor refining aligned with the UK Critical Minerals Strategy. Provide targeted support to develop domestic recycling capacity such as black-mass processing and advanced recovery technologies.

Recommendation 4
Establish central drive for inward investment

Give a named Cabinet minister personal accountability for delivering simultaneous investment in a new gigafactory, EV manufacturing plant and UK active materials supply chain. The Minister should be supported by a small team or secretariat and chair a newly established Cabinet sub-committee.

Recommendation 5
Reduce energy costs

Increase the level of EIIs relief and broaden support to include vehicle assembly and the wider supply chain, with the aim of bringing UK industrial energy costs into closer alignment with relevant EU peers.

Recommendation 6
Reform ZEV mandate

Recalibrate the ZEV mandate to balance a drive for ZEV uptake while avoiding penalties and disincentives for growth for those producing and considering further investment in the UK. In addition, the targets should have a closer alignment with market demand and the EU trajectory by resetting the 2030 target to 50-60% of new car sales while retaining the 2035 target for all new cars and vans to be fully zero emission.

Recommendation 7
Address Rules of Origin

Recognising limited CAM/AAM capacity across the UK and EU, negotiate a deferral or phased transition of the 2027 deadline.

Recommendation 8
Support innovation scale-up

Fast-track the scale-up of next-generation chemistries (e.g., solid-state and lithium-sulfur), while continuing to direct innovation funding towards manufacturability and cost reduction.

Recommendation 9
Expand strategic sites

Expand the Strategic Sites Accelerator to deliver shovel-ready sites with grid, water and transport already secured and supported by early remediation and permit pre-clearance.

Recommendation 10
Develop skilled workforce

Launch a high-profile national campaign modelled on Destination Nuclear, complemented by sector-specific apprenticeships, curriculum reform in universities and colleges and vendor-led training to build the specialist workforce needed.

Part II

The UK's Gigafactory Imperative

2 Introduction

2.1 The Commission

The Commission on securing gigafactories in the UK was established in June 2025 to provide independent advice on how the UK can accelerate large-scale battery manufacturing and attract gigafactory investment. It brings together senior cross-party political figures and industry experts with deep experience in government, manufacturing, finance, energy and policy. The Faraday Institution serves as secretariat, supporting the Commission's analysis and engagement.

The Commission was chaired by the Rt Hon Lord John Hutton, former Secretary of State for Defence. He was joined by five other Commissioners whose collective expertise spans Cabinet-level government, industrial strategy, advanced manufacturing and the automotive sectors. This group brings both political insight and frontline sector knowledge, ensuring the Commission's work was grounded in practical experience as well as strategic and expert industry analysis.
The Commissioners are listed in Appendix A.

2.2 Terms of reference

The remit of the Commission was to assess the UK's competitiveness in attracting and retaining gigafactory investment and to recommend targeted policy interventions to ensure domestic capacity meets the UK's growing demand for batteries by 2030 and beyond. Specifically, it was tasked to:

- Identify barriers and challenges to investment in the UK;
- Compare UK incentives and policies with those of global competitors; and
- Recommend actions for government and industry to strengthen the UK's attractiveness and resilience.

The Commission has focused on attracting investment for battery manufacturing to supply the UK automotive industry due to the scale of the opportunity. However, the Commission has also recognised that electrification will take place across a range of market sectors and thus the opportunity for UK-made batteries to be deployed further than the automotive sector. Example sectors include grid stationary storage, off-highway vehicles, aerospace and defence.

The scope of work has included analysis of financial incentives, supply chain readiness, skills, infrastructure, energy costs and the wider policy environment. The scope of work did not include discussions with stakeholders outside the automotive and battery industries.

Agratas gigafactory, Bridgwater, Somerset, November 2025

The Commission's work has run in parallel with the development and early implementation of the UK's Modern Industrial Strategy.

2.3 Approach

The Commission has operated as a high-level strategic body over a six-month period, meeting every month to examine evidence, deliberate on key themes and agree recommendations. Its approach combined:

- Desk-based research and analysis, reviewing international benchmarks, investment trends and competitiveness factors.
- Stakeholder engagement, including meetings with industry, OEMs, investors and policy specialists to gather diverse perspectives.
- Cross-party deliberation, drawing on the political and industrial experience of Commissioners to ensure recommendations are both ambitious and deliverable within the timeframes needed to influence the industrial strategy.

The Commission's work has run in parallel with the development and early implementation of the UK's Modern Industrial Strategy (published in June 2025). While the Industrial Strategy sets the overall direction for advanced manufacturing and clean energy, detailed implementation is still underway. The Commission's findings are intended to inform the next phase through evidence-based recommendations that can be integrated into delivery of the strategy and related initiatives.

2.4 Structure of the report

The report is organised in three parts, moving from high-level conclusions to detailed evidence and then to strategy for delivery.

Part I

Part I is a standalone section, comprising the Foreword and Executive Summary. It sets out the Commission's conclusions, explains the strategic case for action and presents the ten priority recommendations in a concise form for policymakers and stakeholders.

Part II

Part II provides the analytical foundation, covering three chapters: the strategic case for battery investment, the emerging UK battery industry and global developments. These chapters form the evidence base against which the UK's position has been assessed.

Part III

Part III sets out the strategy for securing investment, explaining how the UK can attract a major original equipment manufacturer, build the domestic supply chain, close competitiveness gaps, reform policy and regulation and ensure effective governance and delivery.

The report concludes with a timeline for implementation and appendices outlining the Commissioners and the industry stakeholders interviewed.

Range Rover's UK-manufactured plug-in hybrid

3 The strategic case for gigafactory investment

This chapter sets out the strategic case for gigafactory investment, focusing on the automotive industry, critical infrastructure and government policy alignment.

Summary:

- Building large-scale battery manufacturing in the UK is essential to securing the future of the automotive sector, strengthen supply chains and maintain competitiveness in the global transition to EVs.
- Gigafactories are critical national infrastructure. Without them, the UK automotive industry faces dependency on imports, industrial decline and the loss of jobs, reduction in exports and investment moving overseas.
- Government strategies link gigafactory growth with net zero, energy security and industrial renewal, but current delivery needs enhancement. Faster action is required to build capacity at scale.

Multilayer pouch cell produced at UKBIC using Altilium's recycled cathode materials.

JLR, 2024, upskilling its workforce for electrification

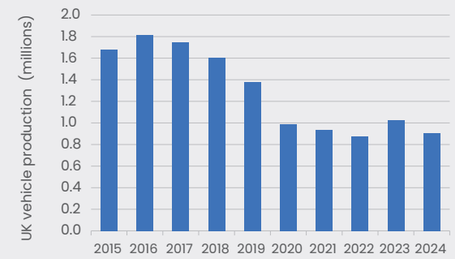
3.1 Supporting the UK automotive industry

The automotive industry employs over 800,000 people across manufacturing, supply chain and other supporting roles. It provides £22 billion in value-added output by supporting wider sectors such as steel, chemicals and advanced engineering.[1] The industry is central to regional development, particularly in the Midlands and North East where automotive clusters support high-skilled jobs and innovation. Accounting for 12% of all UK exports, the automotive industry remains a crucial component of the UK economy.

UK vehicle production declined significantly from a peak of 1.8 million units in 2016 to an average of nearly 1.0 million over the past few years (Figure 3.1). A mix of global headwinds and high energy prices have undermined UK competitiveness. These issues, alongside the transition to EVs, have contributed to falling UK output as global competition intensifies. This erosion not only threatens skilled employment and regional economies but also risks diminishing the UK's industrial base at a critical moment of global transition.

Production dipped in 2024 as some plants temporarily scaled back operations to undertake the conversion of manufacturing lines for EV models, compounded by weakness in key export markets and delays in the EV transition. Volumes are expected to remain well below pre-pandemic levels in the coming years, with the pace of recovery uneven across manufacturers and model types.

Figure 3.1
UK car and commercial vehicle production (2015 to 2024)



Source: SMMT Motor Industry Facts (2015 to 2025) Numerical data for figures.

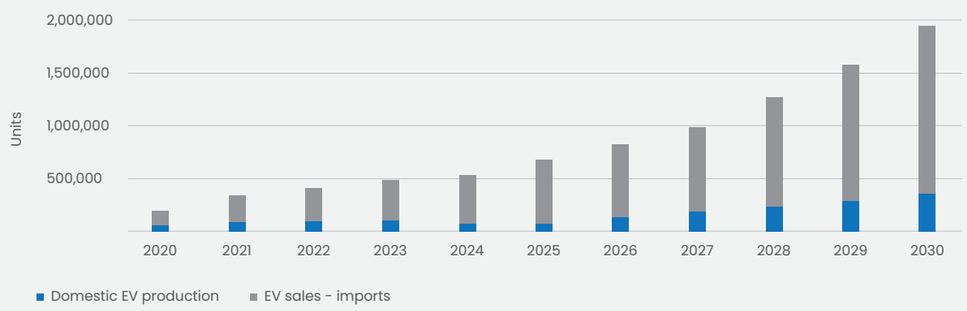
1 SMMT (July 2024). Motor Industry Facts 2024.

As the transition towards electrification is set to continue, growing the UK battery industry is essential to securing the future of the automotive sector. Without domestic battery capacity, UK-made vehicles will face tariffs when exported to the EU (the UK's biggest trading partner for automotive), putting them at a competitive disadvantage. At the same time, the transition to EVs presents an opportunity to grow the UK's automotive industry. Despite a market slow down, the global sale of EVs continues to hit record highs.[2,3]

In the UK, new sales of EVs accounted for a market share of 20% in 2024, ahead of competitor countries such as France (17%), Germany (14%) and the European average (15%).[4] UK EV registrations have recently increased, reaching a market share of 25.4% in October 2025.[5] EV sales are expected to continue to rise towards the end of the decade (Figure 3.2).

Although more than 80% of UK-produced vehicles are exported and the automotive sector will remain export-focused, conditions in the UK market still play an important role in investment decisions. In this context, strong UK demand, currently met largely through imports, represents a major opportunity to expand local EV production, whether through incumbent OEMs or by attracting new manufacturers. This would anchor high-value production in the UK and ensure that production lines, jobs and investment are not lost overseas. Central to this would be an expansion of domestic battery production, securing high-value supply chains and positioning the UK as a competitive hub for advanced manufacturing. Failing to invest in domestic battery production would leave the UK ill-prepared for the shift to EVs, threatening the future prospects of the UK's automotive industry.

Figure 3.2
Projected EV sales in the UK to 2030



Source: Rho Motion (2025).

2 BNEF (June 2025). Global electric vehicle sales set for record breaking year even as market slows sharply.
3 The Guardian (Aug 2025). Record number of EVs registered in Western Europe across last quarter.
4 Car Sales Statistics (Jan 2025). Europe: Electric Car Sales per EU, UK, and EFTA Country.
5 SMMT - Electric Vehicle Data (Accessed November 2025).

3.2 Gigafactories as strategic infrastructure

The establishment of gigafactories in the UK (large-scale battery manufacturing facilities) is vital to securing the future of the UK's automotive industry. Locating gigafactories in close proximity to automotive production will ensure secure and cost competitive supply chains for the UK automotive industry. Gigafactories also present a significant economic opportunity for the UK by reducing the reliance on imports. Importing batteries to supply the UK automotive industry, for example, could increase imports by about £13 billion per year by 2040.[6] This demonstrates the strategic value of developing domestic gigafactory infrastructure.

Current gigafactory development in the UK is limited to two confirmed major projects. These are the construction of the new AESC plant in Sunderland (supplying the nearby Nissan plant and other customers) and the construction of the Agratas facility in Bridgwater (supplying Jaguar Land Rover - JLR - and with the intention to supply new potential future customers). While the facilities already announced mark an important step, they will not be sufficient to support the growth in EV manufacturing required to secure the future of the UK automotive industry. To accommodate expected growth in domestic EV production, additional gigafactories will be required. Without further investment, the UK risks losing future opportunities for high-value manufacturing and skilled employment to overseas competitors.

The UK is already behind the curve on gigafactory development. Globally, more than 400 gigafactories are operational or under construction, totalling around 9,000 GWh of annual capacity.[7] Europe alone is expected to house 38 gigafactories by 2030, producing 1,350 GWh annually, with the UK's share currently only around 4% of European capacity. Closing this gap is essential if the UK is to remain competitive and avoid long-term technological dependency and further decline of the automotive industry. While these represent a major challenge the UK is also the fifth largest vehicle manufacturer in Europe and, following the establishment of the first battery production facility in 2010, has over a decade of experience in EV and battery pack production.

It should be noted that the importance of gigafactories extends beyond the automotive sector. A strong domestic battery industry would support energy security by helping to balance the grid and store renewable energy, while also creating opportunities in other applications such as aerospace and defence. Investment in battery manufacturing is not simply about safeguarding automotive jobs: it is a strategic choice to anchor advanced industries in the UK, drive innovation and strengthen resilience across the wider economy. This imperative aligns closely with UK government frameworks on energy security, net zero and advanced manufacturing. Accelerating gigafactory deployment would therefore constitute a strategic investment in national resilience and competitiveness.

Locating gigafactories in close proximity to automotive production will ensure secure and cost competitive supply chains for the UK automotive industry.

6 Faraday Institution (Sept 2024). UK electric vehicle and battery production potential to 2040.
7 Volta Foundation (2024). Annual Battery Report.

3.3 Strategic alignment with government policy

The UK has an existing framework of national strategies positioning the future of the automotive industry, and by extension gigafactories, as central to the UK's industrial and electrification goals.

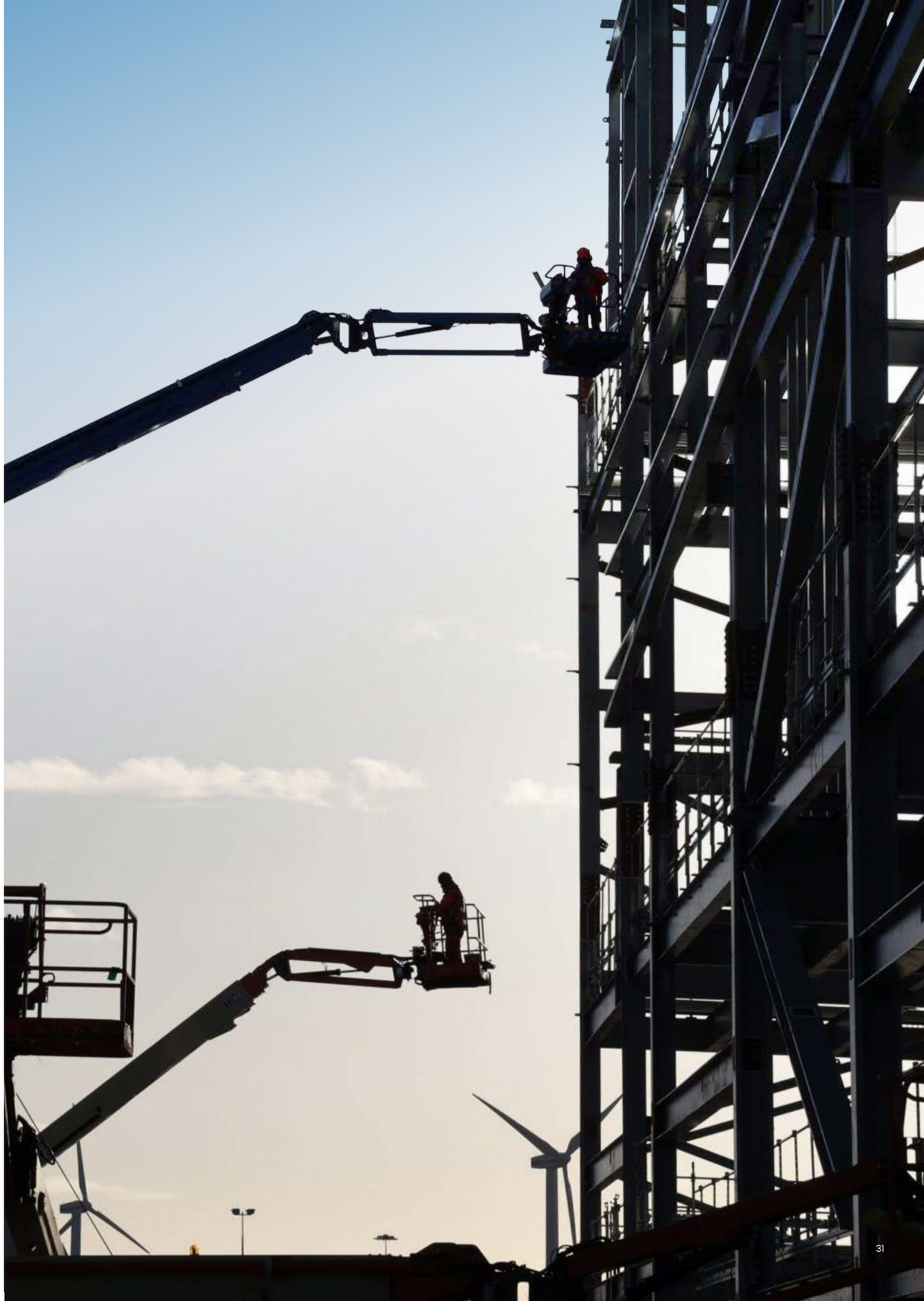
At the heart of this framework sits the **UK Battery Strategy** (2023),[8] which sets out a 'Design-Build-Sustain' framework. This outlines the plan to strengthen innovation, scales manufacturing and embeds sustainability across the battery value chain. It builds on previous initiatives such as the Ten Point Plan for a Green Industrial Revolution and the £1 billion ATF fund to support UK electrification, including at least £500 million for the development of gigafactories in the UK.[9] Additionally, further regional funding, such as the previously announced £42 million pledged through the Local Growth Deal [10] for the battery manufacturing site at the International Advanced Manufacturing Park (IAMP), has helped to catalyse local industrial clusters. The Strategy also helps to deliver broader goals around net zero, economic resilience and regional regeneration, as well as supporting research and development of battery technologies in the UK through initiatives such as the Battery Innovation Programme.

Within the automotive industry, the **Zero Emission Vehicle (ZEV) mandate** places binding targets for manufacturers[11] and requires 80% of new car sales and 70% of new van sales to be zero-emission by 2030, rising to 100% by 2035.[12] Failure to meet these targets will result in OEMs facing fines. The government has now underlined that petrol and diesel car sales will be ended from 2030, but hybrids will be permitted until 2035 for transitional purposes. To support the automotive industry's transition to EVs, the **DRIVE35** initiative commits £4 billion over the next decade, with £2 billion allocated for large-scale manufacturing projects through to 2030 and £500 million dedicated to research and development through to 2035.[13]

Both the Battery Strategy and the ZEV mandate sit within the wider economic vision of the **UK's Modern Industrial Strategy (2025)**.[14] The strategy (see Box 3.1) prioritises advanced manufacturing and clean energy industries as key growth sectors and supports projects through streamlined planning, energy cost reductions and investment certainty. Separately, in early 2025 the government also introduced a planning reform where gigafactories may be designated as Nationally Significant Infrastructure Projects (NSIPs). This is a reform that the Commission supports as it has the potential to accelerate delivery, reduce planning uncertainty and improve investor confidence.

The strategy prioritises advanced manufacturing and clean energy industries as key growth sectors.

8 Department for Business & Trade (Nov 2023). UK Battery Strategy.
9 UK Government (Nov 2020). Ten Point Plan for a Green Industrial Revolution.
10 South Tyneside Council (Oct 2021). Envision AESC welcomes planning permission for UK-first 'at scale' gigafactory.
11 UK Government (April 2025). Backing British business: Prime Minister unveils plan to support carmakers.
12 UK Government (Jan 2024). Pathway for zero emission vehicle transition by 2035 becomes law.
13 HM Treasury (November 2025). Budget 2025.
14 Department for Business & Trade (June 2025). The UK's Modern Industrial Strategy.



Steel frame construction, AESC, Sunderland, 2022

Box 3.1: The UK's Modern Industrial Strategy

The UK's Modern Industrial Strategy, published in June 2025, demonstrates the UK's commitment to attracting investment for economic growth by supporting eight high-growth sectors, including batteries and EVs as frontier technologies. This includes up to £4.3 billion in funding to 2030, including £2.8 billion in research and development funding programmes over the next 5 years.

The Industrial Strategy outlines measures to address investment barriers in the UK, such as collaboration with business community representatives. In addition, the Industrial Strategy addresses other key barriers, including:

- Further reducing energy costs by £35-40 per MWh from 2027 onwards through the new long term British Industrial Competitiveness Scheme;
- Advanced Manufacturing sector funding to help anchor supply chains in the UK;
- The DRIVE35 package, which will support the latest research and development, accelerate commercial scale up and unlock capital investment in zero-emission vehicles, batteries and their supply chains;
- Investing in skills to align the UK's skills systems with the growth-driving sectors;
- Providing an increased supply of investable sites in strategic locations through the Strategic Sites Accelerator;
- Continued focus on reducing the administrative costs for business in the UK.

Beyond these sector-specific policies, higher-level strategies also influence the UK automotive market and the development of gigafactories. The updated **Critical Minerals Strategy** (2025) prioritises scaling domestic midstream mining and processing of lithium, cobalt, nickel and rare earth elements.[15] The Strategy also stimulates midstream innovation and recycling capacity to develop the industrial capability required for a secure low-carbon battery ecosystem.

Complementing supply-chain policy, the **Net Zero Strategy** (2021) identifies battery manufacturing as critical to decarbonising transport and achieving net zero by 2050.[16] The strategy committed over £350 million through the ATF towards gigafactory investment. The **Clean Energy Industries Sector Plan** commits to at least doubling investment to over £30 billion per year by 2035 by creating clean-energy industrial clusters.[17]

15 UK Government (November 2025). Vision 2035: Critical Minerals Strategy.
16 UK Government (Oct 2021). Net Zero Strategy: Build Back Greener.
17 UK Government (June 2025). Clean Energy Industries Sector Plan.

3.4 Conclusions

This chapter sets out how large-scale domestic battery production is essential to the UK's long-term economic and energy strategy. Gigafactories are not only necessary to secure the future of the automotive sector but also to strengthen energy security, reduce import dependency and support wider industrial decarbonisation. While government policy sets a clear direction, current investment remains below the level required to meet the scale of the challenge. Bridging the supply gap will require a coordinated national effort to attract investment and accelerate gigafactory development.

AESC gigafactory under construction, Sunderland

4 The emerging UK battery industry

This chapter provides an assessment of the current UK gigafactory landscape and the supporting ecosystem of infrastructure, supply chains and research capabilities that underpin the emerging battery manufacturing industry in the UK.

Summary:

- The UK has made progress in developing a battery industry, with two gigafactories under construction. The country has strengths in research and innovation, but battery manufacturing capacity remains modest against international competitors.
- Projected battery demand will far exceed committed UK supply beyond 2030, underlining the need for investment in gigafactories, processing, active materials and recycling to remain competitive.
- The UK can build on its strong research base and emerging supply chain activity, but without faster action risks falling behind peers and weakening future EV manufacturing.

Next-generation Nissan LEAF, Sunderland, December 2025

Ellesmere Port 60th anniversary, 2024

4.1 Battery supply and demand

Recent announcements have generated some optimism that the UK can establish a domestic battery industry. As mentioned previously, the UK has two confirmed gigafactory projects under development.

- **AESC, Sunderland**: A second AESC plant currently under construction in Sunderland is expected to deliver 15.8 GWh of annual capacity at full operation.[18] It is located adjacent to the original facility that began operations in 2010 as the UK's first battery production site. AESC is a long-standing supplier to Nissan, which means it benefits from co-location with vehicle manufacturing and access to a well-established automotive cluster.[19]
- **Agratas, Somerset**: In 2023, Tata Group announced a £4 billion gigafactory at the Gravity Smart Campus, designed for 40 GWh of capacity and supplying Jaguar Land Rover in the UK.[20] The first phase of the project is due to begin operation in late 2027, with a capacity of around 15 GWh. The timeline of the further phases of the project has not yet been confirmed.

The Agratas project is the UK's most ambitious battery project to date and together the two projects will provide the UK with around 31 GWh of gigafactory capacity by 2030. There are also further battery production activities under development. Volklec, founded in 2024, is planning to produce cells, initially on UKBIC production lines, using advanced lithium-ion technology licensed from China's Far East Battery company. Volklec has further ambitions to develop their own gigafactory, however not until at least 2030.[21] The West Midlands gigafactory site, just outside of Coventry, is also being presented as a site ready for investment of an up to 60 GWh facility.[22] The site is strategically located near UKBIC and within a major automotive manufacturing region.

Together the two projects will provide the UK with around 31 GWh of gigafactory capacity by 2030.

18 AESC UK.
19 AESC UK – Car Battery Gigafactory, Sunderland.
20 Tata (July 2023), Tata Group to Set Up a Battery Gigafactory in the UK.
21 EV Powered (2025), New £1bn battery gigafactory planned for the UK.
22 Greenpower Park.

An Innovate UK-commissioned report estimates total UK battery demand to reach around 130 GWh by 2035, distributed across a range of applications (Table 4.1). This includes substantial GWh demand from passenger cars alongside HGVs, off-highway vehicles and other transport modes such as aviation, marine and rail. Another important demand sector is stationary storage, where batteries balance renewable energy generation with fluctuating demand and can be co-produced with EV cells, strengthening the commercial case for new gigafactory investment. Although it would be technically difficult to standardise cell requirements across such varied applications, these sectors represent strong areas of expertise for UK engineering.

Although demand is expected to reach 130 GWh by 2035, confirmed UK supply currently stands at only 31 GWh committed capacity, rising to 66 GWh if existing plants are expanded to their maximum site capacity. This leaves an estimated shortfall of roughly 64 to 99 GWh in 2035. Closing this gap will require sustained investment in new gigafactory capacity and a coordinated effort to build out the supporting supply chain, particularly given the long lead times associated with major manufacturing projects.

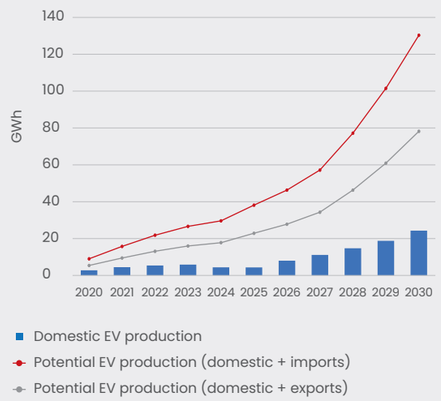
Rho Motion similarly expects UK battery demand to rise significantly, as illustrated in Figure 4.1. The underlying production outlook reflects expected supply-side developments in UK vehicle and battery production and is based on currently secured gigafactory capacity while recognising that only limited additional investment is likely to materialise without new policy support. However, additional gigafactory capacity could support higher levels of EV manufacturing in the UK. For instance, expanded capacity could increase UK production to 80 GWh by 2030, an estimate that reflects the historic relationship between domestic vehicle production and UK vehicle sales and exports. Alternatively, if domestic EV production were to capture the share of the UK market currently supplied by imported vehicles, the addressable market could reach 130 GWh by 2030.

Table 4.1:
2035 UK battery demand by application

	Projected demand (GWh)
Passenger cars	97
HGVs	6
Off-highway	3
Other transport (aviation, marine, rail)	3
Stationary storage	6
Exports	15
Total	**130**

Source: Innovate UK (April 2025). Sector Wide UK Battery Demand Projections to 2035.

Figure 4.1
Scenario-based projections of potential UK EV battery production to 2030



Source: Rho Motion (2025); Faraday Institution.

Given this wide range of estimates, a planning assumption of around 100 GWh of annual battery production in the early 2030s offers a realistic central target for the UK Government to aim for in developing a strategy to secure a global OEM, gigafactory and CAM manufacturer. The Advanced Propulsion Centre's latest modelling forecasts that meeting the UK's industrial strategy ambition of manufacturing around 1.3 million cars and commercial vehicles a year by 2035 would represent around 95 GWh of battery demand. Such demand presents a clear opportunity to attract further EV manufacturing to the UK by incentivising new or incumbent automotive OEMs to expand production. Recent experience shows that major manufacturers have already demonstrated the capacity to invest in UK EV production (Box 4.1).

Box 4.1: Case study on new EV producers in the UK

The global automotive industry is undergoing a major transformation as manufacturers transition from internal combustion engine vehicle production to EV production. In the UK, the transition to EVs is being led by automotive OEMs such as Nissan, JLR and Stellantis.

- Nissan spearheaded EV production in the UK with the LEAF, produced in Sunderland since 2013. The company has since committed to producing two new electric models at the Sunderland plant, which resulted in AESC constructing a new battery production facility near the existing Nissan plant.
- JLR is transforming its Halewood facility into an all-electric production site, and is collaborating with Agratas, a Tata Group subsidiary, for battery production. These initiatives are part of JLR's strategy to electrify its entire lineup by 2030 with both hybrids and full electric vehicles.
- Stellantis has committed to the UK's EV transition with significant investments in the Ellesmere Port plant. In September 2023, the facility became the UK's first all-electric manufacturing plant after a £100 million transformation.

Beyond these manufacturers, there are major OEMs based in the UK still considering if, when, and how to invest in battery electric vehicle manufacturing in the UK. These OEMs should be rapidly supported and encouraged further to make those investments including in their battery supply chains.

Next-generation Nissan LEAF, Sunderland, December 2025

4.2 The UK battery manufacturing supply chain

The battery manufacturing value chain begins with extracting raw materials such as lithium and cobalt, followed by processing these into usable feedstocks. Component manufacturing then produces essential parts such as cathodes, anodes and electrolytes, which are then assembled into functional battery cells, modules and packs to be used in both EV and non-EV applications. The value chain concludes with recycling and reuse, where batteries are dismantled to recover valuable materials for the manufacture of new batteries. Research, innovation and commercialisation activities support the entire battery supply chain. This value chain is summarised below, which also shows how each element links to the Design, Build and Sustain part of the UK Battery Strategy.

Table 4.2:
Key elements of the UK battery manufacturing value chain

Design	Research, innovation and scale-up	• Develop breakthrough technologies such as solid-state, lithium-sulfur and sodium-ion. • Drive rapid improvement of existing technology to enhance battery performance and lifespan. • Chemistry optimisation, controls and engineering optimisation of cell to vehicle. • Researching safety and recycling to improve sustainability.
Build	Extraction	• Mining critical raw materials such as lithium, cobalt and nickel. • Prospecting and site development to identify new mining opportunities. • Ore extraction using advanced technologies to maximise yield. • Preparing and processing ores for transportation.
	Processing	• Refining raw materials to obtain battery-grade quality. • Employing chemical processes to transform materials into usable forms. • Packaging processed materials for safe transportation. • Distributing refined materials to component manufacturers.
	Component manufacturing	• Producing essential components such as anodes, cathodes and electrolytes. • Using refined materials to produce cell components. • Implementing quality control measures to ensure component reliability. • Testing components for performance and safety standards.
	Cell, module and pack manufacturing	• Assembling individual cells from processed components. • Integrating cells into modules and battery packs. • Conducting safety and capacity tests on completed packs. • Ensuring packs meet specific requirements for various applications. • Integrating battery management systems to optimise performance and longevity.
	EV and non-EV applications	• Incorporating batteries into products such as EVs and non-EV applications. • Customising battery designs for specific application needs. • Conducting performance monitoring in real-world usage. • Providing maintenance and support for battery-operated systems.
Sustain	Recycling, reuse and second life	• Collecting end-of-life batteries from various sources. • Dismantling batteries to separate valuable materials. • Re-processing materials for use in new battery production. • Developing second-life applications for used batteries in less demanding environments. • Facilitating the reuse of components and materials in alternative applications.

Cell, module and pack manufacturing

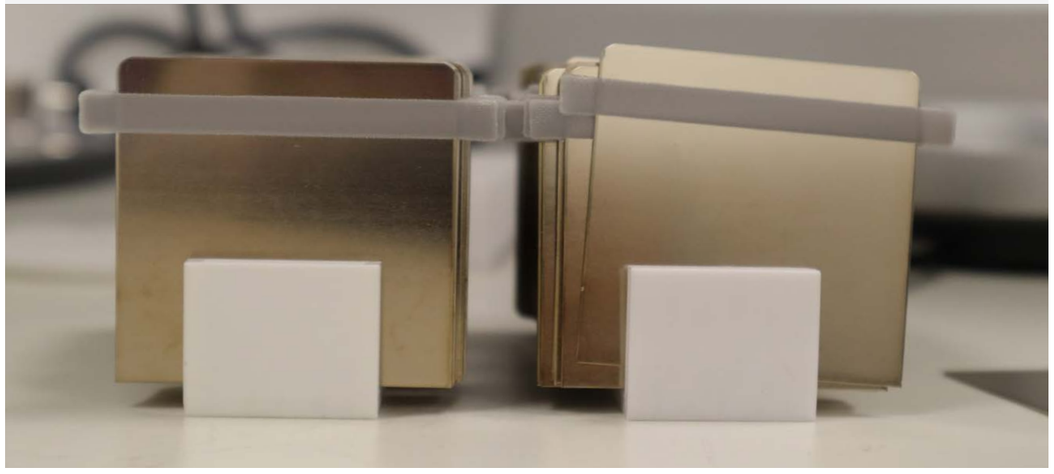
Cell manufacturing involves assembling core battery components such as cathodes, anodes, separators and electrolytes into individual cells. These cells are then combined into modules and packs, incorporating thermal management systems and battery management electronics. Pack design varies depending on performance, safety and format requirements and determines battery efficiency and life.

Although the UK has had (up until now) a limited amount of cell manufacturing, significant expertise has been developed in battery pack design and engineering. The UK is recognised globally for strengths in motorsport-derived technologies, rapid prototyping and advanced manufacturing. This combination positions the UK as a hub for EV innovation, bridging fundamental research and industrial application.

Component manufacturing

Component manufacturing relates to the manufacture of components of the cell, including separators, electrolytes, foils and casings. Cathode and anode electrodes are typically made by coating metal foils with slurries, which determine key battery characteristics such as energy density. Separators are usually made from polyethylene or polypropylene and prevent short circuits while allowing lithium ions to pass through. Electrolytes enable ion transport between electrodes, while foils and casings provide structure, safety and electrical pathways.

The UK currently has little domestic capacity to produce these components at scale. There is no significant UK manufacturing of electrode foil, separators or cell casings and electrolyte production is currently limited to a single site operated by Mitsubishi Chemical Group. Addionics is developing advanced current collectors, but most of the activity in this space remains at pilot or early commercial stages.



Battery tabs by UK-based Avocet Materials

Altilium recycling of critical minerals

Manufacture of active materials

CAM is crucial to lithium-ion battery performance, safety and cost, making up around half of total cell costs. The UK currently has no large-scale commercial CAM production. Companies such as Altilium plan to produce NMC active materials from recycled batteries in Teesside, while Integrals Power and Redoxion are developing LFP cathodes at pilot scale. However, currently planned UK CAM capacity is largely dependent on recycled feedstock precursors and is unlikely to produce significant quantities of CAM until the middle of next decade. This poses a significant barrier to full supply chain localisation, particularly in the context of the incoming RoO deadlines as sourcing CAM from the UK or Europe is essential for compliance (Chapter 10).

AAM is similarly essential to battery function and cost. Most commercial lithium-ion batteries use graphite anodes, although newer chemistries including silicon, lithium metal and niobium-based anodes are under development for higher performance. Despite having upstream capabilities, such as anode coke refining at Phillips 66, the UK does not currently produce graphite anodes at commercial scale. Emerging firms including Nexeon, Echion and Nyobolt are advancing silicon and niobium-based anodes, but these remain in relatively early stages of scale-up. As a result, the UK and Europe remain entirely dependent on imports for current-generation AAM supply.

Material refining and processing

This stage of the supply chain converts mined materials into high-purity chemicals for battery-grade use. Refining methods vary but typically involve chemical conversion, purification and crystallisation to meet strict quality standards. As battery demand rises, refining will be a key bottleneck in building secure supply chains. Lithium, nickel and manganese must all be processed to precise specifications and shortages in refining capacity can stall manufacturing despite raw material availability.

In the UK, several lithium extraction and/or refining projects are in development, including Cornish Lithium, Tees Valley Lithium, Green Lithium and Imerys British Lithium, although most remain in development or pilot stages. Nickel is refined at Vale's Clydach facility. Phillips 66 Limited, based in North Lincolnshire, is the UK's only and Europe's largest producer of battery-grade anode coke, a crucial raw material in the production of graphite anodes for lithium-ion batteries. Current production would support the anode production for 1.3 million EVs annually.[23] However, the UK lacks commercial-scale production of precursor cathode active materials (pCAM) and overall capacity remains limited relative to future needs. Without further scale-up, the UK will remain dependent on imported refined materials. As the feedstock of end-of-life batteries increases towards the mid-2030s, recycling will be essential to generate a stable and domestic supply of raw materials.

23 Phillips 66: Batteries.

Evaporation ponds used for the extraction of lithium from brines, South America

Raw material extraction

This stage sources the critical minerals used in lithium-ion batteries, such as lithium, nickel, cobalt, manganese and graphite and forms the first step in the battery value chain. Demand is rising rapidly with the EV transition, particularly for high-purity grades used in cathodes and anodes. Extraction often takes place in politically or environmentally sensitive regions, making secure and sustainable sourcing a growing priority.

In the UK, exploration has increased since 2017, especially for lithium in Cornwall and North-East England. However, most battery raw materials will need to be imported in the long term, underscoring the need for secure trade links and domestic refining. There is significant potential to highlight the UK's role in building international partnerships with regions rich in critical minerals, such as Latin America, while Canada and Australia also stand out as stable and reliable partners for future collaboration.

Battery recycling and second life

Battery recycling involves recovering valuable materials such as lithium, cobalt and nickel from end-of-life batteries, while second-life use refers to repurposing batteries in less demanding applications such as stationary storage. Battery recycling is gaining traction, with black-mass processing projects advancing in Teesside and Wolverhampton, led by Altilium and Recyclus respectively. The second-life battery market is also emerging, led by firms repurposing EV batteries for energy storage systems. However, most projects are at pilot scale or early commercial stages and will require scaling to meet end-of-life volumes expected post-2030.

Autocraft remanufactures EV battery packs for reuse in vehicles, retaining value higher up the waste hierarchy

4.3 Research and commercialisation

Research, innovation and commercialisation support the entire supply chain via organisations such as the Battery Innovation Programme, Faraday Institution, Advanced Propulsion Centre and UKBIC. The Battery Innovation Programme (formerly the Faraday Battery Challenge) aims to convert UK battery science into industrial and economic advantage, aligned with government's plan for growth and net zero goals. The £452m programme (from 2026 to 2030) will be delivered by Innovate UK, on behalf of the Department for Business and Trade as part of the government's Advanced Manufacturing Sector Plan with three key delivery partners: research (Faraday Institution), innovation (Innovate UK) and scale-up (UKBIC).

The Faraday Institution drives battery research across a range of areas such as: materials development to pack design and performance; sustainable manufacture, scale-up and recycling; and next-generation technology demonstrators and transformational challenges. The organisation works in partnership with academia and industry to accelerate breakthroughs. It also supports spinouts and international collaboration, helping to position the UK at the forefront of battery science. Innovate UK supports business-led innovation R&D and investor partnerships, while UKBIC provides a bridge from laboratory to market, offering GWh-scale prototyping and process development for UK-based manufacturers.

Battery researchers, UCL East

The Advanced Propulsion Centre supports large-scale industrial investment in battery and net zero vehicle technologies through the ATF. It plays a strategic role in scaling supply chains and securing anchor investments in battery manufacturing, while also backing mid-late stage R&D and innovation projects across all innovation areas related to EVs.

The wider ecosystem also includes research centres, such as pilot scale manufacturing at Warwick Manufacturing Group (WMG) and the University of St Andrews, and a dynamic community of spinouts and start-ups. Over 80 UK battery companies have attracted around US$2.4 billion in venture capital since 2018 and are collectively valued at over US$3 billion, reflecting the sector's rising international profile.[24] The UK continues to lead in next-generation battery technologies, such as solid-state and lithium-sulfur, with companies such as Ilika and Gelion actively developing innovations with global potential. Ensuring that these research capabilities translate into commercial-scale production will require targeted investment, strategic partnerships and long-term policy clarity.

The Colin Vincent Centre for Battery Technology, University of St Andrews

4.4 Conclusions

The UK has made progress in developing its battery industry, with landmark projects in Somerset and Sunderland supported by upstream initiatives in lithium and nickel refining, pilot-scale production of cathode and anode materials and early-stage component development. While most supporting activity remains at modest scale, the UK is beginning to establish capabilities across key stages of the battery value chain.

However, critical elements of the supply chain remain underdeveloped and projected demand growth to 2030 and beyond highlights the urgent need for accelerated investment. It is crucial to develop the full battery manufacturing supply chain to ensure that the existing industry can thrive. Without it, the UK automotive sector will struggle to remain competitive, particularly as RoO requirements tighten and the advantages of integrated battery-to-vehicle production become more critical. Without action, the UK cost base could diverge from European competitors with more developed battery supply chains, leaving the UK at risk of being outpaced by competitors and missing the opportunity to anchor EV manufacturing at scale.

It is crucial to develop the full battery manufacturing supply chain to ensure that the existing industry can thrive.

24 Dealroom.co (2024). Electric vehicle battery tech in the UK.

5 Global developments

This chapter analyses global developments in battery manufacturing focusing on capacity growth, regional investment and implications for UK competitiveness. It examines China, US, Europe and the rest of the world to assess how international trends shape the UK's strategic options.

Summary:

- Global battery capacity continues to expand rapidly, with nearly 9,000 GWh in existing and pipeline capacity, but current output is marked by overcapacity, particularly in China where production significantly exceeds demand.
- China retains a dominant position across the value chain, controlling most active material production and refining, while North America and Europe are accelerating investment through large-scale incentive schemes.
- Outside these regions, South Korea and Japan remain important players, with established firms expanding internationally and India emerging as a new market focused on smaller vehicle segments.

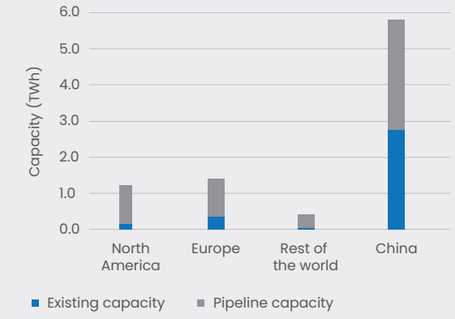
Electric drive unit manufacturing at Ford Halewood, 2024

5.1 Global trends in capacity

Global lithium-ion battery manufacturing capacity reached 3,400 GWh in 2024, with the vast majority deployed in China (Figure 5.1). This is a significant overcapacity of battery production given global production reached 1,500 GWh in 2024 (i.e., 44% of total capacity). This overcapacity can largely be attributed to new gigafactories taking time to ramp up to full production and to lower than expected EV sales. The imbalance between capacity and demand has led some projects to delay or pause development, particularly where investor confidence has weakened or costs remain uncompetitive.

Despite current overcapacity, there continues to be strong growth in capacity and investment. Around 5,500 GWh of future capacity is currently under construction or development, bringing the combined existing and pipeline capacity to nearly 9,000 GWh. Most of this expansion is concentrated in China, although the US and Europe are also seeing substantial investment, in part to move away from China's dominance. Global battery production increased by over 40% from 2023 to 2024, demonstrating continued growth in production alongside capacity. The four main regions for gigafactory development are China, North America, Europe and the rest of the world. Each is discussed in the sections below.

Figure 5.1
Global gigafactory capacity by region and status



Source: Volta Foundation (2024) Annual Battery Report. Numerical data for figures.

Global lithium-ion battery manufacturing capacity reached 3,400 GWh in 2024, with the vast majority deployed in China.

5.2 China

China is the world leader in battery production, accounting for 8 of the 10 largest battery manufacturers globally, including CATL the world's largest battery manufacturer (Box 5.1). China currently has 2,800 GWh of operational capacity with a further 3,000 GWh under development. Despite limited domestic mineral resources, China controls the vast majority of global battery raw material refining and active material production, refining approximately 65% of the world's lithium,[25] 75% of cobalt and over 90% of natural graphite.[26]

Chinese dominance reflects deliberate government intervention since 2009, including tax rebates, sales tax exemptions on EVs and low cost credit for gigafactories. These measures were put in place with the aim of developing a national EV manufacturing industry to rival European and Asian automotive OEMs. Although the Chinese battery industry continues to grow, new projects in China have slowed due to weak EV battery demand, resulting in significant overcapacity. As a consequence, many manufacturers supply the stationary storage market alongside EV cells, providing a limited outlet for excess capacity.

The crowded industry with strong competition across the supply chain has driven down battery manufacturing costs in China and globally. Further cost efficiencies have also been driven down by:

- Vertical integration: allowing producers to pass high costs down the value chain.
- High yields and automation: reducing material waste and labour costs.
- Continuous technical innovation: prioritising incremental optimisation over disruptive technologies.

BYD Shenzhen car carrier - image BYD

25 International Energy Agency (May 2024). Global Critical Minerals Outlook 2024.
26 US Energy Information Administration (May 2025). China dominates global trade of battery minerals.

Box 5.1: CATL's position in the global battery industry

Contemporary Amperex Technology Co. Ltd. (CATL) is the world's largest manufacturer of batteries. In the first half of 2025, CATL held a market share of 38% in the EV battery market, more than double the share of the next largest manufacturer.[27] This leadership is underpinned by its scale, vertical integration across cell and pack production, deep partnerships with leading automakers and heavy investment in research and development, which keeps it at the forefront of the rapidly expanding EV sector.

In terms of production developments, CATL has been expanding aggressively to meet increasing global demand. The company's current installed production capacity totals over 700 GWh, with more than 600 GWh of future capacity currently under development.[7]

CATL has also been expanding its production outside of China, following joint ventures with Ford in the US and Stellantis in Spain. The company is also currently building one of Europe's largest gigafactories in Hungary, with the potential to produce 100 GWh per annum.

CATL also continues to lead the battery industry through technological innovations from cell chemistry to pack design. CATL has helped enable fast-charging LFP battery packs through its Shenxing pack design, which is capable of adding hundreds of kilometres of range with just a few minutes of charging. The company has also announced its sodium-ion battery brand, Naxtra, offering energy density comparable to LFP but at lower cost.

27 CNEVPost (Aug 2025). Global EV battery market share in H1 2025.

Fujian-based CATL plant in Germany

5.3 North America

North America has relatively little existing battery production, but has over 1,000 GWh of capacity under development. The majority of these projects are led by Tesla and joint ventures between US automotive OEMs and Asian battery manufacturers (e.g., Ford with SK Innovation, General Motors with LG Energy Solutions).

The pipeline capacity in the US was significantly boosted by the roll out of the Inflation Reduction Act (IRA) in 2021. Although battery companies were present in the US before the IRA, it led to a rapid growth of gigafactory investment plans from both domestic and foreign companies, including new entrants and existing players. The scheme provided tax credits for products (including batteries and EVs) produced in the US, significantly lowering the cost of production and allowing US manufacturers to compete with Asian-based manufacturers. However, the second Trump Administration has announced plans to repeal the IRA and is introducing tariffs on battery related imports.

Key incentives for the sale of EVs have been halted, while tax credits on US-produced battery cells will be phased out over the 2030 to 2033 period.

The removal of these incentives has shifted the policy direction around battery technology in North America, from accelerating electrification and decarbonisation to strengthening national sovereignty over critical technologies and upstream materials supply.

Tesla factory, Fremont, California

5.4 Europe

Europe has a modest amount of existing production and over 1,000 GWh of capacity under development. Current output is dominated by Asian manufacturers, primarily in Poland and Hungary, attracted by lower labour and energy costs and tax incentives.

European 'homegrown' production is being spearheaded by companies such as PowerCo (a subsidiary of Volkswagen) and ACC (backed by Stellantis). These investment projects have so far been developed without collaboration with Asian joint venture partners. This is in contrast to the US where large automotive OEMs have primarily signed agreements with existing Asian battery manufacturers to co-develop battery production. However, this model may shift in the future with the first joint venture between a European automotive OEM and an Asian battery manufacturer (Stellantis and CATL) being established in Spain for initial battery production in 2026.

The European Commission's support for European gigafactories comes from the Green Deal Industrial Plan launched in February 2023. The plan supports 'homegrown' battery producers by leveraging government grants to unlock private investment. Although European production capacity has increased steadily, the recent bankruptcy of Northvolt, which raised $15 billion since 2016, has highlighted the difficulties in scaling homegrown gigafactory capacity in Europe. This may impact future access to capital for new manufacturers and illustrates the difficulty in establishing gigafactory production while competing with Asian manufacturing prowess.

Electric-powered rickshaw, Bolpur, India

5.5 Rest of the world

The rest of the world accounts for the smallest portion of battery production capacity, with less than 500 GWh of existing and planned production capacity. Nonetheless, this includes important existing manufacturers in South Korea and Japan as well as a key emerging market in India. Asian markets in particular have seen an influx of Chinese companies establishing overseas production facilities looking to circumvent trade rules.

South Korea and Japan have set ambitious targets to control the largest share of the battery production supply chains outside of China and have developed considerable know-how for battery production. Although domestic markets in these countries continue to grow, South Korean and Japanese manufacturers have sought to expand internationally to establish battery manufacturing capacity overseas. A key challenge for Korean and Japanese manufacturers, who have traditionally focused on NMC manufacturing, will be expanding their production into LFP-based cells to counter Chinese dominance of this chemistry.

India is a key emerging market for battery production, with production capacity being supported by government incentives aimed at establishing 50 GWh of production capacity. In contrast to other countries, a key focus in the Indian market is on the production of cells for two and three-wheelers.

5.6 Conclusions

Global battery manufacturing is expanding rapidly, with China maintaining dominance across capacity, refining and active materials, while North America and Europe are scaling investment through substantial incentive programmes. South Korea, Japan and India also remain key players, reinforcing the increasingly competitive international landscape. For the UK, these developments highlight both the risks of technological dependence and the urgency of accelerating domestic investment if it is to secure a competitive position in the global battery industry.

For the UK, these developments highlight both the risks of technological dependence and the urgency of accelerating domestic investment.

Part III

A Strategy for Securing Investment

6 Attracting investment in UK gigafactories

Summary:

- A tripartite approach covering OEMs, battery manufacturers and CAM/AAM producers offers the most credible pathway to secure new UK gigafactories.
- Engagement with established battery manufacturers alongside a primary focus on OEM attraction would maximise the likelihood of success.
- Success will depend on presenting a clear and competitive UK offer covering financial incentives, competitive energy costs, prepared sites, skills and policy reform.

6.1 Overview

The UK faces a widening supply gap with battery production projected to remain significantly below domestic demand. By 2030, UK demand could reach around 100 GWh but only two major plants are confirmed. Without at least one further large-scale plant announced in 2026 or 2027, the UK risks becoming dependent on imports, which would undermine the UK automotive industry, trade and long-term competitiveness.

Gigafactories must be treated not just as sites for the production of battery cells but as elements of strategic national infrastructure. They anchor domestic supply chains, safeguard vehicle production, protect exports and strengthen energy resilience. Global competitors already recognise the strategic value of gigafactories and are moving decisively so that if the UK fails to accelerate investment, then automotive employment and economic activity will drift elsewhere.

The UK risks becoming dependent on imports, which would undermine the UK automotive industry, trade and long-term competitiveness.

JLR - new manufacturing roles supporting production of electric Range Rovers and other next-generation EVs

6.2 Gigafactory business models

Attracting new gigafactory investment requires a clear understanding of the business models on which such projects are based. International experience suggests four main approaches to gigafactory development:

- **Proprietary technology development**, where firms pursue in-house battery innovations and establish independent manufacturing capacity (e.g., Britishvolt, Northvolt, PowerCo);
- **Licensing of novel technologies**, where companies seek to scale battery designs developed by third-party technology providers (e.g., FREYR, Nyobolt, Volklec);
- **Joint ventures between OEMs and battery manufacturers**, which combine vehicle production commitments with established manufacturing expertise (e.g., Ultium Cells, Agratas, AESC); and
- **Capacity expansion by incumbents**, particularly Asian firms with existing industrial scale and global operations (e.g., CATL, LG Energy Solutions, SK Innovation).

Experience across these different models highlights consistent patterns of success and failure across the international battery market in recent years. Key lessons include the following:

- OEM commitment is the most critical success factor, as it reduces demand-side risk and facilitates capital mobilisation;
- Battery manufacturing is a specialised industrial process requiring substantial experience to achieve yield, quality and cost targets;
- Incremental process innovation and phased expansion have generally outperformed higher-risk strategies centred on novel chemistries or disruptive technologies;
- Established manufacturers have demonstrated an ability to scale efficiently, often supported by vertical integration, established supply chains and continuing policy support from host governments; and
- New players seeking to commercialise unproven technologies have faced delays, rising costs and difficulty securing customers.

These lessons are best illustrated by the successful partnerships formed between automotive OEMs and established battery manufacturers. Such joint ventures have consistently proven more resilient than standalone new entrants because they combine operational expertise, long-term offtake certainty and alignment between battery design and vehicle platforms. Many such investments have been led by Asian-headquartered OEMs, with battery partnerships following vehicle production commitments. Examples include Ultium Cells in the US (led by GM and LGES), which transitioned from construction to production within two years, as well as BlueOval SK (Ford and SK On) and StarPlus Energy (Samsung SDI with Stellantis). In the current capital-constrained environment, securing OEM commitment to the UK is even more likely to be a necessary precondition to battery manufacturers developing plans for new gigafactory investments.

In the UK, AESC and Nissan in Sunderland and Agratas and JLR in Somerset represent major OEM-led partnership investments. These projects are characterised by OEM-led demand, collaboration with experienced manufacturers and structured public-sector support, but differ in the underlying business models. AESC is an existing battery manufacturer, while Agratas is currently pursuing proprietary technology development. In contrast, projects lacking OEM backing or operational capability, such as Britishvolt, have found it difficult to progress beyond early-stage development.

Attracting a gigafactory cannot be achieved through a passive policy stance. Success will instead depend on visible government leadership.

6.3 A tripartite approach

Reflecting international best practice, where strategic partnerships have outperformed standalone projects, the Commission concludes that the most viable route to securing new gigafactories is the following tripartite approach:

- A global battery manufacturer as operator, which will most likely be secured by initially attracting an automotive OEM (Chapter 6).
- A focus on securing investment from an existing or new automotive OEM in the UK to act as a demand anchor and reduce demand-side risk (Chapter 7).
- Securing both CAM and AAM producers in the UK supply chain to meet RoO requirements (Chapter 8).

To deliver these principal objectives, the UK must present a competitive offer. The building blocks of such a competitive UK offer for an OEM (and gigafactory) already exist. These must be consolidated into a benchmarked and pre-agreed package that can be deployed rapidly in senior-level negotiations. This should cover the following:

- **Financial incentives:** Grants, low-cost loans and selective equity (Section 7.3).
- **Energy:** Predictable and long-term relief for energy-intensive users alongside market reforms (Section 9.2).
- **Sites:** Pre-permitted, grid-ready land through an expanded Strategic Sites Accelerator (Section 9.3).
- **Skills:** A national workforce plan with apprenticeships, reskilling and international training (Section 9.4).
- **Policy reform:** Adjustment to the ZEV mandate (Section 10.1) and a negotiated delay to the 2027 RoO deadlines (Section 10.2).

Attracting a gigafactory cannot be achieved through a passive policy stance. Success will instead depend on visible government leadership with a named Cabinet minister accountable for proactively securing the required investments, chairing a newly established Cabinet sub-committee, and supported by a small secretariat. Investors will want to see that the UK can present a clear and competitive offer, act quickly to resolve barriers and sustain commitment over the longer term (Chapter 11).

7 Attracting a major OEM as the anchor

Summary:

- The most realistic route to securing a new UK gigafactory is not to pursue standalone battery investment but to focus on attracting a major global automotive OEM with credible near-term plans to expand EV production in the UK or European market.
- Engagement with established battery manufacturers alongside OEM attraction would maximise the likelihood of success by matching production capability with vehicle manufacturing demand.
- An OEM-led project would also act as an anchor and support the development of the wider UK battery supply chain and associated industrial capabilities.

7.1 The current UK and global automotive industry

As set out in Chapter 3, UK automotive production has declined significantly in recent years due to global headwinds and the transition to EVs. UK output stabilised at 905,000 vehicles manufactured in 2024, comprising approximately 780,000 cars and 125,000 commercial vehicles. Production is currently concentrated among a small number of major manufacturers. Nissan remained the UK's largest car producer with an output of around 320,000 units per year and 40% of total UK car production. Other key producers included Jaguar Land Rover with around 210,000 units, BMW Group with around 180,000 MINIs at its Oxford plant and Toyota with around 110,000 cars at the Burnaston facility.

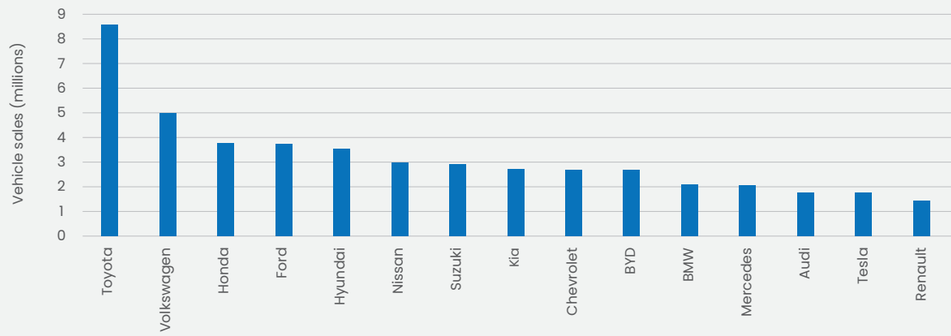
While the UK market features a mix of European and Asian brands, the global automotive market is dominated by Asian manufacturers, with Chinese and Japanese OEMs accounting for many of the world's highest-volume producers and leading the transition to EVs. Several of these players already have a significant UK presence. Nissan partners with AESC in Sunderland and Jaguar Land Rover is linked to Tata's planned Agratas gigafactory. However, Toyota continues to focus its UK manufacturing operations on hybrid vehicles and conventional engine production and has yet to commit to local battery production.

Vehicle production, MINI Plant Oxford, 2023

Given the global scale (Figure 7.1), technological leadership and growing investment capacity of Asian and Chinese automotive OEMs, these firms offer the UK a major opportunity to attract investment into vehicle and battery manufacturing, especially from those with an existing UK footprint.

The Commission held structured discussions with major automotive OEMs, battery manufacturers, materials suppliers and recyclers (Agratas, Altilium, BMW, Cornish Lithium, Cummins, Echion, Fortescue, JLR, Leyland DAF, McLaren, Stellantis, Toyota and Volklec). Key findings in Box 7.1 highlight both comparative advantages and structural weaknesses that influence the UK's ability to attract gigafactory investment.

Figure 7.1
Worldwide car sales in 2023



Source: OICA/Road Genius. Numerical data for figures.

Box 7.1: Industry views on the UK automotive and battery manufacturing sector

Market conditions
Stakeholders recognised the UK's advanced engineering capability, strong research base and established automotive sector, particularly in premium and specialist vehicles. At the same time, they underlined that investor confidence has been weakened by recent policy changes and uncertainty around long-term commitments. Global market dynamics reinforce this caution: persistent overcapacity in China's battery industry has lowered cell prices and left European plants operating well below commercial viability.

Policy and regulation
While the UK's industrial strategy was welcomed, concerns were raised about the credibility of delivery and the limited coordination across government departments. The current ZEV mandate target of 80% battery EV sales by 2030 was widely considered to be out of line with market demand and with the EU trajectory of 50–60%. Several stakeholders warned that such divergence could result in reduced model allocation to the UK or the diversion of associated battery investment to continental Europe. RoO provisions from 2027 were also seen as a source of uncertainty, particularly around CAM.

Cost competitiveness
High industrial energy prices, elevated construction costs and extended grid connection timelines were consistently identified as disadvantages relative to European and US competitors. Stakeholders noted that while domestic production could reduce logistics costs, these savings would be more than outweighed by higher UK operating expenses over the plant lifetime. Other countries were cited as having faster permitting and infrastructure delivery and with more substantial incentive packages. Turkey and Eastern Europe were given as examples of regions offering comprehensive support packages covering land, tax relief and skilled labour.

Finance and investment
Evidence pointed to a persistent funding gap for 'first-of-a-kind' and intermediate-scale facilities that fall between early-stage R&D and large-scale commercial production. The £25m minimum threshold under the National Wealth Fund was regarded as poorly suited to projects of this nature. Stakeholders argued that smaller equity stakes, guarantees and tailored scale-up finance products would be required to mobilise private capital. Some also highlighted the importance of linking public finance to demand risk-sharing mechanisms, such as long-term offtake agreements or procurement guarantees.

Supply chain and recycling
The absence of domestic production of CAM and precursor cathode active materials was regarded as a critical weakness, which exposed the UK to supply chain risk and RoO compliance challenges. In recycling, black mass is currently often exported rather than processed domestically, which was widely described as a lost opportunity to secure critical minerals for reuse within the UK economy. Stakeholders supported clearer permitting and targeted policies to retain and process materials in the UK, noting that co-locating processing, recycling and manufacturing could strengthen resilience and reduce costs.

Skills
Shortages in process engineering and high-volume manufacturing capability were repeatedly raised with companies frequently reliant on overseas expertise to meet immediate needs. Stakeholders noted that leading Asian producers are achieving much higher yields compared with UK and European producers, underlining the importance of experience and training. Stakeholders also emphasised that more systematic investment in training, supplier-led programmes and specialist centres will be required.

High industrial energy prices, elevated construction costs and extended grid connection timelines were consistently identified as disadvantages relative to European and US competitors.

The absence of domestic production of CAM and precursor cathode active materials was regarded as a critical weakness.

Start of construction on AESC's second Sunderland electric vehicle gigafactory, 2022

7.2 Existing and planned interventions in the automotive sector

The Advanced Propulsion Centre was set up in 2013, as a joint venture between the UK automotive industry (represented by the UK Automotive Council) and the UK Government, with the key mission to accelerate decarbonisation of the UK automotive industry. It is jointly funded by the Department for Business and Trade and the automotive industry (by means of industrial contributions from funded R&D project participants).

Energy storage and associated technologies play a key role in the automotive industry's drive towards net zero and are identified by the Automotive Council as key enablers for the decarbonisation of the automotive industry. Over the past decade, the Advanced Propulsion Centre has been working with the UK Government, the automotive industry, research technology organisations and academia to drive research and investment across the end-to-end battery value chain automotive applications. It has facilitated collaboration across technology readiness levels and among organisations from start-ups and SMEs through to Tier 1s and OEMs.

These funding programmes focus on the automotive sector but are open to a wide range of technologies, recognising the potential for benefits in other industries and can support projects with positive cross-sector impacts. The Advanced Propulsion Centre has also complemented other funding bodies working in this space such as Innovate UK, including through the Faraday Battery Challenge (now the Battery Innovation Programme).

In 2020, the ATF was launched with the aim to accelerate electrification of the UK automotive sector through capital funding support, including building resilience in the supply chain. Since then, the UK Government has committed most of the £850m budget to capital projects, feasibility studies and scale-up readiness validation (SuRV) projects, complementing collaborative R&D initiatives running since 2013. Together, these have delivered over £1.65 billion of joint investment, around half of which originated from government). The ATF was designed as a five-year programme and has now been succeeded by DRIVE35, a £4 billion programme for capital and R&D funding for the automotive industry announced in July 2025. Capital support forms a large part of the funding commitment.

ATF capital funding focused on four strategic technologies: batteries, electric machines, power electronics, and fuel cell systems, alongside the associated upstream supply chain for critical materials and mid-stream materials processing.

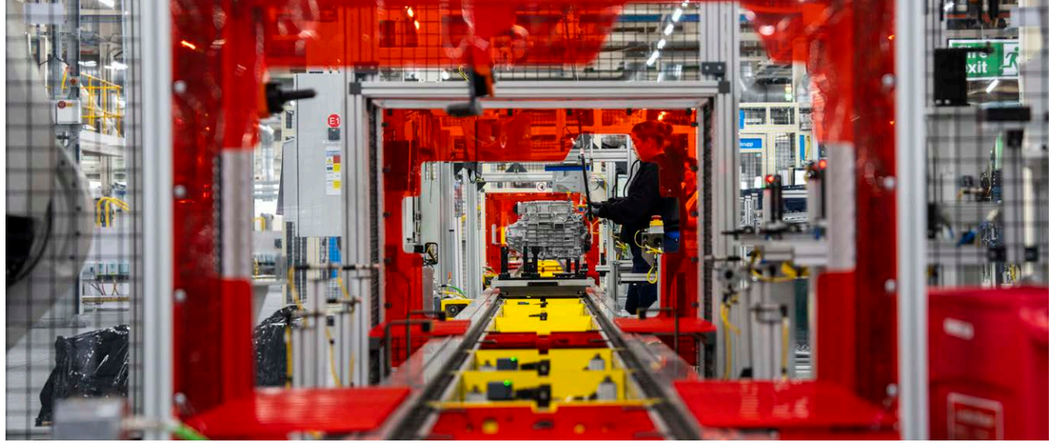
In 2020, the ATF was launched with the aim to accelerate electrification of the UK automotive sector through capital funding support.

Examples of key achievements of the ATF include:

- **Agratas,** Tata Group's global battery business, has committed to invest £4 billion in building Britain's largest gigafactory in Somerset following ATF support.
- **AESC's** new gigafactory in Sunderland, supported by £150 million of ATF investment within a total investment exceeding £1 billion.

The recently announced DRIVE35 programme simplifies the funding landscape for the automotive industry, providing focus in three areas: innovation, scale-up and transformation. The aim is to continue driving innovation and investment in a globally competitive zero-emission vehicle supply chain and building a strong economy through the delivery of safer, smarter, more sustainable, and affordable mobility solutions for the UK, therefore securing UK competitiveness in the global market.

Agratas gigafactory, Bridgwater, Somerset, November 2025



Electric drive unit manufacturing at Ford Halewood, 2024

7.3 Incentives to attract an OEM and a global battery manufacturer

Securing additional OEM and gigafactory investment in the UK is unlikely to be achieved through the passive application of existing schemes. Government already has most of the relevant instruments such as grant funding, energy cost relief, infrastructure support, tax allowances and selective equity. The key difference lies not in the measures themselves but in how they are applied and the level of risk accepted. What is new and essential is the manner of deployment, namely proactive and Cabinet-led negotiation with global OEMs in which the UK starts with a credible and benchmarked opening offer and a willingness to tailor terms in real time to meet investor requirements. The approach must be coherent with a competitive offer presented from the outset rather than leaving investors to navigate a fragmented system. Without this shift in approach, the UK risks being outpaced by competitors that arrive at the table with credible packages and the authority to conclude deals.

Any support should obviously be structured on a case-by-case basis and negotiated confidentially, as it is now, with investment levels dependent on individual negotiations. Incentives must be conditional on measurable outcomes in UK vehicle assembly, battery cell production and localisation of supply chains and the continued allocation of future EV models to UK plants. Funding should be released against milestones with clawback provisions where commitments are not delivered to ensure that public resources remain safeguarded.

In practical terms, OEM packages could draw on the following instruments:

- **Liquidity support** through low-cost finance or equity stakes under the National Wealth Fund to reduce upfront capital intensity;
- **Direct grants and incentives** tied to verifiable outputs in vehicle and battery production, domestic supply-chain spend and job creation;
- **Energy cost relief** extending intensive energy user measures to gigafactory and vehicle assembly investments along with long-term price certainty;
- **Site development incentives,** including infrastructure capital support and fiscal measures such as business rates relief;
- **Selective equity or risk-sharing mechanisms** where government participation can lower entry barriers for established OEMs or provide assurance for new entrants.

As described, many of these measures are not new and already exist in some form (examples of previous support are outlined in Box 7.2).

The package should be pragmatically open to Asian (including Chinese) investors, subject to National Security and Investment Act screening. Such partnerships will require predictable and timely NSI processing to avoid chilling credible proposals (Section 10.3). The UK offer will also need to consider making changes to the ZEV mandate (Section 10.1) and to RoO (Section 10.2). Confidence in delivery will depend on permit-ready sites with secured infrastructure (Section 9.3) and on visible leadership from a responsible minister with the authority to conclude negotiations (Section 11.2).

Box 7.2: Examples of support provided across the UK automotive industry

In 2022, Altilium Clean Technology, a leading battery recycling company, secured funding delivered through the UK's ATF, to advance proprietary recycling technology. Using hydrometallurgical extraction, Altilium is able to recover over 95% of the critical metals found in black mass to produce battery-ready CAM. In just 18 months, this funding enabled Altilium to transform an empty unit into an operational scale-up pilot line for mineral processing and establish an EV Battery Technology Centre in Devon.

Ionic Technologies (formerly Seren), a 2014 spinout company from Queen's University Belfast, has developed new techniques to recycle permanent magnets using a 'revolutionary' process for the separation and recovery of rare earth elements from mining ore concentrates and waste magnets. The company was awarded a grant of £1.72 million from the ATF SuRV programme, which the Advanced Propulsion Centre delivers on behalf of the Department for Business and Trade, to develop the demonstration-scale magnet recycling plant; a significant step towards securing the UK supply of critical rare earth metals for EV manufacture.

Ford secured a £380 million investment – including £30.9 million of governmental support - via the ATF to transform Halewood from a traditional transmissions facility into an electric drive manufacturing plant.

Astemo, a provider of systems and products for the automotive industry, received support to manufacture inverters in the UK. Investment from both the company and government totalling £100 million is committed for the Bolton-based facility.

Dana UK Axle, a global leader in drivetrain and e-propulsion systems, received support to introduce full electrification products in the Witton Birmingham plant, with a total investment of £15 million.

Nissan and JATCO concluded a £50 million investment deal to create a new manufacturing plant in Sunderland. This facility will produce 3-in-1 EV powertrains for Nissan's Sunderland operations, creating 183 new high-value jobs and supporting over 400 jobs in the wider supply chain.

7.4 Policy implications

While several OEMs already have access to battery capacity elsewhere in Europe, such incentives combined with the UK's distinct trade position, skills base and innovation ecosystem could offer comparative advantages. However, any public incentive (particularly to large Asian or Chinese OEMs) would need to have clear conditions attached, such as requiring UK-based manufacturing, use of UK suppliers and tangible investment in domestic R&D, skills and industrial capability.

Attracting an OEM will require coordinated government engagement focused on a small number of global players, potentially prioritising leading Asian-headquartered OEMs. This should include visible and sustained outreach by an appointed Cabinet minister to engage directly with key C-suite decision makers and signal long-term government commitment. It will also require cross-departmental coordination to ensure a unified offer and a single point of contact for investors.

8 Attracting active material producers

Summary:

- A chemistry-neutral approach to CAM development is needed, pursuing both NMC and LFP as market conditions allow. CAM and AAM should be considered together given their combined role in RoO compliance, competitiveness and supply chain resilience.
- Support for CAM should reflect its strategic importance as an anchor for the battery supply chain, with plants typically serving multiple gigafactories. Coordinated demand aggregation across OEMs and cell plants would strengthen the case for investment in UK CAM capacity.
- Developing robust domestic recycling capacity is critical to long-term competitiveness and material security, providing a future strategic source of CAM and AAM inputs.

8.1 Overview

Building on the earlier description of the UK battery supply chain in Chapter 4, this section focuses on the midstream component manufacturing stage, particularly the production of cathode and anode active materials (CAM and AAM). These materials are central to battery performance, safety and cost with CAM alone accounting for around 50% of total cell costs.

The lithium-ion market today is dominated by two CAM types: lithium nickel manganese cobalt oxides (NMC) and lithium iron phosphate (LFP).[28] In Europe, NMC demand is expected to remain higher than LFP due to its higher energy density, which supports EVs with longer range. However, LFP has seen a strong resurgence, driven by improved cost efficiency, safety and longer cycle life.

28 Faraday Institution Insight 18: Developments in Lithium-Ion Battery Cathodes.

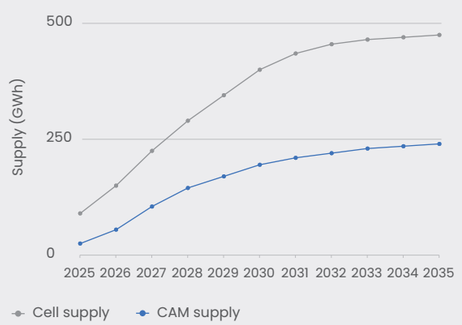
Phillips 66 Limited Humber Refinery including the production of anode-grade cokes

8.2 Active material deficits in UK and EU supply chains

Europe (including the UK) has around 370 GWh of existing battery manufacturing capacity and around 1,000 GWh of announced capacity in the pipeline as of the end of 2024.

Despite the significant battery manufacturing capacity currently under development, there remains a significant deficit in European-based active material supply (Figure 8.1). Although investment in EU-based CAM production is increasing (largely from non-European companies), the supply will remain lower than forecasted cell supply, meaning EU gigafactories will have to continue to rely on imports from outside Europe.

Figure 8.1
Comparison of EU cell and CAM supply



Source: Benchmark Cathode Forecast, Benchmark Battery & Gigafactory Database (2024).

The supply of CAM and AAM is currently dominated by China, which controls critical stages from raw material processing to active material production. Although China does not have significant resources of the critical minerals needed for battery production, it dominates refining and chemical conversion, with over 80% of CAM and more than 90% of AAM globally produced there. This market dominance means that most mined resources flow through Chinese facilities before reaching global markets.[7]

The existing pipeline of active material production in Europe is not large enough to sustain the battery manufacturing capacity under development. This is also true in the UK, which has not secured a committed supply of CAM or AAM from manufacturers, leaving the UK reliant on EU- or Asian-based production.

Without domestic capability, the UK risks being reduced to an assembly hub rather than being able to capture value from across the full automotive manufacturing supply chain. Failure to develop active material capacity would mean a continued reliance on imports from Asian markets, exposing manufacturers to supply chain vulnerabilities, price volatility and geopolitical risks. The UK also faces significant trade frictions if it fails to invest in domestic CAM and AAM production given the requirements set out in the UK-EU Trade and Cooperation Agreement. Building local cathode and anode industries is therefore crucial for supply chain resilience, compliance with trade rules and long-term competitiveness.

8.3 UK active material supply chain

The two announced gigafactory operators in the UK (Agratas and AESC) are expected to be producing NMC-based cells for JLR and Nissan respectively.

Cathode material production in the UK

The only announced plans for CAM production in the UK to date comes from Altilium, a UK-based battery recycling company.[29] Altilium plan to develop a hub in Teesside with extensive battery recycling facilities. These recycled batteries will be used to generate precursors for NMC production, with the company planning on supplying 30,000 tonnes per annum of CAM back into UK battery manufacturing. In March 2025 the company successfully produced cells at UKBIC with active material from recycled EV batteries.[30] However, a shortage of available recycling feedstock means Altilium could find it challenging to meet its production target in time for the stricter RoO taking effect in 2027.

Although NMC production will be needed to meet existing UK-based battery demand, there is also an opportunity to develop LFP production in the UK. As automotive OEMs increasingly diversify chemistries to balance performance, affordability and sustainability goals, demand for LFP batteries in the UK is expected to grow alongside NMC. LFP is seen as the chemistry of choice for mass market EVs produced by Asian automotive OEMs. LFP also has lower IP barriers than NMC, thanks to key patents having already expired around the material.

The UK already has companies developing LFP products, namely Integrals Power and Redoxion. Integrals Power is a battery materials company based in Milton Keynes developing and commercialising LFP-type cathode materials. The company is in the process of establishing a pilot plant in the UK, with the aim of positioning the UK as a hub for LFP cathode supply. Redoxion is looking to develop proprietary synthesis methods for the large-scale production of LFP CAM. The company's manufacturing approach focuses on using industry-standard equipment and novel processing techniques to deliver low-cost solutions for the CAM supply chain. In addition to CAM supply, the UK also has announced capacity for the production of lithium precursor materials, including projects by Cornish Lithium and British Lithium.

For CAM production to be established in the UK, producers would need to secure offtake volumes from multiple gigafactories to ensure sufficient demand and achieve economies of scale. This approach would help justify the significant investment required for CAM operations while mitigating market risk and ensuring efficient plant utilisation. To help meet demand across multiple locations, UK-based CAM producers could export material to gigafactories in the EU under the UK–EU Trade and Cooperation Agreement. Such cross-border supply would support European electrification goals while positioning the UK as a strategic hub for advanced battery materials within the wider European market. The UK also benefits from a lower tariff than the EU when exporting to the US. Given the US has significantly reduced imports of Chinese-made cells, UK-based processing could provide Asian manufacturers with a commercially attractive route to supply US demand while also supporting CAM offtakes in both the EU and US markets. Similarly to gigafactory investments, investment in CAM production would be most successful using partnerships with well-established Asian or European CAM manufacturers that already have proven experience in this area.

29 Altilium (Sept 2024). Altilium announces pioneering project to validate EV cells from recycled batteries.
30 EV Infrastructure News (March 2025). Altilium and UKBIC produce UK first recycled EV batteries.

Opening of Altilium EV battery recycling plant

Anode material production in the UK

Similarly to the cathode, the choice of anode active material will have a significant impact on battery performance, depending on the application and the desired characteristics such as energy density, cost, safety and lifespan. Although the market today for lithium-ion batteries is dominated by graphite anodes, there are a number of next-generation anode materials that are currently under development such as silicon-graphite composite anodes, silicon anodes, lithium metal anodes and niobium-based anodes.

The majority of lithium-ion batteries today use graphite-based anodes, which are estimated to account for 71% of the global anode market in 2023, with silicon-based anodes and lithium metal accounting for the remainder of the market.[31] These emerging materials show strong potential due to their high theoretical energy densities. The manufacture of graphite-based anodes is undertaken by two production routes: synthetic or mined. The UK does not currently produce any synthetic or natural graphite, although some graphite deposits are known to exist in the UK.[32]

Although there is no existing large-scale manufacturing of AAM in the UK, the country does have expertise in producing carbon-based materials drawing on experience in the petrochemical industry. For example, the Phillips 66 refinery in North Lincolnshire can supply battery anode coke sufficient to meet the demand for around 1.3 million EVs per year.

The UK has strong expertise in the development of next-generation and niche AAM. Nexeon, a UK-based developer of silicon-based anode materials, has stated its ambition to manufacture these materials in the UK, although no concrete plans have yet been announced. Nexeon is a leader in developing silicon-based anode materials for lithium batteries and in July 2023 announced a partnership and long-term agreement with Panasonic to supply its anode material for cell production from 2025.[33] Initial production of this material will take place in Gunsan in South Korea.

31 BNEF (July 2025). Long-Term Electric Vehicle Outlook 2025.
32 Lusty & Goodenough (2022). The potential for graphite in the UK, British Geological Survey.
33 Nexeon (July 2023). Nexeon to Begin Commercial Supply of Silicon Anode Material to Battery Giant Panasonic.

8.4 Recycling and the circular economy

Recycling will be an essential part of strengthening the UK's battery supply chain and particularly for CAM and AAM. As EV sales rise, the supply of end-of-life batteries will expand rapidly from the mid-2030s, with retired packs becoming the primary source of feedstock material to produce recycled CAM and AAM. Given the scale of future material demand, recycling represents one of the UK's most critical components for long-term supply chain resilience.

To capture this opportunity, continued investment in research and innovation is essential. Key priorities include improving material recovery processes, developing direct recycling methods and ensuring that recycled outputs consistently meet the quality required for new battery production. Without this, recycled materials risk being viewed as inferior substitutes to virgin inputs.

An effective approach should focus on advancing recycling technologies (including direct methods and higher recovery rates across all chemistries), expanding research on safe and viable second-life uses and embedding design-for-recycling principles while supporting facilities and SMEs to scale. This would help reduce reliance on primary raw materials and further build UK capability to manage future end-of-life batteries.

Policy can help to create the conditions for growth. Initiatives that support second-life applications, encourage reuse and repurposing and promote 'design-for-recycling' standards would extend value and reduce waste. Financial support for recycling facilities, alongside incentives for SMEs and start-ups, will be critical to scaling these emerging technologies to commercial viability.

Domestic recycling capacity should be regarded as a strategic asset. It can reduce reliance on imported raw materials, cut environmental impacts and strengthen resilience to global supply disruptions. Clear and coordinated policy will be central to establishing the UK as a competitive location in the global recycling market.

EMR's EV battery recycling facility

8.5 Policy implications

The underdeveloped battery supply chain in the UK poses a significant barrier to investment by creating reliance on uncertain imports of critical materials. Without targeted policy action, this dependence will undermine competitiveness, discourage investment and limit tariff-free access to the EU market under the RoO legislation. At present, the UK is heavily reliant on imported CAM, which introduces cost volatility, long lead times and exposure to geopolitical risk. Developing domestic CAM production capacity would help reduce these vulnerabilities and enable the UK to capture greater value from its emerging gigafactory ecosystem.

To develop this domestic capability, CAM production should ideally be located near gigafactories. This approach would significantly reduce logistics costs and streamline the flow of raw inputs into cell manufacturing lines. It would also enhance supply chain resilience, helping the UK battery industry to compete globally and positioning it as a strategic hub for advanced battery materials in the wider European market. Given the scale of CAM production required, securing investment from an established NMC or LFP CAM producer to supply both the UK and EU markets appears the most viable route. This inward investment should be actively pursued to help the existing UK battery industry to establish itself and provide the UK automotive industry with UK-made cells and battery packs.

The UK's potential capacity of around 60 GWh, together with access to EU markets, provides strong incentives for CAM producers. However, CAM production in the UK faces several barriers that risk slowing the development of a competitive domestic manufacturing base. Addressing these barriers will require similar approaches to those taken to attract additional automotive OEMs and gigafactories. In particular, policy will need to address:

- Stricter RoO from 2027, which could deter investment in the UK by creating uncertainty and compliance risks before the UK battery supply chain is fully developed. Policy should deliver a phased transition or delay, alongside clear and unambiguous government commitment to the target.
- High industrial energy costs, which undermine competitiveness, particularly compared to international markets where energy subsidies are common.
- Planning support and infrastructure prioritisation, where complex and lengthy planning approvals, coupled with uncertainty over grid connections and site readiness, create delays that deter investors.

Recycling and circular economy capabilities should be treated as a strategic pillar of a competitive UK battery industry. Clear and consistent policy signals, from design-for-recycling standards to investment in large-scale facilities, are required to reduce dependence on imported raw materials and to capture the value of end-of-life batteries. Building UK recycling capacity now will strengthen resilience and lower long-term costs while creating a platform for future export growth.

To develop this domestic capability, CAM production should ideally be located near gigafactories.

9 Closing the competitiveness gap

Summary:

- Substantial and predictable energy cost incentives, together with structural reform of the energy market, are required to close the UK's competitiveness gap.
- Securing gigafactory investment depends on a visible pipeline of pre-permitted sites with established utility connections and supported by transport infrastructure.
- The UK's strong R&D base and SME innovation ecosystem need sustained support to scale and commercialise next-generation battery technologies, with a greater focus on manufacturability and cost reduction, in order to leapfrog competitors.

9.1 Overview

Findings from an assessment of the UK's automotive investment environment, based on industry engagement, international benchmarking and a business survey, identified five key competitiveness themes:[34]

- Labour cost and availability are top investor priorities, but the UK ranks only 13th of 23 for labour competitiveness reflecting higher costs and lower availability of skilled labour;
- Energy costs are a major competitive disadvantage, with the UK having the highest industrial electricity prices among 24 comparator countries. Around 75% of respondents rated energy cost as important or very important for investment decisions;
- Supply chain resilience is a concern, particularly for SMEs, with the UK ranking only 9th out of 11 for supply chain value added. Around 40% of manufacturing SMEs cite access to finance as the biggest challenge;
- Ease and speed of accessing government incentives is viewed as slow compared to other countries despite relatively generous support. Industry perception rated this 2.6 out of 5, while competitors such as the EU deliver grants on average much faster; and
- Political stability and government-industry collaboration are identified as key UK strengths with the UK ranked 7th of 25 for country risk premium. However, over 50% of the competitiveness drivers require better coordination across government departments, which remains inconsistent.

34 Automotive Council UK (2025). UK International Competitiveness Report 2025.

JLR - new manufacturing roles supporting production of electric Range Rovers and other next-generation EVs

Competitive and predictable energy prices are essential to protecting margins and sustaining the UK's role in the global EV value chain.

9.2 Energy costs

Electricity costs remain a significant constraint on the competitiveness of UK manufacturing. UK-based EIIs paid double the European average in electricity costs in 2024,[35] posing a major challenge to the UK ability to attracting future automotive and battery investments. Key structural drivers for high electricity prices include elevated grid access and transmission charges, and the reliance on natural gas for balancing, flexibility and system inertia of the grid. UK wholesale prices are more sensitive to price shocks in the gas market than markets with greater shares of nuclear, hydro or low-cost domestically produced fossil fuels. Crucially, current policies in the UK do not protect EIIs from this wholesale price volatility.

This situation is important as EV, battery and CAM production are all energy intensive processes. Recent analysis from SMMT underscores the severity of the UK's position in automotive production, ranking the country last for industrial electricity prices among major competitor economies. For battery production, it is a similar story. Electricity costs of a 10 GWh gigafactory account for ~26% of total cell production costs in the UK compared to ~14% in China.[36] Competitive and predictable energy prices are essential to protecting margins and sustaining the UK's role in the global EV value chain.

Automotive manufacturing and other EII stakeholders have welcomed the UK's Modern Industrial Strategy, which sets out the government's commitment to lowering electricity costs for all consumers in the UK. Measures include price relief through the British Industry Supercharger, including addressing high network costs through the Network Charging Compensation scheme, as well as efforts to accelerate grid connection timelines for major projects. Future interventions, such as the British Industrial Competitiveness Scheme, launching in 2027, will extend support beyond existing EIIs to a wider range of sectors including automotive.

While these initiatives are steps in the right direction, they remain insufficient to fully address the cost pressures facing EV, battery and CAM manufacturing. Further targeted intervention is required to ensure manufacturing in these industries remains viable and internationally competitive. Moreover, energy costs should be thought of as an early consideration for investors, as many potential projects are screened out at an early stage due to high UK energy prices. Positioning energy affordability upfront in investor engagement will help reduce the loss of investment opportunities and signal that the UK is proactively addressing one of the most significant barriers to competitiveness.

Electrode drying (one of the most energy intensive stages of the battery manufacturing process) at UKBIC

35 Department for Energy Security and Net-Zero (2025). Industrial electricity prices in the EU.

36 CRU Battery Cost Model – Based on the production of an NMC prismatic cell (November 2025).

The following considerations are therefore critical when engaging with existing stakeholders and attracting prospective OEMs to invest in the UK:

- **Provide clarity over existing energy cost policies:** UK energy costs reflect a complex mix of policy, network and wholesale costs that can cause confusion for investors, particularly those without an existing footprint in the UK. Government should clearly communicate how current measures and exemptions apply across different types of industrial users to ensure a consistent understanding for investors.
- **Position EII schemes as a standard element of offers:** The relief approach applied in recent investment deals for energy intensive users should be formalised and embedded as a core component of the UK's initial offer to organisations looking to establish EV, battery or CAM manufacturing in the UK. This measure will improve the credibility of the UK's proposition by ensuring that opening offers are competitive from the outset. Clear eligibility criteria should be set out from the outset, ensuring transparency and predictability for investors.
- **Link near-term relief with long-term market reform:** Even with enhanced support, UK industrial energy prices are likely to remain higher than those in the EU and US in the short term. To maintain investor confidence, near-term relief should be explicitly connected to a clear programme of market reform aimed at closing this structural cost disadvantage. This approach will signal to investors that the UK is not only managing immediate affordability challenges but is also committed to tackling the underlying drivers of high energy costs.

Agratas site, Bridgwater, Somerset, November 2025

9.3 Site identification and development

Securing gigafactory investment relies on a visible pipeline of investible sites. Site identification and development play a crucial role in overcoming investment barriers by ensuring that battery manufacturing projects have access to well-prepared and strategically located land with the necessary infrastructure already in place. In addition to site identification, fast-tracking critical connections to the grid, water and transport networks would further help de-risk investments and enhance the UK's competitiveness. Put simply, the more a site is pre-serviced and pre-permitted, the faster investors can reach an investment decision and the lower the delivery risk.

Global competitors have secured gigafactory and EV production projects by offering fully serviced, decision-ready land. By contrast, UK projects are often slowed by grid queues and uncertainty around off-site works. The UK Connections Action Plan aims to cut average transmission waits from around 5 years to about 6 months and unlock roughly 100 GW of capacity. In practice, an investible site is one where there is a single accountable front door for investors that confirms that:

- land is assembled and (where possible) pre-permitted;
- the grid solution and a confirmed place in the queue are secured under the new 'first-ready, first-connected' reforms;[37]
- road/rail access is agreed, ground conditions confirmed and utility corridors known with a reliable water supply and waste route in place.

When these are locked in and presented as a standard offer, time to agree investment projects is usually shortened, delivery risk falls and investment confidence rises.

UK existing strategy

The Modern Industrial Strategy[17] launched a £600 million Strategic Sites Accelerator to bring priority plots to market faster through fast track planning and by funding land assembly, land remediation, anticipatory grid capacity and transport improvements. The first wave is due within a year and the programme is UK wide.

Delivery is channelled through Industrial Strategy Zones (Freeports and Investment Zones), with streamlined planning (e.g., Local Development Orders/Mayoral Development Orders), investment promotion and access to concessionary finance. The Action Plan explicitly links these Zones to the Strategic Sites Accelerator and commits to targeted support for grid connectivity, including an upcoming Connections Accelerator Service for high-value projects.[38]

Reforms to the NSIP regime introduce a tiered pre-application service and a fast-track route aimed at making decisions within 12 months.[39] In addition, reforms to utility connections through the Connections Action Plan and Electricity System Operator shift the approach from 'first-come' to 'first-ready, first-connected'. The UK Battery Strategy reinforces these priorities, highlighting planning and permitting as a barrier and supporting faster grid connections for battery projects.[9]

37 Department for Energy Security & Net Zero, Ofgem (Nov 2023). Connections Action Plan.
38 Ministry of Housing, Communities & Local Government (June 2025). Industrial Strategy Zones Action Plan.
39 Planning Inspectorate (March 2024). Nationally Significant Infrastructure Reform.

These combined reforms form a coordinated package designed to generate a pipeline of investable and utility-ready sites. A notable example of this proactive approach to removing barriers is the West Midlands gigafactory site near Coventry (Box 9.1). This is now being actively positioned as investment-ready for a 60 GWh facility although, as of late 2025, investment is not yet confirmed and partner discussions continue.

Global competitors have secured gigafactory and EV production projects by offering fully serviced, decision-ready land. By contrast, UK projects are often slowed by grid queues and uncertainty around off-site works.

Box 9.1: Case study on site preparation – the West Midlands gigafactory

The automotive industry is a critical part of the West Midlands economy, with one third of all vehicles made in the UK produced in the region. The transition towards EV production has been identified by the region as an opportunity and local authorities, including Coventry City Council and Warwickshire County Council, have recognised that securing a gigafactory in the region would secure the future automotive industry. Stakeholders in the region have therefore been at the forefront of the UK's efforts to attract large-scale battery manufacturing, with the Coventry Airport site identified as a prime location. The site is strategically located within one of the UK's largest automotive clusters, close to OEMs, suppliers, and research institutions such as Warwick Manufacturing Group and UKBIC.

The Council has partnered with Coventry Airport Ltd to form a joint venture, taking on risk by progressing planning and site development without a confirmed investor. The partnership has secured outline planning consent for a 60 GWh gigafactory, potentially creating 6,000 jobs and attracting £2.5 billion in investment. Significant preparatory work has been undertaken, with over £400 million committed to developing road infrastructure around the site, as well as ongoing developments around utilities and power supply. The site, now called Greenpower Park,[28] is the only available site in the UK with planning permission for a gigafactory.

By investing upfront in servicing and grid readiness, local government has de-risked the location and created a 'shovel-ready' site ready for investment. Preparation has also included putting together a wider proposal for investment, which includes tax incentives and capital allowances.

Despite its strengths, the project would benefit from stronger collaboration with central government, as alignment between national, regional and local authorities is essential. The UK's slower and more complex incentive negotiations, compared to Europe, can make the UK's investment offer appear less agile and responsive to investors. A final critical barrier lies in demand, with investors seeking greater certainty before committing significant capital.

Agratas gigafactory, Bridgwater, Somerset, November 2025

Ongoing challenges

Despite a new strategy and progress under the above reforms, several delivery gaps remain. Gigafactory sites require specialist teams, flexible funding and targeted investor outreach. The Gravity site in Somerset where Agratas is developing their gigafactory illustrates what can be achieved but also the scale of the resources required. The site was pre-permitted through a Local Development Order and, as an Enterprise Zone, the authority can retain growth in business rates locally to finance site preparation. The £150m Locality Investment Plan covers site access, early energy connection, skills and major ground and water works.[40]

While the Office for Investment now provides a single point of contact for complex projects, it lacks the authority to convene departments and remove barriers in the way a Cabinet sub-committee would. Grid capacity also remains a material constraint, and although the Connections Accelerator Service is planned, operational detail and delivery timelines have yet to be set out.

To strengthen delivery, government and developers should establish consistent criteria on what qualifies as an 'investible site'. Alongside this, early-stage funding should be directed towards critical enablers such as grid and water design, with secure connection slots locked in to avoid future bottlenecks. Each priority site should integrate supplier-readiness and workforce skills support to accelerate operational readiness and create a stronger local ecosystem.

40 Somerset Council (May 2024). Gravity Enterprise Zone Investment Plan.
41 Hungarian Investment Promotion Agency (Aug 2022). CATL's New Battery Plant.
42 Presidency of the Republic of Turkiye (Oct 2023). Twelfth Development Plan (2024-2028).
43 Farasis Energy (April 2023). Joint venture Siro laid the foundation stone of the cell factory.
44 Economic Development Partnership of North Carolina (May 2023). NC Megasite Readiness Program Report.
45 Toyota Newsroom (Dec 2021). Toyota Selects North Carolina Greensboro-Randolph Site.

Box 9.2: International case studies

International experience from Hungary, Turkey and the United States highlights that successful gigafactory investment depends on strategically prepared sites supported by strong governance, coordinated delivery and clear institutional leadership. These cases suggest that the UK must combine strategic land preparation with coordinated delivery to compete for large-scale battery projects.

Hungary Debrecen industrial park

Hungary's Debrecen case shows how investable preparation can secure tier-1 battery projects. CATL committed to a 100 GWh plant on a 221-hectare plot in the Southern Industrial Park, citing proximity to European OEMs (Mercedes-Benz, BMW, Stellantis, Volkswagen), renewable electricity options and scope for local materials capacity. The Hungarian Investment Promotion Agency (HIPA) highlights Debrecen's infrastructure, logistics links, automotive base and competitive workforce and provides end-to-end support as a practical single front door.[41] This is underpinned by National Development 2030 and the Smart Specialisation Strategy (2021-27), which align national and regional priorities with EU funding. The project is Hungary's largest greenfield foreign direct investment, creating over 9,000 jobs. The Hungarian experience suggests that the UK should designate and pre-service large industrial parks near automotive hubs, appoint a single accountable lead to coordinate land, permits and utilities and present investors with a standardised site package that can speed up decisions and encourage commitment.

Turkey organised industrial zones

Turkey's model creates serviced, zoned land with clear governance, utilities and a defined site-selection process. Investors benefit from higher-quality infrastructure and lower uncertainty, with delivery overseen by the Ministry of Industry and Technology. This sits within a national framework prioritising competitive, green and digitally enabled manufacturing.[42] Siro, a joint venture between Turkish automotive OEM Togg and Chinese battery manufacturer Farasis Energy, illustrates how this preparation accelerates delivery: module and pack production began at Gemlik in March 2023, while the adjacent 60-hectare cell plant already has environmental approval, zoning and a construction licence, targeting first cells in 2026 and ramping to 20 GWh by 2031.[43]

United States North Carolina Megasite readiness

The North Carolina General Assembly established a Megasite Readiness Program,[44] providing funding to identify and evaluate sites, assist local governments in acquisition and coordinate environmental and transport agencies. Sites are scored against utility, transport and labour criteria, with works cost-planned to make them ready, creating a transparent pipeline for investors. Toyota selected the Greensboro-Randolph Megasite because its core attributes were proven up-front: onsite rail, highway, airport and port access, renewable energy availability, workforce quality and a strong state-local partnership.[45]

Employer partnerships with colleges and universities should start now to build relevant manufacturing skills

9.4 Skills development

The UK's prospects for gigafactory investment depend as much on workforce delivery as on cost and site readiness. Recent global analysis of the battery workforce underscores the importance of skilled labour as both an accelerator and a constraint on gigafactory delivery.[46] Evidence from major manufacturing projects reaffirms that access to a skilled workforce will determine whether investments meet their commissioning and ramp-up schedules. Other countries are facing similar issues, with hiring delays and lengthy onboarding often cited as major risks to operational efficiency.

Scaling and timing of skills needs

UK gigafactory delivery requires a phased workforce strategy, linked to site construction and production scale-up schedules. Early-stage roles focus on plant engineering, commissioning and equipment installation, but once manufacturing commences, most recruits are needed in high-volume operational production (an estimated 60-70%), quality control, technical support, equipment maintenance and facilities management (approximately 20%) and logistics (3-5%). Experience from early UK and European gigafactory projects demonstrates the need to recruit and train hundreds to thousands of workers and starting well in advance of the first production output.

A large majority of future gigafactory staff are already in employment elsewhere rather than coming from school or university. Long-term curriculum reform and employer partnerships with colleges and universities should therefore start now to build relevant manufacturing skills.[47] The key challenge for the UK is to create new courses for young people while also providing clear routes for existing workers to upskill, retrain and move between sectors through short courses and continuing professional development.

Faraday Institution PhD Researchers at Newcastle Battery School, 2023

46 Volta Foundation (Sept 2025). Battery Talent Census Report.

47 Raconteur - Germany's industrial skills shortage: challenges and solutions.

Around 65% of surveyed battery professionals indicated their day-one job readiness would have been improved by stronger foundational knowledge.

Nature of the skills gap

Skills shortages in battery manufacturing are driven by three main factors:

- Rapid scale-up requirements. Individual projects may require the recruitment and practical training of thousands of technical staff within 2-3 years. This places significant pressure on regional and local training providers who will need to develop bespoke modules or access accredited curriculum modules, secure specialised equipment and train their trainers to deliver high-quality accredited courses.
- Specialised technical knowledge. Only a small number of candidates currently possess hands-on battery manufacturing or transferable process experience, with most new hires requiring substantial upskilling through applied learning modules. In the short term, employers may seek to hire temporary workers from Europe to fill shortages.
- Foundational/soft skills. In addition to technical competencies, employers cite digital literacy, safety awareness and the ability to operate within highly automated environments as critical to productivity and plant reliability.

The Volta Foundation Battery Talent Census (2025) confirms that both technical and non-technical skills are required but at different stages. Manufacturing, process engineering and quality control expertise are valued to enter the field, whereas soft skills such as critical thinking, adaptability and communication are important for long-term advancement and leadership success. Around 65% of surveyed battery professionals indicated their day-one job readiness would have been improved by stronger foundational knowledge, with another 45% identifying practical, hands-on skills as essential.

UK skills delivery ecosystem and best practice

The UK's approach has evolved from ad hoc training to more systematic regional and national delivery. Programmes now focus on establishing a national skills framework, developing regional hands-on academies linked to manufacturers (such as those run by key universities and colleges) and creating new digital platforms for real-time workforce planning and micro-credentialing (i.e., short, accredited training modules).

Organisations leading UK battery skills initiatives are working with further education, industrial partners and local government to help operators and technicians from adjacent sectors, such as automotive, processing and logistics, move into battery manufacturing through tailored conversion courses (Box 9.3).

Battery technician training, University College Birmingham

Agratas Plant Quality Training Programme being delivered at UKBIC

Box 9.3: National skills programmes

A skilled and mobile workforce is essential for the UK's battery sector, but the national skills system remains at an early stage. A series of new programmes and pathways supported by the Battery Innovation Programme has been launched to address key skills gaps.

Electrification Skills Network (ESN): Coventry University, Enginuity, WMG and UKBIC develop common competency frameworks and map them to qualifications, giving providers a single reference point for curriculum design.

National Battery Training & Skills Academy (NBTSA): Newcastle University and New College Durham lead this academy, which will initially support AESC and its North East plants, delivering Level 2 and 3 technical training for battery operators and technicians. Programmes combine hands-on experience with clear pathways for progression and lifelong learning.

Digital Enhanced Battery Ubiquitous Training (DEBUT): Led by University College Birmingham (UCB) with consortium partners Warwick Manufacturing Group, Cranfield University, RAVMAC (a UK industrial digitalisation and training specialist) and JLR. Blends classroom teaching with virtual and augmented reality training simulations and an advisory group of employers to deliver courses at Levels 2-4, focused on production, maintenance and quality roles.

UKBIC Battery Manufacturing Training Programme: UKBIC offers a two-day 'Introduction to Battery Manufacturing' course and a suite of short 'Deep-Dive' courses (electrode, cell assembly, formation and battery management systems). Training takes place on gigascale equipment and is open to technicians, managers and SMEs nationwide.

Battery Manufacturing Technician Apprenticeship: A national apprenticeship skills programme developed for Cogent Skills for roles such as electrode technician, cell assembly technician, formation, ageing and testing technician, or module and pack technician (Level 3).

Battery Manufacturing Skills Pathway (B-MSP): City & Guilds-accredited pathway (Levels 2-3) launched by UCB; combines immersive digital tools with hands-on labs and is being piloted with SMEs and large OEMs.

South West Battery Skills Response (SWBSR): University Centre Somerset College Group, working with Agratas, is developing Level 2-3 curricula mapped to Agratas competency needs for a 4,000-strong Somerset gigafactory workforce; materials will be shared nationally.

While these initiatives form the foundation of a national training system, their success will depend on ensuring that qualifications are recognised consistently across the UK. This will enable workforce mobility and give investors the confidence that battery manufacturing skills are standardised and transferable nationwide.

While this is encouraging, more could be done by both industry and the UK government to support and sustain skills efforts at the scale, place and time required to meet the anticipated gigafactory demand, drawing on lessons from Europe and the US.[48]

European battery manufacturing skills programmes, for example, have established significant momentum through the European Battery Alliance (EBA) Academy, launched in 2022 with €10 million in EU funding.[49] The InnoEnergy Skills Institute-led initiative achieved over 100,000 course completions by 2024, although this represents individual course completions rather than unique trained workers. This approach emphasises standardised curricula delivered through distributed networks of local training providers across Member States, ensuring quality control while allowing regional adaptation to local gigafactory needs. Complementary programmes include the Erasmus+ funded VOLTAGE project,[50] which is establishing Centres of Vocational Excellence across Sweden, Finland, Germany, Portugal and Turkey as part of an international collaborative network for high-quality vocational education and training.

In the UK, the nuclear energy industry provides a powerful precedent for skills attraction in a sector facing similar skills and mobility challenges. The Destination Nuclear[51] programme brands the sector, aggregates vacancies and operates a national career portal to increase awareness and the uptake of training opportunities. A comparable 'Destination Batteries' initiative, potentially building on the Electrification Skills Network, could strengthen the visibility and appeal of the UK gigafactory sector as a key national industry for mid-career switchers and new entrants alike.

Ultimately, long-term UK competitiveness in battery manufacturing will depend on its ability to mobilise, train and retain a large and adaptable workforce at pace. This will require both immediate sector-wide upskilling as gigafactories begin operations and sustained investment in education and training to equip the workforce for emerging roles and technologies. Key delivery issues and risks to manage include the following:

- Success depends on early engagement with local colleges and reskilling networks well before production starts. Recruitment activity should align closely with project timelines, using staged intakes and guaranteed places on practical training programmes that deliver job-ready skills for each phase of gigafactory development.
- Immigration policy can support access to skilled technical staff, especially for initial commissioning and hard-to-fill technical roles. However, the workforce should predominantly be sourced domestically to ensure social and political acceptability.
- The gap between current education provision and industry needs should be closed. Curriculum reform is required across higher education and technical colleges, with a focus on growing the pipeline for talent in process engineering, battery safety, digital operations and advanced manufacturing. Strategic partnerships with European skills programmes such as EBA and VOLTAGE could also be pursued.
- Given the high mobility evident in the battery workforce globally, employers and policy must prioritise clear progression pathways and competitive employment conditions to avoid costly churn.

In the UK, the nuclear energy industry provides a powerful precedent for skills attraction in a sector facing similar skills and mobility challenges.

48 ICCT (Jan 2025). Powering the future: Assessment of US light-duty vehicle battery manufacturing jobs by 2032.
49 European Commission (2022). European Battery Academy launched to boost skills for fast-growing battery ecosystem.
50 Voltage - Vocational Training in the Battery Industry.
51 Destination Nuclear.

9.5 Research and commercialisation

The UK has been steadily investing its research infrastructure for battery technology. A network of specialised laboratories and research centres, both within universities and in independent facilities, supports innovation at different stages of battery development. Key facilities include:

- WMG Energy Innovation Centre at the University of Warwick and part of the High Value Manufacturing Catapult.[52] This national facility for battery research undertakes projects across the entire cycle of cell development from fundamental materials science to end-of-life recycling.
- UKBIC, which enables UK-based companies of all sizes to develop and scale up manufacturing capabilities.[53] The purpose-built, world-class facility and engineering team enables battery developers (from SMEs through to large OEMs) to design, prototype and optimise manufacturing processes ready for market.
- Advanced Materials Battery Industrialisation Centre (AMBIC), which complements both WMG and UKBIC, supports materials scale-up activities and bridges the gap between research and active material manufacturing.

The UK has also invested in a range of collaborative research programmes between academia and industry. Innovate UK manages mid-TRL (Technology Readiness Level) collaborative research and development funding competitions. This funding supports progression through the TRLs needed to improve battery performance in areas such as lifetime, range and recycling of batteries.

Other initiatives are explicitly focused on a particular industry. The Advanced Propulsion Centre works jointly with the automotive industry, academic institutions and UK government to accelerate the development of technologies that facilitate the shift towards vehicles with zero emissions. The Advanced Propulsion Centre has backed 354 low-carbon projects involving 614 partners and contributed to the creation or protection of approximately 59,000 jobs in the UK. In 2019, the UK government allocated the management of the ATF to the Advanced Propulsion Centre to accelerate the development of a UK supply chain for net-zero vehicles. These investments target areas such as batteries, motors, drives, power electronics, fuel cells, recycling and related supply chains.

The Battery Innovation Programme is a mission-based programme designed to develop and manufacture UK batteries for the electrification of vehicles and to help UK businesses seize the opportunities presented by the energy transition. The Battery Innovation Programme (formerly the Faraday Battery Challenge) has a budget of £452 million from 2026 to 2030 to invest in research, innovation projects and supporting facilities.[54] The Battery Innovation Programme combines early stage research funding through the Faraday Institution, collaborative business-led innovation through Innovate UK programmes, and scale-up and skills development through UKBIC.

These R&D investments underpin a wider SME innovation ecosystem supported by government programmes, world-class universities and access to venture capital. Initiatives such as Innovate UK, the Catapults and R&D tax incentives have helped sustain high levels of research activity, while government-funded facilities such as UKBIC and AMBIC have helped support scale-up activities. Despite these strengths, SMEs in the UK face several challenges such as barriers to EU trade, scaling constraints and shortages in STEM and technology skills. Although the UK performs strongly in generating startups, it often faces difficulties in scaling these companies and many are acquired by foreign firms. Strengthening interactions between SMEs, OEMs and the research base will be important to accelerate technology transfer.

Alongside improvements in existing lithium-ion technologies, the UK research system is developing next-generation chemistries such as sodium-ion, solid-state and lithium-sulfur batteries, where the UK has opportunities to leapfrog established incumbents. Programmes funded through the Faraday Institution, Innovate UK and the Battery Innovation Programme have begun to progress these technologies toward higher TRLs, but further work is required to address manufacturability challenges, cost reduction and industrial scale-up.

Ensuring that emerging UK-developed chemistries transition from the laboratory to pilot production will be critical to establishing the UK as a credible location for next-generation chemistries and advanced manufacturing processes. It is likely that future funding will need to place greater emphasis on commercialisation to support scale-up beyond research and early development to progress technologies into pilot and commercial production. International research partnerships will also be needed with partners in the EU, US and Japan and there is likely to be substantial opportunities to develop strengths in next-generation applications beyond automotive markets.

From a commercial perspective, the UK ranks fourth globally for venture capital investment in EV batteries, with companies such as Nexeon and Zenobē accounting for a significant share of this activity. UK-based startups and SMEs operate across a wide range of sectors, including battery recycling, battery management systems and battery manufacturing, with key players such as Breathe Battery Technologies, Altilium and Nexeon developing innovations across the battery industry.

University of Nottingham Future Propulsions Lab

52 WMG - Energy Innovation Centre.
53 UKBIC (July 2022). Pioneering a Greener Future.
54 UKRI, Battery research, innovation and manufacturing scale-up funding.

Battery researcher, University of Oxford

9.6 Policy implications

Findings from the UK Automotive Council's Competitiveness report highlight energy, transport and labour costs as persistent disadvantages alongside supply chain vulnerabilities. At the same time, the UK benefits from higher productivity compared to many competitors and from strong research and innovation capabilities. Converting that strength into an investment advantage will require strong and coordinated government engagement to attract international investors and ensure the UK remains a credible location for large-scale battery manufacturing.

High industrial energy costs remain a key barrier to attracting and sustaining investment in UK battery manufacturing. Policy must provide substantial and predictable cost relief while also delivering structural reforms. These steps are essential to bring UK industrial electricity prices closer to those of competitor countries and give investors confidence in long-term cost stability.

Securing a visible pipeline of investible sites is also essential. Investors require land that is pre-permitted, grid- and water-connected and supported by transport infrastructure. Government should move from piecemeal preparation towards a coordinated national offer that packages land, utilities, planning certainty and workforce readiness under a single accountable 'front door'.

Existing funding for research and innovation across the battery sector has helped address fundamental challenges in both existing and next-generation battery technologies. More recent funding rounds from the Faraday Battery Challenge have seen a shift in focus towards taking these innovations from the laboratory into production. The UK's strong R&D base and SME innovation ecosystem can only translate research breakthroughs into competitive advantage if supported by deliberate scale-up pathways and sustained investment in innovation.

Future research activities should therefore aim to leapfrog competitors by continuing to move next-generation technologies, such as solid-state and lithium-sulfur batteries, into production at scale, with an increased focus on manufacturability and cost reduction to ensure competitiveness. Delivery of this will require alignment between research bodies such as the Advanced Propulsion Centre, Battery Innovation Programme and industrial partners to ensure progression from early-stage research through to commercialisation.

This focus on innovation in next-generation chemistries must be coupled with skills development in the battery sector as well. A coordinated national skills framework is also vital to ensure training keeps pace with the growth of the industry. Early engagement with colleges and reskilling networks will enable recruitment at scale, while curriculum reform and new career pathways can expand and retain the skilled workforce needed for new gigafactories.

The UK's strong R&D base and SME innovation ecosystem can only translate research breakthroughs into competitive advantage if supported by deliberate scale-up pathways.

Prototype cell manufacturing line, WMG

10 Reform of policy and regulation

Summary:

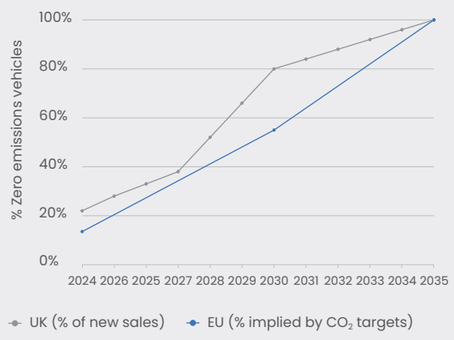
- Closer alignment of the UK ZEV mandate with the EU regulatory timeline would reduce the risk of production moving offshore, maintain regulatory ambition on EV adoption and support the competitiveness of UK-based manufacturing.
- Deferral of the 2027 RoO deadlines within the UK-EU Trade and Cooperation Agreement, calibrated to progress on UK-European supply chain development, would mitigate cliff-edge risks to UK-EU EV trade and provide a more stable environment for investment.
- The UK should define a clear strategy for engagement with EV and battery manufacturers in Asia, particularly China, balancing openness to investment and technology collaboration with safeguards for IP protection, supply chain security and national interest.

10.1 Reform of the ZEV mandate

The UK ZEV mandate sets out a legally binding pathway requiring all new cars and vans to be zero-emission by 2035 (Figure 10.1). By 2030, 80% of new cars and 70% of new vans sold in Great Britain must be zero emission, rising to 100% for both categories by 2035. The 2025 revision maintained this pathway but allowed hybrid vehicles to continue to be sold until 2035. Manufacturers must meet these targets but can offset shortfalls using credits carried over from earlier years or borrowed from future years.

The UK ZEV mandate influences UK vehicle production through its effect on domestic sales and through its impact on OEM profitability and investment decisions. The mandate shapes global OEM perceptions of the UK market, as compliance costs influence expected profitability and in turn decisions on whether to allocate investment to the UK. The current structure, where targets run ahead of consumer adoption and are linked to compliance penalties, could increase commercial risk for manufacturers and deter investment in UK production. In contrast, the stretching nature of the ZEV mandate could act as a positive demand signal for new or EV-focused OEMs, serving as a differentiator for the UK relative to the EU and improving its attractiveness as a location for all-electric vehicle production. International ZEV regulations also affect the production mix of UK plants as most UK-built vehicles are exported.

Figure 10.1
Pathway for UK sales of zero-emission vehicles (2024 to 2035)



Source: DfT Zero Emission Vehicle current mandate, ICCT Policy Update (May 2023). Numerical data for figures.

In the EU, the regulatory approach is based on manufacturer fleet-average CO_2 performance standards rather than a direct ZEV sales mandate. These standards require average emissions from the sales of new cars to be 55% lower by 2030 compared to 2021, and a 100% reduction by 2035. A reasonable estimate is that the 55% reduction target would correspond to around 55-65% of new car sales being battery electric vehicles (BEVs) by 2030. The actual share of BEVs required in 2030 will depend on how manufacturers balance zero-emission models with efficiency improvements and hybrid sales to meet the target.

The current structure of the UK's ZEV mandate presents a challenge for the domestic automotive manufacturing sector. By setting ambitious targets that run ahead of underlying consumer demand and linking compliance to financial penalties, the policy introduces significant commercial risk for manufacturers, which is then reflected in a higher cost of capital. This is particularly relevant given the high capital intensity of the sector and the narrow profit margins on BEVs. As a result, there is a risk that the mandate could deter new investment, reduce model allocation to UK plants and lead to a gradual decline or offshoring of UK production.

A more effective approach would be to recalibrate the mandate to reflect both the pace of market adoption and the regulatory trajectory set by the EU. This should include removing existing penalties and disincentives for non-compliance with the regulations, as these deter further investment in EV manufacturing in the UK given the high thresholds set in the existing targets. Resetting the 2030 requirement to around 50-60% of new car sales, while retaining the 2035 phase-out, would reduce UK-specific risk, lower compliance costs and create a more credible environment for investment. Industry has consistently argued that the current 80% target is out of step with consumer demand and charging infrastructure readiness, with EU alignment seen as more achievable and more likely to sustain vehicle production in the UK.

Building on the removal of compliance penalties, targeted measures should be used to stimulate demand. Priorities could include support to improve EV affordability in mass-market segments, stable incentives for fleets and maintaining VAT parity between home and public charging. Allowing hybrids and other lower-carbon vehicles to play a greater transitional role until 2035 to bridge the reduced EV mandate would also help ease affordability pressures and maintain consumer confidence while charging networks and grid capacity expand.

It is important that the mandate is reviewed regularly through a government-industry mechanism. The review should track progress on demand and affordability, charging and grid readiness, domestic manufacturing capability and RoO compliance. Current forecasts indicate a potential shortfall of around 25% by 2030 if trends continue. Linking any future increases in targets to clear evidence of progress would reduce the risk of production shifting offshore.

A more effective approach would be to recalibrate the mandate to reflect both the pace of market adoption and the regulatory trajectory set by the EU.

10.2 Tariffs and trade

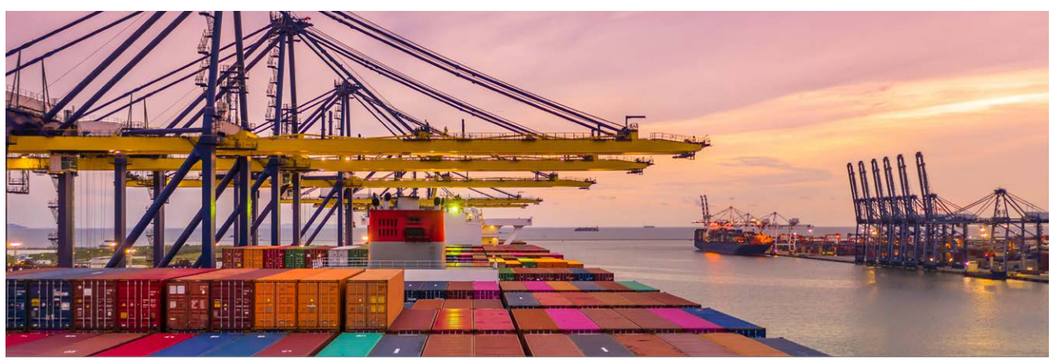
The UK-EU Trade and Cooperation Agreement (TCA) is the post-Brexit treaty governing trade between the two parties. It allows tariff- and quota-free trade in goods, provided the relevant RoO are met. To qualify, goods must be considered to be originating within either the UK or the EU. Materials originating in the UK can be treated as EU-origin materials, and vice versa, provided the goods undergo further processing within one of the territories.

Under the TCA, EVs and batteries traded between the UK and the EU benefit from zero tariffs if they meet the specific RoO outlined in Table 10.2. A 10% tariff applies to any EVs or batteries that do not meet these requirements. Both the existing and future RoO are detailed in the table.

Table 10.2:
RoO relating to batteries produced in the UK

	RoO requirements before Jan 1st 2027	RoO requirements after Jan 1st 2027
Battery cells for use in EV packs (includes plug-in hybrids)	Cells can be made with imported materials; Or Value of non-originating materials used to manufacture the cell must not exceed 70% of the total cell value.	Cells can be made with imported materials, but must use originating CAM; Or Value of non-originating materials used to manufacture the cell must not exceed 35% of the total cell value.
Battery packs for EVs (includes plug-in hybrids)	Packs can be made using non-originating cells; Or Value of non-originating materials used to manufacture the pack must not exceed 70% of the total pack value.	Packs can be made using originating cells with originating CAM; Or Value of non-originating materials used to manufacture the pack must not exceed 30% of the total pack value.
All other batteries under 85.07. (Harmonised system code for electric storage batteries)	Cells can be made with imported materials; Or Value of non-originating materials used to manufacture the battery must not exceed 50% of the total battery value.	No change in ruling.
Hybrid vehicles	Value of non-originating materials used to manufacture the vehicle must not exceed 60% of the total vehicle value.	Value of non-originating materials used to manufacture the vehicle must not exceed 45% of the total vehicle value.
Plug-in hybrids and full electric vehicles	Value of non-originating materials used to manufacture the vehicle must not exceed 60% of the total vehicle value.	Value of non-originating materials used to manufacture the vehicle must not exceed 45% of the total vehicle value, but the battery pack must be considered originating.
Other vehicles under 87.02 to 87.04. (Harmonised system code for different vehicle types)	Value of non-originating materials used to manufacture the vehicle must not exceed 45% of the total vehicle value.	No change in ruling.

Source: TCA Agreement (pages 464 to 477).



As outlined previously, the active materials of the cell, particularly the cathode, represent the most significant cost components of the battery. The RoO outlined above imply that the most straightforward path to ensuring UK-produced cells (and battery packs) qualify as originating products is for them to include UK-produced CAM. AAM could also be produced in the UK and would contribute to RoO, but because they represents a much lower share of battery value they are not critical as CAM. Other cell components (cell casings, separators, electrode foil, electrolyte) could also feasibly be produced in the UK, however many of these are already available from established European suppliers and therefore not a crucial factor to meeting RoO requirements.

The tightening of RoO from January 2027 presents a significant risk to the competitiveness of UK automotive production. Given the limited near-term availability of cathode and anode material production in both the UK and Europe, UK-assembled vehicles will struggle to qualify as originating and could face a 10% tariff on exports to the EU. To mitigate this risk, the UK should advocate for a deferral or phased transition of the 2027 deadlines. Such an approach would provide industry with greater certainty, safeguard export access and support continued investment in UK vehicle and battery manufacturing. Separately, clarification is required for UK-based OEMs on product-specific rules relating to CAM supply. This will enable manufacturers to understand more clearly how post-2027 RoO thresholds can be met and the timelines for doing so.

In addition to the RoO, compliance with the EU Battery Regulation will be required for UK automotive exports, particularly regarding the Battery Passport and recycling targets (Box 10.1). Although the regulation does not apply in the UK, the government has indicated an intention to align domestic battery regulations with the EU Battery Regulation.

The tightening of RoO from January 2027 presents a significant risk to the competitiveness of UK automotive production.

Box 10.1: The EU Battery Regulation

In August 2023, the EU Battery Regulation entered into force, creating a comprehensive legislative framework for sustainable batteries. The regulation applies to all batteries including:

- EV batteries;
- Portable batteries;
- Industrial batteries (>2kWh);
- Starter, lighting and ignition batteries (used mostly for vehicles and machinery); and
- Batteries for light means of transport such as e-bikes and e-scooters.

The regulation sets out a series of rules covering the entire lifecycle of batteries, including targets for waste collection, mineral recovery, recycling efficiency, recycled content and carbon footprint. Of these rules, the minimum recycled content thresholds are particularly significant. By August 2031, batteries sold in the EU must contain at least 16% cobalt, 6% lithium, 6% nickel and 85% lead sourced from recycling (if they contain these elements). These targets are set to rise further by 2036. The rules are designed to stimulate demand for recycled inputs, reduce Europe's dependence on virgin raw materials and encourage investment in recycling infrastructure.

Compliance must be demonstrated through the Battery Passport system. The Battery Passport is a mandatory digital record that will track the carbon footprint, material composition, supply chain and recycled content of every battery placed on the EU market. This system, due to be fully rolled out by 2027, aims to ensure transparency, traceability and compliance across the entire battery value chain.

For UK manufacturers exporting batteries (including EVs) to the EU, this creates immediate challenges. The UK's domestic recycling capacity remains limited, and the availability of recycled materials is constrained. Exporters could rely on imports of recycled raw materials from Asia, particularly China, but these materials would not help UK exporters meet RoO requirements. The UK will therefore need accelerated investment in large-scale recycling facilities, not only to produce recycled materials that meet the EU Battery Regulation standards but also to ensure that exports to the EU can qualify for tariff-free trade under the RoO.

10.3 International relationships

Engagement with China

In terms of global relationships, the most important issue for the UK Government to clarify is the approach to China, given its dominant position in the EV and battery industries. Leading companies such as CATL (world's largest EV battery manufacturer), BYD (EV and battery manufacturer) and Geely (a major Chinese automaker expanding into EVs) are driving global competition through cost reduction and rapid innovation. To ensure the UK can engage with these leading companies, the UK's position on cooperation with Chinese OEMs and the use of Chinese battery technology in critical sectors (e.g., defence and aerospace) should be clarified.

Box 10.2: China's industrial strategy for EV and battery leadership

China's rise as a global leader in EVs and batteries has been driven by an industrial strategy that aligned national R&D programmes and Five-Year Plans towards electrification as far back as the early 2000s. Since then, consumer incentives, performance-based standards, credit mandates and large-scale infrastructure investment have been combined with coordinated finance and land-use support to lower costs, accelerate scale and de-risk investment. China's industrial strategy treats EVs and batteries as linked but distinct policy arenas - stimulating demand and vehicle supply on one side, while scaling battery and materials supply chains on the other.

The competitiveness of China's EV and battery companies reflects the deliberate coordination of industrial policy and firm-level innovation within a national ecosystem that lowers commercial risk and accelerates technological development. However, this does not necessarily reflect underlying market competitiveness as performance often depends on state-backed incentives. This distinction is crucial when assessing supply chain strategies, particularly in understanding the risks to the UK, as reliance on Chinese OEMs also implies a degree of reliance on the Chinese government.

Collaborating with Chinese OEMs would allow the UK to benefit from the technologies and production methods developed by these companies. This approach has already been pursued by countries such as Hungary, which recently attracted investment from BYD. To manage potential risks, the UK could introduce safeguards such as supply chain traceability (e.g., battery passports) and compliance with circular economy regulations.

Competing directly with Chinese OEMs may be more difficult for the UK. However, strengthening the UK's industrial capacity through policy support would help build resilience and reduce reliance on overseas suppliers. While this approach may deliver slower near-term returns compared to foreign OEM-led investment, it would enhance long-term competitiveness.

A third option would be to partner with other non-Chinese battery and EV manufacturers, such as LG and Hyundai, to diversify investment and technology supply chains.

Relationship with EU regulation

A related issue, which could influence future Asian investment, is the UK's regulatory position relative to the EU. The UK could pursue a differentiated regulatory framework from the EU to attract investment from non-EU manufacturers and position itself as a lower-cost, higher-flexibility production hub. By adopting streamlined standards on battery carbon footprint reporting, supply chain traceability and recycling, the UK could reduce compliance costs for investors and accelerate project timelines. This approach may appeal to global OEMs from Asia seeking faster or less complex routes to market than those available under EU regulations.

Collaborating with Chinese OEMs would allow the UK to benefit from the technologies and production methods developed by these companies.

10.4 Policy implications

The current ZEV mandate risks undermining UK production by setting requirements that outpace consumer demand, charging infrastructure and affordability. Policy should consider recalibrating the targets to better align with consumer uptake and the EU's trajectory while maintaining the 2035 phase-out date. This would reduce regulatory risk, improve the investment environment and ensure the UK remains an attractive location for new vehicle and battery production.

RoO provisions under the UK-EU TCA mean that without domestic CAM and related active material capacity (or the ability to source these materials from the EU), UK-assembled batteries and EVs may face tariffs from 2027. Government policy should prioritise CAM investment so batteries and EVs can remain eligible for tariff-free trade with the EU.

Global competition, particularly from Chinese and other Asian manufacturers, is reshaping EV and battery markets. The UK must remain open to investment and partnerships while managing risks through transparent oversight, supply chain standards and alignment with international regulations. A balanced UK approach that combines cooperation and competition will strengthen domestic capability while ensuring resilience against overdependence on any single region.

The UK must remain open to investment and partnerships while managing risks through transparent oversight, supply chain standards and alignment with international regulations.

e-POWER Qashqai production, Nissan Sunderland, 2025

11 Governance and delivery

Summary:

- Previous successful large inward investments highlight the importance of strong ministerial sponsorship, clear targets, industry engagement and dedicated resources to attract private capital and sustain the pace of delivery.
- A Cabinet minister should hold direct accountability for securing OEM, gigafactory and CAM investment, with authority to convene departments, resolve disputes and escalate issues directly to the Prime Minister or Chancellor when required.
- The minister should have a proactive investment and prospecting mandate, supported by the Office for Investment as the investor front door, and reinforced by ministerial taskforces to deliver projects quickly and efficiently.

11.1 Institutional models and lessons learnt

High energy costs, supply chain fragility and limited long-term planning constrain the UK's relative competitiveness. The challenge of securing investment in this context cuts across energy, trade, business, planning and local government. Current institutional structures are therefore not well-suited to attracting OEM, gigafactory and CAM investment. In short, existing delivery mechanisms remain fragmented, reactive and slower than international competitors with more integrated industrial strategies.

Learning the lessons from the Office for Life Science (OLS, Box 11.1), delivery must be driven by a small empowered central team with the authority and capacity to convene decision-makers and drive cross-government action. It should be backed by strong ministerial and industry-led governance to secure commitment and credibility. A ring-fenced budget, formal powers and clear targets will also be vital for swift and effective implementation.

Box 11.1: The Office for Life Sciences

The OLS is a joint unit of the Department for Business and Trade and the Department of Health and Social Care, established to strengthen the UK life sciences sector and accelerate the development and adoption of healthcare innovation. It champions research and innovation, helping to translate UK science into NHS adoption and commercial products to support growth across pharmaceuticals, biotech and medical technologies.

OLS was created in 2009 to bridge the gap between the UK's world-leading research base, slower commercialisation and adoption of innovation within the NHS. It coordinates activity across government to attract investment, improve regulation and accelerate the uptake of new innovations, as well as champion the NHS as a testbed for innovation. The model integrates industry, academia and the NHS to form a connected 'healthcare economy'.

OLS was created in 2009 to close the gap between the UK's world-leading research base and slower commercialisation.

Key achievements include the following:

- Supported over £3.5 billion in private investment and 11,000+ jobs in the sector since 2011;
- Leveraged £250 million through the Biomedical Catalyst and £1 billion in follow-on investment;
- Facilitated major innovation programmes including the 100,000 Genomes Project, Early Access to Medicines Scheme and the NHS Test Bed Programme;
- Helped the UK to become a top destination for clinical trials.

OLS benefits from being embedded in both economic and health departments, allowing coordination of funding, regulation and innovation adoption. Strategic direction is overseen by the Life Sciences Council, a high-level forum co-chaired by ministers and industry leaders. However, challenges remain in adopting innovation within the NHS and in maintaining momentum through political cycles. OLS operates without a standalone budget or statutory powers, relying on departmental collaboration and ministerial support.

Scientist working with petri dishes in laboratory

11.2 A central delivery model for investment

To compete credibly for an OEM and gigafactory investment, government needs to sharpen accountability for delivery at the centre. Increased accountability should help to reinforce the measures outlined in the Harrington Review[55] to shift the UK to a more proactive approach to inward investment and the proposed incentives to improve the business environment.

A Cabinet-level minister should be identified and given personal accountability to the Prime Minister and Chancellor for delivering inward investment into the UK. Rather than waiting for inbound approaches, the minister's role should be to prospect actively for a qualifying EV manufacturer, a battery manufacturer and an active materials manufacturer willing to invest simultaneously in the UK.

A clear benchmarked opening offer should be developed with flexibility to negotiate on a deal-by-deal basis. Each offer should include conditions on UK production, supply chain commitments, milestones, transparency and clawback to safeguard public resources and demonstrate that the UK can deliver complex investments credibly and efficiently.

The central team should remain deliberately small but fully empowered. The minister should be supported by a small secretariat able to run minuted cross-Whitehall meetings (including, where necessary, directly with the National Grid, Highways England, local planning departments, public utilities and UK financial institutions), set deadlines and maintain a single authoritative view of the investor pipeline and the UK's opening offer. To ensure coordination, at least one member of the minister's secretariat should be a secondee from the Office for Investment with an explicit remit to liaise between the new secretariat and that Office.

In order to give the accountable minister the necessary power to deliver, they should chair a newly established Cabinet sub-committee with authority to convene departments, resolve inter-departmental conflicts and remove barriers to the potential investments (e.g., in relation to the national grid and planning issues).

Industry expertise, continuity and transparency should also be built into the model. The minister's secretariat should include a secondee from industry to ensure commercial realism, a small bipartisan advisory panel should provide continuity across political cycles, and the minister should publish a delivery charter within 90 days setting out milestones and responsibilities as well as a quarterly scoreboard of progress.

The minister should enter negotiations with a credible, benchmarked opening offer and flexibility to tailor terms on a deal-by-deal basis, subject to approval by the newly established Cabinet sub-committee. Equity participation should not be excluded, and all offers should carry clear conditions on UK production, milestones, transparency and clawback.

This model (summarised in Box 11.2) concentrates authority where it counts. Lessons from recent large inward-investment projects show that small empowered central teams, backed by direct ministerial authority exercised through a focused Cabinet sub-committee, can remove barriers at pace. A mandate to pursue all three required investments actively and simultaneously, supported by existing institutions, minimises duplication and demonstrates that the UK can move at international deal speed.

A Cabinet-level minister should be identified and given personal accountability to the Prime Minister and Chancellor for delivering inward investment into the UK.

55 HM Treasury (November 2023). The Harrington Review of Foreign Direct Investment.

Box 11.2: A central delivery model for securing OEM and gigafactory investment

Securing simultaneous investment from EV, gigafactory and active material manufacturers requires a delivery model driven from the centre of government. This requires clear commitment from Number 10, accountability for an empowered senior minister and strengthened cross-Whitehall coordination to demonstrate to investors that the UK can act at pace. The key elements of such a model are as follows:

- A Cabinet minister should be given visible personal accountability for securing the OEM, gigafactory and CAM package.
- The accountable minister should be expected to devote a considerable proportion of their time to the task and act proactively by prospecting for the required simultaneous investments, rather than relying solely on inbound interest.
- By chairing a newly established Cabinet sub-committee, the accountable minister should have authority to convene departments, resolve disputes and escalate issues to the Prime Minister and Chancellor when required.
- The accountable minister should be supported by a small secretariat at the centre. This secretariat should include at least one secondee from the Office for Investment (to ensure cross-government coordination) and at least one industry secondee to ensure commercial realism in negotiations and delivery.
- A credible, benchmarked opening offer should be developed with flexibility to tailor terms on a deal-by-deal basis, including equity participation if appropriate.
- Continuity and transparency should be reinforced through a small bipartisan advisory panel and a published delivery charter with milestones and a quarterly scoreboard.

11.2 Policy implications

Securing a major OEM, gigafactory and CAM investment will require stronger delivery arrangements at the centre of government. A senior minister with clear accountability, supported by a small secretariat, should have the authority to convene departments, resolve disputes and escalate issues where necessary.

AESC gigafactory, Sunderland, 2022

Agratas gigafactory, Bridgwater, Somerset, October 2025

12 Summary and timeline

Battery manufacturing is central to securing the UK's industrial resilience, global competitiveness and transition to net zero. However, UK capacity remains insufficient and without additional investment the country risks increased import reliance and declining competitiveness in automotive manufacturing. Other countries are moving quickly, with the US and EU launching large-scale investment programmes, while the UK's position remains constrained by high energy costs, limited supply chain depth and fragmented delivery.

The UK automotive industry is also under stress. UK vehicle production has fallen from a peak of 1.8 million units in 2016 to an average of around 1.0 million in recent years, reflecting pandemic-related disruptions and structural changes in the global automotive industry.

The UK has a narrow window to secure its place in the global battery race. Other countries are moving fast with clear offers to investors, coordinated support across government and significant financial backing. If the UK is to compete, action must be taken now, with clarity of purpose and a strong sense of urgency. The strategy is clear: attract a global OEM to anchor investment, accelerate the next gigafactory and ensure that the UK can offer a competitive and investable supply chain. This must be supported by decisive action at the centre of government, with a single point of accountability and a clear investment offer.

The strategy is clear: attract a global OEM to anchor investment, accelerate the next gigafactory and ensure that the UK can offer a competitive and investable supply chain.

The UK retains strong capabilities in R&D and engineering that can underpin long-term competitiveness if matched by decisive delivery. To move from strategy to delivery, a small set of urgent actions (linked to our 10 recommendations detailed in the executive summary), are required in the first instance:

- Appoint a Cabinet minister, supported by a small team or secretariat, with the authority to convene across departments and lead delivery.
- Define a credible UK offer for priority OEMs, with senior-led engagement, tailored incentives and fast-track, permit-ready sites.
- Secure gigafactory investment linked to OEM commitment, aligning vehicle demand with cell manufacturing to accelerate delivery.
- Establish a programme to secure CAM and AAM inward investment, focused on Asian investors and demand aggregation where necessary across OEMs and gigafactories, while also identifying priority sites and securing precursor and recycling inputs.
- Extend industrial energy support across the supply chain and set out how energy costs will be closer to European peers by 2030.
- Begin the reform of the ZEV mandate and engagement with EU partners to delay the implementation of the RoO requirements.

The next 12-18 months will be decisive. If these steps are taken with urgency, the UK can land a major OEM, bring forward new gigafactory projects and give confidence to investors that the UK is serious about competing. Delay will see projects go elsewhere. The goal is straightforward: a credible, competitive and joined-up UK offer that delivers investment at pace, secures the future of the automotive industry and anchors a new generation of high-value manufacturing jobs.

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Appendix A:
The Commissioners and Secretariat

Commissioners

The Commission is composed of senior cross-party political figures and industry leaders, combining political experience with frontline sector knowledge.

Rt Hon Lord John Hutton (Chair)
Former Secretary of State for Defence

Rt Hon Greg Clark
Former Secretary of State for Business, Energy and Industrial Strategy; Chair of the Society of Chemical Industry; and Chair of the University of Warwick's Innovation District

Dr Isobel Sheldon OBE
Chief Executive Officer of Western CAM

Rt Hon Baroness Lindsay Northover
Member of the House of Lords Science and Technology Committee

Rt Hon Sir Oliver Letwin
Former Minister for Government Policy and Chancellor of the Duchy of Lancaster; currently Senior Adviser to the Faraday Institution

Dr Ian Constance
Chief Executive of the Advanced Propulsion Centre UK

Secretariat

The Commission has been supported by the Faraday Institution, which has acted as the secretariat. The core Faraday Institution team comprised:

Professor Martin Freer
Chief Executive Officer

Stephen Gifford
Chief Economist

Matt Howard
Chief Strategy Officer

Dr John-Joseph Marie
Principal Analyst

Ciara Alleyne
Intern Analyst

In addition, Dr Hadi Moztarzadeh (Head of Technology Trends) at the Advanced Propulsion Centre contributed to the collection and synthesis of views from industry stakeholders.

The Faraday Institution is the UK's independent institute for electrochemical energy storage research, skills development, market analysis, and early-stage commercialisation. It brings together research scientists and industry partners on projects with commercial potential that will reduce battery cost, weight, and volume; improve performance and reliability, and develop whole-life strategies including recycling and reuse. The Faraday Institution is a delivery partner for the Battery Innovation Programme, delivered by Innovate UK.

THE FARADAY INSTITUTION

Appendix B:
Stakeholder engagement

The Commission undertook a series of structured discussions with the following automotive OEMs, battery manufacturers, materials suppliers and recyclers.

- Agratas
- Altilium
- Automotive Council
- BMW
- Cornish Lithium
- Cummins
- Echion
- Fortescue
- JLR
- Leyland DAF
- McLaren
- Society of Motor Manufacturers & Traders (SMMT)
- Stellantis
- Toyota
- Volklec

These stakeholders were consulted to provide insights and evidence to inform the Commission's work. The companies are not responsible for the report's findings or recommendations and their engagement with the Commission also does not imply any endorsement of them.

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