



House of Commons
Business and Trade Committee

Batteries for electric vehicle manufacturing: Government Response to the Committee's First Report of Session 2023-24

Second Special Report of Session
2023–24

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Business and Trade Committee

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Second Special Report

The Business and Trade Committee published its First Report of Session 2023–24, [Batteries for electric vehicle manufacturing](#) (HC 196), on 21 November 2023. The response was received from the Department for Business and Trade on 22 January 2024. The response is appended to this Report.

Appendix: Department for Business and Trade Response

Gigafactories in the UK

1. *In the forthcoming UK Battery Strategy, the Government should specify the extent to which future demand for batteries in the UK should be supplied by domestic sources in 2030 and 2040, along with a 10-year plan for scaling-up this capacity and an estimate of the public money required to do so. To match our competitors, the UK Government should consider targeting at least 90% of the UK's annual demand for batteries to be met from domestic supplies by 2030.* (Paragraph 16)

- A) The UK Battery Strategy sets out the Government's vision to achieve a globally competitive battery supply chain that supports economic prosperity and the net zero transition by 2030. It will enable the UK to be a world leader in sustainable battery design and manufacture, underpinned by a thriving battery innovation ecosystem. The document outlines the Government's activity to support our strategic objectives and establishes the framework and priorities for our future work with industry. Our focus and objectives are centred around building on our comparative advantage, scaling up our emerging supply chain, and securing internationally mobile investment.
- B) The UK Battery Strategy has not set fixed targets across the supply chain for domestic manufacturing capacity, as developments will continue to be driven internationally and it is important that we remain flexible to changing global markets and opportunities. It is not possible (or even desirable) for the UK to onshore all aspects of critical mineral supply chains. Resilient global supply chains have a diverse supply base and rely on global markets and an effective trading system. The UK and others benefit from such a system, and we will work with our partners to promote it. Respondents to the Call for Evidence highlighted that having an entirely domestic UK battery supply chain is unlikely feasible and often not desirable in promoting resilience.
- C) The majority of projected battery demand is made up by EV batteries and there is a significant opportunity for the UK as domestic and global demand for batteries increases. The Faraday Institution estimate that demand for UK battery manufacturing capacity will reach around 100GWh per annum in 2030, increasing to nearly 200GWh by 2040, predominately for private cars and light commercial vehicles (LCVs).
- D) The Department for Business and Trade will continue to ensure that existing public funding is used in a targeted and strategic way across all our programmes to support battery manufacturing, including the Advanced Manufacturing Plan and Auto2030.

- E) The Critical Imports and Supply Chains Strategy will help UK business build secure and reliable supply chains, which are vital to the UK's economic prosperity, national security and the delivery of our essential services. The Strategy sets out how government is working with business and international partners to build resilient supply chains, demonstrating that the UK is a safe and reliable place to do business. This strategy outlines the actions we are already taking and the next phase of work across five priority areas:
- I. Making the UK government a centre of excellence for supply chain analysis and risk assessment. We will build on our existing expertise to better understand the goods and the broader supply chain systems, including transport routes and infrastructure, that the UK needs now and in the future.
 - II. Removing critical import barriers to support the UK's business-friendly environment. The government is committed to ensuring that the UK is a reliable, supportive place to do business where firms can import the goods they need efficiently.
 - III. Building the UK's response to global supply chain shocks. We continue to refine and expand our capability to forecast and respond to external shocks to global supply chains, from extreme weather events, the frequency of which is increasing due to climate change, to geopolitical incidents. We will help to ensure that businesses have the information they need to respond effectively.
 - IV. Ensuring the UK can adapt to long-term trends. Building on the supply chains resilience framework and work in successive G7s to bring international partners together. We will ensure that the UK has the insights, policies and international partnerships needed to address long-term trends impacting supply chain resilience.
 - V. Expanding collaboration between government, business and academia. Government is clear that understanding supply challenges and developing and implementing solutions to address these effectively cannot be achieved without close working with business. We also recognise the expertise that exists on these issues in academia.
- F) We will not simply duplicate the approach of others, nor enter a subsidy race. The UK has consistently taken action on net zero and supporting manufacturers. This includes targeted support for innovation and R&D, making the UK business environment even more competitive, and expanding our collaboration through free and fair trade.

2. *The UK needs gigafactories that can cater for the diverse array of vehicles, including luxury cars, public transport and commercial vehicles, manufactured in this country. Retaining niche segments of the automotive market in the UK is strategically important, because the highly specialised nature of these vehicles provides an opportunity to encourage innovative battery manufacturers into the UK. The UK also has an opportunity to take the lead in supplying forms of transport (rail, maritime, aviation and micro-mobility) and sectors of the economy (e.g. energy storage and military applications), which are expected to see demand for batteries rise, especially from 2030 onwards. To capitalise on these opportunities, the Government should:*

- *outline, in the Advanced Manufacturing Plan, what UK battery manufacturing capacity will be needed to cater for the diverse needs of niche segments of the automotive industry, and by when, together with the measures required to secure this.*
 - *support battery manufacturers looking to supply batteries to non-automotive sectors by stimulating demand for batteries in these industries and ensuring government support is available to manufacturers targeting these market segments.* (Paragraph 17)
- A) The UK Battery Strategy has evaluated a series of independent battery demand estimates and presented a reasonable forecast of demand by end use, including private cars, light commercial vehicles, larger vehicles, aerospace, rail, marine, micromobility, and grid storage. The Faraday Institution estimate that the demand for UK battery manufacturing capacity will reach around 100GWh per annum in 2030, predominately for private cars and light commercial vehicles. The battery sector has the potential to become highly diverse, with different battery types used for different applications based on their key characteristics – including size (volumetric energy density), weight (gravimetric energy density), use-cycle and life-cycle longevity, and power performance. As highlighted in the Call for Evidence responses, the trajectory that technological advances will take and the way the market will evolve are uncertain. The strategy outlines the potential next generation technologies, competing drivers on how markets may evolve and residual uncertainties. We will continue to keep this evolving market evidence under review through the Battery Strategy Taskforce and relevant experts to inform the UK's approach.
- B) In November 2023, the UK published its [Advanced Manufacturing Plan](#) ('the Plan'), which includes a £4.5 billion package of targeted funding for manufacturing, tax cuts and business environment measures to make the UK the best place to start and grow a manufacturing business – including battery manufacturing.
- C) As part of the £4.5 billion funding for strategic manufacturing sectors announced at Autumn Statement, we will make available £2 billion of capital and R&D funding for zero emission vehicles, batteries and their supply chains to 2030, building on the work of the Automotive Transformation Fund and the Advanced Propulsion Centre. This long-term commitment provides certainty to markets and will boost investment in UK manufacturing of zero emission vehicles, batteries and the supply chain.
- D) Government support ensures that the UK continues to lead the way in the development of batteries for different applications. The Aerospace Technology Institute (ATI) leads a £3.58 billion programme to 2025, jointly funded by the Government and industry, to accelerate aerospace electrification and keep the UK competitive in the global aerospace market¹. A further £975 million is being made available for the aerospace sector², as part of our £4.5 billion manufacturing funding package.³
- E) Moreover, the Government continues to facilitate the deployment of grid-scale battery energy storage systems (BESS) by working with the Electricity System Operator and the Energy Networks Association to speed up connections and provide greater flexibility

1 Aerospace Technology Institute. '[Transforming aerospace through technology and innovation](#).' 2023.

2 Aerospace Technology Institute. '[Government announces ATI Programme funding up to 2030](#).' 2023.

3 GOV.UK. '[Billions of investment for British manufacturing to boost economic growth](#).' 2023.

to storage customers. The Government is also exploring options to reform the capacity market to promote the use of BESS and other forms of storage following the 2021 Call for Evidence on long duration electricity storage (LDES), thereby stimulating demand for batteries beyond the transport sector.

- F) In February 2023, the Government announced the British Industry Supercharger, a package of measures offering electricity price support to the most energy intensive industries (EIIs) including in sectors such as batteries. The package will support approximately 300 firms in those sectors that are most exposed to international trade and high industrial electricity prices. The package comprises three measures – the 100% EII Exemption Scheme will be implemented from April 2024, the 100% Capacity Market Exemption will follow in October 2024, followed by the Network Charges Cost Compensation scheme in April 2025, with compensation backdated to cover costs incurred from April 2024.
- G) The Department for Business and Trade will continue to ensure that existing public funding is used in a targeted and strategic way across all our programmes to support battery manufacturing, including the Advanced Manufacturing Plan, the Battery Strategy and Auto2030. This funding is complemented by measures to continually improve the UK business environment, which drives long term investment. This approach was set out in the Advanced Manufacturing Plan, with the Government three key priorities to build on recent successes: investing in the future of manufacturing; supporting resilient global supply chains; and addressing barriers to investment.

3. *Encouraging a competitive mix of battery manufacturers to locate in the UK will help to build the supply chain while capturing intellectual property from new technologies. The Advanced Manufacturing Plan and UK Battery Strategy must set out how the Government plans to attract established battery manufacturers as well as new entrants to the battery market to build gigafactories in the UK. Those plans could include a twin-track process for access to financial support to reflect the differences between firms at different stages of development.* (Paragraph 23)

- A) The Department for Business and Trade provides support to both emerging and established battery manufacturers. The UK is one of the most attractive destinations in the world for inward investment and businesses are already investing significantly into battery manufacturing. With support from the Department for Business and Trade, AESC Group is building its second gigafactory in Sunderland and Tata-Agratas announced a £4 billion investment to build one of Europe's largest gigafactories. These projects will jointly create over 5,000 jobs and increase future UK annual production capacity to an estimated 52GWh by 2026, over halfway to meeting 2030 demand.
- B) The Department for Business and Trade also supports battery manufacturers at earlier stages of development through the Advanced Propulsion Centre (APC). Formed in 2013, it has seen approximately £1.5 billion of joint industry and Government funding to help the automotive industry meet the challenges of decarbonisation, including through the industrialisation of new battery technologies. For example, in October, APC announced the successful applicants of its latest funding rounds worth £86.9 million, including the SiSTEM project by Ilka Technologies and MPAC. Through a partnership with the UK Battery Industrialisation Centre (UKBIC), they will manufacture Ilika electrodes and establish an assembly line capable of producing

1.5 megawatt hours of Goliath batteries annually.⁴ This marks a crucial step toward transitioning from lab-scale development to full-scale industrial production in the UK.

- C) Auto2030 will build on the works of both the ATF and the APC R&D programmes, ensuring continuity in Government support to 2030. This comprehensive package of interventions includes: R&D Innovation grants, to develop strategically important zero emission vehicle technologies, boosting the UK's long-term competitiveness; Scale-Up grants, to fast-track the development of near-commercial pilots for zero emission vehicle technologies, de-risking future capital investment; and Capital transformation grants, to unlock investments in an internationally competitive zero emission vehicle supply chain, anchoring UK manufacturing.
- D) We are investing record sums in battery R&D through the Faraday Battery Challenge to establish the UK as a battery science superpower. It supports world-class scientific technology development and manufacturing scale-up capability for batteries in the UK. Under the Faraday Battery Challenge, the Government is supporting a UK Battery Industrialisation Centre (UKBIC) which provides the missing link between battery technology which has proved promising at laboratory or prototype scale, and its successful mass production. In November we announced the investment of an additional £38 million to enhance the UKBIC development facilities, boosting its capability for research and development in new chemistries and future technologies. This builds on our know-how in lithium-ion solutions and enables the scale-up of emerging innovations. Recent announcements brought the overall budget of the Faraday Battery Challenge to £610 million since 2017.
- E) Further Government-backed finance options are available. We are working with Public Finance Institutions, including the UK Infrastructure Bank (UKIB) and UK Export Finance (UKEF), and engaging businesses and investors, we will seek to better understand these approaches and help ensure public investment crowds in private finance. As committed in the Advanced Manufacturing Plan, we will establish an industry forum, supported by a Call for Evidence, on access to finance for manufacturers to identify the market failures, constraints, and barriers that the sector is facing to unlock additional investment for advanced manufacturing.

4. ***Having secure orders from an anchor customer is critical if battery manufacturers are going to raise sufficient funds to build a gigafactory. Offtake agreements between OEMs and battery manufacturers help signal to investors that there is demand for their product. The Advanced Manufacturing Plan and UK Battery Strategy should set out ways in which the Government could help to facilitate offtake agreements between OEMs and battery manufacturers.*** (Paragraph 26)

- ***Facilitate offtake agreements between OEMs and battery manufacturers to secure orders.***
- ***Designate gigafactory sites as strategically important, providing targeted support and priority for infrastructure improvements.***

4 <https://www.directorstalkinterviews.com/ilika-plc-partnering-with-mpac-group-and-uk-battery-industrialisation-centre-in-scale-up-video/4121129054>

- A) We continue to work with investors via the Automotive Transformation Fund and facilitate collaboration via our R&D programmes. However, agreements between OEMs and battery manufacturers remain a matter for the commercial parties involved to negotiate.
- B) The Government has consistently taken decisive steps to support the development of the battery sector and the business environment that it operates in. This includes new measures related to the planning system, the price of energy and access to grid connections announced at Autumn Statement 2023. These include:
- £185 million on the Industrial Energy Transformation Fund (IETF) to support industrial sites with investment in more energy efficient and low-carbon technologies.
 - The publication of a Connections Action Plan jointly with Ofgem, building on industry-led work, to provide direction on further actions to reduce the average delay a project faces to connect to the transmission network. This will help to enable the majority of projects to get their requested connection date with no wait and, for viable projects, reduce overall connection delays from 5 years to no more than 6 months.
 - Our Transmission Acceleration Action Plan accepts the recommendations from the Electricity Networks Commissioner, Nick Winser in his report which set out a programme of reform to speed up development of new infrastructure, to support delivering up to 50GW of offshore wind power by 2030 and 24GW of new nuclear by 2050. The introduction of new premium planning services across England, with guaranteed accelerated decision dates for major applications and fee refunds wherever these are not met.
 - £5 million to incentivise greater use of Local Development Orders in England, helping to end delays for businesses so that key commercial projects can secure planning permission faster.

5. *There are limited number of potential gigafactory sites—but we have enough sites in the UK to meet the nation's needs, including sites in the UK's key automotive clusters. These sites are strategic national assets and should be treated as such. The Government must designate gigafactory sites as strategically important sites and work with local partners to put together a targeted package of support, with a view to attracting investors and ensuring gigafactories can be built at pace. These sites should be given priority for improvements to energy and transport infrastructure. The Government should work with local partners to grant those areas special economic status.* (Paragraph 29)

- ***Establish a single project office led by the Department for Business and Trade to coordinate support from central government, local authorities, and private companies.***
- A) At Autumn Statement 2023, the Chancellor unveiled a raft of measures that will support investment, including into gigafactories. For example:
- The Government has accepted in principle the headline recommendations of Lord Harrington's review into increasing foreign direct investment. A new

Ministerial Investment Group will be established, tasked with driving the Government's ambition on investment. This will be backed by additional resource and an improved toolkit for the Office for Investment (who remove barriers across HMG departments and agencies), allowing it to deepen its world-class concierge offer to strategically important investors.

- There will be 13 Investment Zones across the UK, with 8 in England and 2 in both Scotland and Wales. There will also be an Investment Zone in Northern Ireland. Of the 7 publicly announced Investment Zones, 5 (North East, South Yorkshire, Greater Manchester, East Midlands, and West Midlands) have chosen Advanced Manufacturing as their sector of focus.
- The Investment Zone funding envelope and freeport tax reliefs have been extended from 5 to 10 years, and a new £150 million Investment Opportunity Fund for freeports and Investment Zones (designed to aid with securing specific business investment opportunities) has been announced.
- The Department for Business and Trade has sector teams specifically providing support to foreign direct investment in the automotive sector. Part of this support includes significant on the groundwork with companies looking to establish gigafactories, assessing company needs and available locations to ensure that the potential sites meet the requirements of the business. These are requirements such as assessing access infrastructure, utilities and size, as well as customers, supply chain and staffing availability.

6. *Building a gigafactory will require support from central Government Departments, local authorities and private companies such as National Grid. The transaction cost of co-ordinating between these bodies should not fall on investors. A single project office integrating the full panoply of public support drawn from the various bodies involved is required, and the Department for Business and Trade should take on that lead role, as 'gold command'.* (Paragraph 30)

- A) See above on support for Office for Investment.
- B) The recently published Battery Strategy represents a whole government effort. It was developed with business following a Call for Evidence and in partnership with an expert Taskforce comprising industry and academia to shape the strategy.

Tata Group, Agratas and Jaguar Land Rover (Box 2)

7. *Tata Group's plans to build a gigafactory in the UK provide a much-needed boost to the UK's gigafactory pipeline, especially after Britishvolt's administration earlier this year. We congratulate the Department on its efforts to secure this investment, following close competition from other markets. However, we reiterate our preference that the scale and scope of support offered to Jaguar Land Rover should be in the public domain.*

- A) We will publish details of the subsidy on the UK Subsidy Database in line with our statutory obligations in due course.

- B) We are engaging with a number of companies to secure investment into the UK, so it would not be appropriate to get into commercially sensitive figures at this stage.
- C) Government support for strategically important and high value investments is reviewed on a case-by-case basis. Assistance is subject to a stringent due diligence and independent assessment process to ensure clear value for the taxpayer.

8. *We are pleased that this new gigafactory will supply batteries to Jaguar Land Rover's suite of electric vehicles built in the UK. However, we would welcome more clarity on the extent to which this facility can be expanded to cater for other manufacturers, within and outside the automotive industry.*

- This is a matter for the company and it would not be appropriate for Government to comment.

Battery supply chain

9. *It is not feasible or desirable to onshore the end-to-end battery supply chain. The UK cannot have a self-sufficient supply of lithium-ion batteries and will continue to rely to some degree on imports of raw minerals, materials and components. However, building the UK's industrial capabilities across the battery supply chain, and especially in midstream processes such as the refining of raw minerals and the manufacture of cathodes and anodes, will confer strategic advantages. The Government should specify the industrial capabilities within the UK battery supply chain that are strategically critical to onshore along with new interventions that will encourage relevant businesses to locate in the UK. Such specifications could be set out either in the forthcoming UK Battery Strategy or in response to this Report.* (Paragraph 50)

- A) As highlighted in the responses to the UK Battery Strategy Call for Evidence, the rapid growth of global battery demand and other net zero enabling technologies is putting pressure on the global upstream and midstream supply chains. The Government is already responding to this challenge by working to ensure that the UK's clean growth sectors have access to the critical inputs that are essential to their success, including through the publication of the Supply Chains Resilience Framework and the Critical Minerals Strategy.
- B) The UK Battery Strategy has identified a variety of strategically important industrial capabilities that will support the development of our battery supply chain, including the production of cathodes and anodes and the recovery of critical minerals from recycling. The Government is providing targeted support for zero emission vehicles, batteries, and their supply chains, including through £2 billion of capital and R&D funding to 2030. This builds on the work of the Automotive Transformation Fund programme that aims to establish a competitive and sustainable UK supply chain for electric vehicles, including by unlocking investment into midstream materials processing.
- C) The UK Battery Strategy set out government's intent to explore a range of policy options to deliver against our priorities, including through fifteen specific

commitments. We will continue to convene a Battery Strategy Taskforce to advise on the delivery of the strategy, emerging risks to security of supply, and opportunities for the UK government.

- D) The Critical Imports and Supply Chains Strategy will help UK business build secure and reliable supply chains, which are vital to the UK's economic prosperity, national security and the delivery of our essential services. We want to equip UK businesses with the tools they need to deal with global supply chain issues – from overcoming bureaucratic barriers to dealing with severe shocks caused by events like the Covid pandemic, Russia's invasion of Ukraine, environmental disasters and more recently attacks in the Red Sea that have threatened a key route for global trade.

10. Global battery supply chains, and especially the upstream supply of critical minerals, have environmental, social and governance challenges. Those supply chains are concentrated in China. The UK's dependence on those supply chains poses risks to the UK and to the Government's strategic objectives, especially if China were to restrict exports of the materials and components that the UK needs. It is critical that the UK Government continues to collaborate internationally not only to diversify the battery supply chain, but to ensure that batteries are produced to high environmental and social standards. (Paragraph 51)

- A) The Advanced Manufacturing Plan is a package of measures to build on recent successes and make the sector even more competitive, including increasing resilience via the Battery Strategy (published 26 November). The Supply Chains Resilience Framework and the Critical Minerals Strategy will continue to guide our efforts to support the battery supply chain.
- B) The UK is also leveraging engagement with our international partners to promote and secure opportunities for UK companies overseas through trade missions. In addition, we are assessing the need for further financing support in relation to critical minerals, and considering options for how any gaps identified might be addressed. This includes assessing the role that UKEF could play where finance is needed and there is a clear link to exports.
- C) The Government is working to strengthen the resilience of global critical mineral supply chains through international collaboration. The Government has signed international critical mineral agreements with seven countries: Australia, Canada, Japan, Kazakhstan, Saudi Arabia, South Africa, and Zambia, to help diversify supply chains and increase the UK's security of supply. Each agreement leverages the UK's strengths in mining services, finance, and R&D, and seeks to build high environmental, social, and governance standards. Furthermore, the UK is negotiating a critical minerals agreement as part of the UK-Korea Accord.
- D) Recent developments demonstrate the Government's leadership when engaging internationally, such as the US-UK Atlantic Declaration that was agreed between the Prime Minister and the US President in June 2023. Negotiations have progressed on a targeted critical minerals agreement covering the five relevant critical minerals most important for electric vehicles – cobalt, graphite, lithium, manganese, and nickel. These aim to agree that minerals extracted or processed

in the United Kingdom count toward sourcing requirements for clean vehicles eligible for the Section 30D clean vehicle tax credit of the Inflation Reduction Act.

- E) On 13 October 2023, Prime Minister Rishi Sunak, jointly with Norwegian Prime Minister Jonas Gahr Store, formally launched their joint ambition to develop a Green Industrial Partnership. This will be a cross-cutting effort with the aim of deepening cooperation on the green transition, benefitting supply chains and supporting skills in low carbon sectors. Importantly, it will include collaboration on low emission transport and EV batteries.
- F) On 22 November 2023 the RT. Hon. Kemi Badenoch MP met with Bang Moon-Kyu, Minister of the Ministry of Trade, Industry and Energy for the Republic of Korea, and announced the launch of negotiations to upgrade the Free Trade Agreement (FTA) between the Republic of Korea and the United Kingdom. Following productive discussions to extend temporary arrangements regarding cumulation and direct transport for two years and reflecting the changing global economic and trade landscape, we will work to agree a new Rules of Origin chapter which reduces the costs businesses face when exporting and recognises our existing and future supply chains, enabling United Kingdom and Korean industries to take full advantage of the FTA.

11. *The UK Battery Strategy should set out how the Government plans to promote robust environmental, social and governance standards across the battery industry domestically and globally to promote transparency and a green and clean battery supply.* (Paragraph 52)

- A) As set out in the Critical Minerals Strategy, the Government is leveraging the UK's position of international leadership including as the home to global mining majors, as a centre for responsible mining finance, metals trading and standards, and as a major consumer of critical minerals in our advanced manufacturing industries. The Government is engaging with UK mining, mining finance and metals trading communities to facilitate and encourage greater private sector capital investment in critical mineral projects along the value chain.
- B) The Government is also ensuring that UK domestic mining complies with permitting and planning regulations and encouraging the proportionate use of globally recognised frameworks and guidelines for responsible mining and investment where applicable. These include EITI standards, the Initiative for Responsible Mining Assurance (IRMA), the ICMM principles, the Equator Principles, and the UN Resource Management System (UNRMS) that protect the interests of communities and our natural environment.
- C) The Government is playing a leading role in global efforts to drive up ESG performance to improve the resilience of supply chains and level the playing field for responsible UK businesses overseas. The UK will use its wide-ranging membership of international forums to explore how we can work with partners to improve existing global ESG standards that support a more transparent, responsible and sustainable critical minerals industry.

- D) In the process of diversification of supply chains, we want the UK to contribute its expertise in responsible mining and enable UK businesses to play a role in the development of global supply. That is why the Government is supporting UK companies to participate in building responsible, diversified supply chains overseas.
- E) As part of our support for UK manufacturing, the government has provided specific funding and support to increase the UK's capacity to recycle or reuse critical goods, through the 'circular economy', and to use innovative new technologies to reduce dependencies on relevant imports. To date this has included: supporting the Faraday Institution with £78 million in funding for electrochemical energy storage research; and launching the Life Science Innovative Manufacturing Fund, providing £60 million in funding to support the UK's ambition to grow the UK life sciences sector and to improve the UK's ability to respond to major shocks or trading constraints.
- F) UK Research and Innovation's (UKRI) "Materials for Manufacturing 2050 Vision" sets out a range of steps to promote research and innovation for manufacturing supply chain resilience by 2050. Action is already underway with specific projects focussed on developing the circular economy of critical goods.

12. *A battery supply chain in the UK would enable businesses based in this country to manufacture batteries sustainably and ethically. This offers the UK a competitive advantage over other markets, especially as consumers demand higher environmental, social and governance standards. The UK's access to low-carbon sources of electricity means that batteries produced in the UK will be produced more sustainably than those in China and many European countries. The Government should empower UK consumers by requiring batteries available on the UK market to come with a battery passport containing information about how sustainably and ethically those batteries were produced.* (Paragraph 53)

- A) The UK Battery Strategy notes that technology will have a key role in facilitating green trade. For example, digital trade will be important, as data on a battery pack's historical performance and cycles will remove barriers to their efficient repair, reuse, and repurposing by re-manufacturing businesses, reducing environmental damage. The UK will be a world leader in sustainable battery design and manufacture, underpinned by a thriving battery innovation ecosystem.
- B) The UK Battery Strategy also notes the opportunity for pro-growth regulation to support the circular economy. Key enablers include:
 - Designing for reuse, recycling, and repurposing.
 - Access to first life battery data for repurposing and reuse, including through certification schemes.
 - Liability and ownership transfer, to enable repurposing and second life, and to avoid "do not fix" default.
 - Certification and re-certification for second life and repurposed batteries.

- C) To facilitate green trade, the UK is working with international partners to align environmental standards and remove barriers to trade. For example, the UK advocates for collective agreement at the Trade and Environmental Sustainability Structured Discussions (TESSD) at the WTO while also working through bilateral and plurilateral channels to lower barriers.
- D) The government has committed to two consultations in 2024:
- The Department for Environment, Food and Rural Affairs (Defra), in collaboration with the Devolved Administrations, is committed to publishing a consultation and Call for Evidence as early as possible in 2024, focussing on increasing collection rates for batteries and encouraging best practice in end-of-life management of all battery types and chemistries. Defra will work with the whole supply chain to consider regulation for the entire eco-system.
 - The government will implement a UK Carbon Border Adjustment Mechanism (CBAM) by 2027. The liability applied by the CBAM will depend on the greenhouse gas emissions intensity of the imported good and the gap between the carbon price applied in the country of origin (if any) and the carbon price that would have been applied had the good been produced in the UK. CBAM liability will lie directly with the importer of imported products within scope of the UK CBAM on the basis of emissions embodied in imported goods. This system will not involve the purchase or trading of emissions certificates. Further details on the design and delivery of a UK CBAM will be subject to consultation in 2024.

Encouraging investment into the battery supply chain in the UK

13. *Global competition for the electric vehicle supply chain has intensified following the passing of the Inflation Reduction Act in the United States. The Inflation Reduction Act has seen investment flow into the electric vehicle supply chain, especially gigafactories, in the United States at the expense of Europe. The UK Government must urgently respond to this intensified global competition with an internationally competitive package of long-term support to attract private investment into gigafactories and the wider battery supply chain within the UK.* (Paragraph 62)

- A) The UK is a global hub for advanced manufacturing. Supply chains and technology are increasingly globally contested, but we won't be drawn into a distortive subsidy battle. Our advanced manufacturing strengths are supported by a strong business environment, a world class network of universities and innovation institutions, and a highly skilled workforce. We continue to build on these existing strengths to attract investment into the battery supply chain, as well as other clean and digital manufacturing technologies.
- B) The Advanced Manufacturing Plan prioritises (a) investing in the long-term future of manufacturing; (b) cooperating internationally and building supply chain resilience; and (c) reducing costs and removing barriers to boost competitiveness.

- C) As part of the Advanced Manufacturing Plan, we have announced £2 billion of capital and R&D funding to unlock strategic investments in zero emission vehicles, their batteries and supply chain. The Auto2030 programme will build on the work of the Advanced Propulsion Centre and Automotive Transformation Fund, speeding up access to support, simplifying the Government's investment offer, and ensuring long-term certainty for investors.
- D) Companies continue to show confidence in the UK, and our approach has already attracted landmark investments in gigafactories and electric vehicle manufacturing, with over £6 billion of UK investment from Nissan, BMW and Tata in recent months. With the support of Government, this includes the recent announcement of a £2 billion Nissan-led investment to produce two new electric vehicles in Sunderland, BMW's investment of £600 million to build next generation MINI EVs in Oxford, and Tata's announcement of a £4 billion investment in a new UK gigafactory.
- E) The UK is also leading the way in the development of batteries for aerospace applications. The Aerospace Technology Institute (ATI) leads a £3.58 billion programme to 2025 jointly funded by the government and industry that supports world-class R&D into sustainable flight innovations. Following last February's announcement of £113m joint R&D investment with industry in hydrogen and all-electric flight technologies, Vertical Aerospace opened the state-of-the-art Vertical Energy Centre in Bristol – believed to be the UK's most advanced aerospace battery facility.
- F) Through the Longer Duration Energy Storage Competition (LODES) Invinity Energy Systems has been awarded £11 million for the VFB LEAD project to build a longer duration, large-scale vanadium flow battery (VFB) that will be deployed at a key node on the National Grid. On top of this, StorTera has developed a sustainable, highly efficient, and highly energy dense lithium sulphur based single liquid flow battery (SLIQ) technology. In Phase 2 of LODES, StorTera will manufacture a prototype SLIQ that utilises a novel cylindrical cell architecture in a modular format to optimise the manufacture, installation, and maintenance of the system.

14. *The UK is competing against other large markets that are offering large subsidies to boost domestic production of electric vehicles and batteries and onshore businesses in the supply chain. The UK Government does not necessarily need to match the scale of subsidies on offer in these markets if the UK's overall package is internationally competitive. However, the UK Government must provide a long-term stable business environment, with a clear framework of support that de-risks investments in the UK's battery supply chain.* (Paragraph 63)

- A) The Government has set out a clear framework to de-risk investments in the UK's battery supply chain through the Advanced Manufacturing Plan and the UK Battery Strategy, providing a long term, stable business environment. Measures include: a £4.5 billion package to 2030 (announced by the Chancellor on 17 November), tax cuts and business environment measures (Autumn Statement 22 November) and increasing resilience (Battery Strategy 26 November).

- B) As part of this, we have announced £2 billion of capital and R&D funding to 2030, boosting the UK's competitiveness and unlocking strategic investments in our automotive industry. This funding will be delivered via Auto2030, an ambitious programme building on the works of the Automotive Transformation Fund and the Advanced Propulsion Centre R&D programmes, ensuring continuity in HMG support.
- C) The new programme builds on significant R&D investment and the UK's clear long-term commitment to zero emission vehicles, including the establishment of the Advanced Propulsion Centre (APC) in 2013 – bringing together £1.5 billion in joint industry and Government R&D advanced propulsion projects³⁴ – and the Faraday Battery Challenge in 2017 – making £541 million of funding available to the UK Battery Industrialisation Centre (UKBIC).
- D) Auto2030 will unlock investment in zero emission vehicles, batteries and the wider supply chain. It will support the R&D and the commercial scale up of innovative zero emission vehicle technologies. This comprehensive package of interventions includes:
- **R&D Innovation grants**, to develop strategically important zero emission vehicle technologies, boosting the UK's long-term competitiveness.
 - **Scale-Up grants**, to fast-track the development of near-commercial pilots for zero emission vehicle technologies, de-risking future capital investment.
 - **Capital transformation grants**, to unlock investments in an internationally competitive zero emission vehicle supply chain, anchoring UK manufacturing.
- E) Furthermore, the UK Battery Strategy announced a £12 million investment to build the Advanced Materials Battery Industrialisation Centre, a new world-class facility to de-risk and accelerate battery materials scale up in the UK. The UK Battery Strategy also announced an additional £38 million investment to further enhance the capability of the UK Battery Industrialisation Centre (UKBIC), which is the UK's gigascale battery manufacturing scale-up facility where businesses can de-risk their battery innovation and prove performance of commercially relevant batteries to investors and customers.
- F) The Government has a strong record of helping the sector to thrive – even in the face of global headwinds. The UK is a global hub for advanced and technology-driven manufacturing, with the fastest productivity growth in the G7 between 2010-2021, and recently overtaking France to become the world's 8th largest manufacturing nation. The Government is committed to ensuring the UK's business environment is competitive. As well as maintaining the lowest headline rate of corporation tax in the G7 at 25%, the UK is the only G7 country to have announced permanent [Full Expensing](#) of capital allowances. Companies can now permanently claim 100% capital allowances on qualifying main rate plant and machinery investments. The UK also has the joint highest uncapped headline rate of R&D tax relief for large companies in the G7.

15. *The **absence of a clear and visible industrial strategy for the UK's automotive sector** had deterred investment in the UK. The forthcoming publication of the Government's Advanced Manufacturing Plan and UK Battery Strategy should help to address that lack of investment. The Government should adopt an integrated approach, with measures to develop industrial capabilities across the battery value chain and to collaborate internationally with friends and partners with rich sources of battery minerals. The Advanced Manufacturing Plan and UK Battery Strategy must set out how the Government plans to capitalise on the UK's sources of competitive advantage and also to address structural barriers that are deterring investment in the UK's battery supply chain.* (Paragraph 66)

- A) The Advanced Manufacturing Plan details the Government's three key priorities: investing in the long-term future of manufacturing, building supply chain resilience and reducing costs and removing barriers to boost competitiveness.
- B) The Government has a longstanding programme of support enabling battery R&D and manufacturing at any level through programmes aimed at encouraging innovation and support industrialisation across the battery supply chain. These include the Faraday Battery Challenge, the Advanced Propulsion Centre, the Automotive Transformation Fund and the High-Value Manufacturing Catapult.
- C) Building on this innovation ecosystem, the Advanced Manufacturing Plan sets out how the UK continues to lead in the development and deployment of clean and digital manufacturing technologies. It also provides businesses with a clear commitment to the longer-term success of the sector. It takes targeted and strategic action to ensure our business environment and international competitiveness remain strong.
- D) As part of the Advanced Manufacturing Plan, we have announced Auto2030, an ambitious programme building on the work of the Automotive Transformation Fund and the Advanced Propulsion Centre R&D programmes, ensuring continuity in HMG support. Auto2030 will unlock investment in zero emission vehicles, batteries and the wider supply chain. It will support the R&D and the commercial scale up of innovative zero emission vehicle technologies.
- E) The UK Battery Strategy has established the Government's integrated approach to supporting the sector and outlined our priorities for our future work with industry. The UK is uniquely placed to benefit from the rising global demand for batteries thanks to our key areas of comparative advantage, including our world class institutions conducting research and development into battery chemistry optimisation, our leading electric vehicle battery start-up ecosystem, and our automotive manufacturing sector, which has the second highest value in Europe.
- F) As described in the UK Battery Strategy, the Government has consistently displayed international leadership in securing access to the critical inputs of our clean grown sectors, including through the publication of the Supply Chains Resilience Framework and the Critical Minerals Strategy.

- G) The Government has recently taken significant steps to strengthen the business environment through improved planning and permitting, more competitive energy prices, and enhanced skills development. At the Autumn Statement, the Government announced measures to address barriers to investment, including:
- Introducing permanent full expensing for plant and machinery will allow businesses to invest for less. With the tax cut now permanent, the UK will continue to offer both the lowest headline corporation tax rate in the G7 and the most generous capital allowances in the OECD group of advanced economies.
 - Through the Grid Connections Action Plan, the Government also announced measures to speed up the delivery of energy infrastructure, cutting average connection times from 5 years to no more than 6 months beyond the date requested by the customer. Collectively, this package will bring forward investment of more than £90 billion over the next 10 years.

16. The Automotive Transformation Fund has helped to unlock private investment into the UK, including in gigafactories and businesses further up the supply chain. However, now global competition has intensified, the UK Government needs to ensure that financial support on offer in the UK is internationally competitive. The Government should conduct a benchmarking review to determine how the financial support on offer compares with that available in competitor countries. It should publish this review and use the findings to inform a new offer of support for the UK's battery industry in its forthcoming UK Battery Strategy. (Paragraph 71)

- A) The UK Battery Strategy sets out the Government's vision to achieve a globally competitive battery supply chain that supports economic prosperity and the net zero transition by 2030. Our focus and objectives are centred around building on our comparative advantage, scaling up our emerging supply chain, and securing internationally mobile investment, rather than engaging in costly subsidy wars. The Department for Business and Trade will continue to ensure that existing public funding is used in a targeted and strategic way across all our programmes. Auto2030 is a significant commitment to the sector, including £2 billion of capital and R&D funding to 2030 to unlock strategic investments in our automotive industry.
- B) When determining the grant amount that should be offered to a company the Department seeks to provide the minimum necessary to influence their decision to invest in the UK; therefore, minimising deadweight loss of the programme and ensuring maximum value for money for the UK taxpayer.
- C) At the Autumn Statement, the Government announced measures to address barriers to investment, including introducing permanent full expensing for plant and machinery will allow businesses to invest for less. With the tax cut now permanent, the UK will continue to offer both the lowest headline corporation tax rate in the G7 and the most generous capital allowances in the OECD group of advanced economies.
- D) Recent investments represent a major vote of confidence in the UK, for example:

- Tata-Agratas announced a £4 billion investment to build one of Europe's largest gigafactories.
- A Nissan-led £2 billion investment to produce two new electric vehicles in Sunderland.
- JLR has set out £15 billion of investment over next 5 years to accelerate their path to electrification in the UK.
- Nissan, in partnership with AESC, is building a new EV manufacturing hub in Sunderland.
- Bentley has announced a £2.5 billion investment to produce its first EVs in Crewe by 2026.
- BMW has announced a £600 million investment to produce the next all electric MINI in Cowley from 2026.
- Stellantis started producing Vauxhall, Opel, Fiat, Peugeot and Citroën electric vans at their Ellesmere Port plant in September 2023, following a £100 million investment that was secured with support from Government.

17. *High energy prices in the UK are deterring investment in the battery supply chain. The Government has taken steps to support energy-intensive industries. However, investors still need more certainty that UK energy prices will remain internationally competitive. The Advanced Manufacturing Plan and UK Battery Strategy should set out further interventions that will provide investors with more long-term certainty that the UK's energy prices will be competitive with other markets.* (Paragraph 74)

- A) The Government has consistently taken decisive steps to reduce the price of energy and strengthen the UK's competitiveness internationally. For example, the 2022 Energy Security Strategy announced that support for Energy Intensive Industries would be extended for a further three years with an increased aid intensity that represents a doubling of the previous annual budget. Importantly, eligibility was extended to the manufacture of batteries, including lithium-ion batteries.
- B) In February 2023, the Government announced further support for key Energy Intensive Industries in the form of the British Industry Supercharger. Over 300 businesses, including manufacturers of batteries and accumulators, will benefit from the additional targeted measures to ensure that energy costs are in line with those of other major economies and level the playing field for UK companies.
- C) At Autumn Statement 2023, the Government announced it is providing support to help industry transition to a resilient, low-carbon, and competitive future. This includes spending £185 million on the Industrial Energy Transformation Fund (IETF) to support industrial sites with investment in more energy efficient and low-carbon technologies.
- D) The Government is also providing around £300 million a year in tax relief in exchange for meeting energy efficiency targets under the new six-year Climate Change Agreement Scheme, with associated relief running until 31 March 2033.

Sectors that meet eligibility requirements but do not currently participate in the Climate Change Agreements Scheme are invited to make a proposal to be added to it.

- E) The Government is committed to ensuring that the costs of the UK's energy transition are fair and affordable for all consumers. The Review of Electricity Market Arrangements (REMA) is looking at our current market arrangements to ensure that they can deliver a secure, cost-effective, low carbon electricity system by 2035.
- F) These interventions will further cement long-term certainty around the UK's energy prices for investors.

18. *The UK faces skills shortages across the battery supply chain. The Advanced Manufacturing Plan and UK Battery Strategy should set out:*

- a) the forecast labour market involved in reaching its targets for UK-supplied batteries***
- b) the forecast training cost for this workforce; and***
- c) how they plan to train and reskill professionals in the automotive sector to support domestic production of electric vehicles, batteries and other processes in the battery supply chain, including through devolution of the requisite training budgets to local areas.*** (Paragraph 76)

- A) The Faraday Institution estimates that meeting domestic demand for batteries for EVs would boost UK employment by approximately 270,000 (full-time equivalent) jobs by 2040. Of these, 100,000 would come from battery manufacturing plants and the supply chain, 145,000 from EV production, and 25,000 from HGV/bus production.
- B) As highlighted in the UK Battery Strategy, recent announcements by AESC as well as Tata-Agratas will increase production by at least 52GWh of capacity by 2026. This requires a manufacturing workforce of over 7,000 people to be up-skilled, re-skilled or new-skilled in the next 2 years.
- C) In recent years, the Automotive Council Skills group, the Faraday Institution, HVM Catapult, and others have worked to develop an in-depth understanding of the job roles and associated skills levels needed.
- D) Comprehensive reskilling and upskilling programmes will be essential to help workers transition from the automotive sector to production of EVs, batteries and other areas of the battery supply chain. In September 2023, the Faraday Battery Challenge awarded £3.2 million to the universities of Coventry, Birmingham and Newcastle to identify and address skills gaps in the UK battery sector. As part of this, two Battery Workforce Training Initiatives were established to support Level 2-3 vocational and technical training in the North East and the Midlands.
- E) The Faraday Battery Challenge also funds the National Electrification Skills Framework and Forum (NESFF), which aims to coordinate a nationally

consistent, responsive, and quality-assured courses specific to emerging skills needs in the sector. NESFF will champion the need for electrification workforce development programmes across all skills levels.

- F) At Autumn Statement 2023, the Government committed £50 million to delivering a 2-year apprenticeship pilot that explores ways to stimulate training in growth sectors and address barriers to entry in high-value standards.
- G) As the UK Battery Strategy sets out, the Government will continue to ensure that manufacturing skills training and education is well supported by a high quality and employer-led skills system. Government supports manufacturing through the flagship Apprenticeship Programme, delivering manufacturing apprenticeships from Aerospace Engineering to Machining. This is bolstered by Institutes of Technology who are working on manufacturing, including advanced manufacturing industry pathfinders and skills bootcamps delivering manufacturing skills in areas such as clean energy, renewable energy, industry and transport.
- H) The Government has an ambitious skills agenda, backed by an additional £3.8 billion of investment over this Parliamentary term. Building on the ambition of the Skills for Jobs white paper (January 2021), we are reforming the skills and technical education system to be employer focused, high quality, and future ready, ensuring that courses are responsive to the needs of employers in growth sectors such as advanced manufacturing.
- I) This includes supporting more people to complete an apprenticeship or a Higher Technical Qualification (HTQ), rolling out more T Levels, and establishing our network of 21 Institutes of Technology. We are also expanding our Skills Bootcamps and Free Courses for Jobs (FCFJ) programmes.
 - Apprenticeships: Through the apprenticeship levy, we will increase investment in apprenticeships to £2.7 billion by 2024-25. We have transformed apprenticeships, so they are higher quality and better meet the needs of employers and individuals, supported by sustainable funding. Employers design apprenticeship standards to meet their skills needs. There are over 670 high-quality, industry-designed apprenticeship standards available, including in advanced manufacturing occupations such as Aerospace Engineer, Science Industry Process and Plant Engineer, and Space Engineering Technician. A Level 3 Battery Manufacturing Technician apprenticeship is in development.
 - On apprenticeships, the government is committing a further £50 million for a 2-year pilot to explore ways to stimulate training in growth sectors and address barriers to entry in high-value apprenticeships. The apprenticeships pilot seeks to explore ways to address barriers to entry in sectors like advanced manufacturing, including high capital costs, and boost provision in high-value apprenticeships.
 - T Levels: are a central pillar of our reforms to technical education. T Levels offer a two-year technical qualification alternative to A levels. Designed with over 250 employers, T Levels are boosting access to high-quality

technical education for thousands of young people and creating our skilled workforce of the future. 16 T Levels are now available in providers across the country. 11 of these T Levels are in STEM and technology subjects.

- Skills Bootcamps are free, flexible courses of up to 16 weeks, giving people the opportunity to build up sector-specific skills, with an offer of a job interview with an employer on completion. They are playing an important role in delivering the skills that are needed to fill the skilled jobs the manufacturing sectors are generating including biologics, clean energy, low carbon and hydrogen advanced manufacturing and electric vehicle maintenance and repair. We are looking to expand Skills Bootcamps delivery to make 64,000 training places available in FY24-25 and will continue to engage with employers in green and advanced manufacturing sectors to ensure that this skills offer continues to grow and meet their needs and give more adults the skills they need to get good jobs.
- J) We will work closely with academia and industry identify areas of highest demand and promote best practice to develop an inclusive talent pipeline. Thanks to this approach, immediate skills needs can be met and longer-term planning can be facilitated, allowing for the pace of training and development to match that of technological progress.

19. *The Government should ensure that mayoral combined authorities or local councils—especially those that govern strategically important sites where gigafactories could be built—have adequate and flexible funding to tailor support local training programmes. Offers of financial support to businesses in the battery supply chain should be conditional on these companies investing in upskilling and reskilling employees from the automotive industry and other sectors.* (Paragraph 77)

- A) The transition to EVs offers a significant opportunity for employment in the UK. Meeting domestic demand for batteries for EVs could boost employment by approximately 270,000 (full-time equivalent) jobs by 2040.⁵ This workforce must have appropriate skills across the battery value chain and at all skill levels. The Government will continue to ensure that manufacturing skills training and education is well supported by a high quality and employer-led skills system.
- B) Government supports manufacturing through our flagship Apprenticeship Programme, delivering manufacturing apprenticeships from Aerospace Engineering to Machining. To help smaller employers benefit from apprenticeships, the Department for Education (DfE) has launched an SME 'Pathfinder', including prioritising manufacturing, in four regions of the North of England to support those that have not had an apprentice in the past two years to do so – from recruitment to accessing funding. The Government is supporting plans to catalyse the growth sectors including advanced manufacturing by committing £50 million to deliver a 2-year apprenticeships pilot in England to explore ways to stimulate training in these sectors and address barriers to entry in high-value apprenticeships.

5 The Faraday Institution. 'UK Electric Vehicle and Battery Production Potential to 2040.' 2022.

- C) To support the Advanced Manufacturing Plan, the Department for Business and Trade will partner with the Department for Energy Security and Net Zero's Green Jobs Action Plan to publish an action plan on green skills in 2024. We will work closely with the DfE and the Department for Environment, Food and Rural Affairs (Defra) to develop a forum with the National Manufacturing Skills Task Force.
- D) Thanks to Government support, the Faraday Battery Challenge has been able to fund two Battery Workforce Training Initiatives to support Level 2-3 vocational and technical training in the North-East and the Midlands. These initiatives will help to deliver innovative vocational and technical training to help upskill local workforces with the skills and qualifications they require for the battery industry.
- E) The Driving the Electric Revolution Building Talent for the Future programme has invested over £4 million to create and deliver course content and materials that will support skills, talent and training across Power Electronics, Machines and Drives (PEMD) manufacturing and supply chains. This includes 29 projects delivered by 37 organisations.

20. *The UK Government's trade policy should aim to secure tariff-free access to global markets for electric vehicles and batteries manufactured in the UK.* (Paragraph 79)

- A) Increased global challenges, geopolitical tensions, and a more fragmented global economy all present risks to the UK's manufacturing sector, including the trend from free international trade towards more managed trade. The UK's resilience is increased through an open global economy and a free trading system that increases fair competition. This must be coupled with going further in mitigating the risks of economic coercion and market distorting practices in our high value manufacturing sectors.
- B) In December 2023, the UK and EU agreed to extend zero-tariff trade on electric vehicles until the end of 2026 to keep costs down for manufacturers and consumers. This agreement facilitates UK-EU tariff-free trade in electric vehicles and prevents 10% tariffs being levied on this trade from January 2024. Industry expects this will save car manufacturers and consumers up to £4.3 billion in additional costs and provide long term certainty to the sector as we continue to scale up our domestic battery supply chain and work to deliver our net zero commitments. This agreement is further evidence that our more constructive relationship with the EU is delivering for UK citizens and businesses. The agreement comes as both the Prime Minister and President of the EU commission committed to working together to bolster our domestic battery supply chain, showing that the Government is taking the lead on securing tariff-free access to global markets for electric vehicles manufactured in the UK and their batteries.
- C) Our approach in the Advanced Manufacturing Plan aligns with the Integrated Review Refresh 2023, which sets out how we are stepping up work to protect our economic security while preserving the UK's strengths as a great place to invest. We will continue to advance fair, free and open international trade in manufacturing goods and services for the UK and globally, as well as support

UK manufacturers in taking advantage of the international opportunities it provides. We will deepen our collaboration with international partners to increase resilience for our supply chains critical to manufacturing, whilst boosting our UK capabilities and strengths. We will also continue to work with international partners to tackle forced labour and ensure business respect for human rights.

D) The Department for Business and Trade (DBT) has an ambitious programme of Free Trade Agreement (FTA) negotiations – the largest such programme in the world – to help our nation become a truly Global Britain. We are also leading a truly whole of Government effort to tackle barriers to trade in direct response to business.

- The Government has secured trade deals with 73 countries plus the EU, partners that accounted for £1.1 trillion of UK bilateral trade in 2022.
- Our comprehensive FTA programme continues at unprecedented pace. We will not, however, sacrifice quality for speed and will only agree a deal if it is right for British businesses and consumers.
- In addition, we estimate that 46 of the barriers which we resolved in 2022-23 alone could boost UK exports by around £6.5 billion over the next five years.
- We want to go even further, focussing on 100 priority barriers which if resolved could boost UK exports by another £20bn over five years.
- Success in reducing these barriers and enabling trade in the automotive sector include:
- Negotiations launched for a Critical Minerals Agreement following the signing of the Atlantic Declaration with the United States of America. The Agreement will enable relevant critical minerals extracted or processed in the UK to be used in clean vehicles benefitting from the Section 30D clean vehicle tax credits of the Inflation Reduction Act.
- UK businesses depend on critical minerals like lithium, cobalt, and graphite to create essential components for electric vehicles and more. This agreement will strengthen companies' access to these resources so that they can produce the technology we need in the UK.
- In parallel with trade engagement with the US federal government, the UK also signed Memoranda of Understanding on trade and economic cooperation with Indiana, North Carolina, and South Carolina in 2022-23. These Memoranda of Understanding provide a framework to unlock trade barriers, realise investment opportunities, and share expertise – supporting growth in bilateral trade.
- Since February 2023 the Brazilian market has improved access via accelerated approval processes in the automotive sector – worth an estimated £25m to UK certification companies.

- Joining CPTPP, following the signing the Accession Protocol in July 2023, means over 99% of current UK goods exports to CPTPP will be eligible for zero tariffs. Reduced tariffs on imported goods will benefit British consumers as well, who could receive better choice, quality, and affordability.
- E) To facilitate green trade, the UK is working with international partners to align environmental standards and remove barriers to trade. For example, the UK advocates for collective agreement at the Trade and Environmental Sustainability Structured Discussions (TESSD) at the WTO while also working through bilateral and plurilateral channels to lower barriers.

Commercialising the next generation of battery technologies

21. *The UK has potential competitive advantages in new battery technologies. However, despite excelling in innovation, it struggles to ensure that new technologies developed in the UK are commercialised domestically. The UK Battery Strategy must set out how the Government plans to ensure that new battery technologies, where the UK has a competitive advantage, are commercialised in the UK.* (Paragraph 83)

- A) The UK has a significant comparative advantage in the development of next generation battery chemistries for both transport and stationary storage applications, with the potential to take a leading role in their commercialisation and industrialisation. Key to the UK's success in automotive R&D and innovation is the certainty of funding, providing industry partners with the confidence that they will receive support throughout the product development cycle, from the drawing board to market. This coordinated and targeted approach has helped position the UK at the vanguard of innovation.
- B) The Advanced Manufacturing plan sets out how we are reducing costs and removing barriers to boost competitiveness by continuing to improve the UK's business environment. This includes making full expensing permanent, a £50 million 2-year apprenticeships pilot to explore ways to stimulate training in growth sectors such as advanced manufacturing and the announcement so far of 5 new advanced manufacturing Investment Zones.
- C) The UK Battery Strategy set out government's intent to explore a range of policy options to deliver against our priorities, including through fifteen specific commitments. We will continue to convene a Battery Strategy Taskforce to advise on the delivery of the strategy, emerging risks to security of supply, and opportunities for the UK government.
- D) The Government will continue providing sustained, consistent, and targeted support for large-scale, long-term research and innovation activities, from early to late stage, across applications and key areas of the battery supply chain to ensure that the UK's battery ecosystem continues to thrive. This includes £2 billion of capital and R&D funding for zero emission vehicles, batteries, and their supply chains to 2030.
- E) Building on the works of the Automotive Transformation Fund and the Advanced Propulsion Centre R&D programmes, Auto2030 will unlock investment in zero

emission vehicles, batteries and the wider supply chain. It will support the R&D and the commercial scale up of innovative zero emission vehicle technologies. The comprehensive package of interventions includes: R&D Innovation grants, to develop strategically important zero emission vehicle technologies, boosting the UK's long-term competitiveness. Scale-Up grants, to fast-track the development of near-commercial pilots for zero emission vehicle technologies, de-risking future capital investment. Capital transformation grants, to unlock investments in an internationally competitive zero emission vehicle supply chain, anchoring UK manufacturing.

- F) We will invest £11 million in 20 competition winners developing technologies across the battery value chain in areas such as artificial intelligence and digital tools to increase battery performance, future technologies such as lithium-metal anodes and sodium-ion batteries, and improved recycling technologies. This brings the overall budget of the Faraday Battery Challenge to £610 million since 2017.
- G) We will explore opportunities to promote the establishment of R&D centres in the UK by leading battery and EV manufacturers. These centres hold a significant role in regional and global product development and in providing collaboration and market opportunities for scaling businesses. The Government is committed to building a pipeline of technology that will enable the UK to remain competitive and future-proof our manufacturing industry.
- H) The Government will work with key public finance institutions to review their offering across advanced manufacturing sectors, with a view to identifying any potential gaps and opportunities for further interventions. The Department for Business and Trade will issue a Call for Evidence and establish an industry forum on access to finance for manufacturers. This will draw on evidence from the UK's public financial institutions – the BBB, UKIB, and UKEF. We will assess how novel financial instruments could potentially be tested, adopted, and offered over suitably long periods where existing ones cannot satisfy demand.

22. *The UK Battery Strategy should include long-term support for research and development of new battery technologies in the UK to ensure the UK remains at the cutting-edge of battery technologies.* (Paragraph 85)

- A) The UK has significant strengths in battery technologies as set out in the UK Battery Strategy. The UK has a world class research base, including educational and R&D institutions. The UK ranks third in the world in terms of research quality into industrial batteries,⁶ and is leading work on future technologies such as sodium-ion batteries.⁷ This is supported by the UK's leading EV battery start-up ecosystem, with the second highest enterprise value in Europe and fourth worldwide.⁸

6 Government Office for Science. 'Rapid Technology Assessment: Novel Batteries.' 2023.

7 The Faraday Institution. Sodium-ion Batteries: Inexpensive and Sustainable Energy Storage.' Faraday Insights: Issue 11. 2021.

8 UK Research and Innovation and Dealroom.co. 'Electric Vehicle Battery Tech in the UK'. 2023.

- B) The Department for Business and Trade, in collaboration with other departments, is driving innovation to support both current applications and the development of future battery technologies through a range of programmes.
- C) The Faraday Battery Challenge (FBC) has received £610 million in funding since 2017 to drive innovations from lab to factory through its two key delivery partners;⁹ the Faraday Institution and the UK Battery Industrialisation Centre (UKBIC). The Faraday Institution brings together 27 UK universities, 85 industry partners and over 500 researchers across 10 major projects covering current and next-generation battery technologies.¹⁰ UKBIC, the national manufacturing development centre, provides open-access infrastructure as well as manufacturing and scale-up skills in its 20,000m² world-renowned facility. UKBIC plays a key role in supporting technology development and de-risking commercialisation pathways for UK battery technologies, helping to remove barriers to firm scale-up and investment. At Autumn Statement 2023, the Government announced an additional investment of £38 million to enhance the Centre's development facilities and support new entrants to the battery market.
- D) Secondly, the Department of Business and Trade works closely with Advanced Propulsion Centre (APC). Formed in 2013, it has seen over £1.5 billion of joint industry and Government funding to help the automotive industry meet the challenges of decarbonisation, including through the industrialisation of new battery technologies. The APC recently announced £86.9 million of Government funding to develop cutting-edge technology, including solid-state battery manufacturing.¹¹ The Automotive Transformation Fund (ATF) is a DBT programme that supports companies across the electric vehicle supply chain, including battery developers and manufacturers. The Advanced Manufacturing Plan will provide further support through £2 billion of capital and R&D funding to 2030.
- E) Thirdly, the Energy Innovation Centre at Warwick Manufacturing Group (WMG) and the Centre for Process Innovation are part of the High-Value Manufacturing (HVM) Catapult, which respectively provide a national facility for research across the R&D process and battery material development, scale-up, and recycling support. These two centres have recently received £12 million of funding for an Advanced Battery Materials Innovation Facility, which will allow for the synthesis, scale-up, formulation, and validation of novel active materials and solid-state electrolytes.¹²
- F) Fourthly, the Government is committed to internationally competitive R&D tax reliefs. Following consultation, the current R&D Expenditure Credit (RDEC) and SME (small and medium sized enterprise) schemes will be merged from April 2024 onwards, simplifying the system and providing greater support for UK companies to drive innovation. Furthermore, the rate at which loss-making companies are taxed within the merged scheme will be reduced. The Government is also making changes to the additional support for R&D intensive SMEs. The

9 UK Research and Innovation. '[Faraday Battery Challenge](#).' 2023.

10 The Faraday Institution. '[About the Faraday Institution](#).' 2023.

11 Advanced Propulsion Centre UK. '[£86.9 million for scale-up and R&D of net-zero vehicle technology](#)'. 2023.

12 Warwick Manufacturing Group. '[WMG in landmark battery development partnership](#)'. 2023.

intensity threshold will be reduced from 40% to 30% for accounting periods that start on or after 1 April 2024, allowing around 5,000 extra SMEs to qualify for an enhanced rate of relief, and a one-year grace period will be introduced to provide certainty for companies that dip under the 30% intensity threshold that they will continue to receive relief. Taken together, changes announced at Autumn Statement 2023 will provide £280 million of additional relief per year by 2028-29 to help drive innovation in the UK.

- G) Finally, university spin-outs are some of our most innovative companies and play a hugely important role for the UK economy. To capitalise on this strength, the Government is accepting all the recommendations of the Independent Review of Spin-outs and setting out how it will deliver them. Several universities and investors have already endorsed the recommendations of the review, and the Government will provide £20 million for a new cross-disciplinary proof-of-concept research funding scheme to help prospective company founders in our universities demonstrate the commercial potential of their research.

23. *The UK may not be able to simply leapfrog into new technologies without first establishing itself in the lithium-ion battery industry. That conclusion reinforces the importance of acting at pace now to develop a battery supply chain in the UK.* (Paragraph 87)

- A) The UK Battery Strategy has set out the Government's activity to support our objectives and established the framework and priorities for our future work with industry, on both the batteries of today and of tomorrow. The Government's strategic and financial commitment to supporting the battery and EV sectors today demonstrates our conviction to act at pace now to achieve a globally competitive battery supply chain that supports economic prosperity and the net zero transition by 2030. The UK will be a world leader in sustainable battery design and manufacture, underpinned by a thriving battery innovation ecosystem.