Department for Business & Trade

Evaluation of the Automotive Transformation Fund

Baseline Assessment

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Contents

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Executive Summary

The Automotive Transformation Fund

The Automotive Transformation Fund (ATF) is a funding programme created by the UK government to support large-scale industrialisation of an electrified automotive supply chain in the UK. The programme aims to establish a competitive and sustainable UK supply chain for electric vehicles. The ATF provides funding for capital and R&D projects in batteries, machines and drives, power electronics, fuel cells, and the upstream supply chain for any of the above.

The impact evaluation

An impact evaluation aims to assess what changes have occurred because of a policy, the scale of those changes and the extent to which they can be attributed to the intervention. An evaluation framework for the ATF, setting out how an impact evaluation should be conducted, was developed by Frontier Economics (with support from ERM) in October 2022. This recommended that the impact evaluation of the ATF should be theory-based, in line with Magenta Book guidance for interventions in complex environments.[1] Theory based methods do not provide a precise estimate of the size of the impact of a policy – instead the aim is to explore whether the intervention contributed to the measured change in outcomes, and why the policy worked or did not work.

The ATF evaluation framework included:

- The **theory of change** (ToC) linking what ATF is doing (inputs and activities) to what it will deliver (the outputs) and the benefits that will be realised in the shorter- and longer-terms (outcomes and impacts).
- The **logic model**, which is a visual representation of the ToC.
- The **impact evaluation questions**, which specific metrics and data sources identified to track and measure success.
- The **evaluation methodology**, setting out how evidence to answer the questions will be obtained and analysed.
- Key **timelines** for future phases of the evaluation.

This baselining report was informed by the evaluation framework, and therefore should be read in parallel with that framework.

The evaluation baseline

The evaluation approach described in the ATF evaluation framework requires identifying a "pre-intervention" baseline, to understand how different quantitative and qualitative indicators of interest have evolved over time. The purpose of this baseline report is to present such values of key metrics before, or in the early stages of, the ATF. This ensures that it will be possible for a future evaluation to analyse how the main metrics of interest have changed over time.

Any observed changes over time will not necessarily be attributable to the ATF, and the evaluation will not be able to determine the quantitative impact of the ATF on all these

[1] HM Treasury (2020), Magenta Book Central Government Guidance on Evaluation

indicators. Instead changes in each indicator will be interpreted alongside other quantitative and qualitative data to compile a picture of the likely contribution of the ATF.

It is important to note that **the baseline report does not in itself constitute an evaluation of the ATF**. Data collected in future will be needed to draw conclusions. However, some of the metrics and data gathered as part of the baseline do contain early insights into the perceived impact of the ATF to date.

This baseline report draws on secondary statistical data, and a bespoke applicant survey to provide a quantitative baseline. These data are complemented by qualitative evidence from interviews with important strategic stakeholders, including the Advanced Propulsion Centre, project representatives from within government, and leading UK and international businesses from across the EV supply chain.

The exact baseline period differs by metric as it depends on data availability. The focus is often on 2019, as the last 'pre-ATF' year, but wherever possible data is presented for each year in the period 2015 to 2023.[2] The primary data collection to support this baselining exercise asked stakeholders about their current perceptions, and about how things have changed since 2019.

This baselining report recognises limitations in its data sources. In particular:

- Due to the challenge of accurate recall, the survey and interviews primarily gauge current views on the EV supply chain.
- The primary data collection, through surveys and interviews, captures diverse perspectives across the EV supply chain. However, secondary data sources often rely on the automotive sector definition as per the Standard Industrial Classification (SIC) category 29, which includes motor vehicle manufacturing but may overlook other EV activities like battery production or upstream activity. Ultimately, impacts of the ATF should be felt within firms captured by this SIC, but this may not capture all the shorter-term or wider impacts on the value chain.
- The survey achieved sample size of 53 respondents limits the robustness of evidence drawn from the applicant survey. In particular, this limits the ability to examine the views of particular subgroups as there is insufficient representation to draw definitive conclusions or generalizations.

Summary of baseline findings

Figure 1 summarises the main findings for each of the baselined quantitative metrics, organised by evaluation theme and question. The data in this summary comes from a mix of primary (survey) sources and secondary sources; references for the secondary data are provided in the main report.

Figure 1 Summary of quantitative metrics

[2] The ATF was first announced at the Conservative Party Conference in October 2019, and was formally launched in July 2020 with the opening of its first funding round for R&D studies.

The second evaluation theme is "To what extent has the ATF met or is it on track to meet longer term objectives?". There are four research questions underlying this evaluation theme.

- The first research question is "Has confidence in the UK supply chain increased?". Two metrics were baselined for this research question.
    - The first one is attractiveness of the UK as a location for investment. This is evidenced from the survey of ATF applicants. 4% of survey respondents think the UK is the world leading location to invest in the EV supply chain. 14% of survey respondents think the UK is more attractive that most of its competitor countries, though not all of them. 43% of respondents think the UK is more attractive than some countries but less attractive that its competitors. 23% of respondents think the UK is less attractive than most countries. 13% of respondents think the UK is much less attractive than most countries. 2% of respondents answered "Don't know".
    - The second metric is private investment in automotive and related sectors. In 2019 Greenfield FDI in the automotive sector was £0.66 billion.
- The second research question for this evaluation theme is "Has the EV sector grown in line with expectations?".
  Three metrics were baselined for this research question:
    - The first metric is "Actual production of electric vehicles in the UK". The number of electric vehicles produced in the UK was 43,590 in 2020; 69,758 in 2021, 73,999 in 2022; 79,867 in 2023.
    - The second metric is "Forecast production of electric vehicles in the UK". This was sourced from IHS Markit forecasts as of June 2023. The forecast production of electric vehicles amounts to 58,690 in 2024; 113,899 in 2025; 237,001 in 2026; 430,971 in 2027; 553,104 in 2028; 653,248 in 2029; 709,457 in 2030.
    - The third metric is "Turnover and number of companies in automotive and related sectors". In 2019 there were 3,355 companies operating in the automotive sector in the UK and the annual turnover of the automotive industry was £82.5 billion.
- The third research question for this evaluation theme is "Have jobs in the automotive sector been created or safeguarded?".
  One metric was baselined for this research question:
    - "Number of automotive jobs, direct and indirect". In 2019 in the UK there was a total of 160,000 jobs in the automotive industry.
- The fourth research question for this evaluation theme is "Is there a secure and resilient local supply of key materials and components?".
  One metric was baselined for this research question:

- This was sourced from the survey of ATF applicants. 36% of respondents rated the supply chain as non-secure/resilient; 17% of respondents rated it as secure/resilient; 17% of respondents gave an intermediate score and another 17% did not answer.

The third evaluation theme is "To what extent has the ATF enabler wider economic or social benefits?".
There are two research questions under this evaluation theme.

- The first research question is "Are there demonstrable local or regional benefits to ATF?".
  One metric was for this research question:
  - "Number of automotive jobs by region". In 2019 the number of automotive jobs was 3,215 in Scotland; 10,610 in Wales; 10,125 in the South West; 19,600 in the South East; 3,425 in London; 6,070 in the East; 52,745 in the West Midlands; 8,790 in the East Midlands; 10,350 in Yorkshire and the Humber; 17,850 in the North West, 16,775 in the North East.
- The second research question is "Is the ATF maintaining trade flows associated with the automotive sector?".
  Three metrics were baselined for this research question:
  - The first one is "Exports of electric vehicles". In 2019, the UK exported EVs for an overall value of $1.2 billion.
  - The second one is "Exports of lithium batteries". In 2019, the UK exported lithium batteries for an overall value of $65 million.
  - The third one is "Imports and exports of automotive goods". In 2019, the overall value of imports and exports of automotive goods was £65.0 billion and £48.1 billion respectively.

The fourth evaluation theme is "What are the main learning points from the ATF?". There is one research question under this evaluation theme:

- "What have the main barriers to, and enablers of the ATF been?". Baseline evidence was contributed by the survey of ATF applicants. The main barriers were perceived to be government support for the sector, access to capital, planning timescales and costs of inputs. The main enablers were perceived to be the R&D environment and access to customers.

The interviews with key industry players and project stakeholders provided further important baseline evidence. All interviewed stakeholders agree that in 2019 (i.e. before the ATF was announced) the UK was perceived as a less viable location for investment in the automotive sector because of uncertainty around trading arrangements after leaving the EU. In the absence of agreement around trade rules, companies were reluctant to invest in the UK at

that time. These uncertainties were partly resolved in 2021 when the EU-UK Trade and Cooperation Agreement entered into force.

Interviewed stakeholders indicated a gradual improvement in the external perception of the attractiveness for investment in automotive in UK since 2021. The current overall impression, however, is that the UK faces stiff competition to attract investment in the EV supply chain. OEMs show a desire to localise vehicle production near to demand, but only when it is cost effective to do so, such as when there is a large enough demand for a vehicle model to satisfy a whole production line. Battery producers show a desire to situate battery manufacturing driven by factors such as cost of production and of transportation of both inputs and products, and trade rules. The main competitive challenges to the UK for OEMs and battery manufacturing have come from Asian and EU countries – particularly those with low cost of labour, and now there is increasing competition from the US, as a result of favourable policy and incentives from the Inflation Reduction Act (IRA).

However, the majority of interviewed stakeholders agreed that there are strengths underpinning confidence in the UK supply chain and its attractiveness for investments, namely: historical geopolitical relationships; robust green energy infrastructure; strong R&D ecosystem; large skilled labour force; established infrastructure; availability of strategically located sites for some types of investments.

The overall sentiment on the status of the UK EV supply chain emerging from the interviews is not unanimous. The majority of the businesses interviewed were of the opinion that other jurisdictions are winning the competition against the UK to attract investment, leading to delayed growth in the UK. Several interviewed stakeholders thought that a battery supply chain would be established in the UK, but not to the extent that it could have been with earlier and stronger public funding support.

On the other hand, some businesses and most APC and project stakeholders interviewed, while aware of existing challenges, expressed cautious optimism. Some of them expressed a belief that the ATF seems to be on track for what would have been considered a good outcome when ATF was envisaged and they see several opportunities for the industry going forwards. One industry stakeholder, in particular, highlighted how the investments of Agratas and AESC in the UK could bring the UK battery capacity to a critical level, at which it would be capable of attracting other parts of the supply chain to the UK.

1 Introduction

The Automotive Transformation Fund (ATF) is a funding programme created by the UK government to support large-scale industrialisation of an electrified automotive supply chain in the UK. The programme aims to establish a competitive and sustainable UK supply chain for electric vehicles. The ATF provides funding for capital and R&D projects in batteries, machines and drives, power electronics, fuel cells, and the upstream supply chain for any of the above.

A previous evaluation framework report set out how the impacts of the ATF should be evaluated. This baseline report provides data and evidence that can be used to support such a future evaluation, allowing for comparisons of key quantitative metrics and qualitative insights to be made to address the evaluation questions set out in the framework.

This baseline report is structured as follows:

- The rest of this section briefly describes the ATF and its objectives, an overview of the evaluation framework, and the purpose of this baselining report;
- Section 2 outlines the baselining approach and data sources used;
- Section 3 provides the baseline results, organised by evaluation theme;
- Section 4 provides selected key international comparisons of some of the metrics in the evaluation framework; and
- Section 5 summarises the recommended next steps for the impact evaluation.

There is also an appendix that provide additional detail on the primary data collection (survey fieldwork) used to support this baseline exercise.

The baseline report was produced by a consortium of Frontier Economics, ERM and BMG Research. ERM provided industry expertise and led on the analysis of international data and policy. BMG Research provided business research expertise and led on the implementation of the business survey.

1.1 The UK automotive sector

The UK's automotive sector plays a crucial role in the UK economy, supporting key national agendas like levelling up, achieving net zero emissions, advancing global Britain, and fostering growth. Generating £71 billion in turnover[3] and adding £15.6 billion in value added[4] to the economy in 2002, automotive manufacturing annually invests approximately £3 billion in research and development.[5]

[3] ONS Monthly Business Survey turnover in production industries
[4] ONS GDP Low Level Aggregates
[5] ONS Business Enterprise Research and Development

Employing over 151,000 individuals in manufacturing and nearly 800,000 across the broader automotive industry,[6] the sector contributes significantly to UK exports accounting for 9% of total UK goods exports.[7] UK-produced vehicles are exported to over 132 countries, and goods from the sector generated a trade value of £95 billion in 2022.[8] With over 25 manufacturers producing more than 70 vehicle models in the UK, supported by 2,500 component providers and highly skilled engineers, the industry demonstrates robust diversity and expertise.

In 2023, the UK manufactured 905,177 cars, 120,359 commercial vehicles, and 1.5 million engines. Impressively, eight out of every ten cars produced in the UK are destined for international markets, spanning more than 130 different countries worldwide.[9]

1.2 ATF

While the UK has a strong automotive sector, the transition to electric vehicles (EVs) presents significant challenges. To avoid a cliff-edge as conventional internal combustion engine technology becomes obsolete, the UK must ensure its automotive R&D and manufacturing capability and competitiveness extend to EVs.

There is global competition to secure investment in next generation vehicle technology. While the UK is an attractive investment location in many respects, with the benefits of language, culture and an internationally recognised R&D ecosystem, it is less competitive in terms of other factors such as energy costs, land prices, construction costs and labour costs.[10] There are also high fixed capital costs of entry, coordination difficulties, and uncertainty on the timescale of return on investment in the sector.

The **Automotive Transformation Fund (ATF)** has been set up to support the development of an internationally competitive EV supply chain in the UK and sustain the commitment of the UK to be at the forefront of the design and manufacturing of zero emission vehicles. The fund is highlighted as an important mechanism to reach targets in UK Government's Ten Point Plan for a green industrial revolution and its Transport Decarbonisation Plan.[11]

The ATF is focused on four priority technology areas: batteries, machines and drives, power electronics and fuel cells. It provides financial support through two strands:

- **Funding R&D and feasibility work**, aimed at providing findings that can be used to help businesses realise commercial opportunities in the EV supply chain in the UK and demonstrate the feasibility to invest through pilot scale projects.
- **Capital grant funding**, aimed at directly supporting capital investment in the EV supply chain in the UK.

[6] DBT estimates based on ONS Employee Jobs and Self-Employed Jobs data. Wider automotive industry including automotive manufacturing, automotive retail, wholesale and maintenance and car leasing.
[7] ONS Trade in Goods by CPA (trade value = exports+imports)
[8] ONS Trade in Goods by CPA (trade value = exports+imports)
[9] SMMT Motor Industry Facts 2023
[10] These factors were highlighted by expert stakeholders interviewed for this baselining assessment.
[11] HM Government (2020) The Ten Point Plan for a Green Industrial Revolution

The ATF was initially capitalised at £500m through the 2020 Ten Point Plan, with a further £350m announced in the 2021 Net Zero Strategy.[12]

The main objectives of the ATF[13] are to:

- Signal the UK's commitment to the future of the automotive sector and raise the profile of the UK as a location for automotive activity, drawing in private investment.
- Reduce global emissions from the automotive sector.
- Safeguard or grow manufacturing jobs in the UK automotive sector.
- Address and remedy the structural weaknesses in the UK supply chain, helping ensure a secure and resilient supply of key materials and components, and work towards increasing local content in UK built electric vehicles, which will support meeting "Rules of Origin" requirements, enabling tariff free access to global markets.

The ATF is managed by DBT, with the Advanced Propulsion Centre (APC) acting as the main delivery partner, and Innovate UK collaborating on the administration of R&D funding.

There are several complementary government initiatives that support objectives similar to those of the ATF. For example: the APC has funding (separate to the ATF) to support R&D to accelerate the industrialisation of technologies that support the transition to deliver net-zero vehicles; the Faraday Battery Challenge, a £610 million government investment in battery technology between 2017 and 2025, aiming to establish the UK as a world leader in battery technology[14]; the Driving the Electric Revolution (DER) Challenge, a £80 million government investment over 5 years in power electronics, seeking to support the UK's electrification supply chain by developing power electronics, machines and drives (PEMD)[15].

1.3 Summary of the evaluation framework

The ATF evaluation framework was developed by Frontier Economics (with support from ERM) in October 2022.

The ATF evaluation framework included:

- The **theory of change** (ToC) linking what ATF is doing (inputs and activities) to what it will deliver (the outputs) and the benefits that will be realised in the shorter- and longer-terms (outcomes and impacts).
- The **logic model**, which is a visual representation of the ToC.
- The **impact evaluation questions**, which specific metrics and data sources identified to track and measure success.
- The **evaluation methodology**, setting out how evidence to answer the questions will be obtained and analysed.
- Key **timelines** for future phases of the evaluation.

[12] HM Government (2021) Net Zero Strategy: Build Back Greener
[13] ATF Business Case
[14] UKRI Faraday battery challenge
[15] UKRI Driving the Electric Revolution

The framework recommended that the impact evaluation of the ATF should be theory-based in line with Magenta Book guidance for interventions in complex environments.[16] Theory based methods do not provide a precise estimate of the size of the impact of a policy – instead the aim is to explore whether the intervention contributed to the measured change in outcomes, and why the policy worked or did not work. Impact evaluation using this methodology would give an evidence-led assessment for the ATF having had (or not having had) the intended impacts, and an understanding of why this was the case.

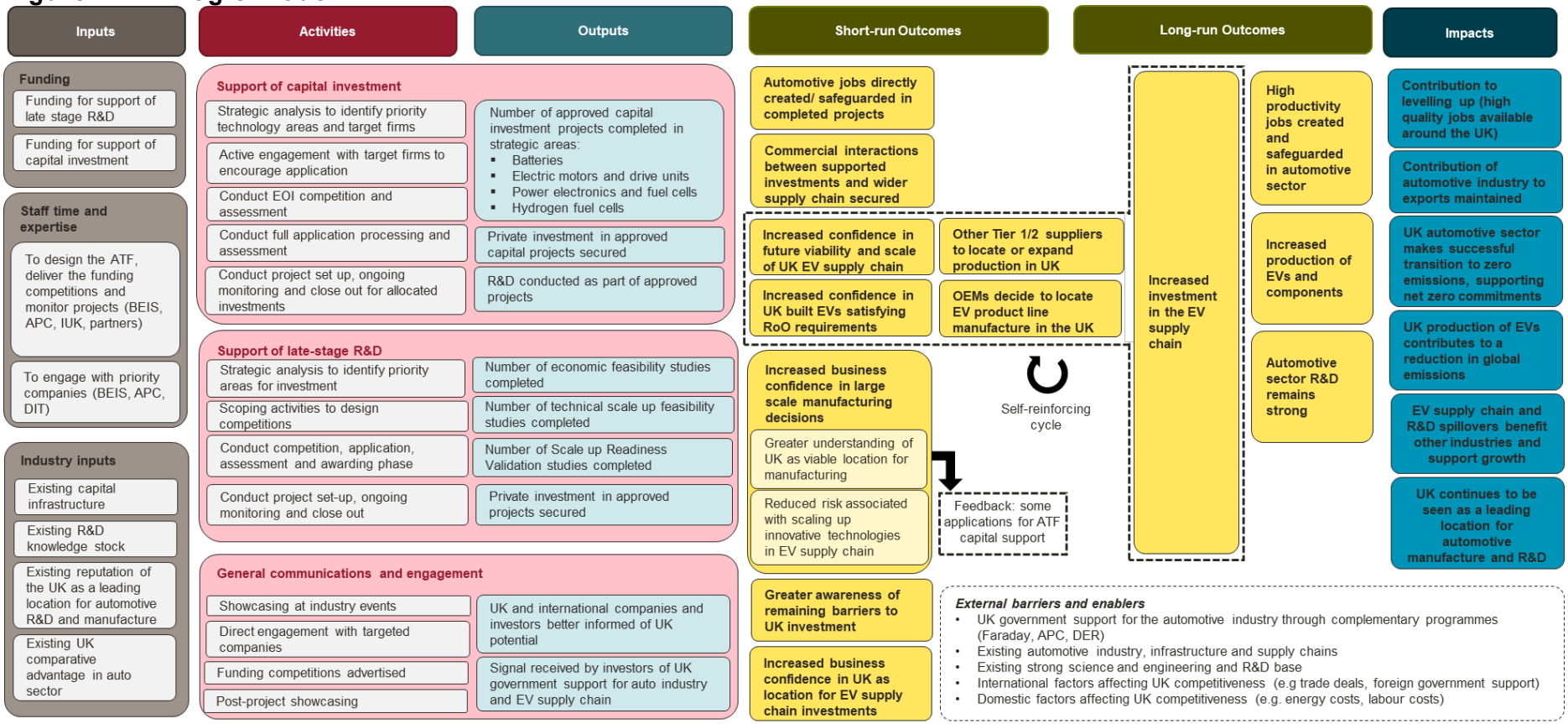
This baselining report was informed by the evaluation framework, and therefore should be read in parallel with that Framework. To contextualise the approach and findings of this report, the following summarises the parts of the evaluation framework most relevant for the baseline analysis.

Logic model

The logic model developed as part of the evaluation framework is illustrated in Figure 2. This illustrates that the capital investment and R&D support provided by the ATF are anticipated to result in jobs and investment in the supported projects, and commercial interactions with the wider supply chain. These outcomes, as well as the ATF activities themselves, are expected to increase confidence in the viability of the UK EV supply chain, resulting in greater investment in the UK, more companies locating their activities here, and anchoring a growing UK EV supply chain. Over the longer term this will secure high productivity jobs in the automotive sector, with automotive R&D remaining strong and the sector successfully transitioning to EV production.

[16] The complex landscape in which the ATF is being delivered means that it is not feasible to use experimental or quasi-experimental methods, which rely on being able to identify a comparator "control" group who were not affected by the ATF. The core principle of experimental or quasi-experimental methods is that the outcome from the group that received an intervention can be compared to the outcome of a "control" group, where that control group is effectively identical to the group of interested except for that they did not receive the intervention.

Figure 2 ATF logic model



Source: *Frontier Economics*

Evaluation methodology

The evaluation framework recommended that the impact evaluation be delivered using contribution analysis (a theory-based evaluation). This approach uses quantitative and qualitative data to verify stages in the Theory of Change such that, if other major influences are accounted for, it is reasonable to infer that the ATF has made a difference to the outcomes of interest.

Evaluation themes and questions

Drawing on the theory of change, the impact evaluation approach set out in the framework report identified four evaluation themes:

1. Are targets for outputs and outcomes being met? If not, why not?
2. To what extent has ATF met, or is it on track to meet, longer-term objectives?
3. To what extent has the ATF enabled wider economic or social benefits?
4. What are the main learning points from the ATF?

Sitting within each of these themes are a set of research questions, which are paired with a range of metrics from which evaluators should look to extract findings. The research questions are summarised in Figure 3 while the metrics underling each are set out in Figure 4.

Figure 3 Evaluation framework themes and research questions

- Evaluation theme 1: "Are targets for outputs and outcomes being met?"
  Research questions underlying evaluation theme 1:
  - Has late stage R&D been supported as expected?
  - Were the outcomes of R&D supported as expected?
  - Has capital investment been supported as expected?
  - Were the short-term outcomes of capital investment supported as expected?
- Evaluation theme 2: "To what extent has the ATF met or is on track to meet its longer term objectives?"
  Research questions underlying evaluation theme 2:
  - Has confidence in the UK EV supply chain increased?
  - Has the EV sector grown in line with expectations?
  - Have jobs in the automotive sector been created or safeguarded?
  - Is a secure and resilient local supply chain or key materials and components available to UK based OEMs?
- Evaluation theme 3: "To what extent has the ATF enabled wider economic or social benefits?"
  Research questions underlying evaluation theme 3:
  - Are there demonstrable local or regional benefits to the ATF realised or expected?
  - Are climate benefits being realised?
  - Is the ATF maintaining the trade flows associated with the automotive sector?
- Evaluation theme 4: "What are the main learning points from the ATF?"
  Research questions underlying evaluation theme 4:
  - Have there been any unexpected outcomes or impacts of the ATF and what is their nature and scale?
  - What have been the main barriers to and enablers of the ATF?
  - Has the ATF complemented other policies and interventions?
  - What lessons are there for future interventions?
  - Has the ATF investment represented value for money?

Source: Frontier Economics

These themes, questions and metrics were developed collaboratively with ATF stakeholders, and are designed to cut across the theory of change in terms of the various outputs, outcomes and impacts identified.

1.4 Purpose of this baselining report

The purpose of this baseline report is to present values of key metrics across these themes before, or in the early stages of, the ATF. This ensures that it will be possible for a future evaluation to analyse how the main metrics of interest have changed over time.

Any observed changes over time will not necessarily be attributable to the ATF, and the evaluation will not be able to determine the quantitative impact of the ATF on all these indicators. Instead changes in each indicator will be interpreted alongside other quantitative and qualitative data to compile a picture of the likely contribution of the ATF.

It is important to note that **the baseline report does not in itself constitute an evaluation of the ATF**. Data collected in future will be needed to draw conclusions. However, some of the metrics and data gathered as part of the baseline do contain early insights into the perceived impact of the ATF to date.

The baselining report is also not intended to provide an introduction to or overview of the automotive sector in the UK. The focus is specifically on metrics identified as being most relevant for a future impact evaluation. An overview of the UK automotive sector is available from the Society of Motor Manufacturers and Traders.[17]

The exact baseline period differs by metric as it depends on data availability. Wherever possible data is presented for 2023 (or the most recent year for which data are available) and annually since 2015. The primary data collection to support this baselining exercise asked stakeholders about their current perceptions, and about how things have changed since 2019, the year before the ATF was announced.[18]

This baselining report also presents data on international comparator countries in Section 4. The ATF evaluation framework did not recommend seeking to evaluate the impact of the ATF by comparing the UK experience to other countries. However, international comparison may provide important context for understanding the experience of the UK and the impacts of the ATF. Furthermore, should a future evaluation wish to consider the impact of similar international comparator programmes to the ATF, then baselining analysis may be valuable. Data on international comparator countries for some of the key metrics in the ATF evaluation framework is therefore provided in Section 4.

[17] SMMT Motor Industry Facts 2023

[18] The ATF was first announced at the Conservative Party Conference in October 2019, and was formally launched in July 2020 with the opening of its first funding round for R&D studies.

2 Baselining approach and data sources

2.1 Evidence sources

The evaluation framework described four key sources of evidence that will be used to measure the impact of the ATF. These are:

- Surveys of organisations involved in the EV supply chain.
- Interviews with organisations involved in the EV supply chain.
- Secondary statistical data.
- Monitoring data held internally by the ATF delivery teams.

This baseline report draws on secondary statistical data, and a bespoke applicant survey to provide a quantitative baseline. These data are complemented by 13 interviews with important strategic stakeholders, including the Advanced Propulsion Centre, project representatives from within government and leading UK and international businesses from across the EV supply chain. These interviews help to provide a qualitative baseline for certain metrics where quantification is not possible or appropriate.

This baseline report does not draw on monitoring data. Monitoring data largely focus on activity- and output-level metrics relating to the ATF, which by definition have a zero baseline and therefore do not require baselining. Monitoring data will be available to a future evaluation.

Survey of organisations in the EV supply chain

The baseline survey was distributed to companies that had applied to the ATF for funding, either submitting an Expression of Interest for capital funding or applying through Innovate UK for R&D funding through one of the feasibility or Scale Up Readiness Validation competitions. Based on discussions with ATF stakeholders, this sampling frame is believed to provide a good proxy for companies across the EV supply chain.

Appendix A provides more detail on the survey methodology. In summary, the survey was conducted online in December 2023 and January 2024. The sample frame contained 446 contacts across 415 companies. Companies were contacted by DBT in advance of the survey to make them aware of it in advance. They were then sent an email, outlining the aims and purpose of the research and containing a link to the online survey. During fieldwork, two reminders were sent via email. From January 8th telephone calls were made to the organisation to encourage completion.

Of the 446 available contacts, 53 completed a survey, resulting in a response rate of 11.9%, which is a fairly strong response rate for this type of survey. Surveys of funding applicants typically have response rates between 5% and 20%. Factors such as the completeness of the same database, the length of time since any engagement with the funding body, whether funding applications were successful, and the amount of funding sought, all impact response rates to this type of survey. Higher response rates tend to be achieved when the sample is as up to date and complete as possible and when the contacts have had high levels of recent engagement with the funding body. It is also typical to see higher response rates for

those who were successful in their funding application, compared to those who were not successful. The response rate of 11.9% can be considered to be a fairly strong response rate, given that not all company contacts were a named contact, many had not received funding from the ATF, and applications for ATF funding may have been made as much as three years earlier.

Table 1 indicates that the respondents cover the breadth of supply chain tiers, technology areas and ATF funding streams.

Table 1 Distribution of survey responses across respondent characteristics

Distribution	Achieved sample
Total	**53**
Supply chain tiers	
An OEM/Prime producer	7
System integrator (similar to OEM but with more focus on the design of vehicle systems)	4
Tier 1 producer/Sub-system manufacturer e.g. vehicle transmission system, e-axle	8
Tier 2 producer/Large component manufacturer and supplier to a Tier 1 producer e.g. motor, inverter	6
Tier 3 producer/Small component manufacturer and supplier to a Tier 2 producer e.g. power transistor, wafers	5
Materials manufacturer e.g. lithium refiner, magnetic alloys manufacture	9
Other (including don't know)	14
Technology areas (as given in the survey)	
Battery: Battery cell materials and components, battery cells, battery packs.	23
PEMD: Power electronics, machines and drives.	14
Fuel cells and hydrogen: fuel cell stacks and systems, hydrogen tanks.	12
Vehicles: Light Duty Vehicles, buses, heavy duty vehicles, off highway equipment.	16
Other	16
Capital type	
Capital funding EOI applicant	35
R&D funding applicant	18

Source: Frontier Economics

Interviews with key stakeholders

In-depth interviews complement surveys and are useful to elicit a large amount of qualitative information from expert individuals. To gain a baseline perspective encompassing the breadth of the EV supply chain, 13 interviews were conducted. This included interviews with the APC, representatives of the Department for Business and Trade and the Office for Investment, and strategic stakeholders from major UK and international businesses from across the EV supply chain. The interviews were conducted between December 2023 and February 2024 (with the majority happening in late December or early January).

The interviews were conducted over video call for around 45 minutes, and were led by ERM and Frontier Economics. The interviews were semi-structured, following a topic guide that set out the areas to be covered. Interviews explored some or all of the following aspects:

- The current state of the UK EV supply chain.
- Key advantages and disadvantages of investing in the UK.
- Main barriers and opportunities for investment and growth in the UK automotive sector and different parts of the EV supply chain.
- How all the above have changed since 2019 (i.e before the ATF was announced).
- Key risks or dependencies for UK seeking to anchor a domestic EV supply chain.
- Changes that need to happen to see an improvement in attitudes towards investment in the UK EV supply chain.

The semi-structured nature of the interviews allowed the interviewers to delve into the key topics to establish the baseline, but also allowed for any unexpected topics or points of interest to be explored. This also enabled interviewers to modify questions to suit the specific individual or individuals being interviewed, and therefore gather the most relevant information.

Interview notes were recorded and evaluated in a framework against relevant evaluation themes. Evaluators organised statements by indexing qualitative evidence according to the thematic framework. This enabled the evaluators to interpret the key findings and evidence in each theme and identify additional evidence that complements other data sources. It also facilitated understanding of where views are held by small numbers of, or particular types of stakeholders, and where they are representative of a consensus of opinion. Throughout the findings this is indicated qualitatively, both to avoid issues of disclosure and because it can be challenging to quantify how many stakeholders hold particular views when qualitative perspectives can be held with different degrees of strength, or with different nuances, across interviewed stakeholders.

Secondary statistical data

The evaluation framework set out different types of secondary statistical data that will be used to conduct the evaluation. These include:

- Industry data;
- Data aggregated to the sector level, such as by Standard Industrial Classification (SIC).

Not all secondary statistical data sources were used to baseline metrics in this report. This is because some secondary sources are expensive to acquire and/or time consuming to clean and analyse (including sources held in secure environments which do not generally approve requests to extract data that is not intended for publication). In these cases the relevant data

are signposted to be obtained as part of a future impact evaluation, at which point both baseline and contemporaneous data can be extracted. Figure 4 below highlights the specific metrics this affects.

2.2 Data timing

The exact baseline period differs by metric as it depends on data availability. Wherever possible data is presented for 2023 (or the most recent year for which data are available) and annually since 2015. The primary data collection to support this baselining exercise asked stakeholders about their current perceptions, and about how things have changed since 2019, the year before the ATF was announced.[19]

2.3 Limitations of the baseline data

The limitations of the survey and secondary data sources used in this baselining report should be acknowledged.

Following discussions with DBT and survey fieldwork experts at BMG Research, it was agreed that most of the questions in the survey (and the focus of the qualitative interviews) would relate to current perceptions. This is because it is hard for people to know what their perceptions were at a specific point in time in the past. Some questions do, however, seek to unpick perceptions of how things have changed since 2019, though limits of recall need to be borne in mind in interpreting these data.

A future impact evaluation can look at changes in these perceptions between the time of the baseline survey and when such perceptions are measured again. This comparison would need to be conducted carefully in order to understand the role of the ATF. It is possible that the ATF has already had some impact on perceptions. However, perceptions from 2019 (even if available) would also have their limitations. The current state of the world has been affected by (among others) the Covid-19 pandemic, the war in Ukraine, and international trade policies – none of which would have been anticipated in 2019. The future evaluation will therefore have to take great care in interpreting the extent to which any changes over time, in any of the metrics baselined in this framework, are attributable to the ATF rather than external factors.

The EV supply chain is large and covers multiple technology areas. The primary data collection (survey and interviews) have captured the perspectives of individuals and businesses from across the supply chain. However, many of the metrics baselined from secondary data sources relate to the “automotive sector” as defined by the Standard Industrial Classification (SIC) category 29: –“Manufacturing of motor-vehicles, trailers and

[19] The ATF was first announced at the Conservative Party Conference in October 2019, and was formally launched in July 2020 with the opening of its first funding round for R&D studies.

semi-trailers". [20] This includes the manufacture of motor vehicles, bodies for motor vehicles, and parts and accessories for motor vehicles, but this does not capture all EV supply chain activity (including battery manufacture or upstream activity). Ultimately, impacts of the ATF should be felt within firms captured by this SIC, but this may not capture shorter-term or wider impacts on the value chain.

While the survey response rate of 11.9% can be considered to be a fairly strong response rate, the achieved sample size of 53 respondents limits the robustness of the evidence provided by the survey data. In particular, this limits the ability to examine the views of particular subgroups as there is insufficient representation to draw definitive conclusions or generalizations.

2.4 Overview of the metrics

Figure 4 presents an overview of all the metrics set out in the evaluation framework report organised by theme, and indicates whether they are baselined with primary data, baselined with secondary data, or not baselined. The figure specifies the reason why a particular metric is not baselined, with the following key:

- "Z" indicates that the approach relies on stated impact survey responses or qualitative perceptions which do not require baselining, or otherwise that the baseline is expected to be zero.
- "M" indicates that the approach relies on monitoring data from the ATF delivery teams which is not yet available.
- "F" indicates that the datasets are expensive to acquire or time consuming to analyse, and therefore baseline data should be extracted and analysed alongside a future impact evaluation.

The non-baselining of these metrics does not have any implication for any future impact evaluation.

Figure 4 Overview of metrics and whether baselined

[20] When available, data is sourced with a focus on specific sub-sectors of SIC 27 ("Manufacture of electrical equipment") and 29 ("Manufacture of motor-vehicles, trailers and semi-trailers") using the following 5-digit SIC codes deemed as the most relevant:

- 27110 – Manufacture of electric motors, generator and transformers
- 27200 – Manufacture of batteries and accumulators
- 29100 – Manufacture of motor vehicles
- 29201 – Manufacture of bodies (coachwork) for motor vehicles (except caravans)
- 29310 – Manufacture of electrical and electronic equipment for motor vehicles
- 29320 – Manufacture of other parts and accessories for motor vehicles.

This targeted approach provides a more accurate depiction of the EV supply chain, encompassing crucial components like electric motors and batteries. In cases where data granularity is lacking, the broader SIC code 29 is used. However, this may overlook EV-related activities or include potentially irrelevant activities under both SIC codes.

Evaluation theme 1: "Are targets for outputs and outcomes being met?"

Research questions underlying evaluation theme 1:

- Has late stage R&D been supported as expected?
  Metrics associated with the research question:
  - Number of feasibility studies supported – Not baselined (M)
  - Private investment secured – Not baselined (M)
- Were the outcomes of R&D supported as expected?
  Metrics associated with the research question:
  - Number of R&D studies that result in capital application – Not baselined (M)
  - Perceptions of stakeholders – Not baselined (M)
- Has capital investment been supported as expected?
  Metrics associated with the research question:
  - Number of approved investment capital projects completed – Not baselined (M)
  - Private investment secured – Not baselined (M)
- Were the short-term outcomes of capital investment supported as expected?
  Metrics associated with the research question:
  - Number and capacity of gigafactories produced – Not baselined (M)
  - Commercial links by capital projects after completion – Not baselined (M)
  - Employment by capital projects after completion – Not baselined (M)

Evaluation theme 2: "To what extent has the ATF met or is on track to meet its longer term objectives?"

Research questions underlying evaluation theme 2:

- Has confidence in the UK EV supply chain increased?
  Metrics associated with the research question:
  - Attractiveness of the UK as a location for investment – Baselined using survey and interviews
  - Private investment in automotive and related sectors – Baselined using secondary data sources
  - Qualitative assessment of stakeholders – Baselined using survey and interviews
- Has the EV sector grown in line with expectations?
  Metrics associated with the research question:
  - Amount of private investment in automotive and related sectors – Baselined using secondary data sources
  - EV production (actuals and forecasts) – Baselined using secondary data sources

- Turnover/number of companies in automotive and related sectors – Baselined using secondary data sources
- Qualitative assessment of stakeholders – Baselined using survey and interviews

- Have jobs in the automotive sector been created or safeguarded?
  Metrics associated with the research question:
  - Number of automotive jobs, direct and indirect – Baselined using secondary data sources
  - Qualitative assessment of stakeholders – Baselined using survey and interviews
- Is a secure and resilient local supply chain or key materials and components available to UK based OEMs?
  Metrics associated with the research question:
  - Share of local content built in UK vehicles – Not baselined (M)
  - Imports of EV components – Baselined using secondary data sources
  - Security and resilience of supply – Baselined using survey
  - Qualitative assessment of stakeholders – Baselined using survey and interviews

Evaluation theme 3: "To what extent has the ATF enabled wider economic or social benefits?"

Research questions underlying evaluation theme 3:

- Are there demonstrable local or regional benefits to the ATF realised or expected?
  Metrics associated with the research question:
  - Number of automotive jobs in the UK by region, direct and indirect – Baselined using secondary data sources
  - Investment in the automotive and related sectors by region – Not baselined (F)
  - Qualitative assessment of stakeholders – Baselined using survey and interviews
- Are climate benefits being realised?
  Metrics associated with the research question:
  - Emission impacts from increased EV production – Not baselined (Z)
  - Qualitative assessment of stakeholders – Baselined using survey and interviews
- Is the ATF maintaining the trade flows associated with the automotive sector?
  Metrics associated with the research question:
  - Total imports and exports of EVs – Baselined using secondary data sources

- Imports and exports of EV components – Baselined using secondary data sources
- Qualitative assessment of stakeholders – Baselined using survey and interviews

Evaluation theme 4: "What are the main learning points from the ATF?"

Research questions underlying evaluation theme 4:

- Have there been any unexpected outcomes or impacts of the ATF and what is their nature and scale? – Not baselined (Z)
- What have been the main barriers to and enablers of the ATF? – Not baselined (Z)
- Has the ATF complemented other policies and interventions? – Not baselined (Z)
- What lessons are there for future interventions?
  Metrics associated with these research questions:
  - Qualitative assessment of stakeholders – Baselined using survey and interviews

Source: Frontier Economics

3 Baseline findings

This section describes the findings for each evaluation metric requiring baseline evidence. Where relevant, the baselined quantitative data are accompanied by additional context or qualitative information drawn from the interviews. The findings are organised by the themes set out in the evaluation framework.

3.1 Theme 1: Are targets for outputs and outcomes being met?

This theme in the evaluation framework examines whether the ATF delivered on the activities planned, whether the investments supported delivered their intended outputs, and, if not, why not. There are four underlying evaluation questions:

- Has late stage R&D been supported as expected?
- Were the outcomes of late stage R&D supported as expected?
- Has capital investment been supported as expected?
- Were the short term outcomes of capital investment supported as expected?

The metrics paired with these indicators do not require baselining. They will be evidenced using monitoring data from the ATF delivery teams, and qualitative reflections from stakeholders in future, and by definition have a zero baseline.

3.2 Theme 2: To what extent has ATF met, or is it on track to meet, longer-term objectives?

This theme examines the extent to which the ATF is on track to deliver on its longer term objectives of anchoring an EV supply chain in the UK, with the associated investment, R&D, production, and jobs. There are four underlying research questions:

- Has confidence in the UK EV supply chain increased?
- Has the EV sector grown in line with expectations?
- Have jobs in the automotive sector been created or safeguarded?
- Is a secure and resilient local supply of key materials and components available to UK based OEMs?

Each of these research questions includes metrics that can be baselined.

Has confidence in the UK EV supply chain increased?

There are three quantitative metrics that are baselined, as well as the qualitative perceptions of stakeholders:

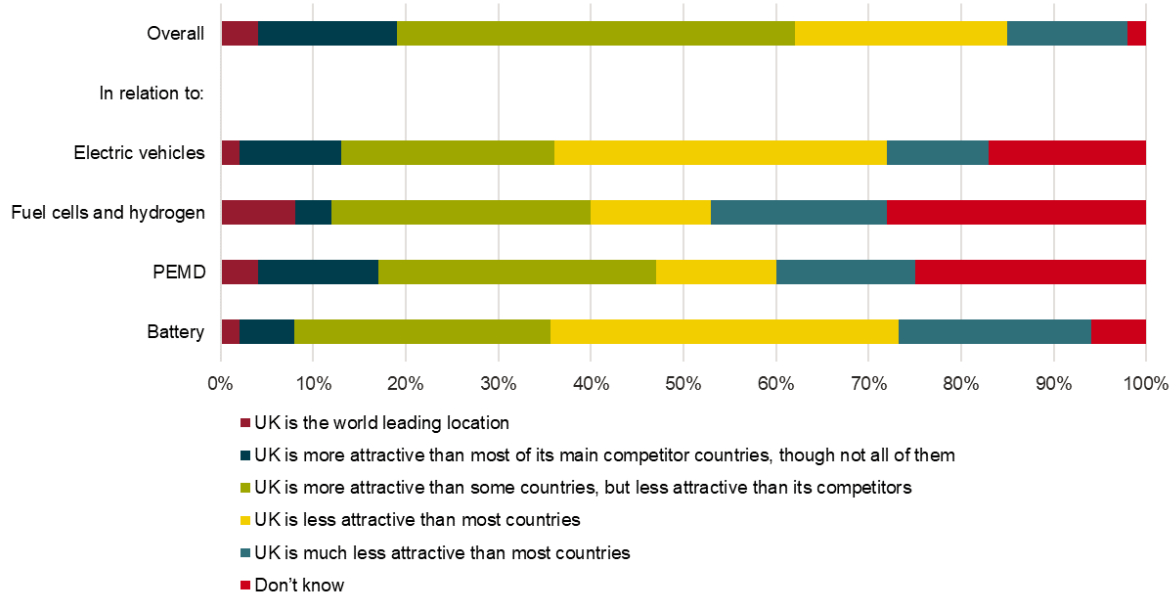
- Attractiveness of the UK as a location for investment.
- Levels of investment in the automotive sector.
- Greenfield Foreign Direct Investment in the automotive sector.

Attractiveness of the UK as a location for investment

Current perceptions of the attractiveness of the UK as a location for investment are not very positive according to the survey responses. Only 4% of respondents believe the UK is the world leading location and only 15% of respondents believe that the UK is more attractive than most of its main competitor countries, though a further 43% believe the UK is more attractive than some countries.

Based on the view of all survey respondents, the area of the EV supply chain where the UK is most attractive is Power electronics, Machines and Drives (PEMD), with 17% of respondents believing the UK is more attractive than most competitor countries (4% thinking the UK is the world leading location). This is shown in Figure 5. The battery segment emerges as the least attractive, with only 8% of all respondents believing the UK is more attractive than most of its competitor countries in this area.[21]

Figure 5 Perceptions of the attractiveness of the UK as a place to invest in the EV supply chain



Source: Survey of organisations in the EV supply chain

Notes: Answer to survey question C01 and C02 (see Appendix A). In question C02, PEMD was presented as "Power electronics, Motors and Drives" rather than as "Power electronics, Machines and Drives". Sample size: 53 respondents.

[21] This pattern stands somewhat in contrast to differences in perceptions of the overall attractiveness of the UK as a location to invest across respondents in operating different areas, with battery firms the most optimistic and those in the fuel cell/hydrogen area the least optimistic (bearing in mind the caveat of very small sample sizes among respondents in particular technology areas).

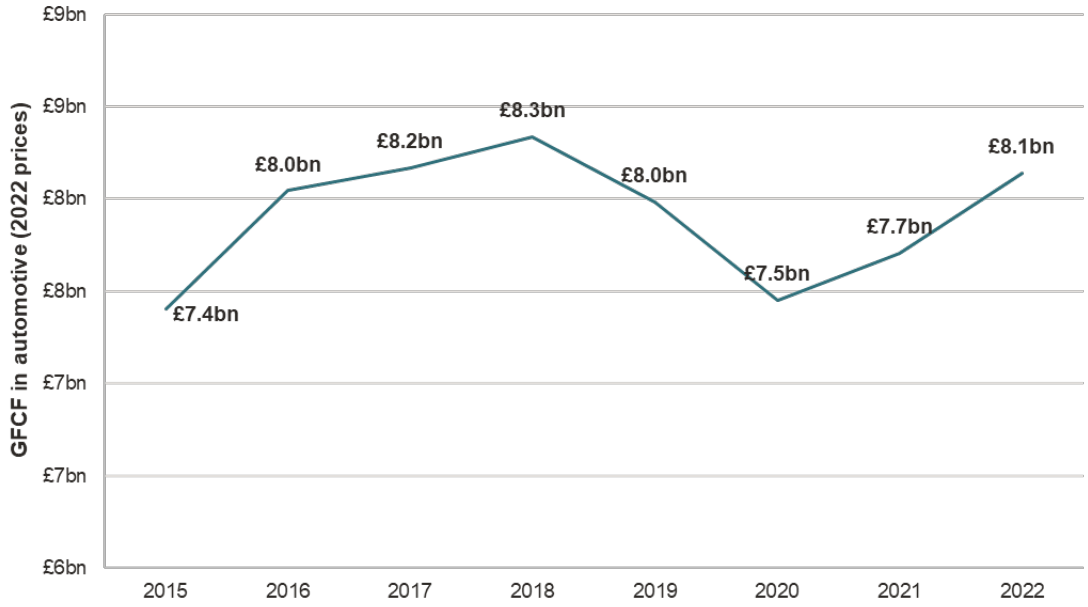
Perceptions of how the attractiveness of the UK as a place to invest has changed since 2019 vary across survey respondents: 27% believe the UK has become more attractive, while 45% believe the UK has become less attractive (see Figure 32 in Appendix B).

Levels of investment in the automotive sector

Gross fixed capital formation (GFCF) is an estimate of net capital expenditure by both the public and private sectors. It includes spending on plant and machinery, transport equipment, software, new dwellings and other buildings as well as intellectual property and R&D, and major improvements to existing buildings and structures, such as roads. Data on GFCF for the automotive sector is sourced from the ONS, using the Standard Industrial Classification code 29 – "Manufacture of motor-vehicles, trailers and semi-trailers".

Figure 6 shows that between 2015 and 2022 GFCF fluctuated between a minimum of £7.4 billion in 2015 to a maximum of £8.3 billion in 2018. In 2019, the year prior to the ATF, GFCF in the automotive sector was £8.0 billion.

Figure 6 Gross fixed capital formation in the automotive sector, 2015 to 2022 – 2022 prices

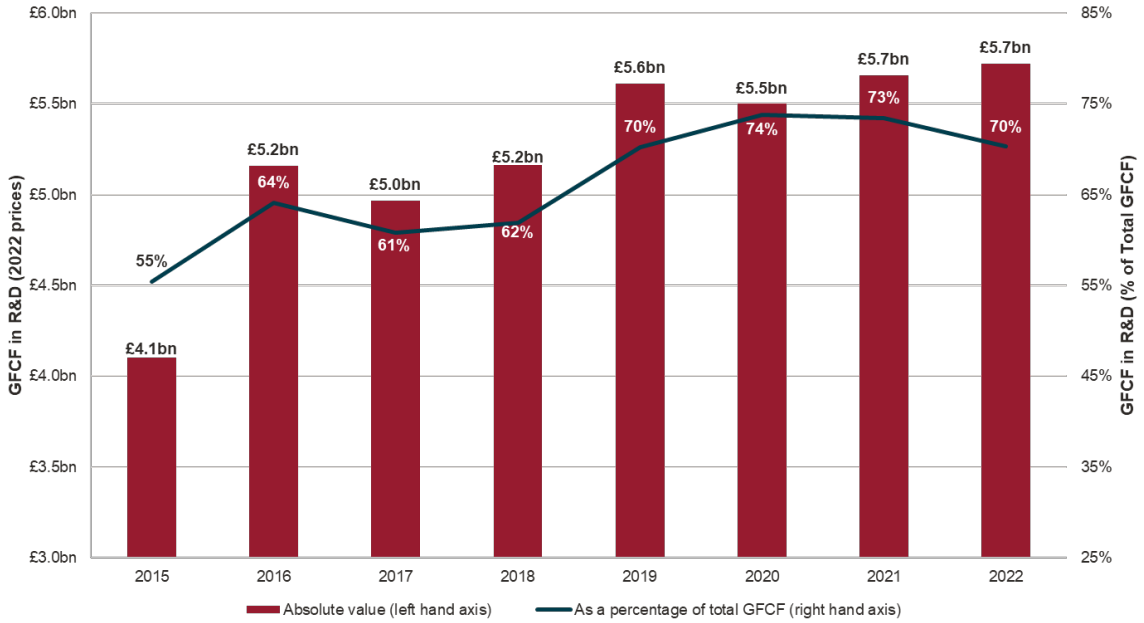


Source: *ONS annual estimates of GFCF by asset and industry*

Notes: *This chart shows GFCF in R&D in the industry identified by the 2-digit SIC code 29 – Manufacturing of motor vehicles, trailers and semi-trailers. Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

Figure 7 shows investment in R&D (a component of GFCF) conducted by the UK automotive sector between 2015 and 2022. Over this period, R&D investment ranges from a minimum of £4.1 billion in 2015 to a maximum of £5.7 billion in 2022. The 2019 value was £5.6 billion. In terms of its share of overall GFCF, R&D investment in the automotive sector has fluctuated between 55% and 74% suggesting that R&D has been a consistent investment focus for the UK automotive sector.

Figure 7 R&D in the automotive sector, 2015 to 2022 – 2022 prices



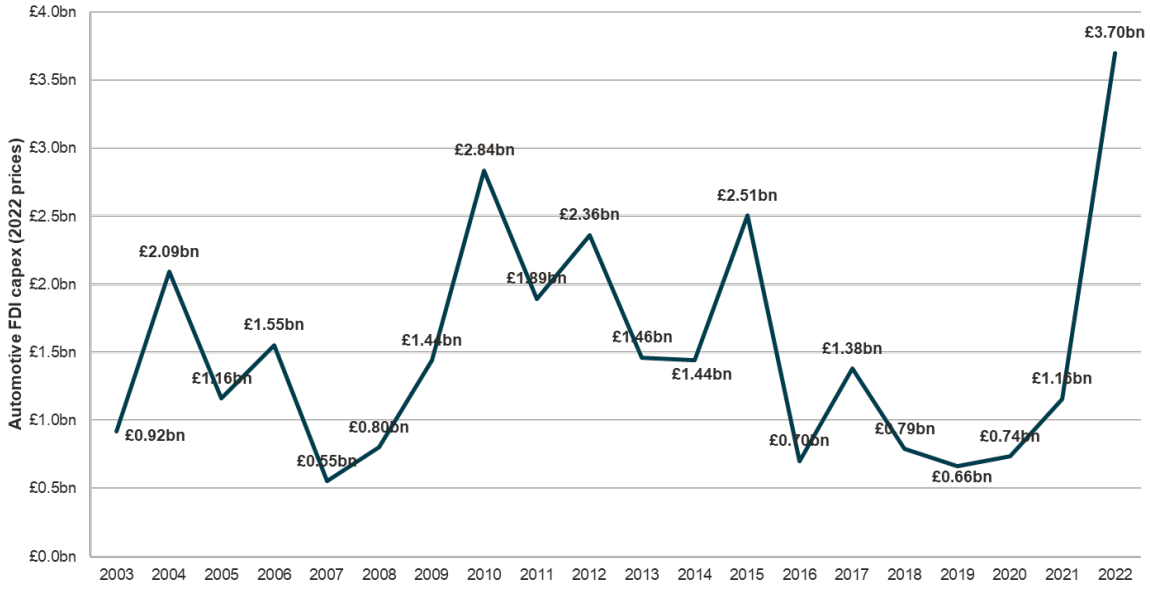
Source: *ONS annual estimates of GFCF by asset and industry*

Note: *This chart shows GFCF in R&D in the industry identified by the 2-digits SOC code 29 – Manufacturing of motor vehicles, trailers and semi-trailers. Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

Another important metric of investment is Foreign Direct Investment (FDI) in the UK automotive sector. This is particularly important given the number of established overseas multinational companies in the global automotive industry and EV supply chain. Figure 8 shows Greenfield FDI in the UK automotive sector (which includes automotive components and automotive original equipment manufacturer, but not gigafactories).[22] Given that FDI was significantly affected by the outcomes of the UK exiting the EU and the uncertainties related to the EU-UK trade deal negotiations, this time series spans from 2003 to 2022, aiming to illustrate the prolonged trend under standard business conditions. In 2019 Greenfield FDI in the UK automotive sector was £0.66 billion.

[22] Greenfield FDI is a type of investment in which a parent company creates a subsidiary in a different country, building its operations from the ground up.

Figure 8 Greenfield Foreign Direct Investment in the UK automotive sector – 2022 prices



Source: *Overview of Greenfield foreign direct investment (FDI)*

Note: *Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

Qualitative perceptions of stakeholders

Interviewed stakeholders highlighted that in 2019 (i.e. before the ATF was announced) the UK was perceived as a less viable location for investment in the automotive sector because of uncertainty around trading arrangements after leaving the EU. In the absence of agreement around trade rules, companies were reluctant to invest in the UK. These uncertainties were partly resolved in 2021 when the EU-UK Trade and Cooperation Agreement entered into force. However, it took several months for the industry to grasp the implications of the trade deal, and some interviewed stakeholders indicated that there is still uncertainty and confusion regarding the trade rules.

Interviewed stakeholders indicated a gradual improvement in the external perception of the attractiveness for UK automotive investment since 2021. The current overall impression, however, is that the UK faces stiff competition to attract investment in the EV supply chain. OEMs show a desire to localise vehicle production near to demand, but only when it is cost effective to do so, such as when there is a large enough demand for a vehicle model to satisfy a whole production line. Battery producers show a desire to situate battery manufacturing driven by factors such as cost of production and of transportation of both inputs and products, and trade rules. The main competitive challenges to the UK for OEMs and battery manufacturing have come from Asian and EU countries – particularly those with low cost of labour, and now there is increasing competition coming from US as a result of favourable policy and incentives from the Inflation Reduction Act (IRA). The UK also faces competition from other countries for other aspects of the supply chain such as mineral processing, an expected area of high growth for Canada, due to its availability of low carbon energy, supply of materials (lithium and graphite feedstocks), simplified permitting processes and demand from US automotive markets.

Interviewed stakeholders revealed a multitude of strengths underpinning confidence in the UK supply chain and its attractiveness for investment:

- **Historical geopolitical relationships:** long-standing geopolitical relationships (for instance with countries like India, exemplified by partnerships with companies like Tata Motors) and companies with existing footprints in the UK are a crucial building block for future investment.
- **Robust green energy infrastructure:** the UK's green energy infrastructure provides a solid foundation for sustainable manufacturing practices, aligning with global trends towards environmental consciousness. However, industry preferences for green energy today were felt to not be as strong as they will be in future, with price sensitivity still key.
- **R&D:** the UK's R&D ecosystem is a unique selling proposition. Proximity of academia to industry and supportive R&D culture contribute to the country's competitiveness. Furthermore, programmes like the Faraday Battery Challenge, the Faraday Institution and the UK Battery Industrialisation Centre are known to foreign investors and contribute positively to the perception of the UK in the battery technology space.
- **Skilled labour and established infrastructure:** the UK boasts a large, highly skilled workforce with a rich automotive industry. This labour force is complemented by strong academic and technical institutions, fostering innovation and collaboration. Furthermore, the country's excellent infrastructure, including ports for global shipping, enhances logistical efficiency.
- **Availability of strategically located sites:** the UK has several potential development sites that are suitably located with logistics and energy connections, enhancing the appeal of the UK for investment in the EV supply chain.
- **Supportive business environment:** the UK's emphasis on fostering relationships within the industry – supported by favourable tax policies, a business friendly legal system and the use of English language - enhances its attractiveness, especially to Asian nations. The UK is typically seen as a safe region.
- **Synergies with the aerospace sector:** the country's aerospace sector serves as an additional advantage, particularly for battery investors, showcasing the diversification of its industrial strengths and battery applications beyond traditional sectors.

Conversely, interviewed stakeholders identified several weaknesses and challenges that could potentially undermine confidence in the UK supply chain and its attractiveness for investment:

- **High labour cost:** higher labour costs in the UK compared to other regions (particularly eastern European countries) impacts the cost competitiveness of locating manufacturing operations in the UK.
- **Perceived high energy costs:** the disparity in energy costs between the UK and other European countries (for instance Spain, Hungary and Poland) has prompted apprehensions on UK cost competitiveness. The UK Government has extended energy-intensive industry exemptions introducing the British Industry Supercharger scheme. The scheme's provisions, by relieving 60% of network charges and all capacity market charges, potentially allow qualifying industries to buy electricity on the forward markets at a lower cost. However, while these schemes lower energy costs, they are complex to understand for foreign companies, and there are also uncertainties about the long-term reliability of these policies.
- **Bureaucratic planning processes:** bureaucratic planning processes and higher construction costs relative to Eastern Europe pose significant hurdles for potential

investors, potentially hampering the speed and efficiency of investment in the UK EV supply chain.

- **Intricacies of rules of origin:** the complexities of rules of origin requirements and the limited internal market of the UK as compared with the EU27 raise uncertainties about the UK's competitive positioning, and introduces additional hurdles for investors to navigate.
- **Challenges in accessing grant schemes:** while the UK's strengths in R&D are acknowledged, interviewees highlighted challenges in navigating grant schemes (voicing their perception that European schemes provide more certainty around the size of possible grant funding) and stressed the importance of addressing these factors to enhance the country's attractiveness for investment.
- **Technological lag and innovation gap:** while the UK has a strong tradition of R&D, it lags behind other global players in certain aspects of EV technology commercialisation, particularly battery development. The reluctance to take risks on emerging technologies and the absence of a cohesive strategy for sector-wide innovation hinder the UK's competitiveness in the EV supply chain.
- **Absence of critical minerals:** the UK will continue to rely on trade agreements to be able to import critical minerals, including cathode active materials, anode active materials, separators, foils and electrolytes to support the total domestic battery demand from automotive.
- **Uncertainties due to policy instability:** the UK's recent political instability, evolving regulatory landscape and funding environment pose challenges for investors, as they make long-term planning difficult. The delay to the ICEV phaseout was highlighted by some of the industry stakeholders interviewed as unhelpful. Moreover, funding processes are perceived to be slow and bureaucratic, deterring potential investors.
- **Geopolitical dynamics and trade uncertainties:** geopolitical tensions and trade dynamics, exacerbated by the UK exit from the EU, further complicate the investment landscape. One stakeholder has cited instances where the EU has shown greater agility in addressing supply chain issues related to component imports compared to the UK

While competitive forces are clearly still very important, one stakeholder stressed that the sourcing process has evolved over recent years. Over time OEMs and their suppliers have forged strong relationships, working together to achieve the quality needed at low costs, in some cases vertically integrating, and co-locating. Therefore, historically, suppliers used to be chosen mainly on the basis of quality and cost criteria (each OEM used to have their preferred supplier and they would locate near them or ship from their existing facility). However, suppliers are now chosen through a more multi-dimensional decision-making approach that also includes factors such as rules of origin, localisation and environmental considerations. Localisation of supply to meet rules of origin requirements will minimise tariffs, and shorten supply chains, reducing costs and risks. Additionally, there is a growing emphasis on considering the carbon footprint of sourced materials, with some discussions around potential taxes in industries like steel.

Interviewed stakeholders highlighted the importance of public announcements and news coverage for industry's perceptions and sentiment. Public announcements of significant projects have played a crucial role in creating confidence and attracting further investments and have changed perceptions about the UK's capability to support domestic champions and develop advanced technology. Early projects like Johnson Matthey's gigafactory for fuel cell membrane electrode assemblies and Ford Motor Company's investment in Halewood for electric power units sent a strong signal on UK competitiveness and improved its

attractiveness for export-oriented investments. Conversely, negative media coverage and harmful publicity from unsuccessful developments (like the failure of Britishvolt) were seen to have hindered confidence to invest in the UK. Confidence and momentum in the EV supply chain is felt to have increased recently with more recent positive stories. 2023 saw notable commitments and expansions by key players – including key announcements from Nissan and Jaguar Land Rover, and recently confirmed announcements by Tata Agratas.

Has the EV sector grown in line with expectations?

There are two quantitative metrics that are baselined, as well as the qualitative perceptions of stakeholders:

- Production of electric vehicles
- Number of companies and turnover of the automotive sector

Production of light vehicles and EVs

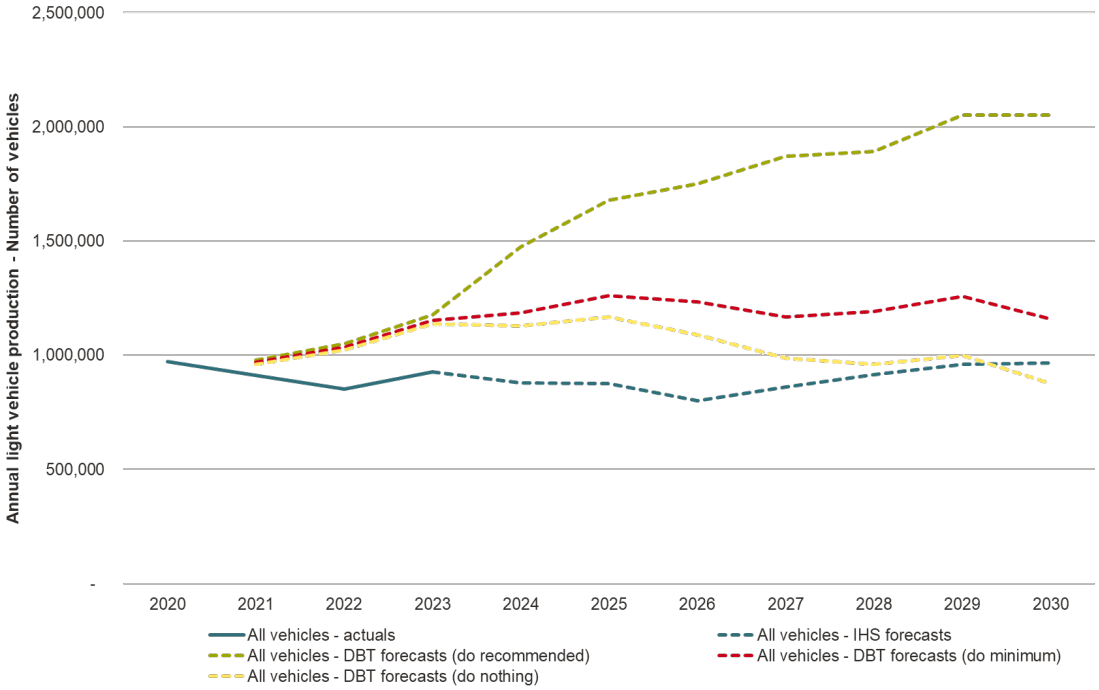
Data on outturn and forecast production of total light vehicles and EVs is sourced from IHS Markit, a prominent provider of data, research and insights across various domains. The forecast made in June 2023 for future light vehicles and EVs production is shown in Figure 9 and Figure 10 respectively. Figure 9 also displays three sets of forecasts that were produced internally by DBT in 2020 to support the ATF business case. These represent forecasts under three alternative funding scenarios for the ATF – "Do recommended", "Do minimum" and "Do nothing".[23] The recommended option for the ATF programmes was expected to increase automotive production to 1.5 million light vehicles in 2024 and over 2 million vehicles by 2030. The Do minimum and Do nothing options were forecast to sustain the auto industry in the short term but it was expected there would be long term decline, with the long-term forecast for production in 2040 being 0.2 million vehicles under the do nothing scenario and 0.9 million vehicles under the do minimum scenario.

The ATF was funded at a level between the "Do minimum" and "Do recommended" scenarios. The number of vehicles produced in the UK in 2022 and 2023 was lower than forecast by DBT under either of these scenarios. Interviewed stakeholders pointed to the covid pandemic and global semiconductor shortage as important external factors that will need to be acknowledged by a future evaluation when seeking to interpret these data to evaluate the ATF.

Figure 10 focuses on EVs specifically. In 2020 EV production stood at 43,590 units, constituting 4% of total vehicles production. Subsequent years witnessed increases, with production figures climbing to 79,876 units in 2023 (9% of total vehicles production). Looking ahead, IHS forecasts from 2022 project further growth, with estimates suggesting production volumes reaching 431,000 units in 2027 (50% of forecast total vehicles production) and 709,000 units (plus 4,000 fuel cell vehicles24) in 2030 (74% of forecast total vehicle production).

[23] These forecasts were produced based on IHS forecasts from the time, and adjusted for internal DBT modelling to reflect how much EV battery capacity was expected to be established in the UK under different ATF funding scenarios and consequently how much vehicle production that would be expected to support in the UK.
[24] Fuel cell vehicles are not displayed in Figure 6.

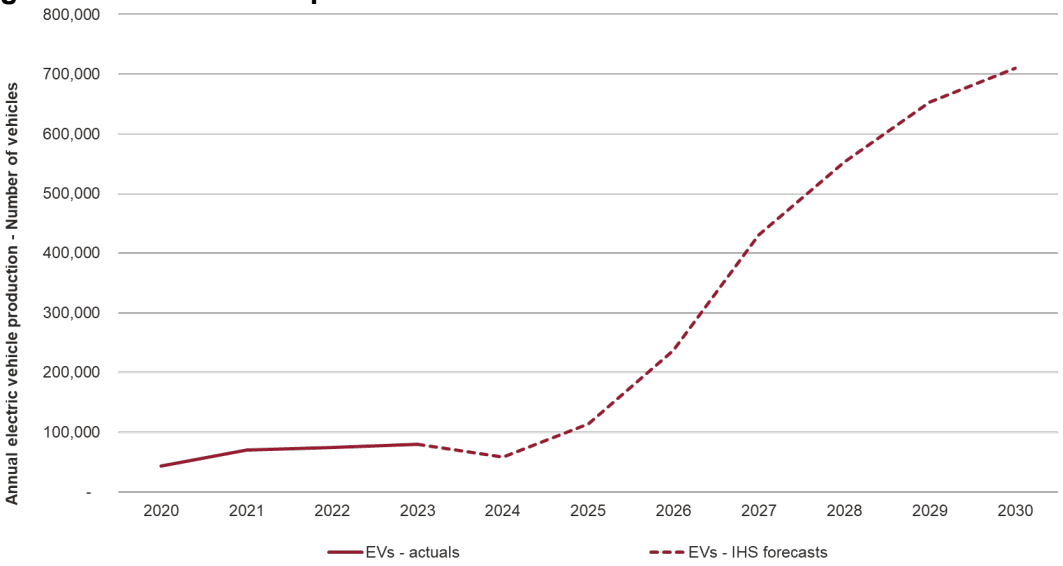
Figure 9 Forecast production of light vehicles in the UK



Source: IHS Markit data

Note: IHS Forecasts as of June 2023, DBT forecasts as of 2020..

Figure 10 Forecast production of EVs in the UK



Source: IHS Markit data

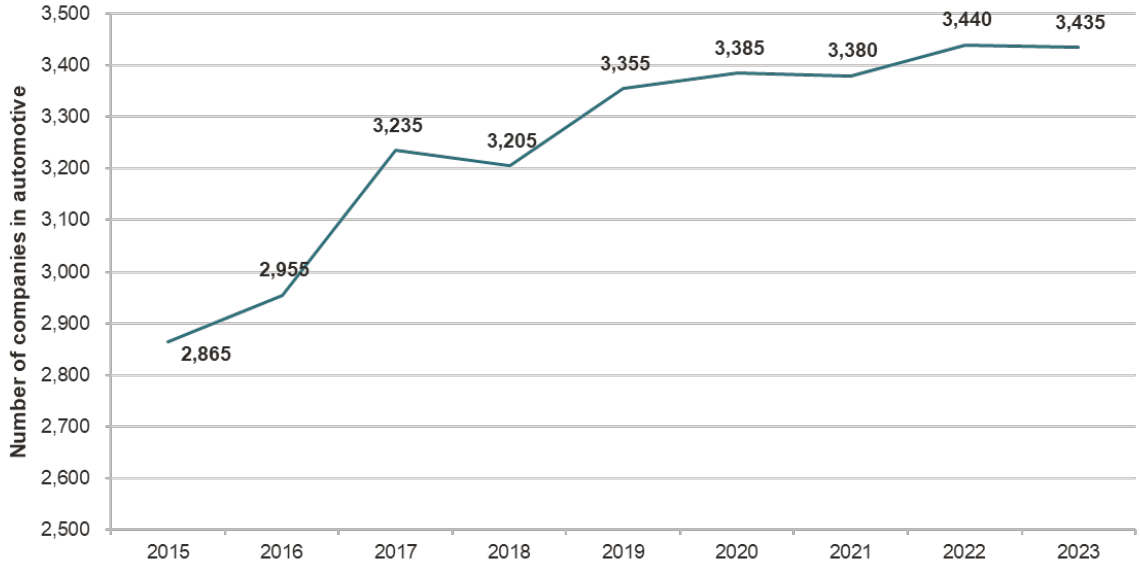
Note: Forecasts as of June 2023.

Number of companies and turnover of automotive sector

Data on the number of companies in the automotive sector is sourced from the UK Business Counts ONS dataset. To construct an as accurate as possible portrayal of the EV supply chain, the dataset aggregates the number of companies active in the most relevant sub-sectors of SIC 27 ("Manufacture of electrical equipment") and 29 ("Manufacture of motor-vehicles, trailers and semi-trailers") described in Figure 11.

Figure 11 displays the fluctuating count of companies in the automotive sector, spanning from 2,865 in 2015 to 3,440 in 2022, with 3,355 recorded in 2019. The sector experienced a 20% increase in company numbers from 2015 to 2023.

Figure 11 Number of companies in the automotive sector in the UK, 2015 to 2023



Source: *ONS – UK Business Counts. Downloaded from Nomis*

Note: This chart shows the number of companies active in industries identified by the following 5-digits SOC codes: i) 27110 – Manufacture of electric motors, generator and transformers; ii) 27200 – Manufacture of batteries and accumulators; iii) 29100 – Manufacture of motor vehicles; iv) 29201 – Manufacture of bodies (coachwork) for motor vehicles (except caravans); v) 29310 – Manufacture of electrical and electronic equipment for motor vehicles; vi) 29320 – Manufacture of other parts and accessories for motor vehicles.

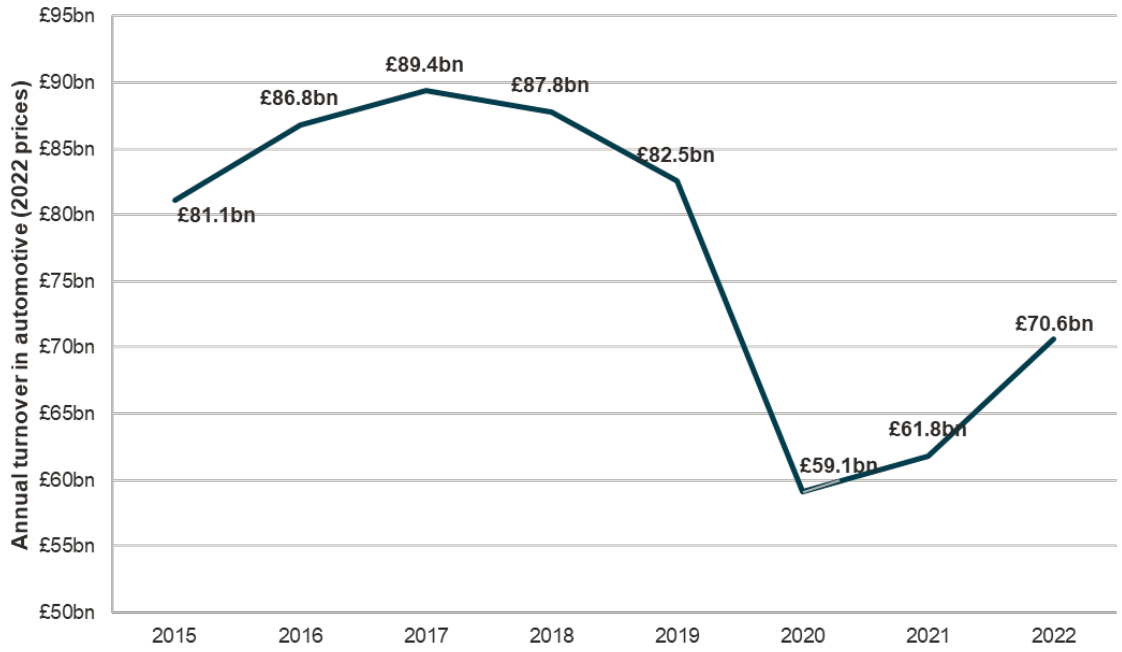
The majority of companies in the automotive sector are small. In 2019, 2,535 companies (75.2% of the total) had fewer than 10 employees, while 465 companies (13.8% of the total) had 10 to 49 employees, 265 companies (7.9% of the total) employed between 50 and 249 individuals, while 105 companies (3.1% of the total) had 250 or more employees.[25]

Data on annual turnover is sourced from the ONS Monthly Business Survey[26], using the SIC code 29 – "Manufacturing of motor-vehicles, trailers and semi-trailers". Figure 12 shows that over the period 2015 to 2022 annual turnover in the UK automotive sector ranged between a minimum of £59.1 billion in 2020 and a maximum of £89.4 billion in 2017. The 2019 value was £82.5 billion.

[25] *ONS UK Business Size and Location*

[26] The ONS Monthly Business Survey is a series of surveys conducted by the ONS to collect information on the performance of businesses across the UK. It is the largest single survey of businesses in the UK, and it provides data on a wide range of topics, including turnover, employment, investment and prices.

Figure 12 Annual turnover in the automotive sector in the UK, 2015 to 2022 – 2022 prices



Source: *ONS – Monthly Business Survey*

Note: *This chart shows the annual turnover produces in the industry identified by the 2-digit SIC code 29 – Manufacturing of motor vehicles, trailers and semi-trailers. Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

Qualitative perceptions of stakeholders

Most stakeholders interviewed noted that 2023 had been a good year for the UK EV supply chain, with notable commitments and expansions by key players such as Ford, AESC, Nissan, JLR and BMW, signalling a positive trajectory for the UK's EV supply chain. However, despite this positive momentum building up, views on the future prospects varied. Some interviewed stakeholders expressed a pessimistic view, while others expressed a cautiously optimistic view that the UK would succeed in establishing a globally competitive EV supply chain.

The majority of businesses interviewed were relatively pessimistic, asserting that other jurisdictions were winning the competition against the UK to attract investment, leading to significantly delayed growth in the UK. Several interviewed stakeholders thought that a battery supply chain would be established in the UK, but not to the extent that it could have been with earlier and stronger public funding support.

All interviewed stakeholders agreed that the main challenges for growth of the supply chain in the UK derive from global competition. As alluded to above, EU countries with low costs of labour and construction offer cost competitiveness that is difficult for the UK to match. The ATF also faces an uphill battle in that governments in other countries have introduced policies to support EV investments in their countries (discussed more in section 3.4).

In addition to the challenges of attracting new EV investments to the UK, one project stakeholder within government expressed concern about the ability of existing UK automotive supply chain businesses to pivot towards EV, as the pace of strategic decision-making and reinvention within the legacy supply chain is perceived to be an issue. This

stakeholder underlined how some of the businesses operating in the internal combustion engines vehicles supply chain are often experiencing declines in revenue and volume due to their ties to conventional engines, and struggle to generate sufficient profit to support continuous investment and innovation. Furthermore, they often lack resources to think strategically about the long term and struggle to take decisions to transition to new technologies. For this reason, they require support to identify and seize new opportunities. Ensuring these companies do not go out of business as conventional engine vehicles become obsolete would be desirable to reduce disruptions to the UK labour market and automotive sector and retain these businesses and jobs in the UK. Addressing these challenges requires concerted effort to support businesses in embracing EV technologies and fostering a culture of adaptability and innovation within the traditional manufacturing sector. Roadmaps coordinated by the APC were indicated as a powerful tool to educate businesses about future technologies and opportunities, helping them navigate the risks and benefits. Giving the industry clear targets for the uptake of EVs will support the business case for strategic decisions of supply chain actors. However there will still be risks for those actors, while the market develops and OEMs ramp up EV manufacturing.

In contrast to most businesses, APC and project stakeholders interviewed, while aware of the existing challenges, expressed cautious optimism. Some of them believe the ATF seems to be on track for what would have been considered a good outcome when the ATF was envisaged and all of them see several opportunities for the industry going forwards.

One project stakeholder from within government saw a possible, if challenging, outcome for the UK being: the establishment of three to four gigafactories with the potential for a specialised fifth facility (90 GW/h was indicated as the minimum desirable capacity and one that is not outside reach); the UK being Europe's primary source of rare earth metals; at least 50% of battery materials sourced domestically; and two to three motor manufacturers supplying both the UK market and international markets.

According to APC stakeholders interviewed, there are several areas where the UK could expect to grow successfully:

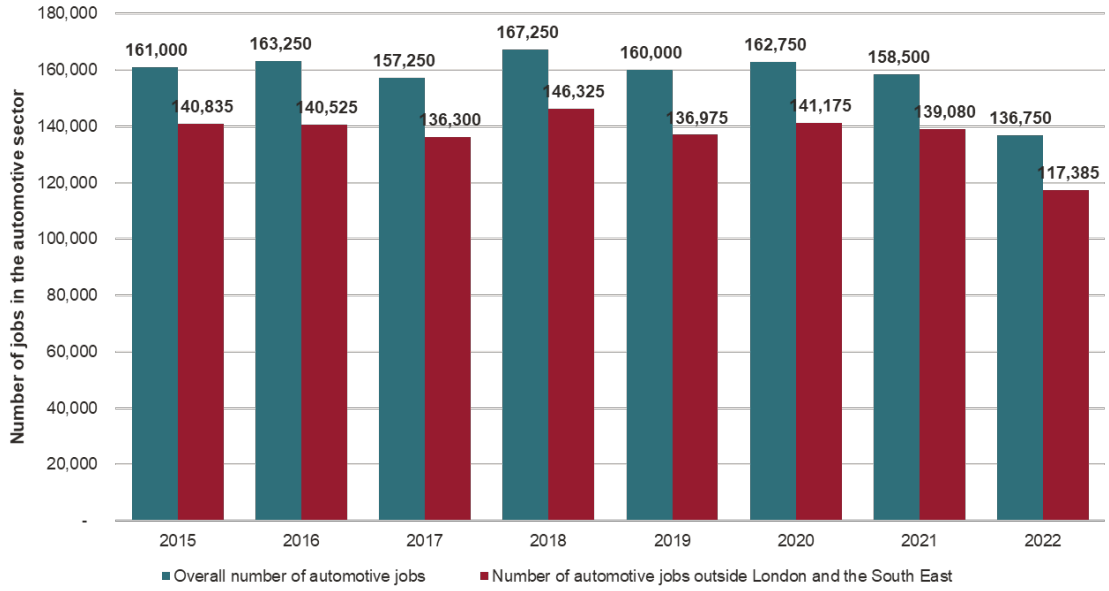
- Electric motors, where the UK has strong capability and competence, both in R&D and manufacturing, and where there is a credible opportunity for success.
- The UK demonstrates strength in hydrogen and hydrogen fuel cells, possessing foundational intellectual property rights and hosting key industry players, although not yet at significant scale.
- The UK has proficiency in midstream materials processing, underscored by robust chemical sector processing capabilities and well-established port infrastructure. There is a wide array of potential commodities that the UK could export to Europe, such as mixed metal sulphates, battery-grade lithium carbonate or hydroxide, which could in the future attract active cathode materials manufacturers.
- The UK presents opportunities in battery and magnet recycling, aligning with sustainability goals and future industry requirements to recycle and use recycled content, within the EV ecosystem.

Not all industry stakeholders interviewed were pessimistic about the outlook for the UK. One highlighted how the investments of Agratas and AESC in the UK could bring the UK battery capacity to a critical level, at which it would be capable of attracting other parts of the supply chain to the UK.

Have jobs in the automotive sector been created or safeguarded?

The number of jobs in the automotive sector is baselined using data from the ONS Business Register and Employment Survey (BRES), available solely for Great Britain and not encompassing the entirety of the UK. The automotive sector is again defined using SIC code categories, focusing on the most relevant sub-sectors of SIC 27 ("Manufacture of electrical equipment") and 29 ("Manufacture of motor-vehicles, trailers and semi-trailers") as set out in Figure 13. Figure 13 shows that the number of jobs in the automotive sector in Great Britain between 2015 and 2021 ranged between a minimum of 136,750 in 2022 and a maximum of 167,250 in 2018. The number of jobs in 2019 was 160,000. Restricting the focus to jobs in the automotive sector outside London and the South East, it ranged between 117,385 in 2022 and 146,325 in 2018.

Figure 13 Number of jobs in the automotive sector in Great Britain



Source: *ONS – Business register and Employment Survey.*

Note: *This chart shows the number of companies active in industries identified by the following 5-digits SOC codes: i) 27110 – Manufacture of electric motors, generator and transformers; ii) 27200 – Manufacture of batteries and accumulators; iii) 29100 – Manufacture of motor vehicles; iv) 29201 – Manufacture of bodies (coachwork) for motor vehicles (except caravans); v) 29310 – Manufacture of electrical and electronic equipment for motor vehicles; vi) 29320 – Manufacture of other parts and accessories for motor vehicles.*

Is a secure and resilient local supply of key materials and components available to UK based OEMs?

There are two quantitative metrics that are baselined, as well as the qualitative perceptions of stakeholders:

- Current and expected future security and resilience of supply
- Imports of key materials and components

Current and expected future security and resilience of supply

Surveyed businesses were asked to rate the security and resilience of the current supply chain of the key materials and components necessary for them to have operations in the UK,

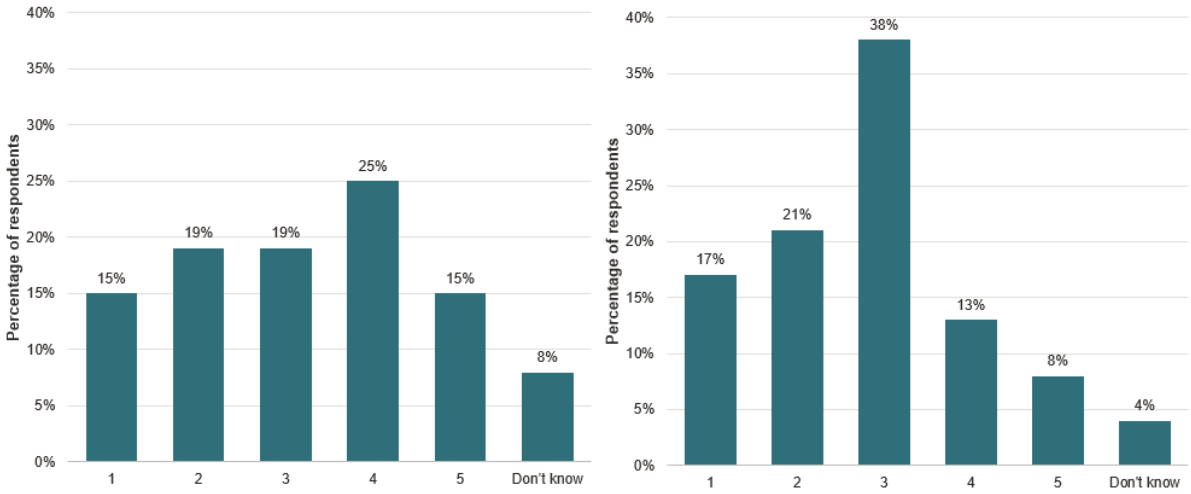
on a scale from 1 to 5. Perceptions of the current situation are shown in the left hand panel of Figure 14 while expectations of the situation in 2030 are shown in the right hand panel.

34% of respondents see their current supply chain as non-secure/resilient (expressing a score of either 1 or 2), while 40% see it as secure/resilient (expressing a score of either 4 or 5) and the remaining 19% expressed an intermediate score. Looking forwards, 38% of respondents expect their supply chain to be non-secure/resilient in 2030 and 21% expect it to be secure/resilient. On average therefore the expectation on the future security and resilience of supply is worse than the current perception, potentially suggesting a lack of confidence in positive developments.

Comparing current and future perceptions for individual respondents, 45% of respondents had the same expectations of security and resilience in future as they had current perceptions, while 11% of respondents had a more positive perception of the future than the present and 34% more negative perception of the future than the present.[27] (Further detail is provided in Table 4 in Appendix B).

Figure 14 Perceptions of security and resilience of the supply chain for own operations

… currently: **… expected in 2030:**



Source: BMG survey of businesses in the EV supply chain.

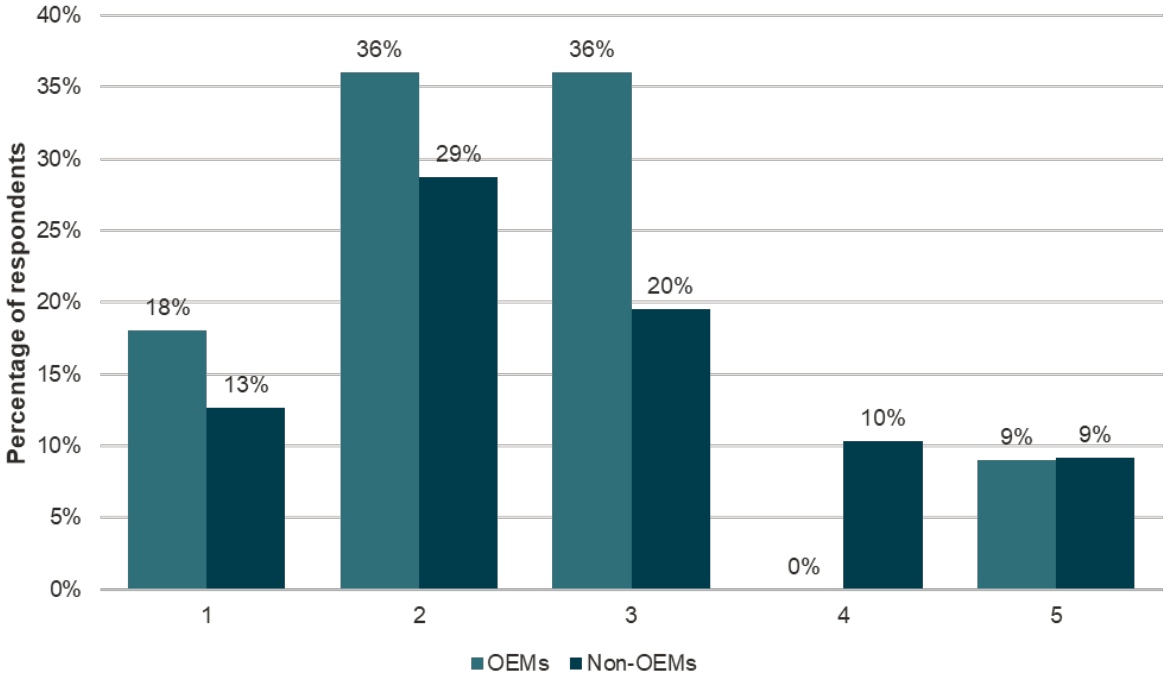
Note: Survey respondents rated security and resilience on a scale of 1 to 5, where 1 is "not at all secure or resilient" and 5 is "completely secure or otherwise resilient". Answers to survey question B01 and D02 (see Appendix). Sample size: 53 respondents.

The perception of security and resilience of the current supply chain of the key materials and components necessary to have operations in the UK is lower among OEMs than among respondents as a whole. Noting caution in interpreting findings from very small sample sizes (only 11 OEM respondents) 55% of respondent OEMs saw their supply chain as non-secure/resilient and only 9% of respondent OEMs seeing the supply chain as secure/resilient. In addition to this, when non-OEMs where asked to rate the security and resilience of the currently supply chain of the key materials and components necessary for

[27] 9% of respondents reported "Don't know" to either the question about their current perception of security/resilience or the question about their perception of future security/resilience.

OEMs to have operations in the UK, they confirmed the OEMs' view of lack of security/resilience of OEM supply chains – illustrated in Figure 15.

Figure 15 Perceptions of security and resilience of the current supply chain for OEM operations



Source: BMG survey of businesses in the EV supply chain.

Note: Survey respondents rated security and resilience on a scale of 1 to 5, where 1 is "not at all secure or resilient" and 5 is "completely secure or otherwise resilient". Percentages displayed on this chart are calculated excluding respondents who answered "Don't know". Answer to survey question B02 (see Appendix A). Sample size for OEMs: 11 respondents. Sample size for non-OEMs: 42 respondents.

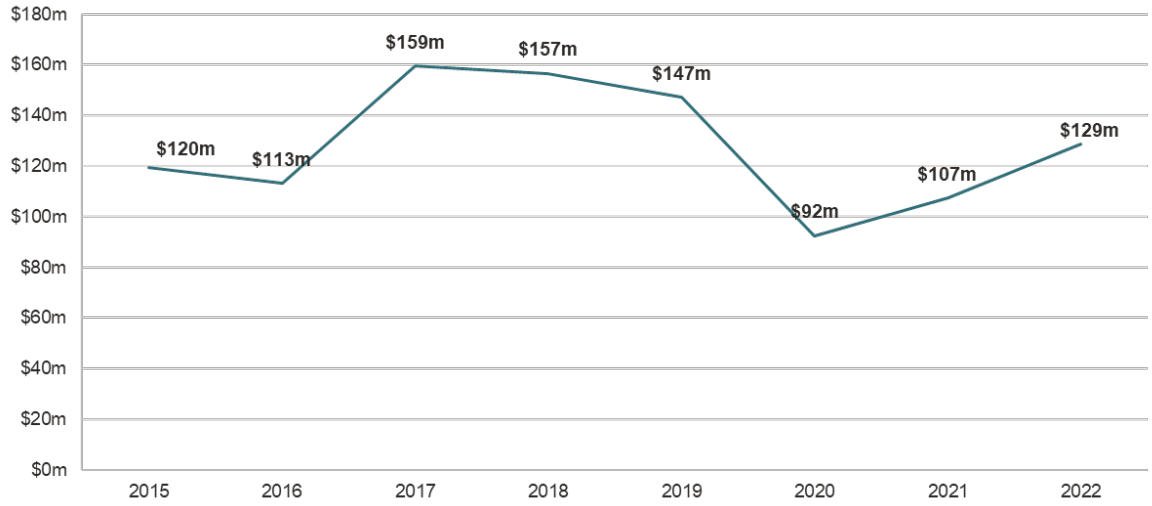
Imports of key materials and components

Data on imports of lithium batteries to the UK is sourced from UN Comtrade[28], using the Harmonised System (HS)[29] Code 850650 ("Cells and batteries, primary, lithium"). An important limitation of this metric is that the HS codes does not distinguish between EV batteries and lithium batteries used in consumer electronic devices and power tools. Therefore it is not possible to establish which proportion of the import of lithium batteries was destined to the EV supply chain. However, according to analysis from Avicenne Energy, 71% of the worldwide production of lithium-ion batteries was destined to the automotive sector in 2020, with this percentage expected to reach 89% in 2030.[30]

[28] UN Comtrade is a comprehensive database of international trade statistics maintained by the United Nations Statistics Division. It provides detailed information on the trade of goods and services between countries, including the value, quantity and country of origin and destination of each shipment.
[29] HS codes, or Harmonised System codes, are an internationally standardised system for classifying goods traded internationally. They are assigned to every product traded across borders, and they provide a unique identifier for each product. HS codes are used by governments, businesses, and trade organisations to track trade flows, collect tariffs, and analyse trade patterns.
[30] The Rechargeable Battery Market and Main Trends 2011-2020 (elbcexpo.org)

Figure 16 shows that from 2015 to 2022 imports of lithium batteries to the UK ranged between a minimum of $92 million in 2020 and a maximum of $159 million in 2017. The 2019 value was $147 million.

Figure 16 Imports of Lithium Batteries to the UK – 2022 prices



Source: *UN Comtrade*

Note: *HS Code 850650 – Cells and batteries; primary, lithium. Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

Qualitative perceptions of stakeholders

The feedback from most stakeholders interviewed was that the availability of a secure and resilient local supply of key materials and components was a concern for OEMs and lower-tier producers. This is because disruptions, whether due to natural disasters, geopolitical instability, or logistical challenges, can result in significant costs for companies. It was also felt that the vulnerability inherent in relying on distant suppliers would become increasingly pronounced with increasing scale of production volumes. Some interviewed businesses have evidenced how they face specific deficiencies in power electronics and semiconductors and how they are heavily dependent on China for such resources.

However, while security and resilience of supply are believed to be important, cost considerations were perceived to remain a central factor shaping decision-making. Stakeholders interviewed noted that while OEMs periodically show a particular desire for a secure and resilient local supply of key materials and components (for example in the aftermath of disruptive events such as the Fukushima incident, the Suez Canal blockage, and geopolitical tensions in regions like Ukraine), the transient nature of executive tenures and short institutional memory challenges the sustained prioritisation of security and resilience. OEMs are cautious about achieving these goals at any cost, balancing the need for security with cost-effectiveness.

An inherent obstacle for the UK (common with other EU and international countries) lies in the absence of critical minerals domestically, necessitating reliance on trade agreements and transportation to access these resources.

3.3 Theme 3: To what extent has the ATF enabled wider economic or social benefits?

This theme in the evaluation framework examines the wider intended outcomes of the ATF, particularly with regard to the geographical distribution of the EV supply chain and climate benefits. The three underlying research questions are:

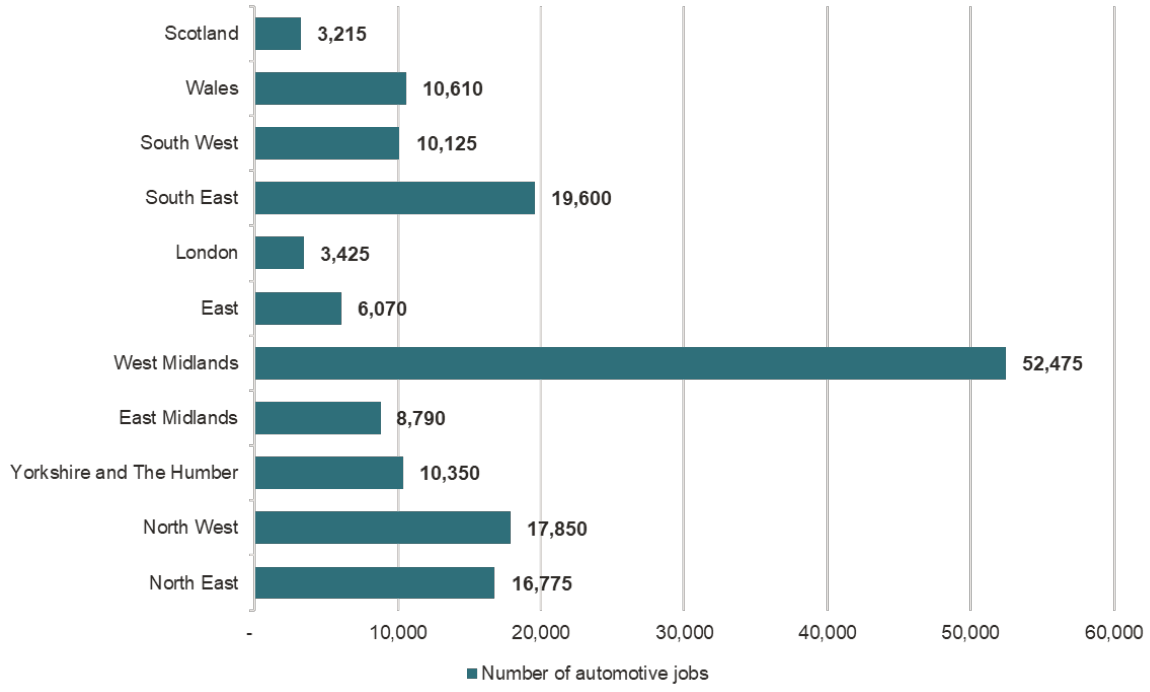
- Are there demonstrable local or regional benefits to ATF realised or expected?
- Are climate benefits being realised?
- Is the ATF maintaining the trade flows associated with the automotive sector?

Are there demonstrable local or regional benefits to ATF realised or expected?

The metric that is baselined for this research question is the number of automotive sector jobs by region. This metric is again sourced using data from the ONS Business Register and Employment Survey (BRES), available solely for Great Britain and not encompassing the entirety of the UK, with the automotive sector again defined using SIC code categories, focusing on the most relevant sub-sectors of SIC 27 ("Manufacture of electrical equipment") and 29 ("Manufacture of motor-vehicles, trailers and semi-trailers") as set out in Figure 17. As discussed previously, this chosen metric may not comprehensively capture all facets of the EV supply chain, since the chosen SIC codes may not fully encompass every activity within the EV supply chain.

Figure 17 illustrates the distribution of automotive jobs in 2019 around the regions of England, Scotland and Wales. A significant number of jobs are located outside of London and the South East. The West Midlands had 52,475 jobs, followed by the South East with 19,600 jobs, collectively representing more than half of the total jobs in the UK automotive sector. Conversely, Scotland has the fewest jobs with only 3,215, followed by London with 3,425, accounting for less than 5% of total jobs. Other regions show moderate employment levels, ranging from 6,070 in the East to 17,850 in the North West. Figure 13 in Section 3.2 shows the time series of jobs in the automotive sector outside of London and South East, highlighting that they represent a very high percentage – consistently between 85% and 90% – of all automotive jobs in the UK.

Figure 17 Number of jobs in the automotive sector in Great Britain by region in 2019



Source: *ONS – Business Register and Employment Survey*

Note: *This chart shows the number of companies active in industries identified by the following 5-digits SOC codes: i) 27110 – Manufacture of electric motors, generator and transformers; ii) 27200 – Manufacture of batteries and accumulators; iii) 29100 – Manufacture of motor vehicles; iv) 29201 – Manufacture of bodies (coachwork) for motor vehicles (except caravans); v) 29310 – Manufacture of electrical and electronic equipment for motor vehicles; vi) 29320 – Manufacture of other parts and accessories for motor vehicles.*

Are climate benefits being realised?

One hoped-for impact of the ATF (illustrated in the logic model in Figure 2) is a reduction in global carbon emissions. This would arise if EV production and supply chain activity that locates in the UK produces fewer carbon emissions than if that activity had located elsewhere.

This evaluation question does not require baselining. This benefit can be calculated as part of a future impact evaluation by combining data on growth of the EV sector in the UK (discussed under theme 2 above), with expert stakeholder views on where that activity might otherwise have located, and future data on the carbon emissions associated with energy consumption in different countries. This data will be sourced from the UNFCCC (United Nations Framework Convention on Climate Change) which tracks the emissions from energy consumption of 45 countries. There is historic data from 1990 and forecasts to cover the period to 2040.

Is the ATF maintaining the trade flows associated with the automotive sector?

There are four quantitative metrics that are baselined:

- Exports of motor vehicles and EVs

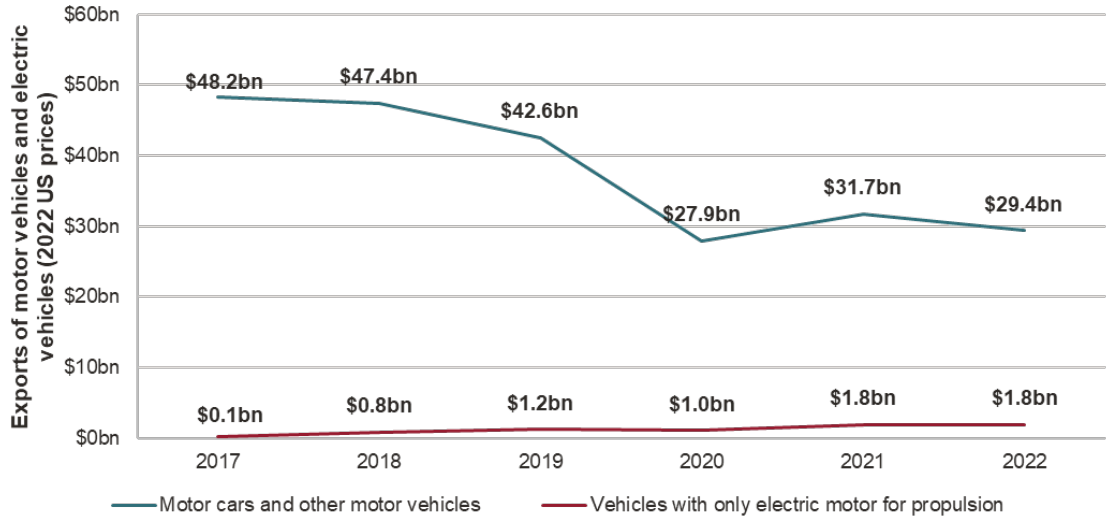
- Exports of batteries
- Total imports and exports of automotive goods

Exports of vehicles and EVs

Data on exports of motor vehicles and EVs from the UK is sourced from UN Comtrade, using the Harmonised System (HS) Codes 8703 ("Motor cars and other motor vehicles") and 870380 ("Vehicles with only electric motor for propulsion"). Data for HS code 870380 is only available from 2017 onwards, therefore the time series of exports of vehicles and EVs from the UK focuses on the period between 2017 and 2022.

Figure 18 shows that from 2017 to 2022 exports of motor vehicles from the UK ranged between a minimum of $27.9 billion in 2020 and a maximum of $48.2 billion in 2017. The 2019 export of motor vehicles from the UK amounted to £42.6 billion. Meanwhile, in the same period, the exports of EVs from the UK ranged between a minimum of $0.1 billion in 2017 and a maximum of $1.8 billion in 2022. The 2019 export of EVs from the UK amounted to $1.2 billion.

Figure 18 Exports of motor vehicles and electric vehicles from the UK, 2017 to 2022 – 2022 US prices



Source: UN Comtrade

Note: HS codes 8703 for "Motor cars and other motor vehicles" and 870380 for "Vehicles with only electric motor for propulsion". Values are reported in 2022 prices, calculated using GDP deflators from the World Bank

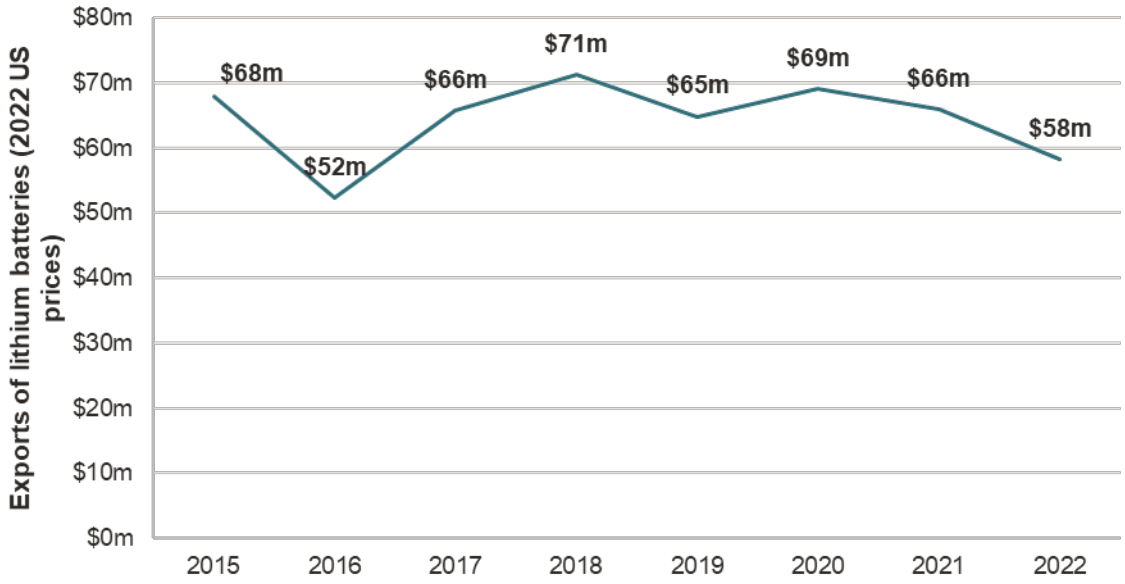
Exports of batteries

Like data on imports, data on exports of lithium batteries to the UK is sourced from UN Comtrade, using the Harmonised System (HS) Code 850650 ("Cells and batteries, primary, lithium"). Like data on imports, this metric on exports does not distinguish between EV batteries and lithium batteries used in consumer electronic devices and power tools. Therefore it is not possible to establish which proportion of the export of lithium batteries was destined to the EV supply chain. However, according to analysis from Avicenne Energy,

71% of the worldwide production of lithium-ion batteries was destined to the automotive sector in 2020, with this percentage expected to reach 89% in 2030[31].

Figure 19 shows that from 2015 to 2022 the export of lithium batteries from the UK ranged between a minimum of $52 million in 2016 and a maximum of $71 million in 2018. In 2019 the export of lithium batteries from the UK amounted to $65 million.

Figure 19 Exports of Lithium Batteries from the UK, 2015 to 2022 - 2022 US prices



Source: *UN Comtrade*

Note: HS Code 850650 – Cells and batteries; primary, lithium. Values are reported in 2022 prices, calculated using GDP deflators from the World Bank

Total imports and exports of automotive goods

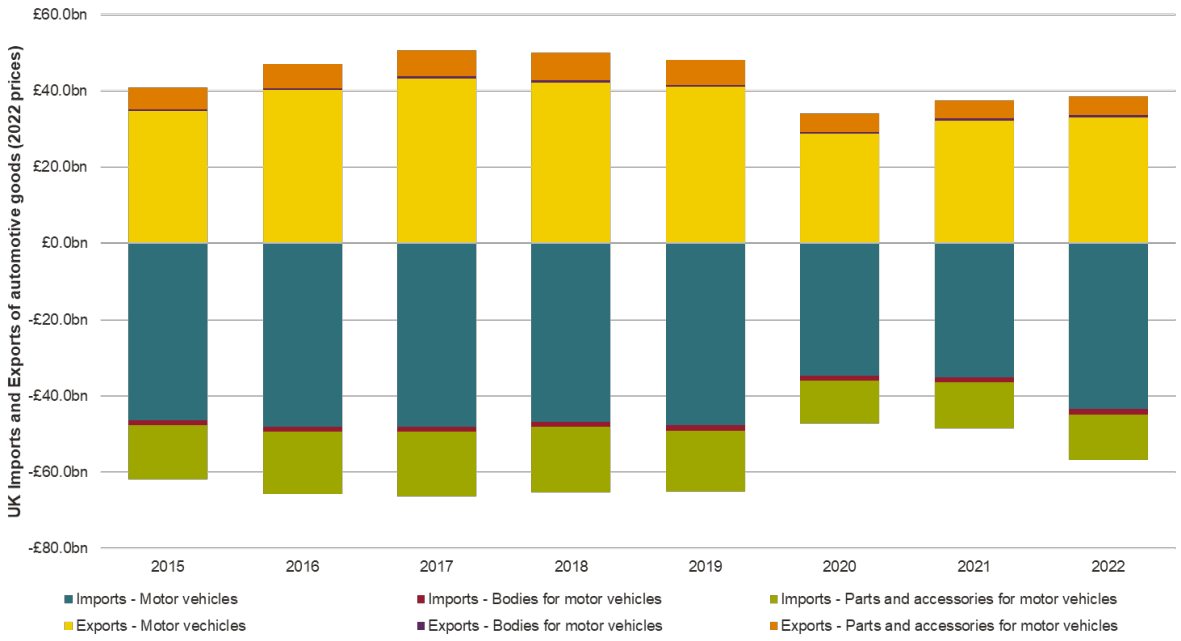
Data on total imports and exports of automotive goods is sourced from the ONS Trade in goods tables, using the product categories 29 – "Motor-vehicles, trailers and semi-trailers" and its subcodes 29.1 ("Motor vehicles"), 29.2 ("Bodies for motor vehicles"), 29.3 ("Parts and accessories for motor vehicles").[32] It should be noted that this is the trade flows of *automotive goods*, not trade flows for the *UK automotive sector* (i.e. export of automotive sector outputs or import of inputs into the automotive sector). The latter would be valuable to baseline, since this would allow future evaluations to examine, for example, whether the ATF has contributed to onshoring the automotive supply chain. However, this is not possible from available ONS data, which is based on product categories rather than the importing/exporting industry. Some insight into this can be gained by examining imports of product categories (e.g. parts and accessories for motor vehicles), but this will not capture all imported inputs that are used in the automotive supply chain as some inputs will appear in other (non-automotive) product categories.

[31] The Rechargeable Battery Market and Main Trends 2011-2020 (elbcexpo.org)
[32] ONS trade in goods classification of product by activity time series

Figure 20 shows that the UK economy has been a net importer of automotive goods (including both motor vehicles and components) over the period 2015 to 2021. Over this period, the value of exports ranged between a minimum of £34.0 billion in 2020 and a maximum of £50.7 billion in 2017, while the value of imports ranged between a minimum of £47.1 billion in 2020 and a maximum of £63.3 billion in 2017.

In particular, from 2015 to 2022, exports of motor vehicles ranged between £28.7 billion (2020) and £43.2 billion (2017), exports of bodies for motor vehicles ranged between £424.7 million (2016) and £789.0 million (2022), and exports of parts and accessories for motor vehicles ranged between £4.6 billion (2021) and £7.1 billion (2018). On the other hand, imports of motor vehicles ranged between £34.8 billion (2020) and £48.1 billion (2016), imports of bodies for motor vehicles ranged between £1.1 billion (2020) and £1.6 billion (2022), and imports of parts and accessories for motor vehicles ranged between £11.2 billion (2020) and £17.2 billion (2018).

Figure 20 Total UK imports and exports of automotive product, 2015 to 2022 – 2022 prices

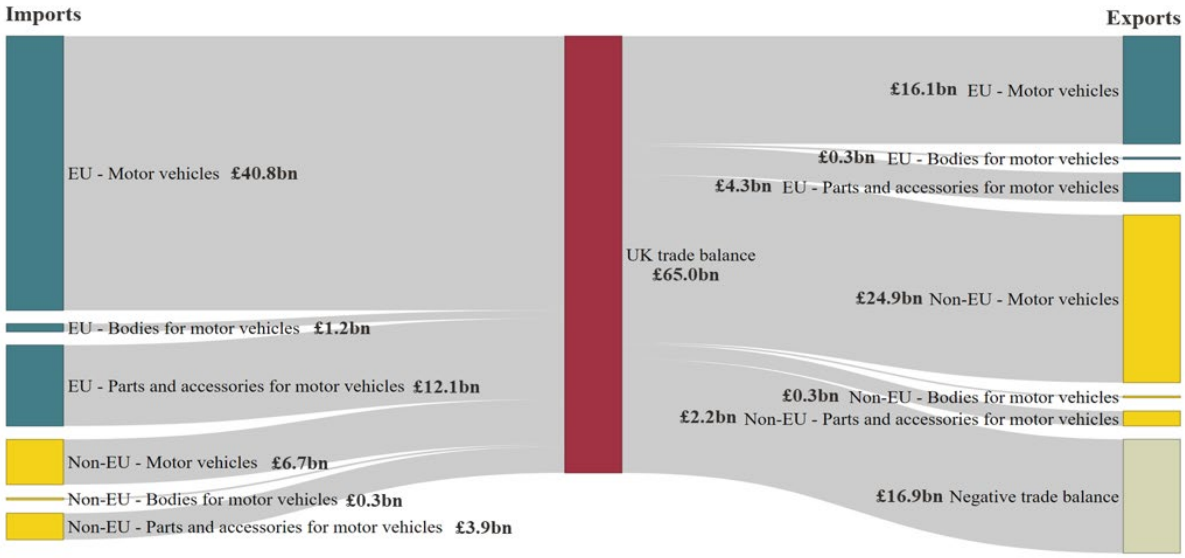


Source: *ONS trade in goods classification of product by activity time series*

Note: *This chart shows imports and exports in the industry identified by the product categories 29 ("Motor vehicles, trailers and semi-trailers"), and its subcodes 29.1 ("Motor vehicles"), 29.2 ("Bodies for motor vehicles"), 29.3 ("Parts and accessories for motor vehicles"). Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

The 2019 volume of exports of motor vehicles, bodies for motor vehicles, and parts and accessories for motor vehicles amounts to £41.0 billion, £561.8 million and £6.5 billion respectively, compared against imports totalling £47.6 billion, £1.5 billion and £16.0 billion respectively. This culminated in a negative trade balance of £16.9 billion for automotive product. Figure 21 shows this data further broken down into whether imports and exports originated from or were destined for the EU or non-EU.

Figure 21 Total UK imports and exports of automotive product, 2019 – 2022 prices



Source: *ONS trade in goods classification of product by activity time series*

Note: *This chart shows imports and exports in the industry identified by the product categories 29 ("Motor vehicles, trailers and semi-trailers"), and its subcodes 29.1 ("Motor vehicles"), 29.2 ("Bodies for motor vehicles"), 29.3 ("Parts and accessories for motor vehicles"). Values are reported in 2022 prices, calculated using GDP deflators from the World Bank*

3.4 Theme 4: What are the main learning points from the ATF?

This theme in the evaluation framework aims to capture wider learnings from the ATF. There are five underlying evaluation questions:

- Have there been any unexpected outcomes or impacts of ATF (whether positive or negative) and what is their nature / scale?
- What have the main barriers to and enablers of the ATF been?
- Has the ATF complemented other policies and interventions seeking to promote similar outcomes and impacts effectively?
- What lessons are there for future interventions?
- Has the ATF investment represented value for money?

These evaluation questions are not associated with specific quantitative metrics that require baselining. They will be answered at the time of an impact evaluation by drawing on desk research, survey questions (seeking perspectives on the impacts of the ATF and drivers of impacts or lack of impacts) and interviews. However, there is data from the baselining survey and qualitative interviews that provides valuable evidence in support of the second and fourth of these research questions that is therefore documented here.

What have the main barriers to and enablers of the ATF been?

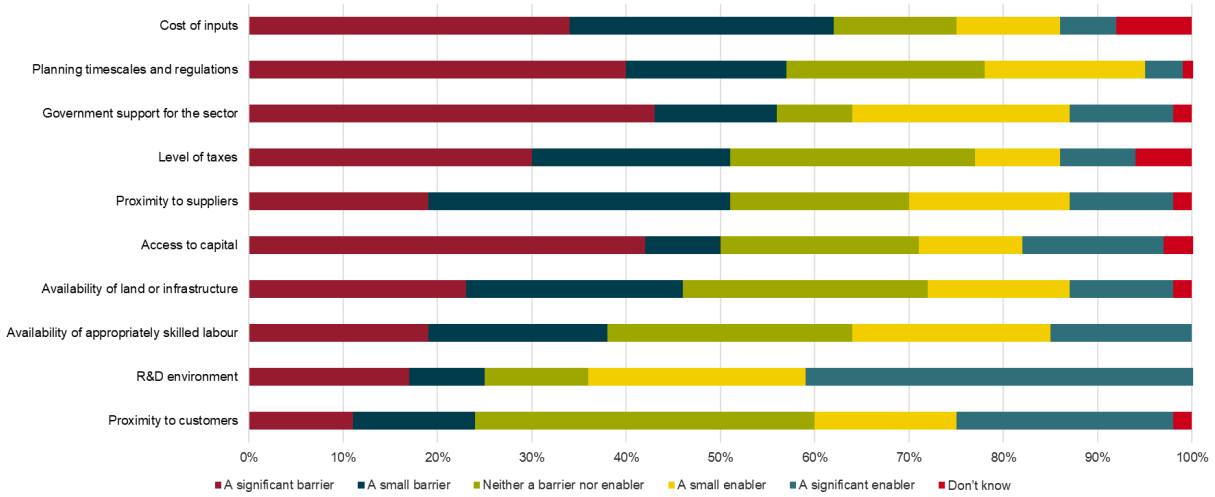
The logic model for the ATF (presented in Figure 2) highlighted several external barriers and enablers that will affect the extent to which the ATF is able to achieve its intended outcomes and impacts. These include domestic and international factors affecting the competitiveness of the UK, as well as the UK's existing automotive industry and R&D base.

The baselining survey elicited respondents' quantitative views on the extent to which a variety of factors were perceived to be barriers or enablers to investment in the UK EV supply chain. The results are illustrated in Figure 22. These perceptions align with the qualitative viewpoints on the strengths and weaknesses of the UK as a location for investment discussed in more detail in section 3.2.

The main barriers (among those asked about) are perceived to be government support for the sector, access to capital and planning timescales (considered as a significant barrier by 43%, 42% and 40% of respondents respectively). The cost of inputs was also highlighted, reported to be a significant barrier by 34% of respondents and a small barrier by a further 28%.

The main enablers were identified as the R&D environment and access to customers (reported as significant enablers by 42% and 38% of respondents respectively). Perhaps surprisingly, given the proportion thinking it was a significant barrier, 34% of respondents viewed government support as an enabler to investment in the EV supply chain, suggesting mixed perspectives.

Figure 22 Perceptions of barriers and enablers to investment in the UK EV supply chain



Source: *BMG survey of businesses in the EV supply chain*

Note: *Answer to survey question C03 (see Appendix A). Sample size: 53 respondents.*

There are only very small sample sizes of respondents businesses from different segments of the supply chain (see Table 1). However, bearing that caveat in mind, there are some notable differences in perceptions of barriers across respondents, with businesses operating in the area of fuel cells and hydrogen having divergent perspectives from other businesses. This was particularly in relation to the following factors:

- The availability of appropriately skilled labour was perceived as a barrier by 67% of fuel cells and hydrogen producers compared with 38% among all respondents.
- The availability of land and infrastructure was perceived as a barrier by 83% of fuel cells and hydrogen producers compared with 46% of all respondents.
- The cost of inputs was perceived as a barrier by only 33% of fuel cells and hydrogen producers compared with 62% among all respondents.

These figures are illustrated in full in Appendix B.

The qualitative interviews also yielded further insights on some external barriers that the ATF faces in achieving its desired outcomes:

Complex and time sensitive decision-making processes: The current landscape requires industry buyers to take complex strategic decisions and interviewed stakeholders raised the concern that not all purchasing teams have the necessary decision-making tools. Discussion on these matters often happens at higher levels, and there is a risk that lower down in the supply chain, decisions might be made in isolation by buyers and purchasing managers. Furthermore, the OEM's strategic decisions on the location for building vehicles and sourcing components can often be required to happen at a pace greater than the ATF and its funding support can be mobilised to accommodate. It is important to ensure that the right people have the right tools and information for decision making.

Fragmentation of industry products and technologies: The diversity of products and technologies of the UK automotive industry is generally thought to be advantageous, but it can also present challenges in terms of simplicity and scale. In the EU, aggregated volumes for more basic vehicle models make decisions more straightforward. The complexity of the UK industry can lead to potentially high profits but may lack significant volume.

Global competition and investment challenges: Intense global competition for investments in the battery supply chain, exacerbated when other countries offer significant financial incentives, pose notable challenges for the UK.

- According to some stakeholders interviewed, the US market is very attractive for investments due to lower interest rates, opportunities to leverage significant tax incentives, and state subsidies for battery production. The US IRA created favourable conditions for investments, drawing significant capital away from Europe and other parts of the world. These policies have been written into law and are expected to persist for a considerable period, regardless of changes in administrations, making it a longstanding concern for the UK EV industry. 55% of survey respondents believed the IRA has reduced the attractiveness of the UK as a place for investment in the EV supply chain.[33]
- The European Green Deal has increased the attractiveness of EU countries for investment in the EV supply chain, by establishing funding for R&D, subsidies and tax breaks, and investments in charging infrastructure. 19% of survey respondents believed the Green Deal has reduced the attractiveness of the UK as a place for investment in the EV supply chain.[34]
- One industry stakeholder also discussed how emerging hubs like Canada pose a challenge to the UK's EV industry. Offering advantages such as local graphite and lithium feedstocks, low-carbon energy sources, and streamlined permitting processes, Canada has become an attractive destination for EV businesses. The development of large cathode facilities and battery manufacturing hubs further enhances its appeal, with provinces actively enticing businesses and EU-based companies to relocate to capitalise on the favourable business environment.

Interviewed stakeholders also discussed additional external enablers in addition to the strengths of the UK identified in section 3.2 and above:

[33] BMG survey of businesses in the EV supply chain. 53 respondents.
[34] BMG survey of businesses in the EV supply chain. 53 respondents.

Strong demand signal: The presence of a strong and consistent demand signal was reported to be crucial to create the conditions for investment. Some interviewed stakeholders stated that there is currently a strong demand signal in the UK, despite the ICEV ban delay. However, this view was not unanimous. Some other interviewed stakeholders expressed a more pessimistic views on consumers' propensity to purchase EVs, citing the ICEV ban delay and lack of build out of EV infrastructure lowering consumers' confidence in EVs.

Supporting policy initiatives: Stakeholders interviewed pointed to government policies to address energy costs, particularly the British Industry Supercharger scheme, as key in helping to address the competitiveness of the UK for energy intensive industries and support the objectives of the ATF. Furthermore, some businesses acknowledged the effective efforts of the APC in demonstrating the long-term potential for enhanced competitiveness in energy costs, which has positively influenced investment decisions.

What lessons are there for future interventions?

The stakeholders interviewed shared some reflections on the design of the ATF and how they felt this has impacted on the ability of the ATF to deliver its intended outcomes. The following themes emerged:

- **Scope limitations:** The ATF was perceived by some to have been too narrow in scope, excluding ICEV parts, some fuel cell and hydrogen materials and other non-EV focused manufacturing technologies that are needed to advance EVs and the UK automotive industry in general to maintain global competitiveness.
- **Lack of marketing and communication:** The ATF was perceived to be not well marketed and advertised. This was thought to limit its ability to have impact, both because firms may not be aware of support available and because it limits the positive impact on sentiment that is important for crowding in wider investment. Interviewed stakeholders felt more communication is needed on whether the ATF will continue, how much funding it will provide and for how long.
- **Lack of clarity for support offered:** Industry stakeholders interviewed felt the ATF needs to be more clear in what it offers. In the US, the Inflation Reduction Act (IRA) explicitly lays out how and what support companies will receive for a project, whereas in the UK ATF applicants need to go through multiple rounds of negotiations before they can understand how the UK government will support them.
- **Bureaucratic process challenges:** The grant process was felt by interviewed stakeholders to be too arduous and too slow to match global OEM internal decision-making timelines, suppliers and the broader chain need to be ready before OEMs get involved. In fact, when global OEMs are making strategic decisions, they may end up doing this without factoring in the support of the ATF, because it cannot be put in place soon enough to affect the business case for the UK arm of the global business.
- **Lack of funding:** Some stakeholders interviewed believed that the funding offered by ATF is too limited and is not always enough to beat or equalise the support offered or the favourable local conditions, such as low cost labour and energy, in other countries,
- **Funding gap for bigger SMEs:** The ATF provides funding for technologies that have already completed a proof of concept and are ready for large-scale manufacturing. One stakeholder thought there is a considerable gap that is not well covered between initial seed funding and large-scale capital grants (for example between the traditional seed funding of up to £1m and the £30-40m of big capital grants from the ATF). Bigger SMEs

need funding in the single-digit millions to help build the technology and scale further to better prove the concept.

- **Need for a more proactive and risk taking approach:** Many stakeholders interviewed shared the view that the UK must demonstrate a more proactive and cohesive approach to industry growth, taking calculated risks in embracing new technologies and providing consistent, transparent funding mechanisms to support OEM planning. Ultimately, according to most stakeholders interviewed, the sector's success hinges on fostering a conducive environment for innovation, investment, and collaboration, ensuring its relevance and competitiveness on the global stage.

While these reflections offer lessons for future interventions, they also provide important timely feedback for the ATF. Most of these reflections re-iterate the findings of an earlier process evaluation of the ATF, and indicate potential design features and implementation issues with the ATF that may reduce its impact. Industry stakeholders interviewed were quick to emphasise the time critical nature of securing EV investments in the UK and therefore wanted to encourage government to make any possible improvements to the operation or scope of the ATF as soon as possible.

Despite these concerns, several stakeholders interviewed did report that the ATF has facilitated important strategic investments. The main examples cited were the establishment of gigafactories by AESC and Agratas. By generating significant volume of activity in the UK, these gigafactories are believed by interviewed stakeholders to have the potential to attract other segments of the supply chain and elevate the UK’s position within international companies.

Project stakeholders interviewed also stressed how the practical outcomes of ATF-supported projects have enabled successful participation in international events and trade missions, fostering collaboration and interest from international industry players. Having practical projects being undertaken in the UK and supported by the ATF allows for direct and meaningful discussions at various levels, and significantly improved the ability of the APC to engage with potential investors and partners.

4. International Comparisons

International comparisons can be valuable in evaluation. Comparing data on metrics of interest for different countries can be a useful way of understanding the impact of a policy that is introduced in one country but not in others. Further, where countries are implementing different policies with similar objectives, comparing outcomes can help understand the relative benefits of different kinds of interventions.

The evaluation framework for the ATF did not recommend seeking to evaluate the impact of the ATF by comparing the UK experience to other countries. This would not be a simple exercise for two reasons.

- First, other countries do not give an easy guide to how the UK would have evolved in the absence of the ATF. Countries differ in their current automotive capabilities, their relative attractiveness for investment, and their growth trajectories, and this context would need to be understood. Furthermore, many countries have introduced policies to encourage the development of domestic EV supply chains, which will affect their outcomes.
- Second, the evaluation framework highlighted a large number of important metrics that can only be evidenced from primary data collection. Comparing the UK to international experience on these metrics would require similar data to be collected internationally, which would not be proportionate.

That said, international comparison may provide important context for understanding the experience of the UK and the impacts of the ATF. Furthermore, should a future evaluation wish to consider the impact of similar international comparator programmes to the ATF, then baselining analysis may be valuable.

This section therefore discusses five comparator countries, and baselines key metrics from the evaluation framework for those countries. The five countries are: France, Spain, Canada, Korea and Hungary. These were chosen through discussion with DBT, and the context for each country is described in Section 4.1. The key metrics that are baselined for each country are summarised in Section 4.2. The baseline analysis is presented in Section 4.3.

4.1 Countries included in the international comparison

An assessment was undertaken, with input and agreement from DBT, to identify relevant countries to include in the international comparison. The selection of countries was based on the countries being similar to the UK on various dimensions and having relevant comparator programmes to the ATF.

Comparator programmes are publicly funded capital grant programmes developed by countries other than the UK, that have a similar structure and objective as the ATF. To distinguish them from other policy instruments, the following conditions are considered:

1. The funds should be dispensed as capital grants to suppliers, as opposed to loans or other financing benefits.
2. The funds should be focused on electrified vehicles or battery manufacturing supply chain development. Examples include the expenses incurred producing, refining or

processing of new product units related to the EV supply chain, such as land or construction costs to establish facilities or purchase costs for goods and equipment.
3. The funds should be active for a similar period as the ATF.
4. The funds should be of a similar relative magnitude that the ATF has with the UK's automotive sector.

Programmes that broadly align with these conditions are considered, though there may be variation in how these conditions are represented. For example, some funds may be a dedicated sum of capital that is available until exhausted, while others may be ill-defined and determined on a case-by-case basis. Some funds may be broader, encapsulating a variety of green technologies or eligible expenses for R&D and labour as well as direct manufacturing, while others may be targeted to EV production only.

Countries operating comparator programmes to the ATF were found to include the US, Germany, France, Spain, Canada, Poland, Hungary, Japan and Korea; in addition, programmes at EU-wide level were also identified. China and Turkey were also noted to have a record of subsidies to the automotive sector, although they do not have formal programmes in place.

The countries operating comparator programmes were selected for inclusion in this international comparison based on their similarity to the UK on dimensions including:

1. Country size by population,
2. Country GDP and GDP per capita, and
3. Existing automotive industry size and powertrain composition

If countries deviate too far from the UK on the above characteristics there may be too many confounding factors that explain the differences in outcomes for national automotive industries. Furthermore, it is the impact of alternative policies in contexts otherwise similar to the UK that is most of interest for UK policy makers.

The five countries ultimately selected for inclusion were: France, Spain, Canada, South Korea and Hungary. The reasoning for their inclusion and their comparator programmes are described below. The comparator programmes are summarised in Table 2. Other major automotive industries and their comparator programmes, such as Germany, USA and China were excluded due to their greater size compared to the UK.

France

Under France 2030, the France's Clean Transport Investment Plan is a EUR2.5bn fund operating from 2021-2030 with the objective to support the production of 2 million EVs annually by 2030.[35] France also has a separate EUR500m fund, the Critical Materials and Batteries Fund, that aims to strengthen the resilience of industrial and battery supply chains at intermediate manufacturing stages.[36] It was selected due to its similarity to the UK in geography, operating in Western Europe and relying on the European market. The country is also similar in size, GDP, and historical strength in automotive manufacturing.

[35] Ministère de l'Économie, des Finances et de la Souveraineté industrielle et numérique (2023). France 2030 : un plan d'investissement pour la France | economie.gouv.fr
[36] Ministère de l'Économie, des Finances et de la Souveraineté industrielle et numérique ((2023). 11/05/2023 - France 2030 : le Gouvernement annonce le lancement d'un fonds d'investissement dédié aux minerais et métaux critiques - Presse - Ministère des Finances (economie.gouv.fr)

Spain

Spain's Strategic Projects for Economic Recovery and Transformation for the Electric and Connected Vehicle (PERTE VEC) is a EUR2.975bn fund operating from 2021 for the development and manufacturing of the EV supply chain.[37] Similar to France, Spain's similarity to the UK's location, size and automotive manufacturing help to better identify what factors may distinguish their growth.

Canada

Canada's Strategic Innovation Fund is a CAD7.2bn fund operating from 2021-2028 for the commercialization, expansion and retention of technologies that bring economic and environmental benefits, including EVs.[38] This fund is broader than other comparators, encompassing many other sectors as well as the full battery and EV supply chain. Significant projects have already been announced, and Canada is notable in its advertisement of the recipients of its investment. The inclusion of Canada in this international comparison reflects Canada's high potential in scaling quickly as an up-and-coming country, especially in the upstream supply chain. Similar to the UK, Canada also has existing automotive manufacturing capacity, and also domestic EV material feedstocks.

South Korea

South Korea's Foreign Investment Promotion Act has been an active programme since 1998 to provide cash grants for manufacturing, especially for engines, technologies, and auto parts.[39] Similarly, their 2022 Act on Special Measure for Strengthening the Competitiveness of Materials, Components, and Equipment Industries focuses on scaling "technologies of strategic importance", especially batteries and EVs, in a variety of ways including financial support.[40] South Korea has been a leading producer of batteries and vehicles, and their full supply chain focus and location in Asia can provide a different perspective on how to respond to the recent push for EVs as a country with significant experience.

South Korea, does however have a large national ambition to develop a hydrogen economy, and is home to the leading manufacturer of fuel cell electric vehicles (FCEVs) Hyundai.

Hungary

Hungary's VIP cash subsidy system's Temporary Crisis and Transition Framework is a 2023-2025 grant programme for sectors that are needed for a net-zero emissions economy.[41] Up to EUR350m can be provided for projects that produce batteries, key components used as direct input for batteries, and the production or recovery of related critical raw materials related to the above. Compared to other European comparator countries, Hungary is much smaller both in population and GDP per capita, but still has a meaningful automotive manufacturing base. In addition, its EU membership, cheaper labour and lack of domestic competition make it well positioned for foreign investment.

[37] Ministerio de Industria y Turismo (2021). Resumen Ejecutivo (mintur.gob.es)
[38] Innovation, Science and Economic Development Canada (2024). Business Innovation and Growth projects (canada.ca)
[39] Invest Korea (2024). Support Provided | InvestKOREA(ENG)
[40] Ministry of Legislation (2023). Enforcement Regulations of the Act on Special Measures for Strengthening the Competitiveness of the Materials, Parts, and Equipment Industry and Stabilizing the Supply Chain (law.go.kr)
[41] Hungarian Investment Promotion Agency (2023). Significant amendments in the VIP Cash Grant system - Hungarian Investment Promotion Agency (hipa.hu)

Table 2 Summary of comparator programmes in countries included in the international comparison

Country	Programme	Notable characteristics
United Kingdom	The Automotive Transformation Fund	• Up to £850 million to be invested in developing a high-value end-to-end electrified vehicle supply chain in the UK • Focussed on priority technology areas: batteries, machines and drives, power electronics and fuel cells. • Funding for R&D and feasibility work and capital grant funding
Canada	The Strategic Innovation Fund	• CAD7.2bn over 7 years to spur innovation, • Of that, CAD5bn will be dedicated to the Net Zero Accelerator to scale up projects that decarbonize heavy industry, supports clean tech, and reduces emissions. • Remaining CAD2.2bn to support projects across the economy, including in automotive
France	France's Clean Transport Investment Plan, the Critical Materials and Batteries Fund (France 2030)	• EUR2.5bn to produce 2 million EVs annually by 2030 • EUR500m to strengthen the resilience of the industrial fabric on metal supply chains
Hungary	VIP Cash Subsidy System - Temporary Crisis and Transition Framework - TCTF subsidy	• Granting of cash subsidies for sectors that are needed for a net-zero emissions economy, including batteries
South Korea	Foreign Investment Promotion Act, Act on Special Measures for Strengthening the Competitiveness of Materials, Components, and Equipment Industries	• Cash grants for manufacturing especially for engines, technologies and auto parts • Act focusing on technologies of strategic importance, likely to be batteries and EVs, to provide "support, including finance"
Spain	Spain's Strategic Projects for Economic Recovery and Transformation for the Electric and Connected Vehicle (PERTE VEC)	• EUR2.975bn for the development of the EV supply chain, including batteries and EVs

4.2 Metrics baselined in the international comparison

The metrics that are baselined in this international comparison are summarised in Table 3. The metrics are a subset of those set out in the ATF evaluation framework, and were selected based on the availability of replicable reliable and complete data.

While the international comparison is focussed on a few metrics, these include key outcomes of interest – namely forecast and actual EV production, EV battery production capacity, the size of the automotive sector (as measured by GVA and employment), and imports and exports of EVs and lithium batteries.

Table 3 Metrics baselined in the international comparison

Key metric	Timing	Data sources

Electrified vehicle (passenger car) production	• Actual EV production (time series)
	• Forecast EV production (2019)
		• IHS Markit data segmented by powertrain type
		  ○ Actual production (EVs/pa)
		  ○ Forecast production (EVs/pa)

Automotive sector GVA	(Time series)	• Regional statistical datasets (EuroStat, StatCan, KOSTAT)
Automotive sector jobs	(Time series)	• Regional statistical datasets (EuroStat, StatCan, KOSTAT)

Battery production capacity	• Installed plant capacity (time series)
	• Planned plant capacity (2019)
		• Benchmark Minerals Intelligence (BMI) Gigafactory Assessment
		  ○ Actual installed capacity (GWh/a)
		  ○ Planned capacity (GWh/a)

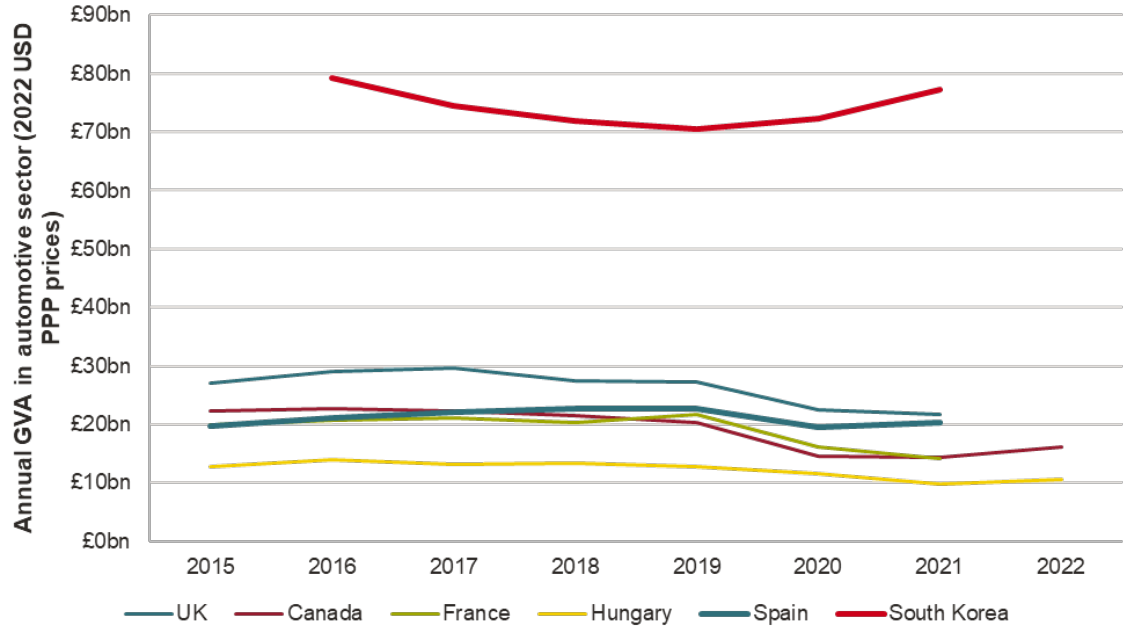
Imports and exports	• Electrified vehicles (time series) • Lithium batteries (time series)	• UN Comtrade

4.3 Baseline findings

Automotive sector GVA

Figure 23 shows the relative size, in terms of value added, of the automotive sectors in each of the comparator countries since 2019 (where available). Korea's automotive sector is at least twice the size of the UK's in value added terms. Canada, France and Spain are a similar size, and Hungary is the smallest, only a third the size of the UK.

Figure 23 Automotive sector GVA in selected countries, 2015 to 2022 – 2022 USD PPP prices



Source: UK Office of National statistics: Regional gross value added (balanced) by industry: all International Territorial Level (ITL) regions (Dec 2023). Manufacture of motor vehicles. Regional accounts methodology guide: June 2019 - Office for National Statistics (ons.gov.uk)

Statistics Canada: Principal statistics for the motor vehicle and motor vehicle parts manufacturing industries on an annual basis (Dec 2023), Automobile and light-duty motor vehicle manufacturing, Motor vehicle body and trailer manufacturing. Principal statistics for the motor vehicle and motor vehicle parts manufacturing industries on an annual basis (statcan.gc.ca)

Eurostat: National accounts aggregates by industry (Dec 2023), Manufacture of motor vehicles, trailers and semi-trailers. Statistics | Eurostat (europa.eu)

Statistics Korea: Value of Shipments, Gross Output, Value-added and Major Production Cost by province and industry(10 or more workers) (Dec 2023). Manufacture of motor vehicles, trailers and semitrailers. Value of shipment, gross output, added value and major production costs(over 10 persons) (kosis.kr)

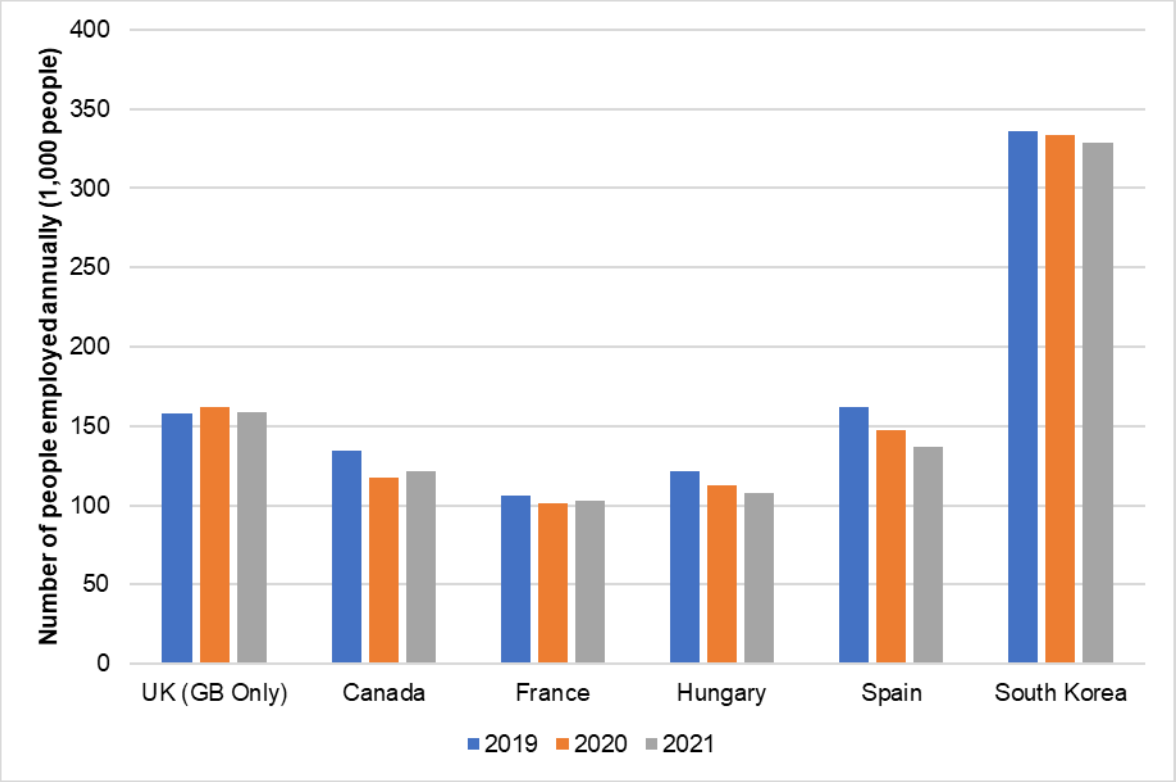
Note: The UK, France, Spain, Hungary and South Korea are well aligned in the GVA fields compiled here for the manufacture of motor vehicles, bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers, parts and accessories for motor vehicles, electrical and electronic equipment for motor vehicles, and other parts and accessories for motor vehicles. Canada's figures were replicated to try to match the data available by summing the GVA generated from automobile and light-duty motor vehicle manufacturing, heavy-duty truck manufacturing, motor vehicle body and trailer manufacturing and motor vehicle parts manufacturing.

Automotive sector jobs

Figure 24 shows employment in the automotive sector in each comparator country. The UK is the second largest sector behind Korea, albeit with around half the number of people employed. Canada and Spain's workforce is larger than France, despite similar GVA, suggesting both countries employ more people per unit value added, or its workers on

average create less value per person. This picture is true of Hungary too, employing a similar size workforce to France, the value added per person in Hungary is lower.

Figure 24 Automotive sector employment in selected countries, 2019-2021



Source: UK Office of National statistics: Business Register and Employment Survey (Dec 2023). Manufacture of motor vehicles. Business Register and Employment Survey : open access - Nomis - Official Census and Labour Market Statistics (nomisweb.co.uk) Eurostat: National accounts employment data by industry (Dec 2023), Manufacture of motor vehicles, trailers and semi-trailers. Statistics | Eurostat (europa.eu) Statistics Canada: Employment and average weekly earnings (including overtime) for all employees in the automotive industry, monthly, seasonally adjusted, Canada (Dec 2023), Automobile and light-duty motor vehicle manufacturing, Motor vehicle body and trailer manufacturing. Employment and average weekly earnings (including overtime) for all employees in the automotive industry, monthly, seasonally adjusted, Canada (statcan.gc.ca) Statistics Korea: Mining and Manufacturing Survey, Statistics by industry, employment size for Manufacture of motor vehicles, trailers and semitrailers. & Statistical information report for users_Mining and manufacturing industry survey_2021 (Dec 2023). Manufacture of motor vehicles, trailers and semitrailers. Statistics by industry, employment size of establishment(over 10 persons) (kosis.kr)

Note: The UK, France, Spain, Hungary and South Korea are well aligned in the employment fields compiled here for the manufacture of motor vehicles, trailers and semitrailers. Canada's figures were replicated to try to match the data available by summing the employment of the motor vehicle manufacturing, motor vehicle body and trailer manufacturing, and motor vehicle parts manufacturing sub-sectors.

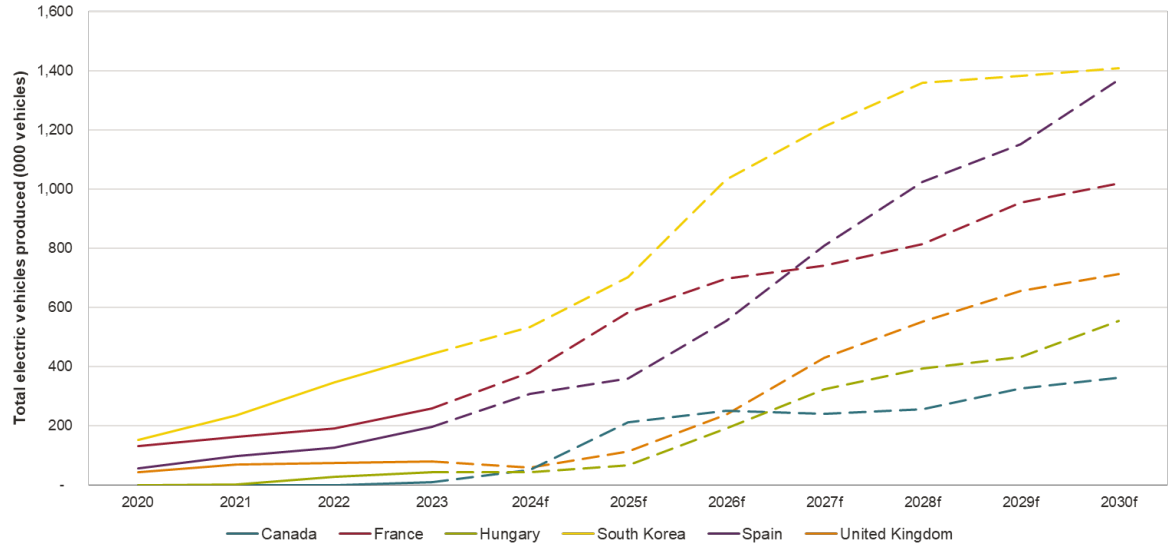
Forecasts for EV production

Data on outturn and forecast production of Electric Vehicles for the UK and comparator countries is sourced from IHS Markit, a prominent provider of data, research and insights across various domains,. The forecast made in June 2023 for future EV production in each country is shown in Figure 25.

Figure 25 illustrates that from 2020 to 2023, the UK surpassed Hungary and Canada in EVs production but trailed behind Spain, France and South Korea. Looking ahead, the UK's EV production is projected to experience significant growth from 2024 to 2030, with an estimated production of 709,500 battery electric vehicles by 2030, and 4,000 fuel cell vehicles. However, despite this anticipated surge, the performance of the UK relative to comparator countries is

expected to remain unchanged. South Korea, Spain and France are still projected to outproduce the UK in EVs, while Canada and Hungary are expected to produce fewer EVs during the same period. Spain is expected to overtake France by 2027 and match Korea's output by 2030.

Figure 25 Production of Electric Vehicles by country – actuals and forecasts



Source: IHS Markit data

Note: Forecasts as of late 2022.

Battery production capacity

Figure 26 shows EV battery production capacity data in 2019, as well as forecasts in 2019 for future battery production capacity in 2025 and 2030. In 2019, there was ca.450 GWh of global battery manufacturing capacity. The vast majority (73%) of this capacity is in China, followed by USA (10%), South Korea (5%) and Japan (3%). At only 1.9GWh, the UK represented 0.4% of global battery production capacity. France, Spain and Canada did not have established gigafactories in 2019. Despite its relatively small automotive industry, Hungary had capacity for 10 GWh of battery production.

This capacity represents the potential output of established battery manufacturing plants, however this does not indicate that that maximum capacity was in fact produced.

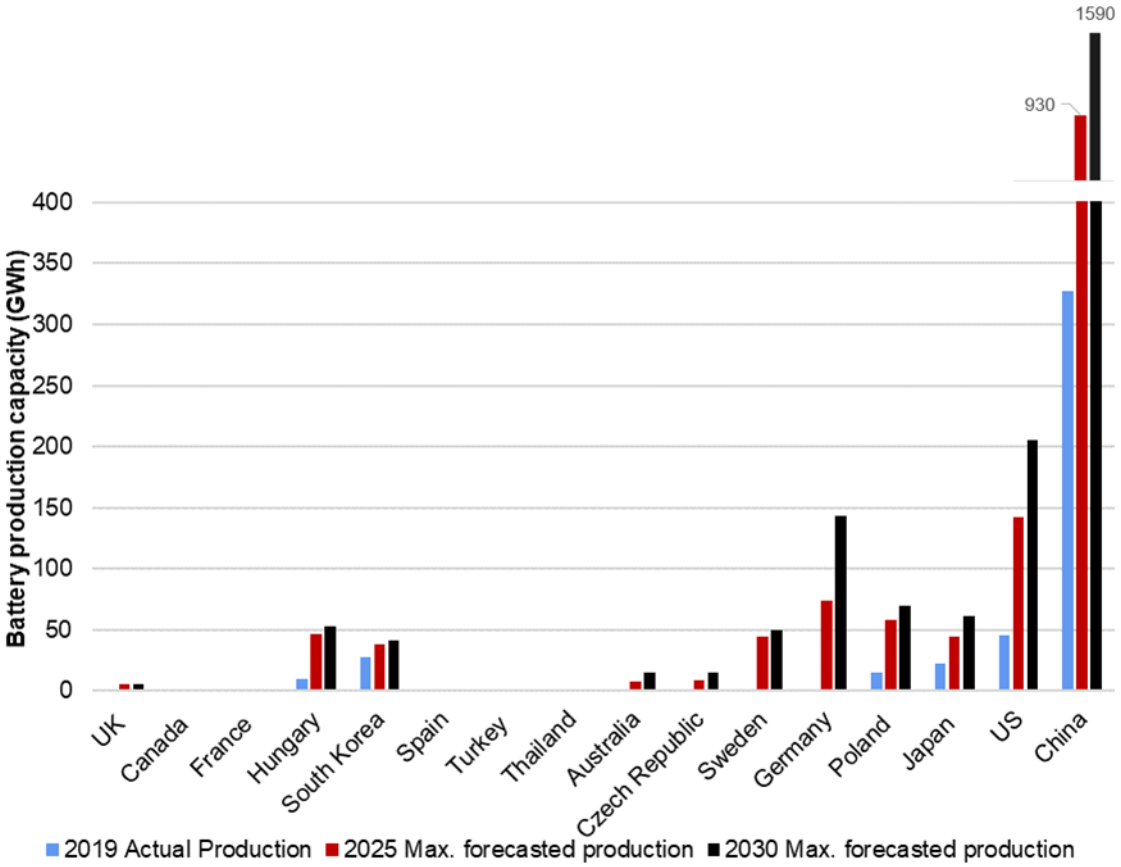
The forecasts for future battery capacity (in 2025 and 2030) were based on the announced plans for factories in different countries as of 2019.

Forecasts for 2025 implied significant growth is expected. The UK was predicted to triple its capacity during this period, from 2 to 6 GWh, maintaining its market share of 0.4%. Hungary in particular was forecast to set up large new factories that would far exceed its current production.

Projections from 2019 for production in 2030 indicate continued global battery manufacturing capacity increases, but at slower levels of growth than between 2019 and 2025. However, this may show the limits of forecasting based on real announcements, as many plans for production plants are considered within around a 5-year time horizon. IEA's Global EV

Outlook in 2019 predicted a potential demand for EV batteries in 2030 between 1,300 to 2,800 GWh, whereas BMI's forecast based on announced planned capacity was 2,295 GWh, 70% coming from China.[42]

Figure 26 EV battery production capacity



Source: Benchmark Minerals Intelligence (Dec 2019).

Note: Additional countries were included in the battery analysis due to the comparator programmes' underrepresentation of the global capacity as of Dec 2019.

Imports and exports of EVs

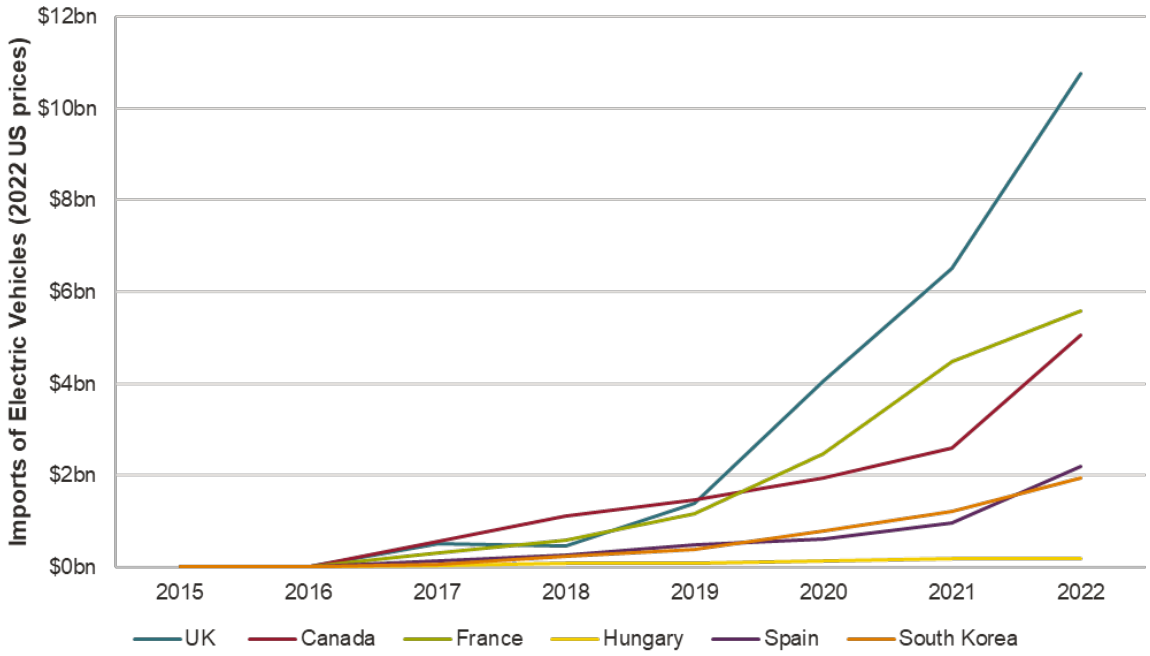
Data on imports and exports of EVs is sourced from UN Comtrade using the Harmonised System (HS) Code 870380 ("Vehicles with only electric motor for propulsion"). Data for this HS Code was collected from 2017 onwards, therefore the time series of imports and exports of EVs focus on the period between 2017 and 2022.

Figure 27 shows that between 2019 and 2022 the UK's volume of imports of EVs has consistently been higher than for comparator countries. While all comparator countries have seen an increase in the volume of EVs imports, the UK has seen a much more rapid growth, with a 7.6-fold increase between 2019 and 2022. In fact, while in 2019 the UK and Canada

[42] Global EV Outlook 2019 – Analysis - IEA

had roughly the same volume of EVs imports – around $1.4 billion – in 2022 the UK's volume of imports has more than doubled that of Canada.

Figure 27 Imports of Electric Vehicles, 2015 to 2022 – 2022 US prices

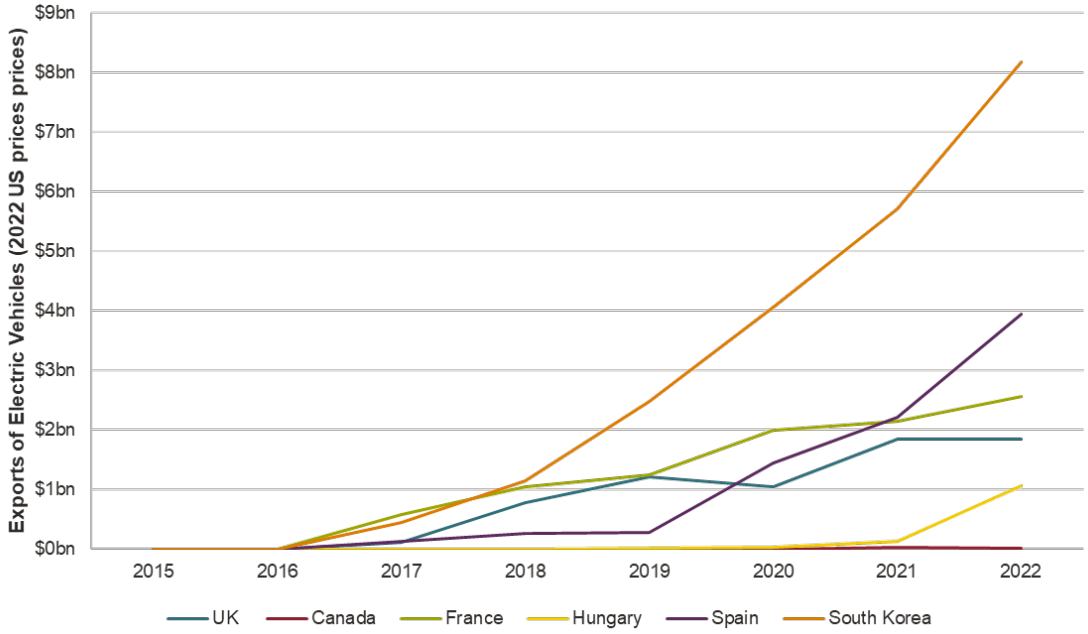


Source: *UN Comtrade*

Note: *HS codes 8703 for "Motor cars and other motor vehicles" and 870380 for "Vehicles with only electric motor for propulsion". Values are reported in 2023 prices, calculated using GDP deflators from the World Bank*

Figure 28 shows that in 2019 the value of UK EV exports was just over $1bn. This was higher than the value of exports from Hungary and Spain but lower than France and South Korea. Between 2019 and 2022, UK EV exports increased, but not at the pace of the value of exports from South Korea, France, and Spain. Notably, Canada and Hungary consistently demonstrate EV export volumes significantly lower than those of the UK.

Figure 28 Exports of Electric Vehicles, 2015 to 2022 – 2022 price



Source: *UN Comtrade*

Note: *HS codes 8703 for "Motor cars and other motor vehicles" and 870380 for "Vehicles with only electric motor for propulsion". Values are reported in 2023 prices, calculated using GDP deflators from the World Bank*

Imports and exports of lithium batteries

Data on imports and exports of lithium batteries to the UK is sourced from the UN Comtrade, using the Harmonised System (HS) Code 850650 ("Cells and batteries, primary, lithium"). An important limitation of this metric is that the HS code does not distinguish between lithium batteries for EVs and lithium batteries used in consumer electronic devices and power tools. Therefore, it is not possible to establish which proportion of the import or export of lithium batteries was destined to the EV supply chain. However, according to analysis from Avicenne Energy, 71% of the worldwide production of lithium-ion batteries was destined to the automotive sector in 2020, with this percentage expected to reach 89% in 203043.

Figure 30 shows that exports of lithium batteries between 2015 and 2022 were lower in the UK than France and South Korea, and greater than Hungary and Spain. In 2019 the value of UK lithium batteries exports was $64.8 million. This corresponds to approximately half of the value of exports of South Korea and France, and around the same as Canada.

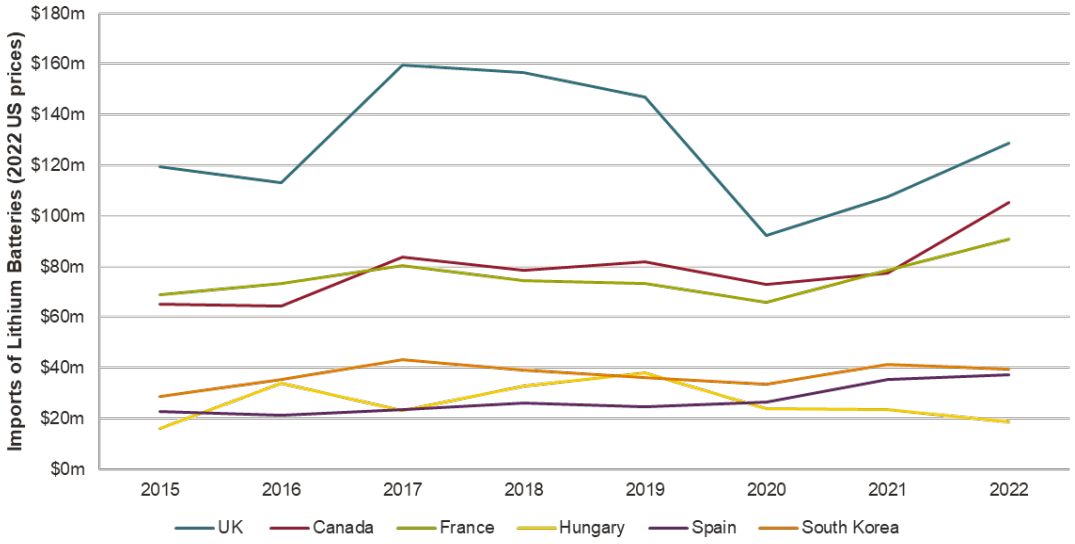
Figure 29 shows that between 2015 and 2022 the UK's value of imports of lithium batteries has consistently been higher than the value of imports of comparator countries. In 2019 the UK imported lithium batteries for a value of $147 million, approximately twice as much as France and Canada and five times as much as Hungary, Spain and South Korea.

Figure 30 shows that exports of lithium batteries between 2015 and 2022 were lower in the UK than France and South Korea, and greater than Hungary and Spain. In 2019 the value of

[43] The Rechargeable Battery Market and Main Trends 2011-2020 (elbcexpo.org)

UK lithium batteries exports was $64.8 million. This corresponds to approximately half of the value of exports of South Korea and France, and around the same as Canada.

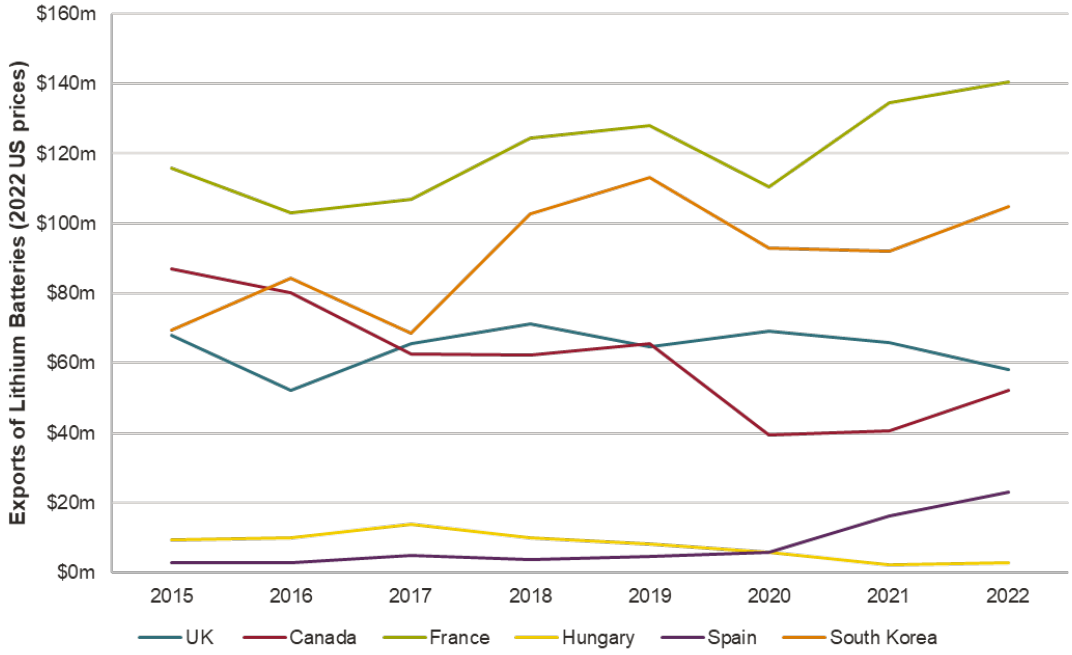
Figure 29 Imports of lithium batteries, 2015 to 2022 – 2022 US prices



Source: *UN Comtrade*

Note: *HS Code 850650 – Cells and batteries; primary, lithium. Values are reported in 2023 prices, calculated using GDP deflators from the World Bank*

Figure 30 Exports of lithium batteries, 2015 to 2022 – 2022 US prices



Source: *UN Comtrade*

Note: *HS Code 850650 – Cells and batteries; primary, lithium. Values are reported in 2023 prices, calculated using GDP deflators from the World Bank*

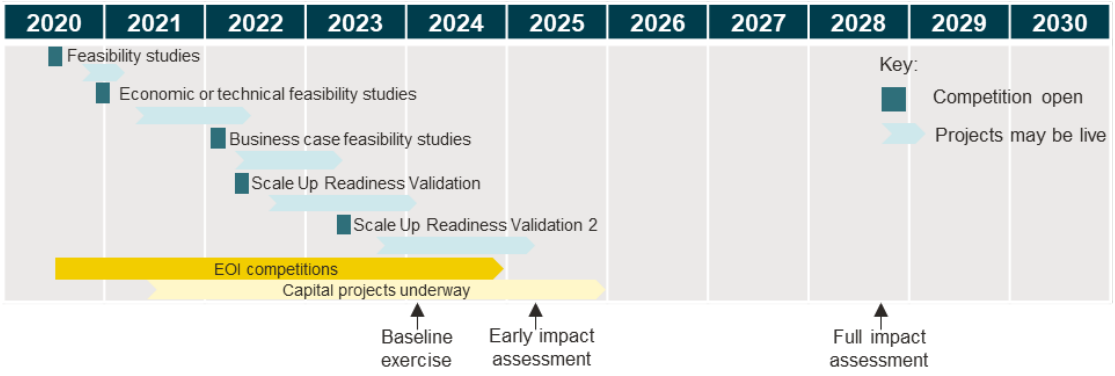
5. Evaluation next steps

The ATF evaluation framework recommended two stages to the impact evaluation:

- An **early impact assessment**, to be concluded before March 2025 (the end of the current ATF funding). Based on the timings identified in the Theory of Change, the focus of the early impact assessment should be on delivery of activities, outputs and short-term outcomes as leading indicators of longer-term benefits the ATF is seeking to achieve. Conducting an early assessment while the ATF is still "live" will maximise access to delivery stakeholders and internal data to support analysis of activities and outputs.
- A **final impact assessment**, to be conducted in 2028. This phase will be focused on the longer term impacts of the ATF, drawing primarily on secondary data sources and stakeholder engagement.

These recommended future stages are still judged to be appropriate. Figure 31 below summarises the timeline of the impact evaluation, with respect to the overall ATF timeline.

Figure 31 Timeline of the impact evaluation relative to the ATF delivery timetable



The baseline project has yielded two lessons that are relevant to a future early impact assessment:

- Bespoke survey data collection from industry stakeholders is challenging. In part this is due to difficulties identifying appropriate individuals to approach, and in part due to survey fatigue and non-response among survey targets. While a survey of a similar group was suggested in the evaluation framework as part of an early impact assessment, and may be a useful source of self-reported evidence on the additionality of ATF support, DBT and ATF stakeholders should consider whether a survey is likely to yield high enough response rates to provide robust findings if the early impact assessment takes place within the next year. If a survey is desired, resource needs to be available to ensure that DBT, ATF and a future evaluator can engage the sample of respondents appropriately to generate good response rates..
- Accessing historic IHS Markit data on forecasts of light vehicle production has proved time consuming. This would be valuable for measuring changes in expectations of UK EV production over time, and therefore it is recommended that negotiations with IHS Markit continue from this baseline project.

Appendix A. Survey methodology

Sampling frame

The sampling frame consisted of all companies who have applied for ATF funding, through either the capital or R&D funding competitions. These companies work across the EV chain, and represented a full range of organisational sizes. Whilst this sampling frame has the limitation that it only contains those companies who had applied for ATF funding, it was determined to be the fullest sample available.

The initial email was sent to all contacts on 12th December 2023. Where company information contained named contacts, emails were addressed directly to them, although in many cases this information was not available. In total, the database contained 499 contacts at 415 unique companies, all of which were invited to take part in the survey. Of these 177 had available telephone numbers and were eligible for calling. Of the 499 contacts in the database, 68 had email addresses that were undeliverable, and of these 53 did not have a telephone number available, making them uncontactable. This means that in reality, there were 446 available contacts.

Sample methodology

Where companies had multiple contacts who had been involved in funding applications, all contacts were emailed a link to the survey. Across the completed surveys, 51 unique companies are represented, and two companies each have 2 completed surveys within the dataset. All surveys were sent with a unique link, to prevent duplicate responses. Two further reminder emails were sent to those contacts who had not completed.

Details of the organisations contained in the database were sought in public information sources, and where possible telephone numbers were identified for them. From the 8th of January calling began, to encourage completion. All contacts were called a maximum of five times each, with calling spread across different times and different days across the weeks, to ensure the greatest chance of reaching the contact. The calling was used to ensure the most appropriate person had received the email, and up-date the contact details and re-send the email if necessary. Where multiple contacts in the database were associated with the same company, these were rotated on a daily basis, so that only one person per company could be called per day.

Survey content - Questionnaire

The survey was designed around the evaluation framework, and focused on respondents' assessment of the UK EV supply chain, strengths and weaknesses, expectations of supply and demand, perceptions on the current and expected state of the EU EV market, and any expected or early impacts of the ATF.

Below is the questionnaire used for the survey. Instructions for scripting are in red. These instructions were not visible to survey respondents.

Introduction

The following questions will refer to the "electrified automotive (EV) supply chain". We define the EV supply chain as a complex network involving the research, development, manufacturing and distribution of components (including batteries, motors, power electronics, and fuel cells) that collectively contribute to the design and production of electric vehicles, as well as the research, development and manufacturing of electric vehicles themselves.

Your valuable insights will play a crucial role in understanding strengths and weaknesses, expectations of supply and demand, perceptions on the current and expected state of the UK EV supply chain. Your participation is highly appreciated, thank you for taking the time to share your views with us.

Background

ASK ALL

A1. Which of the following best describes your organisation in relation to the EV supply chain?

SINGLE CODE

A. *An OEM/Prime producer*
B. *System integrator (similar to OEM but with more focus on the design of vehicle systems)*
C. *Tier 1 producer/Sub-system manufacturer e.g. vehicle transmission system, e-axle*
D. *Tier 2 producer/Large component manufacturer and supplier to a Tier 1 producer e.g. motor, inverter*
E. *Tier 3 producer/Small component manufacturer and supplier to a Tier 2 producer e.g. power transistor, wafers*
F. *Materials manufacturer e.g. lithium refiner, magnetic alloys manufacture*
G. *End of life service provider e.g. component disassembly, reconditioning and recycling components*
H. *Researcher e.g. research institutes, universities and academics)*
I. *Other (please write in)*
J. *Don't know*

ASK ALL

A2. Which of the following areas does your organisation focus on? Please select all that apply

MULTICODE

A. *Battery: Battery cell materials and components, battery cells, battery packs.*
B. *PEMD: Power electronics, motors and drives.*

C. *Fuel cells and hydrogen: fuel cell stacks and systems, hydrogen tanks.*
D. *Vehicles: Light Duty Vehicles, buses, heavy duty vehicles, off highway equipment.*
E. *Other (please write in)*

ASK ALL
A3. What proportion of your organisation's business is currently part of the EV supply chain? Please give an estimation of the proportion of your organisation's total output that is part of the EV supply chain. Please include all sites and subsidiaries.
SINGLE CODE

A. *0%*
B. *1% - 10%*
C. *11% - 25%*
D. *26% - 50%*
E. *51% - 75%*
F. *76% - 99%*
G. *100%*
H. *Don't know*

ASK ALL
A4. And what proportion of your organisation's business do you expect to be part of the EV supply chain in 2030?
SINGLE CODE

A. *0%*
B. *1% - 10%*
C. *11% - 25%*
D. *26% - 50%*
E. *51% - 75%*
F. *76% - 99%*
G. *100%*
H. *Don't know*

ASK ALL
A5. Which of the following best describes your organisation?
MULTICODE

A. *Headquartered in the UK, and only do work in the UK* EXCLUSIVE
B. *Headquartered in the UK, but also do work in wider-Europe*

C. *Headquartered in the UK, but also do work outside of Europe*
D. *Headquartered outside of the UK* EXCLUSIVE
E. *Don't know* EXCLUSIVE
F. *Prefer not to say* EXCLUSIVE

ASK ALL
A6a. How many members of staff does your organisation currently employ globally? Please think about the number of full-time equivalent employees.
NUMERIC, MIN 0 MAX 999,999, WHOLE NUMBERS ONLY

A. *Please write in number of full-time equivalent employees*
B. *Don't know*

IF A6a = "DON'T KNOW"
A6b. If you don't know the exact number please give an estimate.

SINGLE CODE

A. *0-4 employees*
B. *5-9 employees*
C. *10-19 employees*
D. *20-49 employees*
E. *50-99 employees*
F. *100-249 employees*
G. *250-499 employees*
H. *500-999 employees*
I. *1,000-4,999 employees*
J. *5,000-9,999 employees*
K. *10,000+ employees*
L. *0-10 employees*
M. *Don't know*

ASK ALL
A7a. How many members of staff does your organisation currently employ in the UK? Please think about the number of full-time equivalent employees.
NUMERIC, MIN 0 MAX 999,999, WHOLE NUMBERS ONLY

A. *Please write in number of full-time equivalent employees*
B. *Don't know*

IF A7a = "DON'T KNOW"

A7b. If you don't know the exact number please give an estimate.

SINGLE CODE

A. *0-4 employees*
B. *5-9 employees*
C. *10-19 employees*
D. *20-49 employees*
E. *50-99 employees*
F. *100-249 employees*
G. *250-499 employees*
H. *500-999 employees*
I. *1,000-4,999 employees*
J. *5,000-9,999 employees*
K. *10,000+ employees*

ASK ALL

A8. Which of the following bands would best describe your UK turnover for the previous financial year? Please think about all UK turnover, even if some operations are outside of the EV supply chain.

SINGLE CODE

A. *Zero*
B. *Less than £100,000*
C. *£100,000 - £499,999*
D. *£500,000 - £999,999*
E. *£1m - £4.9m*
F. *£5m - £9.9m*
G. *£10m - £24.9m*
H. *£25m - £49.9m*
I. *£50m or more*
J. *Don't know*
K. *Prefer not to say*
L. *Current supply chain*

Supply Chain Strength

ASK ALL

B1. On a scale of 1 to 5, where 1 is "not at all secure or resilient" and 5 is "completely secure or otherwise resilient", please rate the security and resilience of the current supply chain of the raw materials necessary for you to have operations in the UK.

SINGLE CODE

1-5 or Don't Know

IF A1 =B-J (i.e. RESPONDENT IS NOT OEM)

B2. On a scale of 1 to 5, where 1 is "not at all secure or resilient" and 5 is "completely secure or otherwise resilient", please rate the security and resilience of the current supply chain of the raw materials necessary for OEMs to manufacture EVs in the UK.

SINGLE CODE

1-5 or Don't Know

ASK ALL

B3. What are the greatest strengths of the current UK EV supply chain in your opinion?

FREE TEXT ANSWER

ASK ALL

B4. What are the greatest weaknesses of the current UK EV supply chain in your opinion?

FREE TEXT ANSWER

Attractiveness for investment

ASK ALL

C1. Overall, how attractive do you think the UK is currently as a place to invest in the EV supply chain?

SINGLE CODE

A. *UK is the world leading location*
B. *UK is more attractive than most of its main competitor countries, though not all of them*
C. *UK is more attractive than some countries, but less attractive than its competitors*
D. *UK is less attractive than most countries*
E. *UK is much less attractive than most countries*
F. *Don't know*

ASK ALL

C2. Now thinking about the following aspects of the EV supply chain, how attractive do you think the UK is currently as a place to invest in relation to each of these?

SINGLE CODE PER STATEMENT

a. Battery: Battery cell materials and components, battery cells, battery packs.
b. PEMD: Power electronics, motors and drives.
c. Fuel cells and hydrogen: fuel cell stacks and systems, hydrogen tanks.

d. Electric vehicles: Light Duty Vehicles, buses, heavy duty vehicles, off highway equipment.

A. UK is the world leading location
B. UK is more attractive than most of its main competitor countries, though not all of them
C. UK is more attractive than some countries, but less attractive than its competitors
D. UK is less attractive than most countries
E. UK is much less attractive than most countries
F. Don't know

ASK ALL
C3. Do you think each of the following is a barrier or enabler to investment in the UK EV supply chain?
SINGLE CODE PER STATEMENT

- Availability of appropriately skilled labour
- Availability of land or infrastructure
- Proximity to suppliers
- Proximity to customers
- Cost of inputs
- Level of taxes
- R&D environment
- Access to capital
- Planning timescales and regulations
- Government support for the sector

A. A significant barrier
B. A small barrier
C. Neither a barrier nor enabler
D. A small enabler
E. A significant enabler
F. Don't know

Expected growth

ASK ALL
D1. Which of the following best describe how you expect the UK EV supply chain to change by 2030?
SINGLE CODE

A. *It will grow significantly*
B. *It will grow slightly*
C. *It will stay about the same*
D. *It will decrease slightly*
E. *It will decrease significantly*
F. *Don't know*

ASK ALL

D2. How would you rate the expected security and resilience of the supply chain of the raw materials necessary for you to have operations in the UK in 2030, on a scale of 1 to 5, where 1 is "not at all secure or resilient" and 5 is "completely secure or otherwise resilient"?
SINGLE CODE

1-5 or Don't Know or Not applicable

IF A1 =B-J (i.e. RESPONDENT IS NOT OEM)

D3. How would you rate the expected security and resilience of the supply chain of the raw materials necessary for OEMs to manufacture EVs in the UK in 2030, on a scale of 1 to 5, where 1 is "not at all secure or resilient" and 5 is "completely secure or otherwise resilient"?
SINGLE CODE

1-5 or Don't Know

ASK ALL

D4 What are the greatest barriers to the future growth of the EV supply chain in the UK? FREE TEXT ANSWER

Change in attractiveness for investment since 2019

ASK ALL

E1. Overall, how do you think the attractiveness of the UK as a place to invest in the EV supply chain overall has changed since 2019?
SINGLE CODE

A. *Become much more attractive*
B. *Become somewhat more attractive*
C. *Stayed the same*
D. *Become somewhat less attractive*
E. *Become much less attractive*
F. *Don't know*

ASK ALL

E2. How do you think the attractiveness of the UK as a place to invest in the EV supply chain overall has changed since 2019 on each of the following dimensions?
SINGLE CODE PER STATEMENT

- Availability of appropriately skilled labour
- Availability of land or infrastructure
- Proximity to suppliers
- Proximity to customers
- Cost of inputs
- Level of taxes
- R&D environment
- Access to capital
- Planning timescales and regulations
- Government support for the sector

A. *Become much more attractive*
B. *Become somewhat more attractive*
C. *Stayed the same*
D. *Become somewhat less attractive*
E. *Become much less attractive*
F. *Don't know*

ASK ALL
E3. What do you think have been the main drivers of change in relative attractiveness of the UK as a place to invest since 2019? FREE TEXT ANSWER

ASK ALL
E4. How has the US Inflation Reduction Act impacted the relative attractiveness of the UK as a place for investment in the EV supply chain?
SINGLE CODE

A. *Become more attractive*
B. *Stayed the same*
C. *Become less attractive*
D. *Don't know*

ASK ALL
E5. How has the Green Deal Industry Plan impacted on the attractiveness of the UK as a place for investment in the EV supply chain?
SINGLE CODE

A. *Become more attractive*
B. *Stayed the same*
C. *Become less attractive*
D. *Don't know*

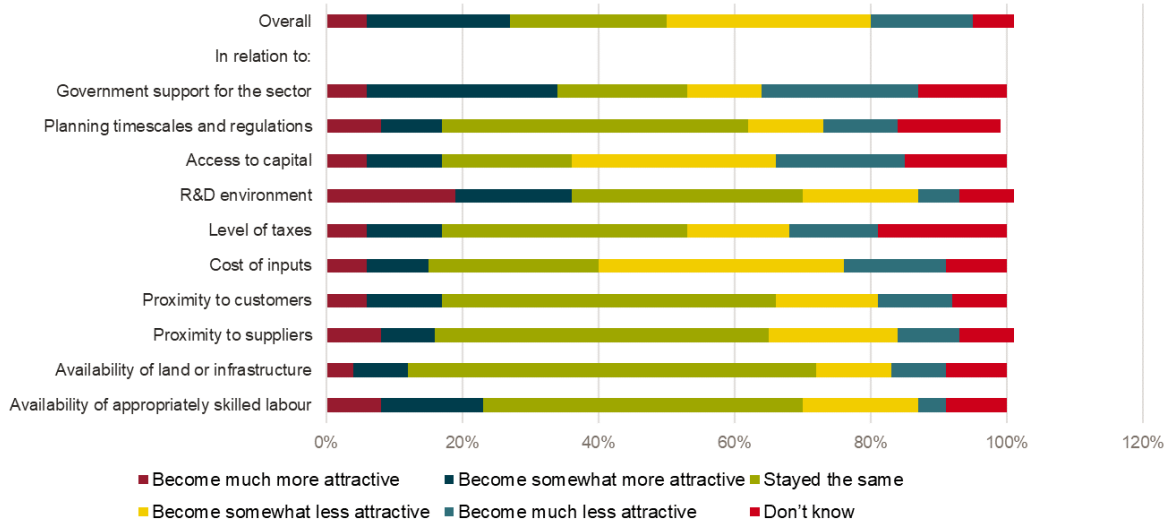
Close

ASK ALL

F1. Are there any additional comments you would like to add?

Appendix B. Additional figures

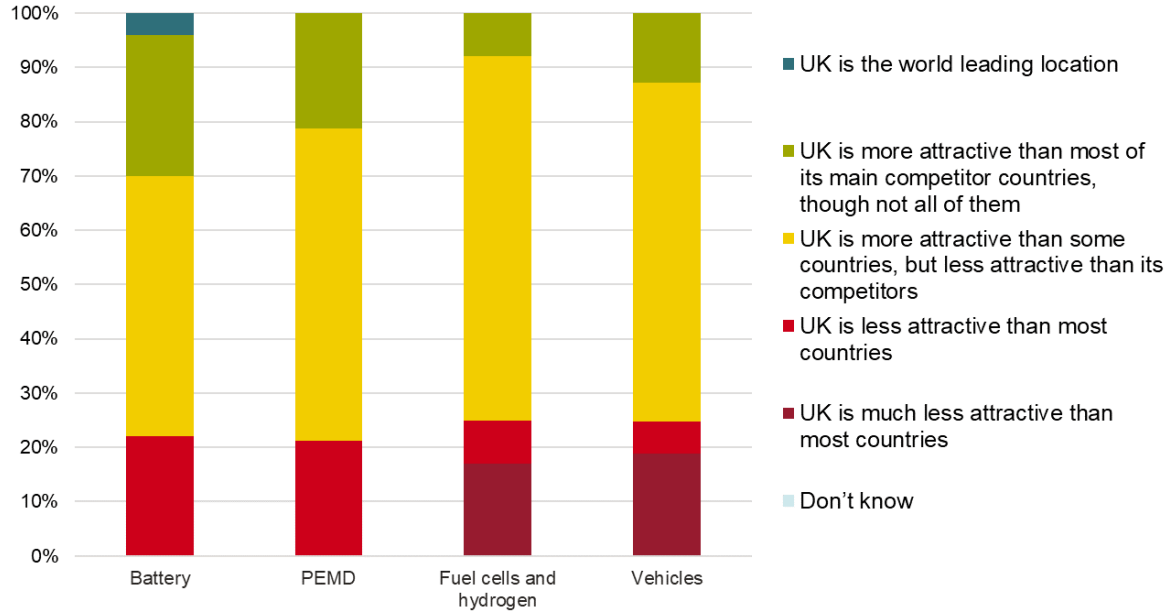
Figure 32 Change in perceptions of the attractiveness of the UK as a place to invest in the EV supply chain since 2019



Source: Survey of organisations in the EV supply chain

Notes: Answer to survey question E01 and E02 (see Appendix A). Sample size: 53 respondents.

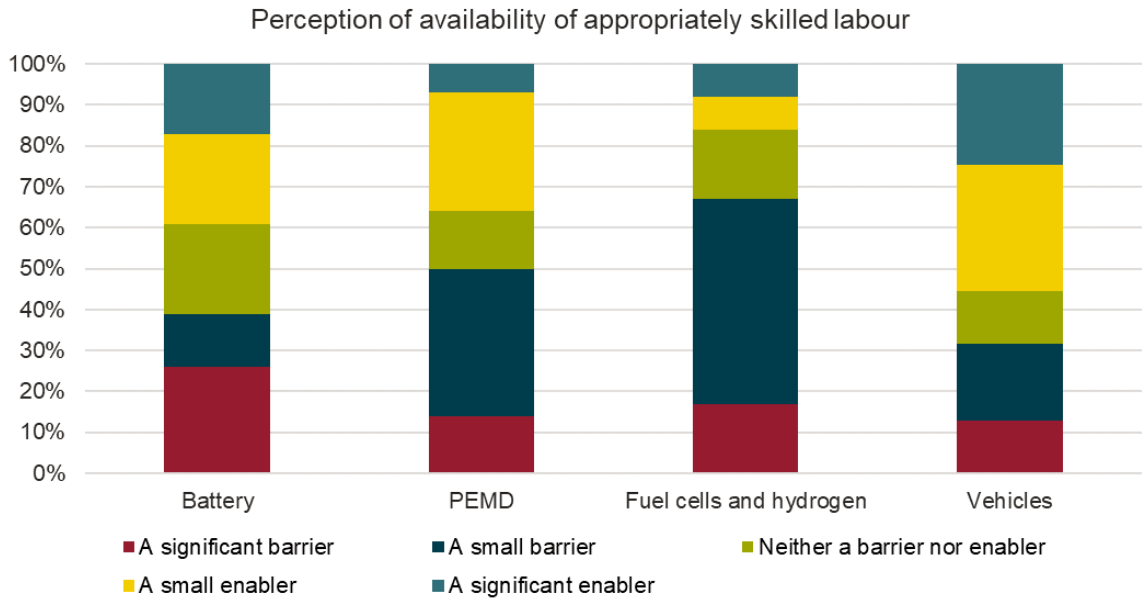
Figure 33 Perception of the attractiveness of the UK as a place to invest in the EV supply chain, from respondents across different segments of the supply chain

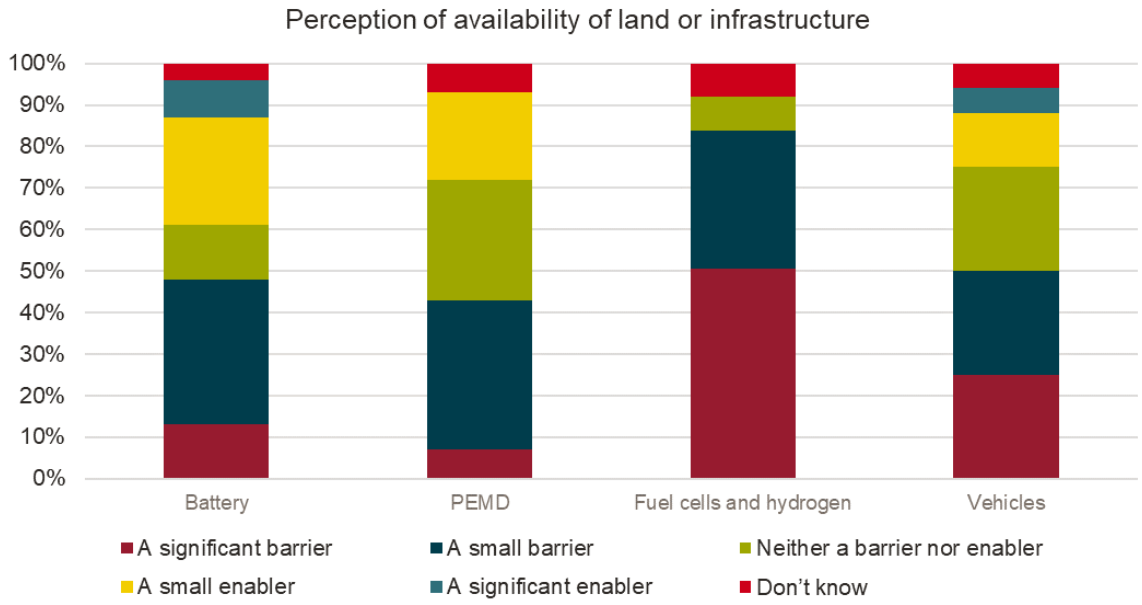


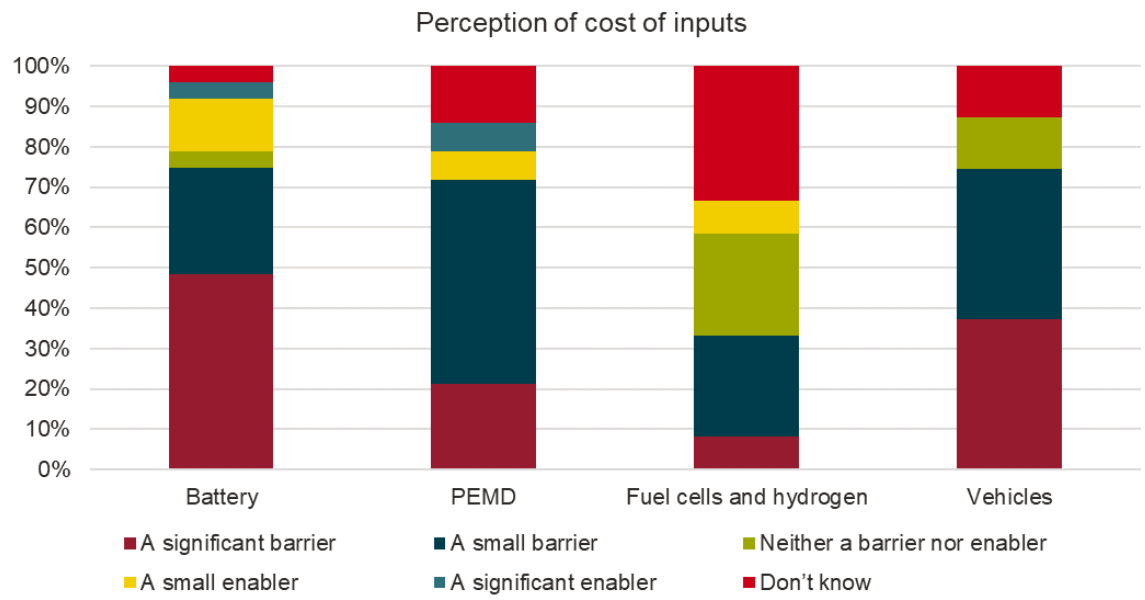
Source: BMG survey of businesses in the EV supply chain

Note: Answer to survey question C01 (see Appendix A). Sample size: 53 respondents (23 in the battery segment, 14 in the PEMD segment, 12 in the fuel cells segment, 16 in the vehicles segment – notice that different segments of the supply chain are not mutually exclusive, therefore the same business can belong to multiple segments).

Figure 34 Perception of some factors across different segments of the supply chain







Source: BMG survey of businesses in the EV supply chain

Note: Answer to survey question C03 (see Appendix A). Sample size: 53 respondents (23 in the battery segment, 14 in the PEMD segment, 12 in the fuel cells segment, 16 in the vehicles segment – notice that different segments of the supply chain are not mutually exclusive, therefore the same business can belong to multiple segments).

Table 4 Difference in current and future perceptions of security and resilience of the supply chain for own operations

	Future expected security/ resilience the same as today	Future expected security/ resilience worse than today	Future expected security/ resilience better than today
All respondents	45%	34%	11%
By current perception:			
Non-secure/resilient (score 1 or 2)	19%	4%	9%
Intermediate (score 3)	13%	4%	2%
Secure/resilient (score 4 or 5)	13%	26%	0%

Source: BMG survey of business in the EV supply chain.

Notes: Sample size 53 respondents. Reported % are out of the full sample. Not included in the table are 9% of respondents who reported "Don't know" to either the question about current security/resilient or the question about future security/resilience.

Appendix C. Logic model

Figure 35 ATF logic model

The ATF inputs are:

- Funding:
  - Funding for support of late stage R&D.
  - Funding for support of capital investment.
- Staff time and expertise:
  - To design the ATF, deliver the funding competitions and monitor projects (BEIS, APC, IUK, partners).
  - To engage with priority companies (BEIS, APC, DIT).
- Industry inputs:
  - Existing capital infrastructure.
  - Existing R&D knowledge stock.
  - Existing reputation of the UK as a leading location for automotive R&D and manufacture.
  - Existing UK comparative advantage in the sector.

The activities being delivered by the ATF are:

- Support of capital investment:
  - Strategic analysis to identify priority technology areas and target firms.
  - Active engagement with target firms to encourage application.
  - Conduct EOI competition and assessment.
  - Conduct full application processing and assessment.
  - Conduct project set up, ongoing monitoring and close out for allocated investments.
- Support of late-stage R&D:
  - Strategic analysis to identify priority areas for investment.
  - Scoping activities to design competitions.
  - Conduct competition, application, assessment and awarding phase.
  - Conduct project set-up, ongoing monitoring and close out.

- General communications and engagement:
    - Showcasing at industry events.
    - Direct engagement with targeted companies.
    - Funding competitions advertised.
    - Post-project showcasing.

The anticipated outputs from these activities are:

- Support of capital investment.
    - Number of approved capital investment projects completed in strategic areas:
        - Batteries.
        - Electric motors and drive units.
        - Power electronics and fuel cells.
        - Hydrogen fuel cells.
    - Private investment in approved capital projects secured.
    - R&D conducted as part of approved projects.
- Support of late-stage R&D:
    - Number of economic feasibility studies completed.
    - Number of technical scale up feasibility studies completed.

Number of Scale up Readiness Validation studies completed.

    - Private investment in approved projects secured.
- General communications and engagement:
    - UK and international companies and investors better informed of UK potential.
    - Signal received by investors of UK government support for auto industry and EV supply chain.

The short-run outcomes expected to follow logically from the ATF activities and outputs are:

- Automotive jobs directly created/safeguarded in completed projects.
- Commercial interactions between supported investments and wider supply chain secured.
- Increased confidence in future viability and scale of UK EV supply chain.
- Increased confidence in UK built EVs satisfying RoO requirements, leading other Tier 1/2 suppliers to locate production in the UK.
- Increased business confidence in large scale manufacturing decisions, leading OEMs to decide to locate the EV product line manufacture in the UK.
- Greater understanding of UK as viable location for manufacturing.

- Reduced risk associated with scaling up innovative technologies in EV supply chain.
- Greater awareness of remaining barriers to UK investment.
- Increased business confidence in UK as location for EV supply chain investments.

The long-run outcomes are:

- Increased investment in the EV supply chain.
- High productivity jobs created and safeguarded in automotive sector.
- Increased production of EVs and components.
- Automotive sector R&D remains strong.

The ultimate anticipated impacts of the ATF are:

- Contribution to levelling up (high quality jobs available around the UK).
- Contribution of automotive industry to exports maintained.
- UK automotive sector makes successful transition to zero emissions, supporting net zero commitments.
- UK production of EVs contributes to a reduction in global emissions.
- EV supply chain and R&D spillovers benefit other industries and support growth.
- UK continues to be seen as a leading location for automotive manufacture and R&D.

There are a number of external barriers and enablers that will affect whether the ATF delivers its expected outcomes and impacts, including:

- UK government support for the automotive industry through complementary programmes (Faraday, APC, DER).
- Existing automotive industry, infrastructure and supply chains.
- Existing strong science and engineering and R&D base.
- International factors affecting UK competitiveness (e.g. trade deals, foreign government support).
- Domestic factors affecting UK competitiveness (e.g. energy costs, labour costs).

Department for Business and Trade

We are the UK's department for economic growth. We support businesses to invest, grow and export, creating jobs and opportunities across the country.

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- Securing investment from UK and international businesses.
- Advising, supporting, and promoting British businesses to grow and export.
- Opening up new markets for businesses by removing barriers and striking trade deals.
- Promoting free trade, economic security and resilient supply chains.

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