

# ELECTRIFYING GROWTH

Exploring what electrification could mean  
for the UK's automotive industry

October 2024



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# Foreword – Energy and Climate Intelligence Unit

In decades past, the UK's automotive sector struggled to keep pace with change. The pain of job losses was felt by families and communities across the country as the industry struggled to compete with international peers, slow to wake up to the advance of new technologies. It took many years to rebuild the industry, successfully attracting inward investment and adopting advanced manufacturing techniques on the way.

Today, the UK finds itself at a crossroads yet again with a choice to support the modernisation of its car industry or risk repeating the events of the 70s and 80s. Globally, the momentum towards electrification is unstoppable as this new technology, that is already better in many ways than the alternatives, is driven to further improvements through competition.

In industrial transitions like this, that take the world to the next level of technology, there are inevitably some winners and some losers. What this report clearly demonstrates is that, as in so many other technology revolutions, stasis is a recipe for decline. Even to stand still in the global economy at moments like this you need to embrace change.

The good news is much of the UK's car industry recognises that change is the best course of action. Significant investments and commitments are being made, including the £4bn gigafactory being built by Jaguar Land Rover in Somerset with Government support, Nissan's investment of £3bn to ready its Sunderland plant to build three new EV models, and BMW's confirmation that two new electric MINI models will be built at its plant in Oxford. All of these investments will create and secure good quality jobs and see British-built EVs exported around the world, encouraged and supported by the UK's government.

These investments, with Government and the car industry working together, matter. Competition is fierce, and not just from China. The UK finds itself in a global race with the US Inflation Reduction Act and the EU Net Zero Industries Act incentivising investment to go elsewhere. The UK can compete here – but the question, particularly for the British Government, is whether it will plan and invest to win...or not.

This EV transition can be a UK success story. We have a strong automotive sector, with a strong heritage. But the Government will need to work with industry to ensure that our automotive sector remains competitive. With economic growth a key political goal, extra effort will be needed to ensure the industry does grow, and more high-value automotive jobs are created.

CBI Economics has previously calculated that the UK's Net zero economy was worth £74bn (GVA) in 2023 and grew 9%, but growth cannot be taken for granted.

**Pete Chalkley**

Director, Energy and Climate Intelligence Unit



## Foreword – CBI Economics

The UK automotive industry stands at a critical juncture as it navigates the global transition towards net zero and the adoption of electric vehicles (EVs). As one of the cornerstones of the UK economy, the automotive sector's ability to adapt will play a key role in shaping not only its own future but also the wider economy. Electrification of the industry represents both a challenge and an unparalleled opportunity for the sector to modernise, innovate, and secure its place in a rapidly changing global market.

We have already seen some of the industry's major players make significant investments towards supporting electrification in the UK: Jaguar Land Rover in Merseyside, BMW in Oxford and Nissan in Sunderland have collectively committed billions in recent years.

This report, commissioned by the Energy and Climate Intelligence Unit (ECIU) and developed by CBI Economics, seeks to provide comprehensive analysis of the UK's automotive sector and its journey to electrification. It is an effort to assess the sector's current strengths, challenges, and the potential economic impacts of various future scenarios as the industry adapts to evolving markets and policy environments.

The findings of this report are stark. In the most optimistic scenario, where the UK automotive sector can embrace electrification, the UK economy could see a £16.1 billion increase in GVA by 2035. Conversely, in a more pessimistic scenario, where the UK automotive sector does not have the correct environment to adapt to changing market conditions, the UK economy could lose £34.1 billion by 2035. These projections underscore the high stakes and the need for a proactive, ambitious strategy to support the sector's evolution.

In this time of change, it is essential for stakeholders across government, industry, and civil society to collaborate and ensure that the UK remains competitive on the global stage, while continuing to build on its rich automotive legacy. The research presented here offers insight into the opportunities arising from electrification, to help ensure the UK automotive sector remains a cornerstone of the UK economy.

We hope that this report adds to the wider conversation about the action needed to support electrification of the UK automotive industry and how to unlock the full potential of our automotive industry.

**Louise Hellem**  
Chief Economist, Confederation of British Industry



## Glossary

- **Gross Value Added (GVA):** is the income generated by a company or industry, which can be re-spent or re-invested, creating additional value. It is the sum of gross operating profits, wages and salaries, self-employment income and taxes (less subsidies) on production.
- **Output:** The output of a sector is made up of multiple different components. At the highest level, these can split into two broad categories; cost of industry inputs (production costs) and the value added to these inputs (gross value added, GVA). Production costs are made up of three core components: cost of imported inputs, cost of domestically sourced inputs and taxes less subsidies on products. GVA is made up of three components as well: compensation of employees, gross operating surplus and mixed income and taxes less subsidies on production. The output of the industry would be defined as the cost of production and the gross value added to these inputs by the industry's activities.
  - **Note:** In this study we only report on the output generated by businesses apart of the UK's automotive sector and this study does **not** include reporting on the output generated via supply chain and induced effects. This differs from the study's reporting on economic contribution (GVA and FTE jobs), which does include supply chain and induced effects. This explains why our GVA figures are higher than the reported output figures, even though GVA is a component of output, and the two should not be compared directly.
- **Full-Time Equivalent (FTE):** is an employment metric which accounts for the average number of hours worked by an employee. One FTE is assumed to work an average of 37 hours per week. An individual working more than this average would be counted as more than an FTE and vice-versa.
- **Automotive industry:** all those companies and activities involved in the manufacture of motor vehicles, including most components, such as engines and bodies, but excluding tires, batteries, and fuel.
- **Electric Vehicle Manufacturing (EVM):** Operators in this industry manufacture and assemble electric vehicles (EVs). EVs include passenger cars and commercial vehicles, such as vans and lorries, which are powered by electricity. They also include buses and special purpose vehicles such as snowmobiles and fire engines. Industry firms also produce EV engines and vehicle chassis.
- **Electric Vehicles (EVs):** This refers to vehicles that use an electric drive train and are permitted under the Zero Emission Vehicle (ZEV) mandate. They encompass two types of vehicles, battery electric vehicles and fuel cell electric vehicles.
- **Battery Electric Vehicles (BEVs):** These vehicles are powered entirely by electricity stored in batteries.



- **Fuel Cell Electric Vehicles (FCEVs):** These use hydrogen fuel cells to generate electricity, emitting only water vapor.
- **Standard Industrial Classification (SIC) codes:** These are industry codes used in the UK to identify activity associated with a certain industry. They are up to 5 digits long, the ones relevant to this research's definition of the automotive sector are 29100, 29201, 29310 and 29320.



## Executive Summary

*The net zero transition and move to electric vehicles will lead to fundamental shifts in the automotive sector. CBI Economics was commissioned by the ECIU to comprehensively assess the size and economic contribution of the automotive sector and, crucially, electric vehicle production within this. This analysis first assessed the current state of the sector, before forecasting it out to 2035 under four different scenarios.*

### **The UK's automotive sector is crucial to the UK economy, contributing £46.8bn in GVA and supporting over 552,000 FTE jobs**

- The UK automotive sector produced just over a million total motor vehicles in 2023.<sup>1</sup> Within this, non-BEVs containing internal combustion engines (HEVs, PHEVs, diesel and petrol vehicles) still constitute the vast majority (93%) of UK vehicle production. The remaining 7% of UK vehicle production is comprised of BEVs as the UK manufactured an estimated 74,700 in 2023.
- Just over a fifth (21%) of vehicles produced in the UK are sold in the UK. The remainder are exported with approximately a third going to the EU, 15% going to the US and 9% to China. The remainder are sold across various different global markets.
- When taking into account the activity of automotive manufacturers and their wider economic contributions, the automotive sector contributed a total £46.8 billion to the economy in GVA – greater than the total economic contributions of Northern Ireland.
- The sector also supported employment totalling over 552,000 FTE jobs. The 138,000 FTE jobs created by the activity of automotive manufacturers (excluding supply chain and wider economic impacts) had an estimated average salary of £37,489, 13% higher than the UK average full-time salary.<sup>2</sup>
- Based on the total economic contribution, the automotive sector is shown to have a very strong multiplier effect. For every £1 of initial GVA, an additional £2.26 of GVA is generated in the wider economy. Likewise, for every job created directly in the automotive sector, a further 3.1 jobs are created elsewhere in the UK economy.

### **BEVs will be fundamental to the future prosperity of the UK automotive sector, which could vary in size by up to £50 billion in GVA<sup>3</sup>**

The automotive sector and the BEV production sub-sector of this were forecasted between 2024 to 2035, under four different scenarios. Scenarios were fundamentally driven by variation in future demand for BEVs, ranging from more optimistic 'maximalist' and 'baseline' scenarios, where the industry moves quickly in transitioning to the manufacturer of electric vehicles, to the 'pessimistic' and 'worst case' scenarios, where the transition to BEVs is slower.

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<sup>1</sup> Motor vehicles in this study refers to cars, light goods vehicles, heavy goods vehicles, buses and coaches.

<sup>2</sup> The median wage was used to determine the average wage level

<sup>3</sup> This figure is dependent on the extent to which the industry makes the shift to electrification



- Total GVA contribution of the UK automotive sector could rise by 35%, or £16.1 billion, under a maximalist scenario, or decrease by 73%, or £34.1 billion, under a worst case scenario. There is a staggering GVA difference between these two potential scenarios of over £50 billion – greater than the current automotive sector's contributions.
- FTE employment contributions are forecast to change by similar margins, with the automotive industry estimated to support 167,000 more FTE jobs by 2035 in a maximalist scenario and 404,000 fewer FTE jobs by 2035 in a worst case scenario.
- **Figure 1** summarises the scenarios and their associated GVA and FTE impacts.



Figure 1: Summary of our forecasting results by scenario<sup>4</sup>

SCENARIO	IMPLEMENTATION IN FORECASTING	GVA in 2035 (% change from 2023)	FTE Employment in 2035 (% change from 2023)
<b>MAXIMALIST</b>	BEV production grows significantly throughout the forecast period in line with the logarithmic S-curve. This growth is consistent with an inflection point at 2030, tending to a maximum carrying capacity of pre-COVID (2017-2019) total vehicle demand.	£62,913m (+35%)	719,342 (+30%)
<b>BASELINE</b>	BEV production grows significantly throughout the forecast period in line with the logarithmic S-curve. This growth is consistent with an inflection point at 2030, tending to a maximum carrying capacity of total vehicle production in 2023.	£50,661m (+8%)	579,967 (+5%)
<b>PESSIMISTIC</b>	BEV production throughout the forecast period is entirely linear, continuing the historical trend observed between 2010-2023 for the domestic market and 2017-2023 for the global markets.	£19,028m (-59%)	220,097 (-60%)
<b>WORST CASE</b>	BEV production experiences zero growth and completely stagnates throughout the forecast period. It remains in line with total production/output in 2023, the most recent year of available data.	£12,700m (-73%)	148,097 (-73%)

<sup>4</sup> For further information on the S-Curves and our methodology please visit our accompanying methodology document.

# 1 Introduction

## 1.1 The UK's automotive sector has faced challenges of late, finding itself at a critical crossroads with regards to the EV transition

The automotive industry is a crucial element of the UK economy. The Society of Motor Manufacturers & Traders (SMMT) estimates that the sector generated £93 billion turnover and £22bn in value added to the UK economy in 2023, with £4 billion invested annually in Research & Development. Automotive goods account for 12% of UK goods exports to over 140 countries. It excels from an employment perspective, as many of the sector's jobs are outside London and the South East, with wages about 13% higher than the UK average.<sup>5</sup>

Despite being the top global producer of luxury cars, the UK automotive industry has faced some challenges of late.<sup>6</sup> Production dipped significantly to below one million units between 2020-2022 due to the pandemic, chip shortages and lockdowns, although this recovered somewhat in 2023 and was up nearly 20% on the previous year. Significant manufacturers choosing to relocate their operations abroad has inflicted further damage on the automotive sector. Honda, at their Swindon plant, and Ford, at their Bridgend plant, exited the UK in 2021 and 2020 respectively, with both sites deemed unviable.<sup>7 8</sup> However, other manufacturers like Aston Martin and Jaguar Land Rover have committed to making significant investments to electrify the fleet they produce in the UK.<sup>9 10</sup>

The UK automotive sector finds itself at a crossroads and must consider how it adapts to a changing market and the EV transition. This is necessitated further by the Zero Emission Vehicle (ZEV) mandate that requires 80% of new cars and 70% of new vans sold in Great Britain to be zero emission by 2030, reaching 100% by 2035.<sup>11</sup> The Government has committed £850 million to develop an electrified automotive supply chain.<sup>12</sup>

Given the current state of the sector, domestic and international policy supporting an increase in consumer demand for BEVs, switching to BEV production is seemingly of the utmost importance to secure the future vitality of the UK automotive sector. At present, BEVs comprise a very small proportion, about 7%, of domestic vehicle production.

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<sup>5</sup> SMMT (2024) Industry Topics: UK Automotive

<sup>6</sup> Department for Business & Trade (2022) Automotive Roadmap: Driving us all forward

<sup>7</sup> The Independent (2019) Honda to close Swindon plant by 2021 with loss of 3,500 jobs

<sup>8</sup> WalesOnline (2019) Exactly why Ford says it is closing the Bridgend engine plant

<sup>9</sup> Aston Martin (2023) Aston Martin to create industry leading ultra-luxury high performance electric vehicles

<sup>10</sup> Jaguar Land Rover (2023) JLR to invest £15 billion over next five years as its modern luxury electric-first future accelerates

<sup>11</sup> Department for Transport (2024) Pathway for zero emission vehicle transition by 2035 becomes law

<sup>12</sup> Advanced Propulsion Centre UK (2024) Automotive Transformation Fund

## 1.2 CBI Economics and ECIU therefore undertook extensive forward-looking research to explore the outlook for UK automotives and BEVs

The Energy and Climate Intelligence Unit commissioned CBI Economics to assess the UK's Electric Vehicle (EV) manufacturing and broader automotive industry. This research provides unique insights into the sector's current composition, contribution and its position in the EV transition. The report also presents forecasts highlighting the critical importance of the EV transition for the future of the UK's automotive sector and overall economy. These forecasts emphasise the need for a clear and coherent policy environment to support British automotive manufacturing in making the transition to building electric vehicles.

The report therefore takes the following structure:

- **Chapter 2:** Analyses the current contributions of the UK automotive sector and BEV production, through the metrics of vehicle unit production, total output, GVA and jobs.
- **Chapter 3:** Presents forecasts of output for both the overall automotive sector and its BEV production component up to 2035, exploring distinct scenarios and global markets.
- **Chapter 4:** Estimates the GVA and FTE employment contributions for the four distinct scenarios, covering the entire automotive sector and the specific contribution of BEV production.



## 2 Where does the UK's BEV and automotive sector currently stand?

In order to generate forecasts and projections it is first crucial to understand the current state of the UK automotive sector. This chapter sets out a comprehensive assessment of the current contributions of the UK automotive sector, and BEV production within this.

### 2.1 To assess its economic contributions, the UK automotive sector was disaggregated by both sub-sector and market

To produce a holistic, detailed assessment of the automotive sector, it was analysed as a function of its constituent parts. UK automotive was disaggregated into various sub-sectors which were modelled individually, while irrelevant sub-sectors were excluded. This analysis centred around the 'Manufacture of Motor Vehicles, Trailers and Semi-Trailers' sector, or the UK Standard Industrial Classification (SIC) code 29 and refers to the manufacturing of cars, light goods vehicles, heavy goods vehicles, buses and coaches. Within this, the 'Manufacture of Motor Vehicles' sub-sector (SIC29100) was particularly significant, along with other sub-sectors associated with manufacture of inputs. Three main sub-sectors of 'Non-BEV Production', 'BEV Production' and 'Other Sector Activity' were generated from this, illustrated in **Figure 1**.

**Figure 2: SIC sector structure alignment with sectors utilised in this research**

SIC29 Manufacture of motor vehicles, trailers and semi-trailers	SIC29100 Manufacture of motor vehicles	NON-BEV PRODUCTION	BEV PRODUCTION
	SIC29201 Manufacture of bodies for motor vehicles	OTHER SECTOR ACTIVITY	
	SIC29202 Manufacture of trailers and semi-trailers	EXCLUDED	
	SIC29203 Manufacture of caravans	EXCLUDED	
	SIC29310 Manufacture of motor vehicle electrical/electronic equipment	OTHER SECTOR ACTIVITY	
	SIC29320 Manufacture of motor vehicle parts and accessories	OTHER SECTOR ACTIVITY	

Source: CBI Economics analysis (2024)

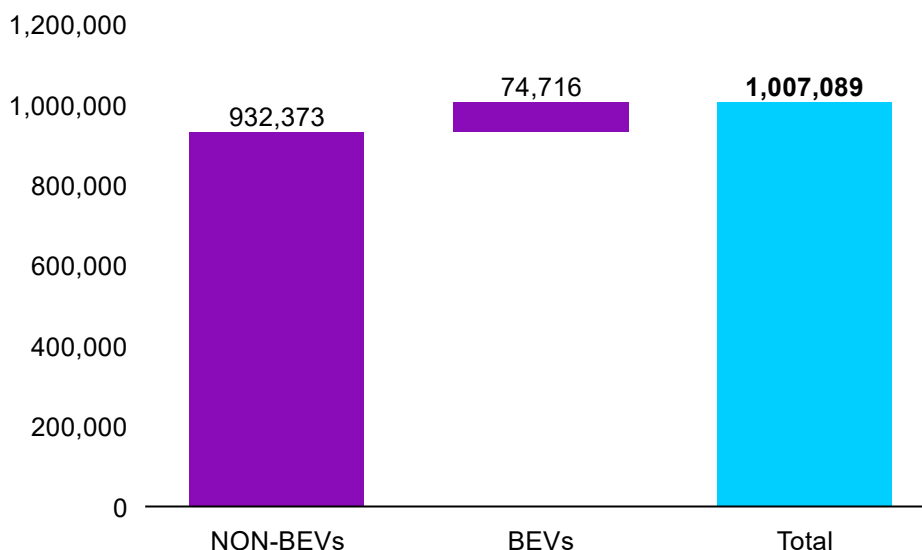


In addition to sub-sectors, the UK automotive sector was also disaggregated into the main markets that it serves globally. This included UK automotive output that satisfies domestic demand along with the four main export markets, categorised into the EU, US, China and Rest of World. Output and current contributions of the automotive sector were modelled for all five markets individually before being aggregated into a total figure. Modelling automotive contributions, specifically by both sub-sector and market, adds a great degree of nuance and detail to this analysis, ensuring that the different characteristics and conditions in these areas are adequately captured.

## 2.2 The UK automotive sector produced over one million vehicle units in 2023, of which 7%, or 74,700, were BEVs

The UK automotive sector produced an estimated 1,007,100 total motor vehicles in 2023.<sup>13</sup> Within this, non-BEVs containing internal combustion engines (HEVs, PHEVs, diesel and petrol vehicles) still constitute the vast majority (93%) of UK vehicle production, at 932,400 total units. The remaining 7% of UK vehicle production is comprised of BEVs as the UK manufactured an estimated 74,700 in 2023. UK BEV manufacturing has increased steadily in recent years, both in absolute terms and as a proportion of overall production. However, it will need to grow at a significantly faster rate over the coming decade to satisfy growing domestic and export demand, as UK and international markets transition away from non-BEVs to BEVs.

**Figure 3: UK automotive production by type of vehicle (total vehicle units, 2023)**



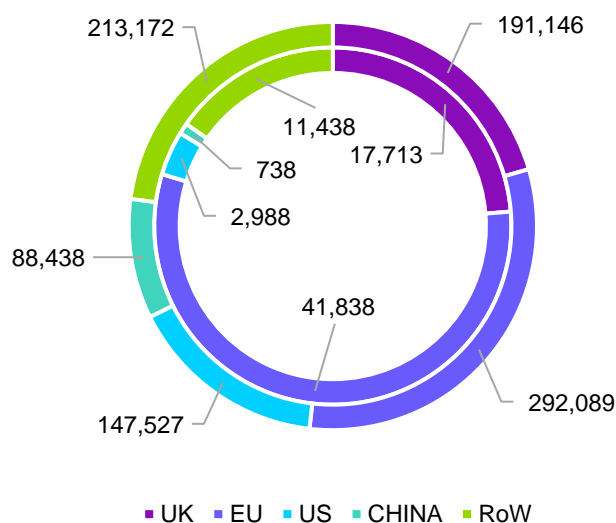
Source: CBI Economics analysis (2024)

<sup>13</sup> Motor vehicles in this study refers to cars, light goods vehicles, heavy goods vehicles, busses and coaches.



The destination of vehicle production is largely similar across different powertrains, although a slightly greater proportion of UK-manufactured BEVs remained in the UK than their non-BEV equivalents. Approximately one-fifth (21%) of total UK vehicle production in 2023 was sold in the domestic market, representing 208,900 units. For BEVs however, this share grew to almost one-quarter (24%) as 17,700 units were produced and sold in the UK.

**Figure 4: UK automotive production by market destination (total vehicle units, 2023. Inner Ring: BEVs, Outer Ring: Non-BEVs)**



Source: CBI Economics analysis (2024)

The overwhelming majority (79%) of UK-produced vehicles are exported to satisfy demand globally, within which the EU represents the biggest market. Over one-third (33%) of all vehicles produced in the UK are exported and sold in the EU, constituting over two-fifths (42%) of total UK export demand. The Rest of World market is responsible for over a quarter (28%) of all UK vehicle exports, while the US and China demand 19% and 11% of UK exports respectively. BEV trade patterns diverge slightly from this perspective. The EU represents a far more significant export market for BEVs than non-BEVs, demanding over half (56%) of all UK-produced BEVs and almost three-quarters (73%) of those that are exported, whilst the US and Chinese markets are far less significant. This could be due to the ongoing agreement between the EU and UK that allows UK manufacturers of EVs to benefit from tariff free trade with EU markets without complying with current EU policy on the origin of components for EVs.

### 2.3 The UK Automotive sector currently contributes £46.8bn in GVA to the UK economy, supporting over 552,000 FTE jobs

In 2023 the automotive sector contributed £46.8bn in total to the economy in value-added terms, equivalent to 2.1% of the whole UK economy. The £14.3bn of initial GVA in Figure 6 denotes economic contributions that are directly associated with the initial activities of businesses in the sector. Throughout its wider supply chain, captured via the direct and indirect GVA impacts, the automotive sector contributed a further £18.4bn in GVA to the UK economy.<sup>14</sup> Induced GVA impacts indicate that an additional £14.0bn of further value is generated by the spending of employees working in the automotive sector and its supply chain. These spillover effects mentioned deliver a very strong multiplier, as for every £1 of GVA initially generated by the automotive sector, a further £2.26 is supported throughout the economy.

**Figure 5: Total GVA contributions of the UK automotive sector, 2023 (£m, 2022 prices)**

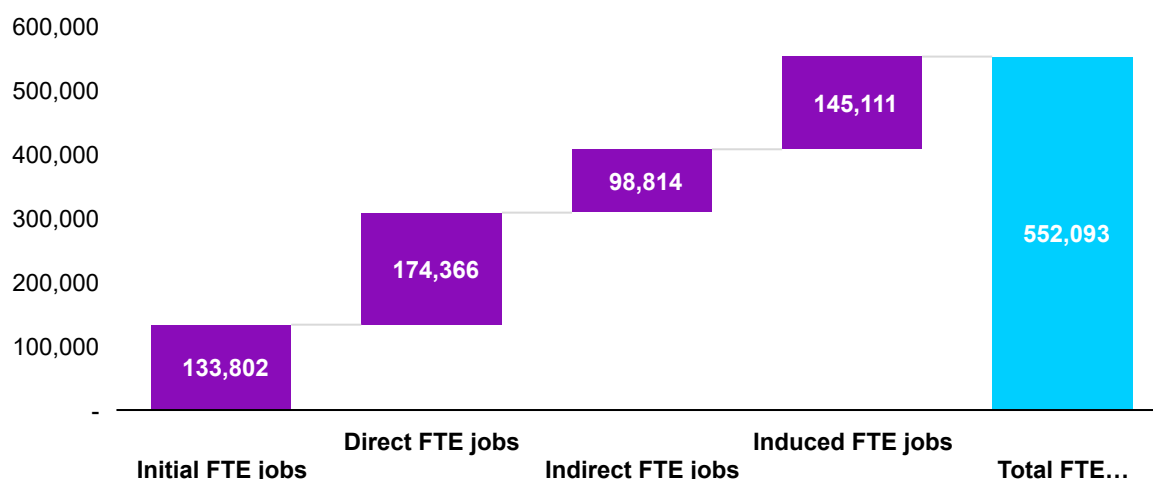


Source: CBI Economics analysis (2024)

<sup>14</sup> Direct GVA is the value derived from the immediate supply chains of automotive manufacturers. Indirect is the value of any wider supply chain activity.

The automotive sector also makes significant employment contributions to the UK economy, especially throughout its broader supply chain. In total, the sector supports 552,100 full-time equivalent (FTE) jobs, equal to 2.0% of overall UK employment. Within this, 133,800 FTEs are directly associated with the initial activities of automotive sector businesses while a further 273,200 jobs are provided in the wider supply chain (direct and indirect impacts). Those 133,800 FTE jobs supported by the initial activity of the sector paid an estimated 13% better than the UK average salary for a full-time worker.<sup>15</sup> The value generated by employee spending supports a further 145,100 FTE jobs. Broader supply chain and employee spending impacts generate a significant multiplier effect, as for every job created directly in the automotive sector a further 3.1 jobs are created throughout the wider economy. This multiplier is likely greater than the GVA equivalent due to greater productivity in the automotive sector than in sectors throughout its supply chain.

**Figure 6: Total FTE jobs contributions of the UK automotive sector, 2023**



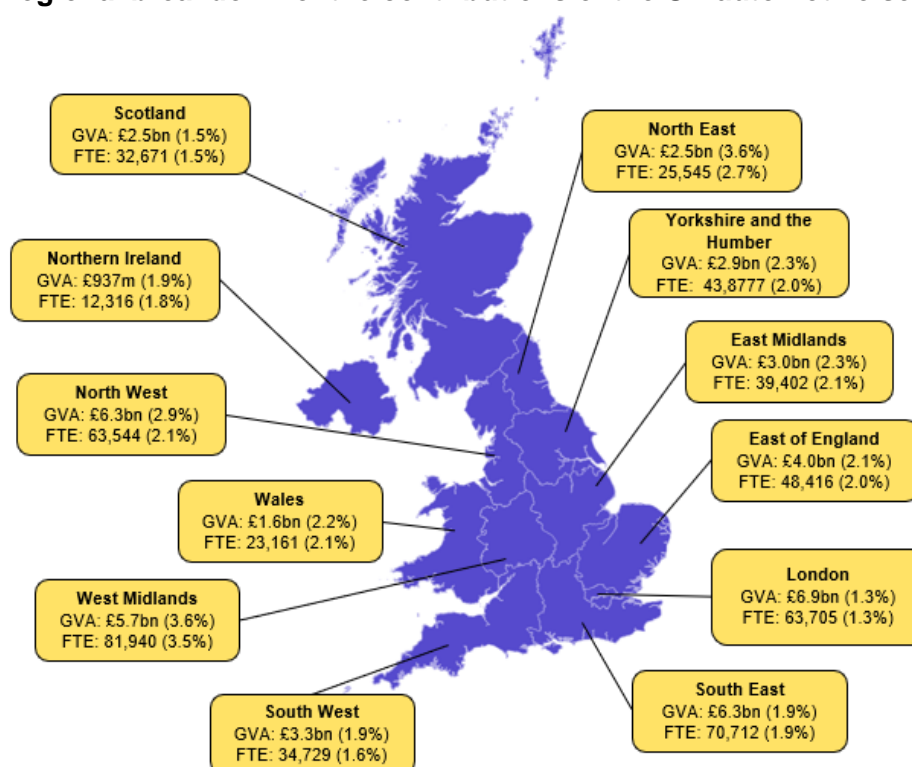
Source: CBI Economics analysis (2024)

<sup>15</sup> When using median salary to measure average wage.

## 2.4 The automotive sector makes significant contributions to regional economies in the West Midlands, North West and North East

Economic impacts of the overall automotive sector are particularly strong throughout the midlands and northern regions. The West Midlands, North West and North East exhibit the strongest automotive sector in relative terms, with GVA contributions equivalent to approximately 3% or more of all three regional economies, versus a nationwide average of 2.1%. They also exhibit strong relative contributions in FTE employment terms, as these regions align with significant factories and manufacturing centres operated by companies such as JLR, Nissan and Stellantis. **Figure 7** illustrates the data in more detail.

**Figure 7: Regional breakdown of the contributions of the UK automotive sector, 2023**



Source: CBI Economics analysis (2024)

## 2.5 Within the automotive sector, BEV production specifically contributes £4.3bn in GVA while supporting 48,400 FTE jobs

Within the automotive sector the current economic contributions specific to BEV production were also modelled. In total, this BEV production currently contributes £4.3bn in GVA to the UK economy, representing 9.2% of the GVA contributions of the overall automotive sector. Value added by the initial activities of BEV manufacturers make up £1.3bn of the sub-sectors GVA, while a further £1.7bn is generated by businesses throughout the BEV supply chain. The remaining economic contributions, equal to £1.3bn, come from the value generated by increased employee spending. Therefore, for every £1 in GVA created by BEV production, a further £2.35 is created within the wider economy. BEV production multiplier effects exceed those of non-BEV production, likely due to the differing geographic and sectoral supply chain profiles associated with each type of vehicle, implemented within our modelling.

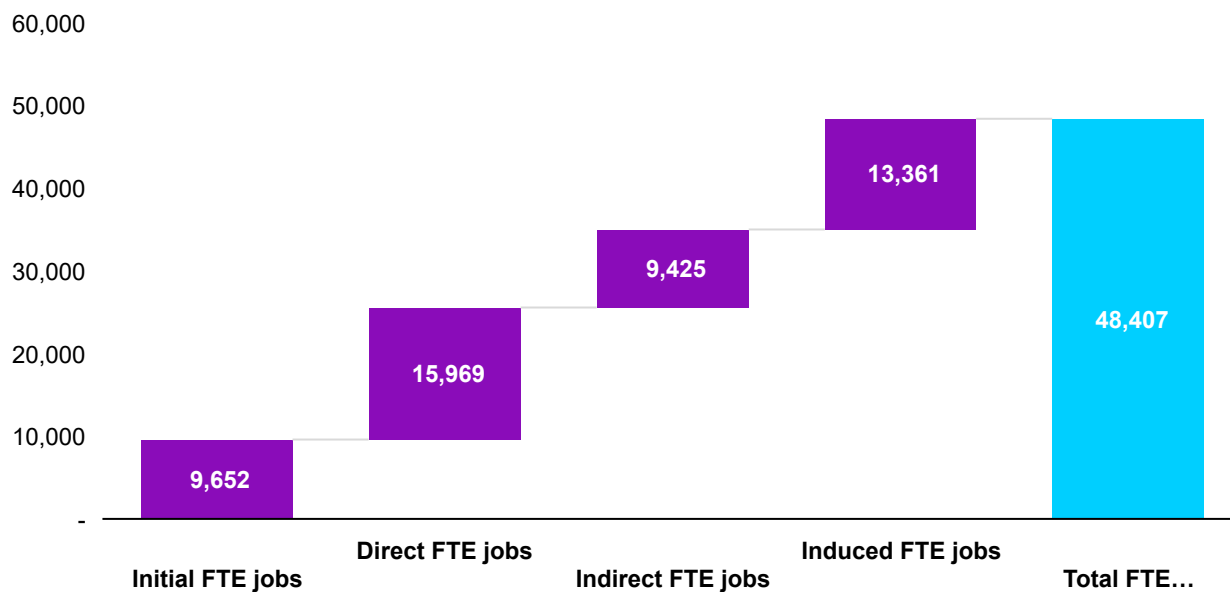
**Figure 8: Total GVA contributions of UK BEV Production, 2023 (£m, 2022 prices)**



Source: CBI Economics analysis (2024)

BEV production supports a total of 48,400 FTE jobs, constituting 8.8% of the total employment associated with the overall automotive sector. The initial activity of BEV manufacturers supports 9,700 FTE jobs, while their supply chain employs 25,400 FTEs and the value generated by employee spending creates a further 13,400 FTE jobs. BEV production carries a notably stronger jobs multiplier than the non-BEV equivalent. For every job initially created by BEV manufacturers, a further 4 jobs are supported throughout the economy, versus 3.1 in the non-BEV sector, again likely due to their differing supply chains.

**Figure 9: Total FTE jobs contributions of the UK BEV Production, 2023**



Source: CBI Economics analysis (2024)





## 3 How could automotive demand and its composition progress up to 2035?

*Having comprehensively assessed the current state and contributions of UK automotives, the output of both the overall sector and its BEV production component was forecasted up to 2035. Four different scenarios around BEV demand were modelled, utilising a similar framework to the current state assessment in structuring the sector.*

### 3.1 Forecasting analysis also disaggregated the automotive sector into its constituent sub-sectors and global markets

The context and scope of this forecasting analysis fundamentally differed from the current state assessment. However, the overarching framework used to structure and estimate UK automotive economic contributions was consistent between both, as the sector was conceptualised as a function of its sub-sectors and markets. These constituent parts were modelled individually, before being aggregated to arrive at total annual output figures throughout the forecast period.

Automotive sub-sectors were again split into BEV production, non-BEV production and other sector activity, with each one exhibiting different degrees of variation in modelling. As the main variable of interest, BEV production was subject to the most variation, dependent on both the different scenarios for automotive demand and markets. Non-BEV production differed by market but was modelled constantly across scenarios whilst other sector activity was more standardised. **Figure 10** details this further.

**Figure 10: Different modelling approaches of each automotive sub-sector within forecasting analysis**

<p><b>BEV PRODUCTION</b> <i>Both scenario- and market-dependent.</i></p>	<p>The main variable we looked to model in our forecasting. It exhibited the greatest detail and varied between each different scenario and each different market, with individually-forecasted paths for different aspects.</p>
<p><b>NON-BEV PRODUCTION</b> <i>Market-dependent, constant across scenarios.</i></p>	<p>This was subject to detailed modelling and varied across each market based on their characteristics. The forecasted path of non-BEV demand and production was constant across scenarios to reflect rigid EV policy and government mandates.</p>
<p><b>OTHER SECTOR ACTIVITY</b> <i>Constant proportion across scenarios and markets.</i></p>	<p>As the non-vehicle production remainder of the automotive sector, this was not modelled individually for different scenarios and markets. It was calculated as a given proportion of overall output from the other two categories.</p>

Source: CBI Economics analysis (2024)

Demand generated by different sub-sectors of the UK automotive sector was also modelled individually within each different market. On the domestic side, forecasted automotive demand was initially derived from DfT vehicle registration data regarding the total numbers of BEVs and non-BEVs registered in the UK. Demand was also modelled individually for each different global market, with forecasting founded in HMRC trade data around the value of BEVs and non-BEVs exported to the EU, China, US and Rest of World.

### **3.2 Four distinct scenarios of varying levels of BEV production were forecasted, ranging from maximalist to worst case**

To reflect a range of potential outcomes for the UK BEV sector and uncertainty over the pace of transition, four different scenarios were modelled in the forecasting analysis. The approach to this scenario analysis was a generalised, high level one. The forecasting and modelling for each scenario intends to capture a broader, holistic BEV environment, as opposed to detailed policies or certain legislations, and their specific quantitative implications.

Different scenarios dictate how demand for UK manufactured BEVs progresses throughout the forecast period, ranging from the more optimistic 'Maximalist' and 'Baseline' scenarios to the more pessimistic 'Pessimistic' and 'Worst Case' scenarios. Under the more optimistic scenarios BEV demand grows in line with the logarithmic Sigmoid curve of innovation adoption. In the more pessimistic scenarios growth trends are weaker, as BEV production either increases in line with a linear function from historic BEV data, or stagnates at a constant, current level.

**Figure 11** presents more detail around each scenario along with their implementation in modelling and forecasting. Indicative policy environments are presented for each scenario, but these serve purely as guidance for the types of policies and legislation that may be conducive to the scenarios modelled. Forecasted scenarios reflects broader, holistic environments around BEV production, and do not individually encapsulate policies stated in **Figure 11**.

**Figure 11: Overview of forecasting scenarios, implementation, and potential policy environment** <sup>16</sup>

SCENARIO	IMPLEMENTATION IN FORECASTING	INDICATIVE POLICY ENVIRONMENT
<b>MAXIMALIST</b>	BEV demand grows significantly throughout the forecast period in line with the logarithmic S-curve. This growth is consistent with an inflection point at 2030, tending to a maximum carrying capacity of pre-COVID (2017-2019) total vehicle demand. UK automotive production matches this demand.	<ul style="list-style-type: none"> <li>• Fastest possible/feasible transition to EVs.</li> <li>• UK and EU mandates potentially being brought forward to 2030.</li> <li>• Generous funding and incentives provided by government to producers, charging and scrappage support.</li> <li>• Specific trade agreements to boost exports.</li> </ul>
<b>BASELINE</b>	BEV demand grows significantly throughout the forecast period in line with the logarithmic S-curve. This growth is consistent with an inflection point at 2030, tending to a maximum carrying capacity of total vehicle demand in 2023. UK automotive production matches this demand.	<ul style="list-style-type: none"> <li>• 'Most likely' scenario reflecting the trajectory of UK EVs</li> <li>• Planned policies/targets stay in place, most importantly the 2035 target for UK and EU mandates.</li> <li>• Some additional support for gigafactories, EV producers and upgrades to infrastructure, continuation of trading relationships.</li> </ul>
<b>PESSIMISTIC</b>	BEV production fails to meet the forecasted demand in the baseline or maximalist scenario, instead it follows a path as if BEV demand throughout the forecast period is entirely linear, continuing the historical trend observed between 2010-2023 for the domestic market and 2017-2023 for the global markets.	<ul style="list-style-type: none"> <li>• The 'do nothing' scenario based purely on current trends of EV production and the wider automotive sector.</li> <li>• Maintaining the 2035 target, but with limited funding for producers and gigafactories, no consumer incentives.</li> <li>• Erosion of trading relationships and favourable EU agreements.</li> </ul>
<b>WORST CASE</b>	BEV production fails to meet the forecasted demand in the baseline or maximalist scenario, instead it follows a path as if BEV demand experiences zero growth and completely stagnates throughout the forecast period. It remains in line with total production/output in 2023, the most recent year of available data.	<ul style="list-style-type: none"> <li>• The 'worst case' scenario that could feasibly occur.</li> <li>• Government rolls back on the 2035 target, could potentially push it further out to 2040 and weaken the mandate itself.</li> <li>• Zero EV sector support through gigafactory investment, producer or consumer incentives, poor trading relationships and tariffs.</li> </ul>

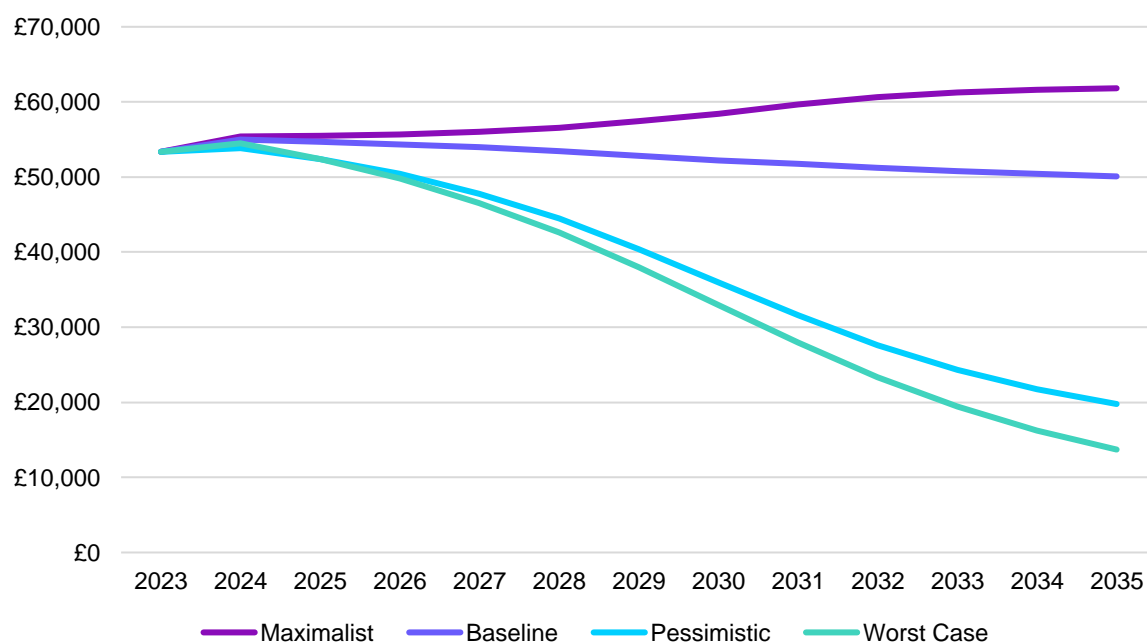
Source: CBI Economics analysis (2024)

### 3.3 Total demand for the UK's automotive sector grows 16% by 2035 in the most optimistic scenario while the more pessimistic ones see demand shrink by up to 74%

Figure 12 illustrates forecasted total demand for the UK's automotive sector – all sub-sectors and markets aggregated – throughout the forecast period. The maximalist scenario dictates that, with the optimal market conditions and policy environment, demand for the UK automotive sector could grow by 16% from 2023-2035. Sector demand increases £8.5bn by 2035 to reach £61.8bn in total. Within this total, demand for UK produced BEVs grows by £33.8bn from 2023 levels to more than offset the significant drop-off in non-BEV demand, while demand for other sector activity increases modestly by £2.5bn.

<sup>16</sup> For further information on the S-Curves and our methodology please visit our accompanying methodology document.

**Figure 12: Forecasted total demand for the UK's automotive sector by scenario (£m, 2022 prices)**



Source: CBI Economics analysis (2024)

In the baseline scenario, total demand for the UK's automotive sector declines by 6% in real monetary terms and 5% in unit terms. However, the key metric for assessing the future vitality of the automotive sector is its wider economic contribution, or GVA. As discussed in Chapter 4, the sector's GVA increases by 8% in the baseline scenario. The increase in economic contributions can be associated with the stronger multiplier effects of BEV production compared to non-BEV production, leading to more economic activity in the wider economy.

The decrease in total demand (in monetary terms) for the UK automotive sector, in the baseline scenario, can be partially attributed to the falling cost of BEVs over the forecast period, where we expect the cost of a BEV to fall 28% by 2030, in real terms. We have assumed the cost of non-BEVs to remain constant over the forecast period such that, as demand for non-BEVs transitions towards BEVs, the monetary value of this demand decreases slightly in line with decreasing costs. It should also be noted, that due to the current higher cost of producing BEVs the monetary value of the UK Automotive Sector's output is higher than if the UK were to only produce non-BEVs.

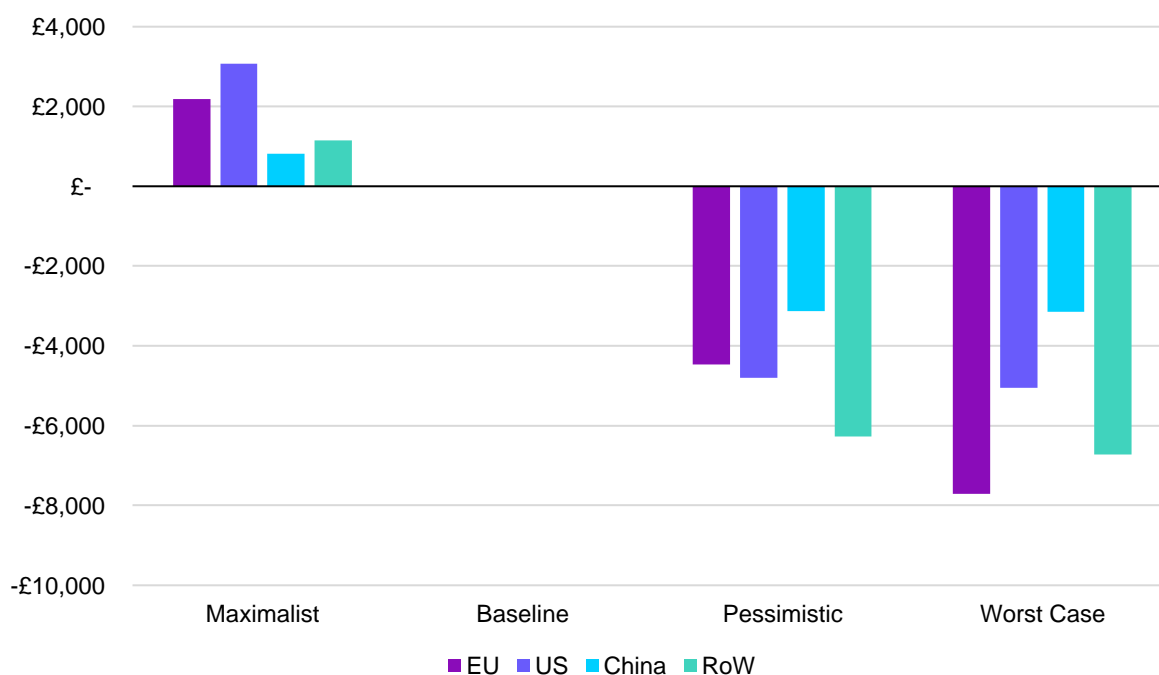
Another reason demand falls slightly, in unit and monetary terms, in the baseline scenario is our approach to modelling UK consumer preference. Our research estimates that UK production of BEVs fulfils approximately 5% of UK consumer demand for BEVs and UK production of non-BEVs fulfils an estimated 11% of UK consumer demand for non-BEVs. We have assumed that these proportions remain constant through the forecast period. In reality, this assumption is unlikely to hold as we would expect the proportion of UK consumer demand for BEVs fulfilled by UK production to increase over time. However, due to a lack of research and data around how this proportion may change over time, we have chosen to

hold it constant over the forecast period. This leads to more conservative estimates, and a slight decrease in demand for the UK automotive sector.

The baseline scenario still represents a significant improvement on both the pessimistic and worst case scenarios, in which demand declines substantially by 63% and 74% respectively. In 2035, total sector demand in the baseline scenario is more than double that of the pessimistic and worst case scenarios, exceeding them in absolute terms by more than £30bn. The automotive sector is forecasted to stimulate demand worth £50.1bn in the baseline by 2035 and, within this, demand for UK produced BEVs grows by £25.5bn throughout the forecast period to reach £29.3bn.

Delving deeper into the automotive sector forecast, **Figure 13** presents the change in export demand of all UK-produced vehicles between 2023 and 2035. As the baseline scenario is modelled for total net exports to remain constant throughout the forecast period, there is no overall change in this scenario. In the maximalist scenario, although the EU is the UK's most significant export market in 2035 with £14.6bn of total demand, it is the US export market that exhibits the greatest growth potential. Throughout the forecast period, US export demand grows by 55% or £3.1bn in absolute terms. Looking to the pessimistic and worst case scenarios however, US exports stand to lose out, very significantly, by 86% and 90% respectively under these scenarios. On balance, export demand from the Rest of World represents arguably the biggest downside risk of all export markets, forecast to decline by £6.3bn and £6.7bn in the pessimistic and worst case scenarios respectively.

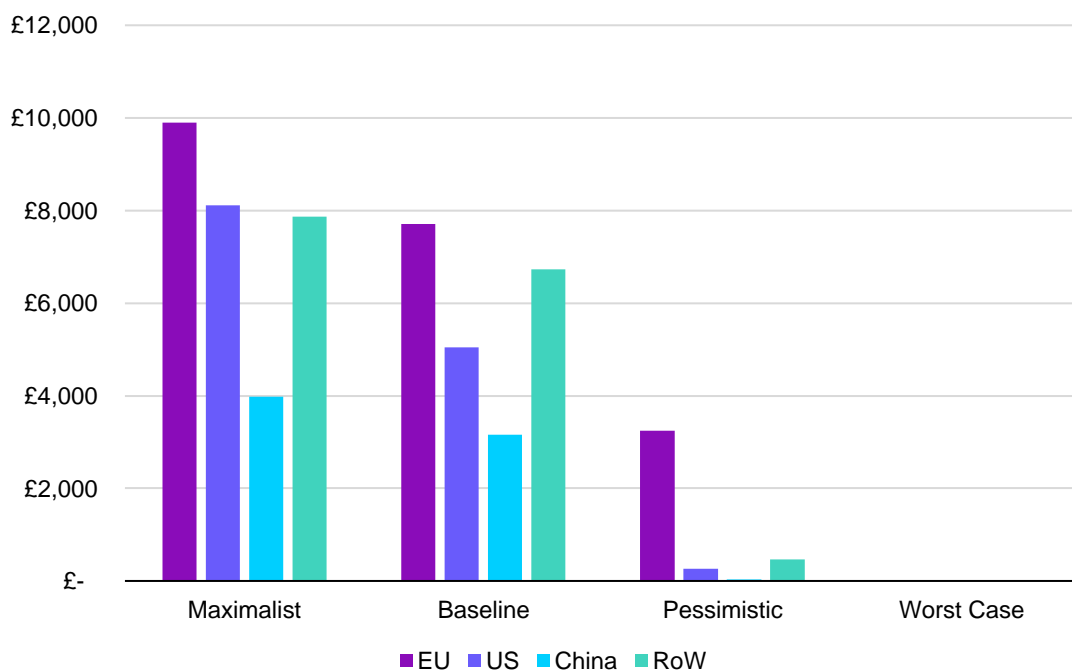
**Figure 13: Change in automotive export demand throughout the forecast period by market and scenario (£m, 2022 prices)**



Source: CBI Economics analysis (2024)

Within the automotive exports forecast, **Figure 14** narrows the focus purely to BEVs which show far greater growth potential than vehicles overall. As the worst case scenario modelled for zero growth in BEV demand, there is no change in export demand under this perspective. The EU is forecast to remain the UK's largest BEV export market as the world transitions to electric vehicles. Under the optimum conditions in the maximalist scenario, the EU export market for UK-produced BEVs could grow more than five-fold by £9.9bn throughout the forecast period, reaching £12.1bn in 2035. This market generates substantial growth even in both the baseline and pessimistic scenarios, experiencing net gains of £7.7bn and £3.2bn respectively between 2023 to 2035. The US export market also represents a significant growth opportunity for UK BEVs. Under the maximalist scenario, US BEV exports have the potential to increase by £8.1bn throughout the forecast period, or with growth of £5.1bn in the baseline scenario to reach £5.2bn by 2035.

**Figure 14: Change in BEV export demand throughout the forecast period by market and scenario (£m, 2022 prices)**



Source: CBI Economics analysis (2024)



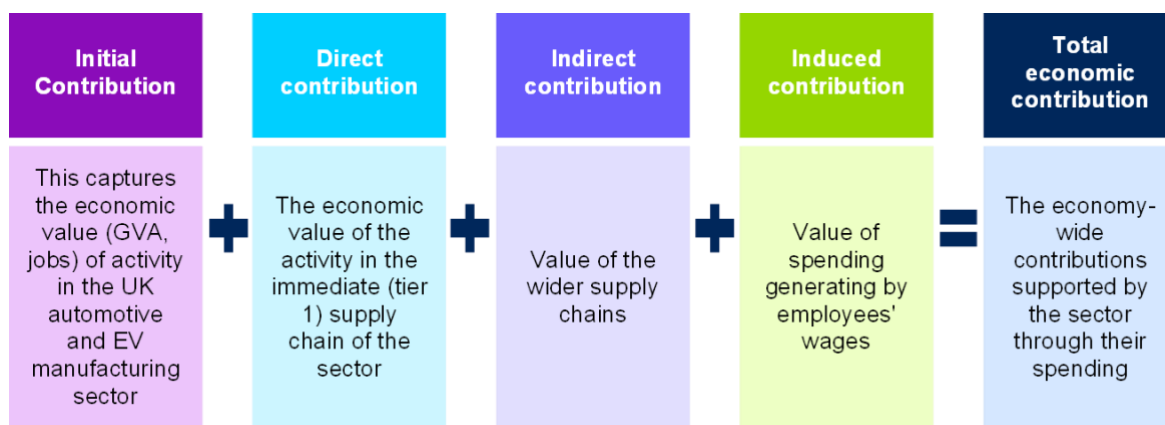
## 4 What do we stand to gain – or lose – from the EV transition?

Utilising the forecasted demand figures as inputs into our bespoke input-output model, CBI Economics have estimated GVA and FTE employment contributions for the four distinct scenarios. These cover both the entire automotive sector and BEV production specifically.

### 4.1 The EV transition presents a significant growth opportunity but failing to capitalise could be costly

For each scenario, CBI Economics derived an estimate for the total demand for the UK's automotive sector over the forecast period. Using these forecasts for demand to determine the inputs of the CBI Economics bespoke input-output model allowed us to generate robust estimates of gross value added (GVA) and full-time equivalent (FTE) jobs, which are comprised of initial, direct, indirect and induced contributions.

**Figure 15: Components of Economic Contribution Modelling**

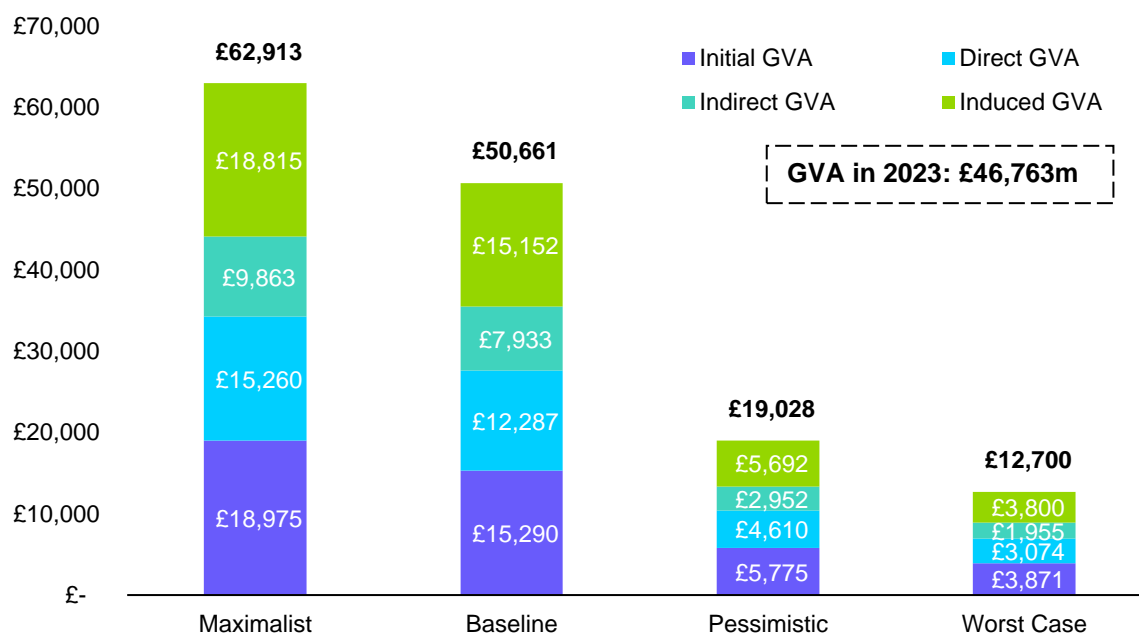


Source: CBI Economics (2024)

As **Figure 16** overleaf shows, under the maximalist scenario, the total GVA contribution of the automotive sector could be as high as £62.9bn, comprised mostly of the value added by the activity of businesses classified within the UK automotive sector. This is followed in size by the induced impact and then the direct and indirect impacts. By total GVA contribution, the maximalist scenario is almost 25% larger than the baseline scenario.

The baseline scenario is almost two and a half times larger than the pessimistic scenario which in turn is over half as large as the pessimistic scenario. The reduction between scenarios is driven by their smaller initial GVA, which reduce significantly in the pessimistic and worst case scenarios.

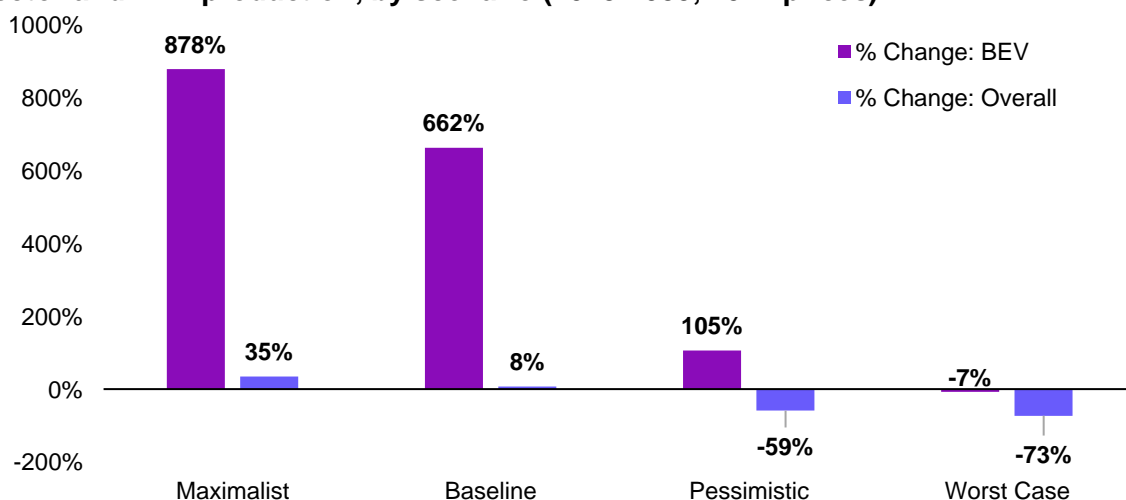
**Figure 16: Future GVA contributions of the UK Automotive sector in the year 2035, by scenario (£m, 2022 prices)**



Source: CBI Economics analysis (2024)

In 2023, the automotive sector generated £46.8 bn in GVA. The maximalist scenario would therefore represent growth of 35% from this year up to 2035. However, the BEV growth within this period is considerable at 878%. The baseline scenario would represent a modest growth rate across the sector, of 8%, though still see a notable increase of 662% in the BEV component between 2023 to 2035. By contrast, the pessimistic scenario would see a 59% reduction in automotive sector activity and the worst case scenario would lead to a 73% reduction in sectoral GVA.

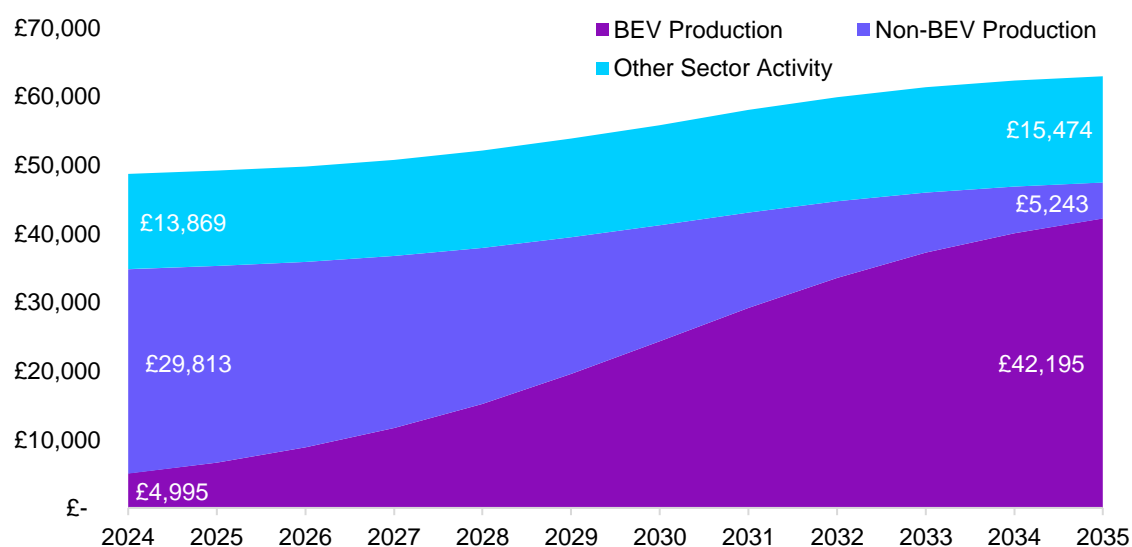
**Figure 17: Percentage change in GVA contributions of the overall UK Automotive sector and BEV production, by scenario (2023-2035, 2022 prices)**



Source: CBI Economics analysis (2024)

The figure below shows the evolution of forecasted GVA in the automotive sector under the maximalist scenario.<sup>17</sup> The most prominent change in this scenario is the 745% increase in GVA attributed to BEV production between 2024-2035, and the 82% decrease in GVA generated through non-BEV production. There is also a reasonable 12% increase in GVA related to other sectoral activity which reflects the sizeable overall increase in production.

**Figure 18: Evolution of GVA contributions under the maximalist scenario (2024-2035, £m, 2022 prices)**

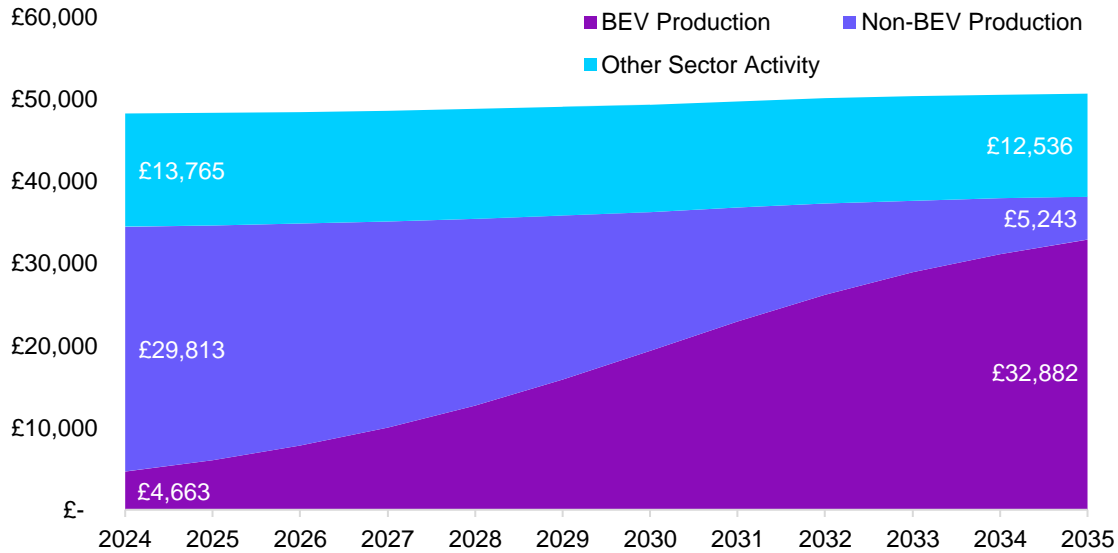


Source: CBI Economics analysis (2024)

The baseline scenario exhibits the same trend in GVA contributed by non-BEV production, decreasing 82% from £29,813m in 2024 to £5,243m by 2035. Similarly to the maximalist scenario, though to a lesser extent, BEV production rises considerably with GVA generated from BEV production increasing 605% during the forecast period. Under this scenario, there is a slight decrease of 9% in GVA contributed by other sectoral activity.

<sup>17</sup> Note that the forecast period is between 2024 and 2035 whereas we have previously compared to 2023 levels. The point of this commentary is to show how the forecast evolves over time.

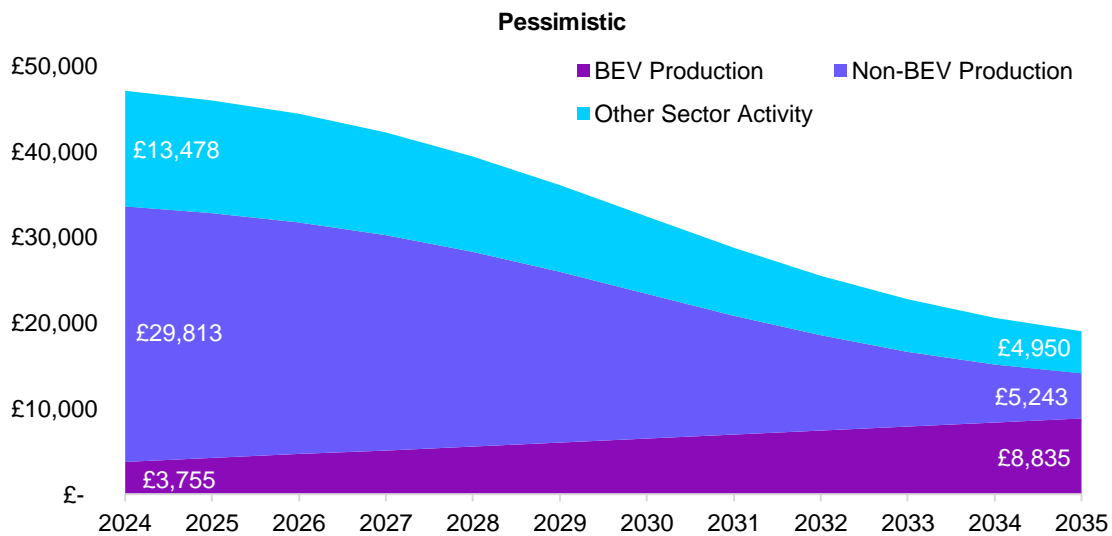
**Figure 19: Evolution of GVA contributions under the baseline scenario (2024-2035, £m, 2022 prices)**



Source: CBI Economics analysis (2024)

Under the pessimistic scenario, both the non-BEV and other sectoral activity components of production are anticipated to contribute less to the UK economy, with GVA contributions falling by 82% and 63% respectively between 2024-2035. This is offset somewhat by a 135% increase GVA contributions from BEV production. Overall, this would represent a 59% decline in the economic contributions of the sector, with 2035 GVA contributions from BEV production failing to reach a third of current GVA contributions from non-BEV production.

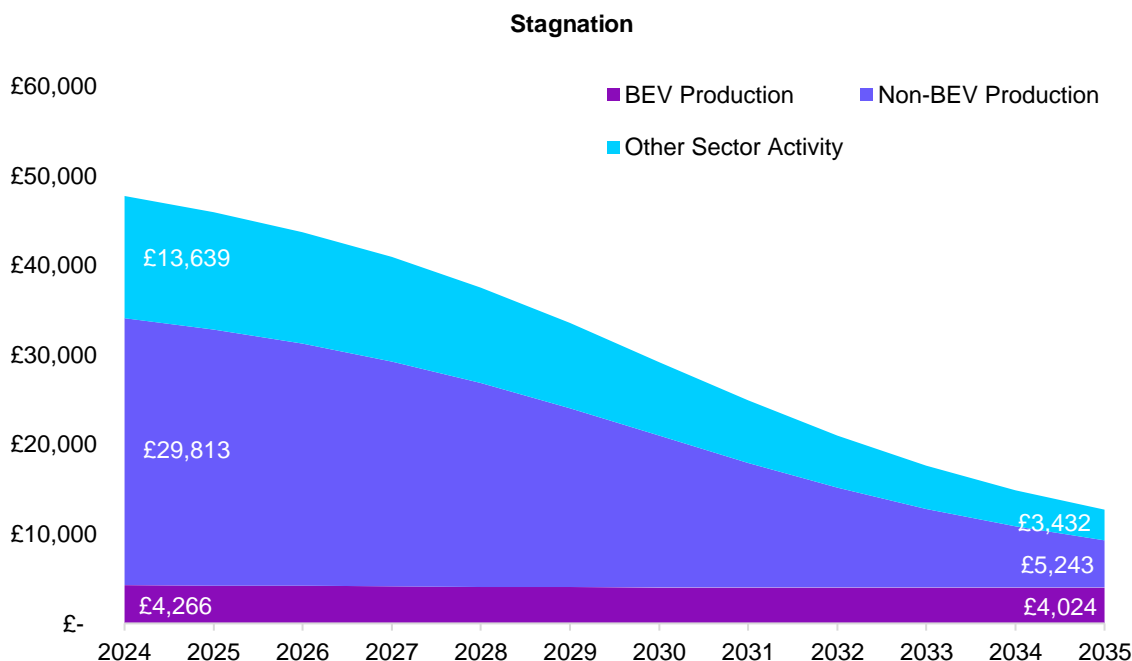
**Figure 20: Evolution of GVA contributions under the pessimistic scenario**



Source: CBI Economics analysis (2024)

It is estimated that under a worst case scenario, GVA contributions from all three components of the sector would decrease over the forecast period. The largest decrease in economic contributions would come in the non-BEV production component, which is anticipated to reduce by 82% throughout the forecast period. GVA contributions from other sector activity and BEV production would decrease by 75% and 6% respectively.

**Figure 21: Evolution of GVA contributions under the worst case scenario (2024-2035, £m, 2022 prices)**



Source: CBI Economics analysis (2024)

#### 4.2 UK automotive sector employment is at a crossroads

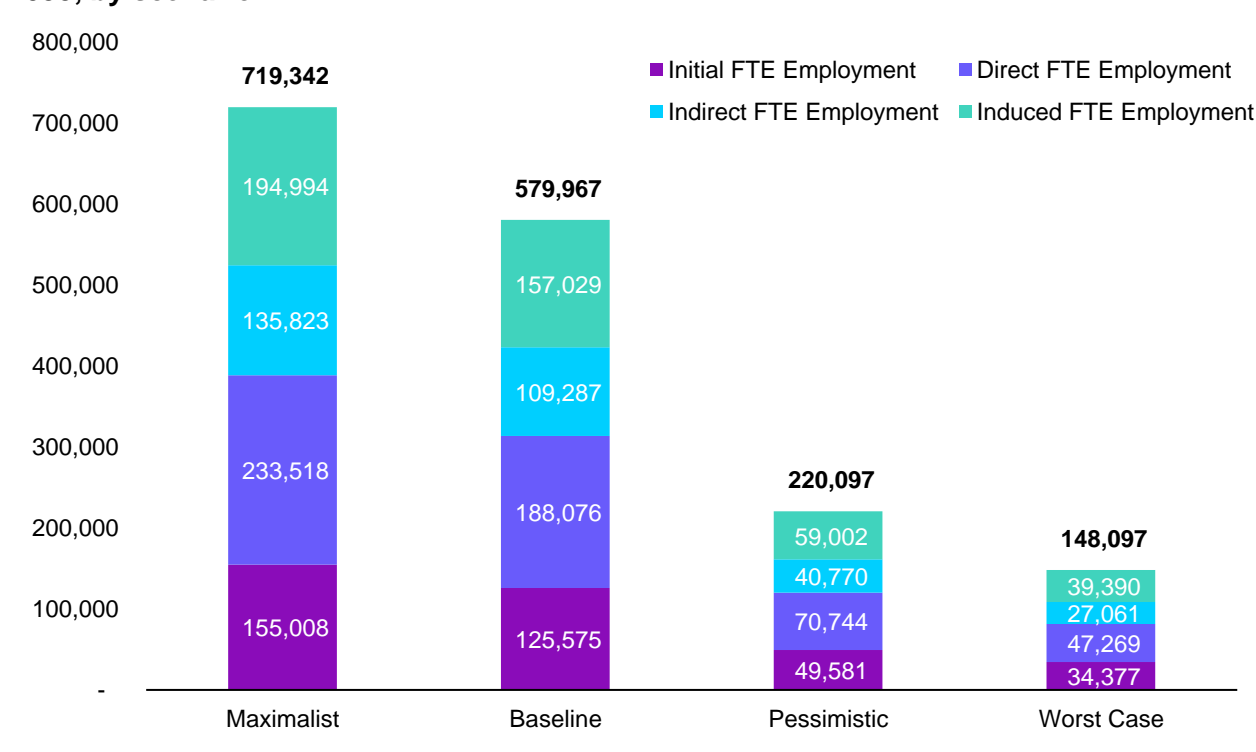
Under the maximalist scenario, FTE employment is forecasted to reach almost 720,000 jobs in 2035. This is primarily comprised of jobs within the supply chain, which account for over half, 370,000, of the FTE jobs supported by the sector's activity. FTE employment in the baseline scenario is forecasted to be 20% lower than the maximalist scenarios and represents 139,000 fewer jobs being supported within the UK economy. However, total employment contributions from the sector will still increase over the forecast period and reach 580,000 FTE jobs by 2035, an increase of 38,000.

The pessimistic and worst case scenarios would represent even fewer jobs being supported by 2035. At the starkest contrast, FTE employment in the worst case scenario would be approximately a fifth of the maximalist scenario, with only 148,000 FTE jobs being supported within the UK automotive sector activity by 2035. This is a drop-off in employment equivalent to 432,000 full-time jobs when compared to the baseline scenario and 571,000 full-time jobs when compared to the maximalist scenario.

In the pessimistic scenario, 2035 employment fares marginally better, but forecasted employment in this scenario remains a long way from the levels exhibited in the maximalist and baseline scenarios. Total FTE employment supported by the activity of the UK

automotive sector in the pessimistic scenario is forecasted to be 220,000 in 2035, this would represent almost 500,000 fewer jobs being support throughout the UK economy by 2035 compared to the maximalist scenario, this number is 360,000 FTE jobs when comparing to the baseline scenario forecast for 2035.

**Figure 22: Future FTE employment contributions of the automotive sector in the year 2035, by scenario**

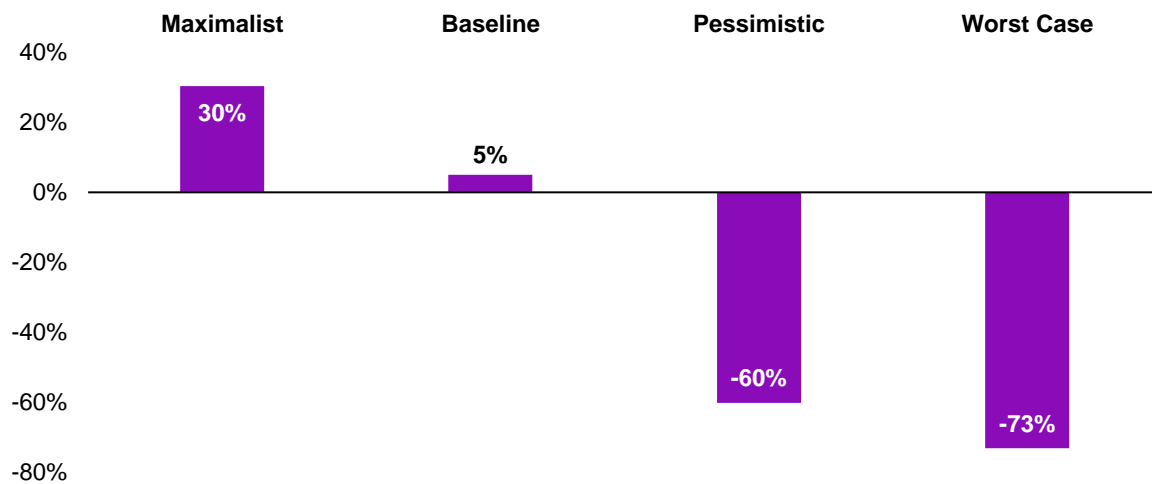


Source: CBI Economics analysis (2024)

Automotive sector activity supported approximately 552,000 FTE jobs in 2023 throughout the UK economy. The maximalist scenario would therefore represent a 30% uplift on the current level of employment supported by the activity of the automotive sector. Similarly, though to a lesser extent, the baseline scenario would represent a 5% uplift on the 2023 level of FTE employment supported by the sector. By contrast, the pessimistic scenario would lead to a 60% reduction, representing the loss of 332,000 FTE jobs, in employment supported by automotive sector activity. The worst case scenario would lead to an even greater loss of jobs, amounting to a 73% reduction across the UK economy or 404,000 FTE jobs.



**Figure 23: Percentage changes in FTE Employment by scenario (2023-2035)**



Source: CBI Economics analysis (2024)



## 5 Conclusion

This analysis has evidenced the potential economic benefits of embracing the EV transition in the UK, but more importantly, it has exposed the alarming risks and consequences associated with not transitioning fast enough. The most optimistic scenario of scaling up BEV production sees economic activity supported by the automotive sector grow by 35% to 2035. Conversely, should the transition to BEVs be slow, economic activity supporting the sector could shrink by 59% under a pessimistic scenario. No growth in BEV production throughout the ZEV mandate period would represent even greater losses and could see the automotive sector shed up to three quarters of its jobs it sustains today. The consequences of such a decline on the UK's economy would be grave, and the impact on local communities could be catastrophic.

The stakes are therefore very high, with the automotive sector finding itself at a crossroads. UK production has faltered due to lockdowns, chip shortages and other global factors, and has only somewhat recovered since the pandemic. While BEV production has grown steadily throughout this period, the pace of this growth is insufficient to fully support the EV transition. BEVs constituted just 7% of UK vehicle manufacturing in 2023, 75,000 units, representing less than one-tenth of the value added by the whole automotive sector.

Global competition is only set to intensify further in the BEV market. Governments throughout the UK's substantial export markets are implementing measures to support and incentivise BEVs, both in terms of production and consumption. The EV transition and scaling up of BEV production is therefore not a domestic choice, but a global inevitability.

In the face of this inevitability, this research has underlined the importance of championing BEV production in the UK. Optimal conditions could add £16.1bn and 167,000 jobs to our economy over the next 11 years. More importantly, a supportive policy environment, enabling a faster industry transition to BEVs and incentivising consumer uptake of EVs, is paramount to preventing the UK automotive sector experiencing significant downturn over the coming decades. This downturn could result in a £34bn loss in value for the UK economy and job losses across the UK equivalent to 404,000 full-time jobs by 2035, at a time where the UK economy continues to struggle in its efforts to grow.

October 2024

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