This report was commissioned by the Faraday Battery Challenge

Delivered by Innovate UK

CATAPULT High Value Manufacturing

WMG THE UNIVERSITY OF WARWICK

SECTOR-WIDE UK BATTERY DEMAND PROJECTIONS TO 2035

APRIL 2025

HIGHLIGHTS

- The automotive sector accounts for circa 90% of UK demand.
- Additional 55 GWh needed to satisfy UK demand, of which 35 GWh is for the auto sector. Resolving the demand shortfall is vital for businesses across sectors to ensure suitable supply for business operations.
- Other sectors represent a smaller battery demand but have a significant impact on UK industry, employment, GVA and exports, especially in niche automotive markets.
- A cost-effective alternative to NMC (nickel manganese cobalt) batteries is essential for market growth.
- LFP (lithium iron phosphate) and LMFP (lithium manganese iron phosphate) are cheaper alternatives. There is potential for European supply chains to adapt and provide a regional source of LFP and LMFP, reducing our reliance on uncertain supply chains.
- Aggregation is needed for sectors with smaller battery demand.
- Industrial actions and R&D are needed to ensure a competitive supply chain that supports economic growth and net zero goals.

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

MAINTAINING A CRITICAL SUPPLY OF BATTERIES FOR AN ELECTRIFIED FUTURE

As part of the clean energy transition, UK battery demand is forecast to reach over 100 GWh per annum by 2030 and around 160 GWh by 2035, reaching nearly 200 GWh in 2040(1).

This report covers eight key UK industrial sectors (see right) and their predicted demand for batteries in 2030 and 2035.

The report includes the factors and scenarios likely to impact this, as well as the associated research work needed to maximise demand and ensure that the UK is globally competitive for both batteries and electrified products.

Key Sectors Covered:


Light duty automotive, inc. niche automotive


Heavy duty automotive


Aerospace


Stationary energy storage


Off highway


Rail


Marine


Personal mobility

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

MAINTAINING A CRITICAL SUPPLY OF BATTERIES FOR AN ELECTRIFIED FUTURE

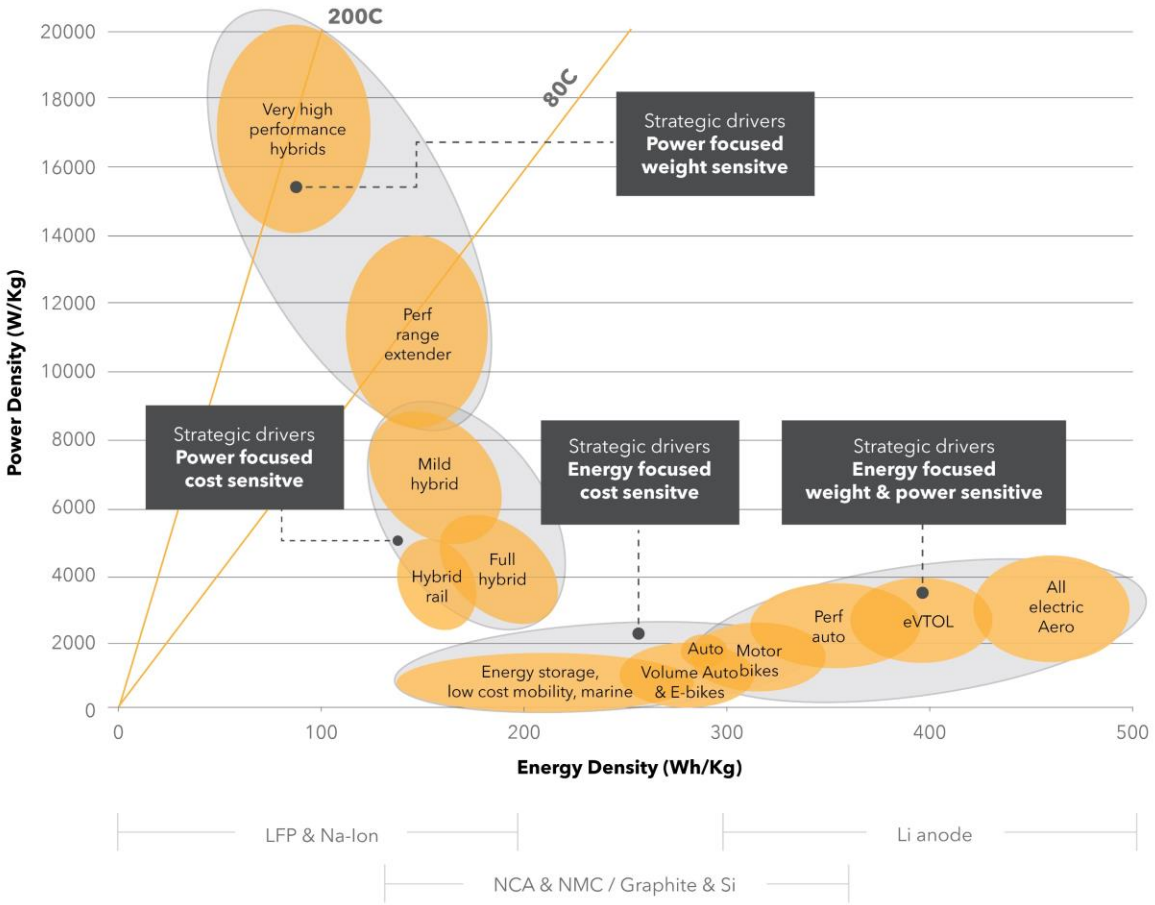
To enable the transition to electrification across a wide range of sectors, we need to understand how a suitable battery supply can be established and what challenges must be met to enable this.

This report aims to identify the future demand for batteries and understand the technical challenges for each sector.

This builds upon a previous study [2] that identified the strategic priorities for each sector and the performance targets needed to enable economically viable electrification.

For example, some sectors will need cells that prioritise **power density** (able to deliver energy faster, but not necessarily for a long time); while others will need cells that prioritise **energy density** (able to store more energy, but not necessarily to deliver lots of it in an instant).

Sector Battery Priorities: Power versus Energy

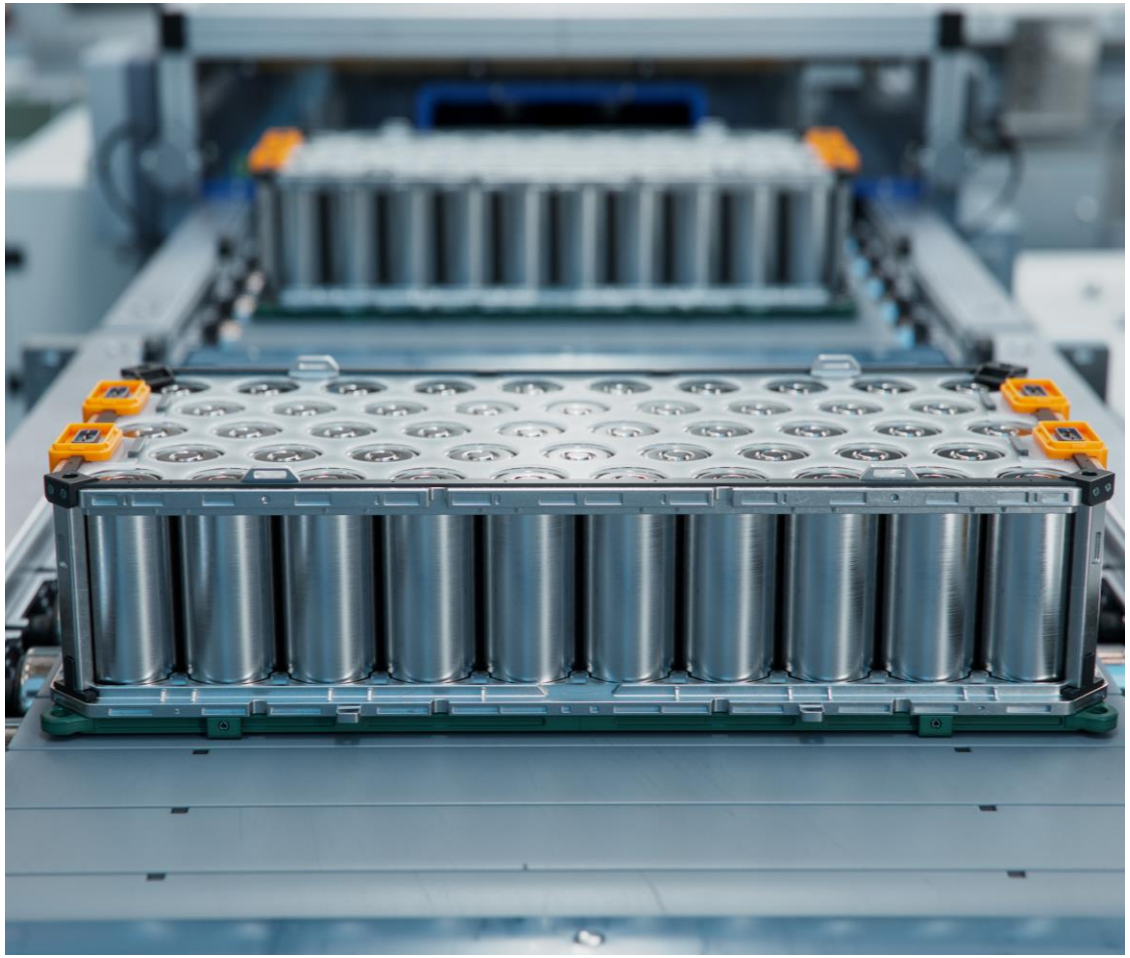


This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

MAINTAINING A CRITICAL SUPPLY OF BATTERIES FOR AN ELECTRIFIED FUTURE

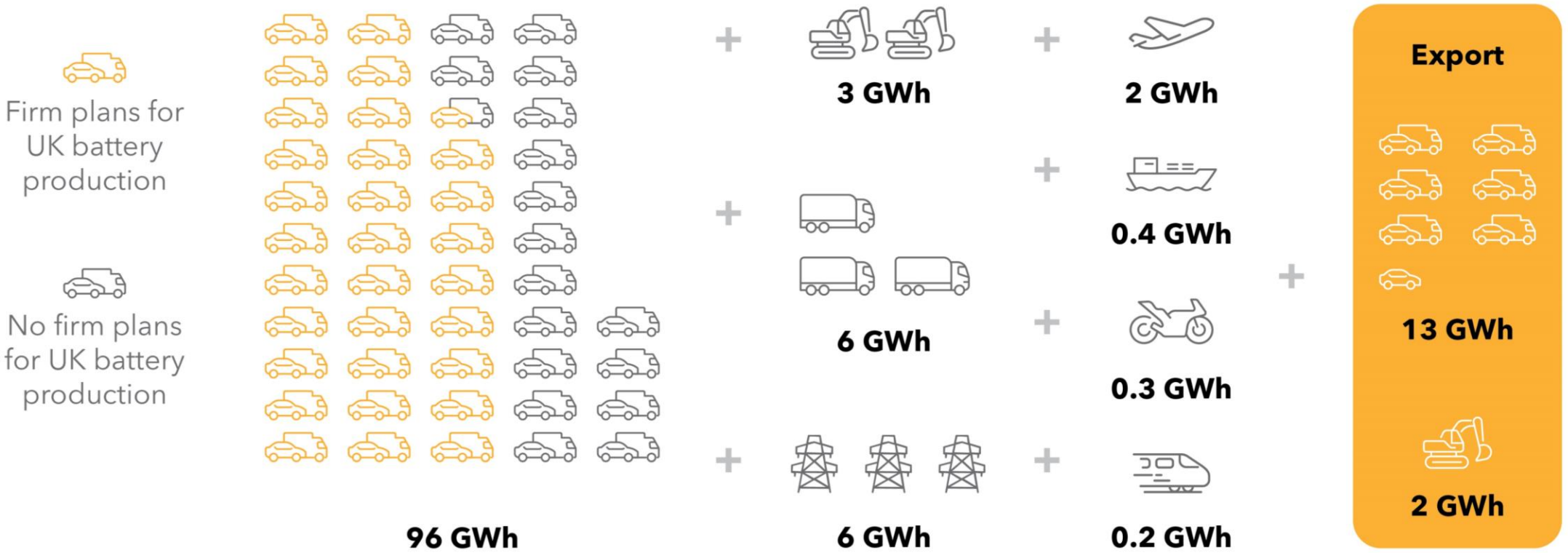
The types of batteries needed by different sectors can be described in one (or more) of the following ways.

- **Power focused cost sensitive**: prioritises power density over energy density, must be relatively low cost to manufacturers
- **Power focused weight sensitive**: prioritises power density over energy density, must not be too heavy
- **Energy focused cost sensitive**: prioritises energy density over power density, must be relatively low cost to manufacturers
- **Energy focused weight and power sensitive**: prioritises energy density over power density (while providing relatively more power density than 'energy focused cost sensitive' type), must not be too heavy



This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

A 55 GWh SHORTFALL IN BATTERY SUPPLY IS PREDICTED ACROSS UK INDUSTRY SECTORS IN 2035



- **Total demand in 2035 is expected to be 115 GWh** and is dominated by the automotive industry (>90%).
- Potential for additional **15 GWh demand** for export.
- There is an **expected 55 GWh shortfall** in battery supply across sectors in the UK. Many sectors lack a domestic source and will either rely on imports or lose domestic manufacturing.

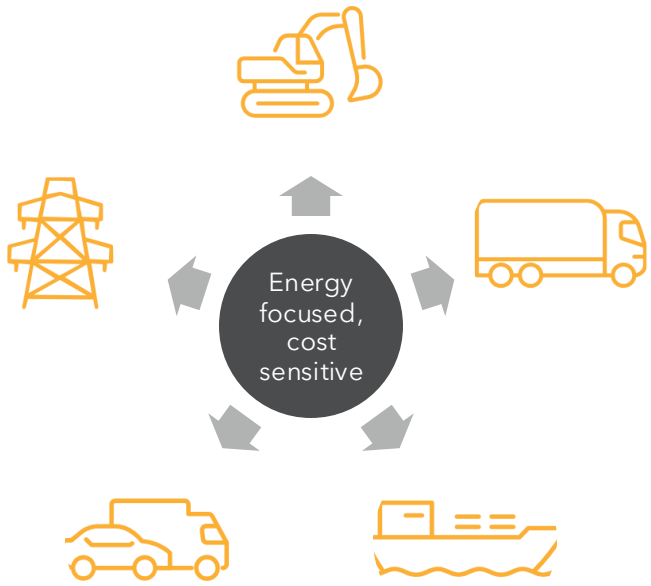
Note that 'demand' represents batteries for electrified products and 'export' refers to those exported at cell and/or battery level for product assembly elsewhere.

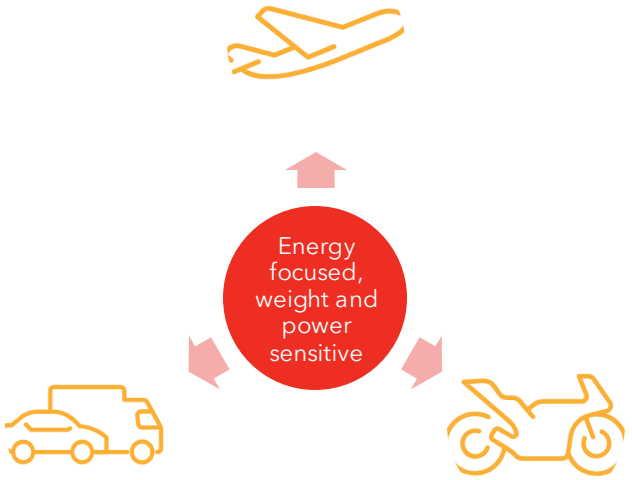
This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

MAPPING OPPORTUNITIES TO MEET DEMAND IN 2035

Each sector has its own individual targets and requirements in terms of cell characteristics. Additionally, within a sector the demand for a battery type can vary. Automotive, for example, can be served by large LFP cells using cell-to-pack approaches alongside high performance NMC cells for sports and niche cars.

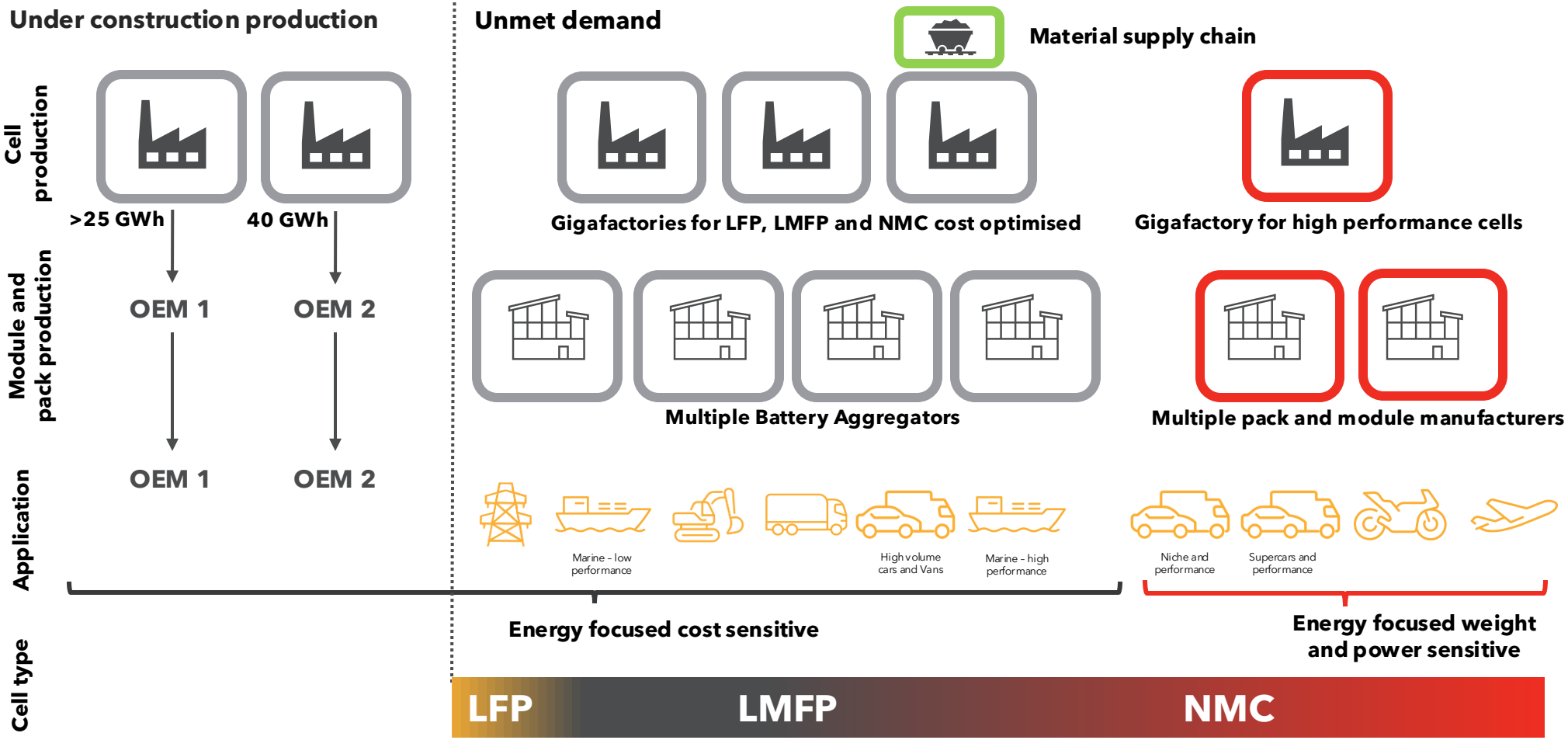
The following page gives a simplified potential strategy to deliver a supply of cells and the intermediary mechanisms between the final application and the material source. It is worth noting that this is based on the analysis outlined in this report and not related to OEM strategy.





This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

POTENTIAL INDUSTRALISATION STRATEGY TO COVER DEMAND IN 2035

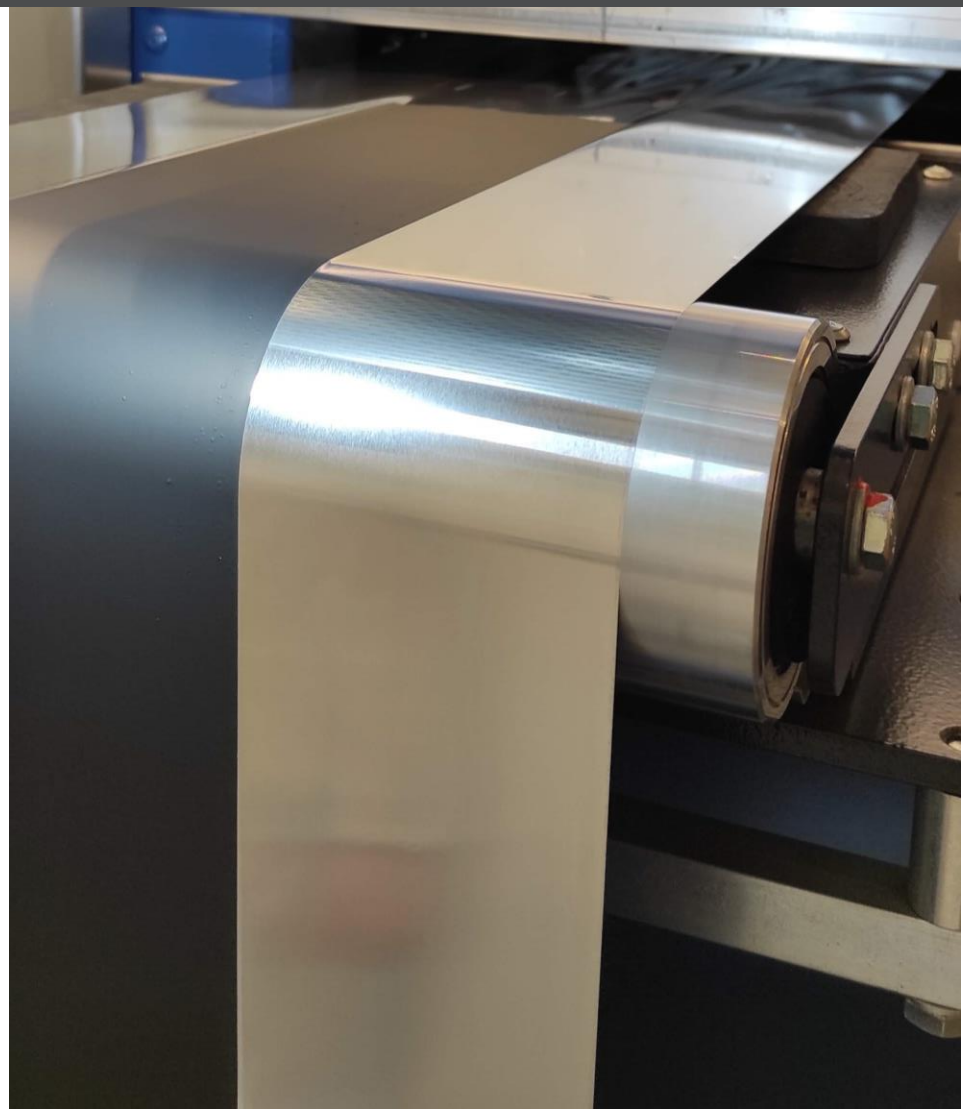


RESEARCH PRIORITIES IDENTIFIED FROM THE EIGHT SECTORS

Some of the factors expected to impact UK industry are consistent across multiple sectors, particularly around cost, charging performance and thermal runaway.

Energy density improvements vary by sector. In aerospace, they can significantly impact battery demand, while in automotive, their effect is minimal if regulations push for 100% BEVs. Higher energy density may accelerate the transition but could be less impactful if costs rise. Conversely, enhanced energy density could create new, viable aerospace markets, significantly boosting sector demand for batteries.

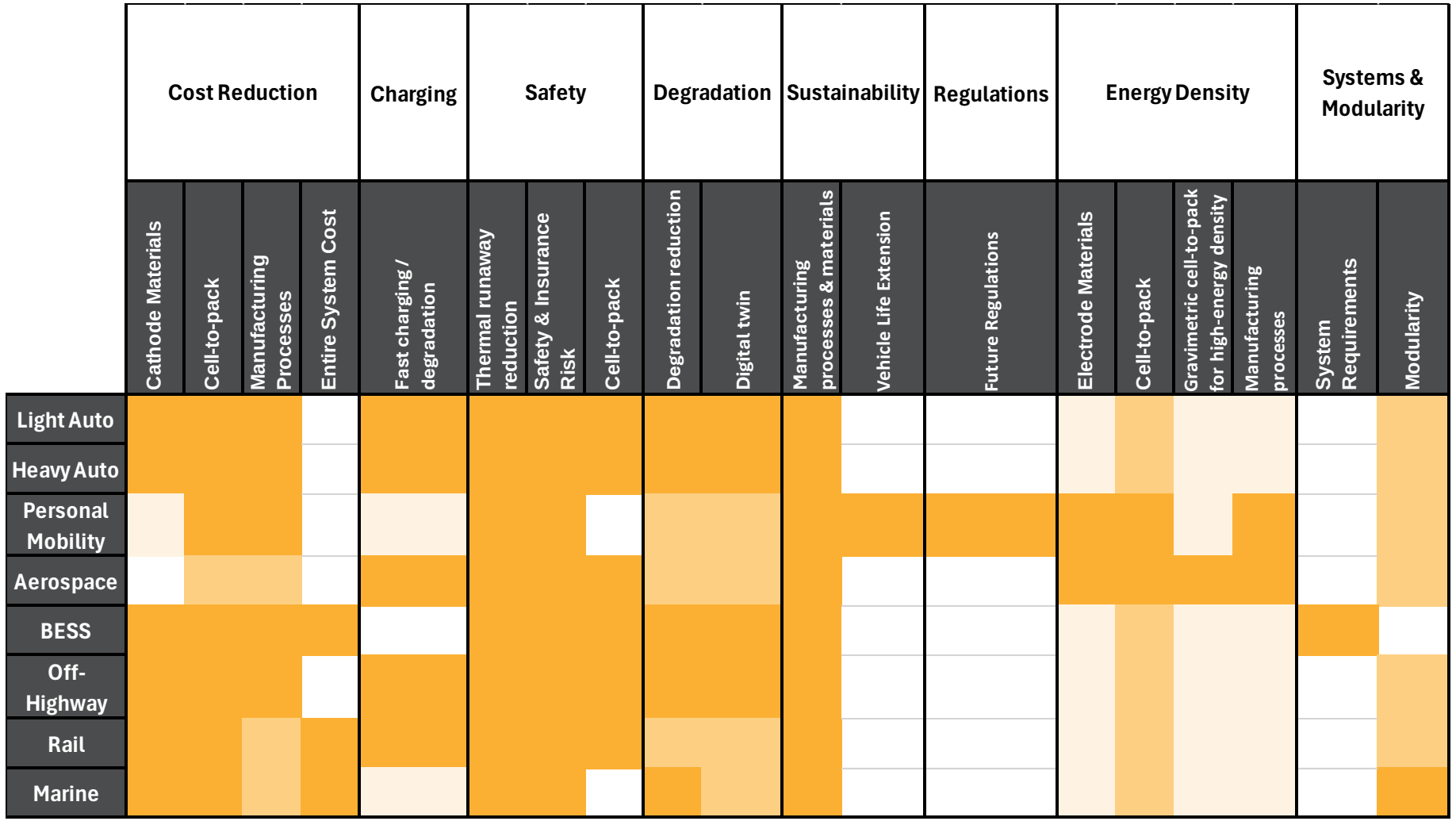
If the aim is to maximise total battery demand, then the focus should be on automotive as it dominates anticipated demand. However, a broader view of industry value to the UK should be considered to support other industries.



RESEARCH CHALLENGES BY SECTOR HAVE SIGNIFICANT COMMONALITY

The heat map shows where there is sectoral overlap between the research challenges that have the biggest impact on battery demand.

The details and solutions for those R&D challenges may differ between sectors.



THERE ARE A WIDE RANGE OF AREAS FOR FUTURE RESEARCH, SOME ARE CROSS-SECTOR

How can cost be reduced?

Cost is a critical factor across almost all sectors. There is likely some level of shared battery technology between many of the sectors, allowing any cell-level improvement in cost to be shared. The idea of a "low-cost-good-enough" (for volume automotive) cell has broad appeal, with work indicating that UK-produced LMFP can achieve $61.6/kWh vs $73.0/kWh for NMC811[18].

How can charging performance be improved?

Charging performance is also critical for most sectors with regards to charging rate and subsequent cell degradation. In automotive, improved charging performance can help reduce barriers to purchase. In aerospace, it may be important for utilisation and financial viability of operation.

How can TR/safety be improved?

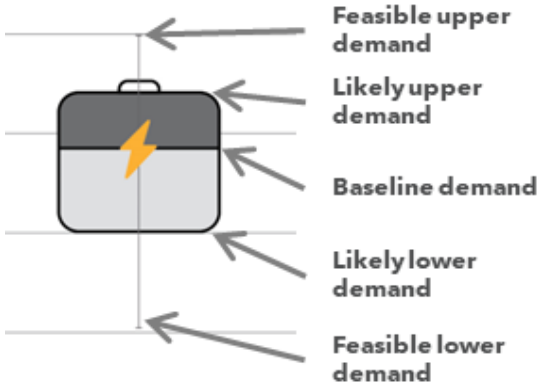
Improving thermal runaway (TR) is crucial in cell-to-pack approaches and must be carefully managed. Various sectors, such as personal mobility and aerospace, require enhanced safety and thermal runaway mitigation due to specific constraints. Solutions will vary based on different attribute requirements.

DETAILED SECTOR ANALYSIS

GUIDANCE ON READING THE GRAPHS

Demand Detail by Segment

Demand by sector is shown as a box-plot in this report. The centreline represents the baseline, the box is the likely variability, the whiskers are the realistic feasible variability. A higher/lower demand is not impossible, but this would require a combination of events that are considered unlikely.



This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

LIGHT-DUTY AUTOMOTIVE - BACKGROUND

Global legislation is set to accelerate the shift to battery electric vehicles (BEVs), making battery supply crucial. The primary demand is for energy focused, cost sensitive cells, while niche applications may prioritise energy focused, weight and power sensitive cells.

Currently, European-built electric vehicles mostly use NMC cells with increasing nickel content, which has an impact on cost. LFP cells are a low-cost, good-enough alternative to NMC, which are currently sourced from China. There is an opportunity to develop an alternative supply chain in Europe - and establish a more resilient supply of LFP.

CURRENT UK MANUFACTURING SECTOR SIZE

2,500
Component providers [3]

182,000
People employed [3]

£14.5bn
Annual GVA [4]

£32bn/4%
of total UK exports [5][6]

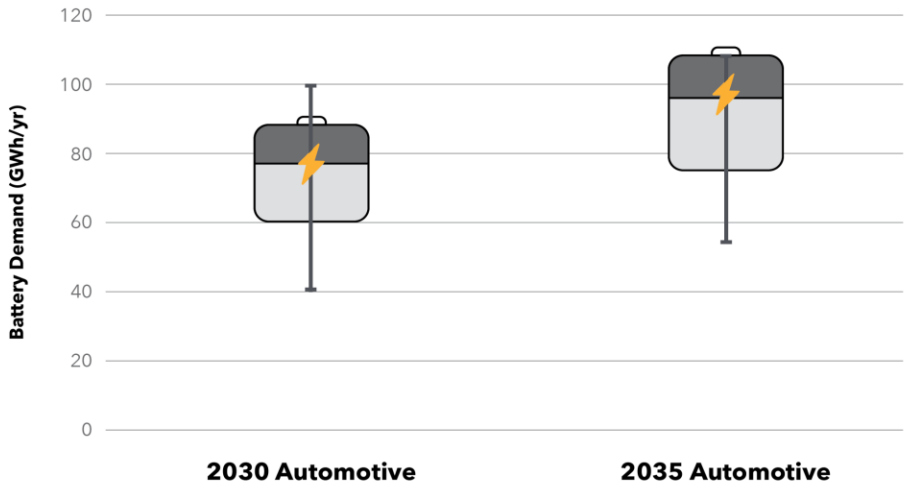
This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

LIGHT-DUTY AUTOMOTIVE - DEMAND & DYNAMICS

The main factors expected to impact UK light-duty automotive battery demand between now and 2035 are:

- **Increased emissions/sustainability regulations:** e.g. changes to internal combustion engine (ICE) bans
- **Increased/decreased barriers to customer adoption:** e.g. purchase price/incentives/VAT, driving range, charging speed, charging infrastructure, perceived safety
- **Increased/decreased UK manufacturing base:** loss of a single existing manufacturer due to negative economic conditions could have a bigger impact than whole other industries
- **Quicker plateau in long term battery size:** the baseline in the graph (right) assumes that battery sizes will continue to grow, but this could plateau (e.g. due to cost or reduced range anxiety)
- **Increased/decreased UK production volumes:** changes could be driven by original equipment manufacturers' (OEMs') product strategy or global demand for UK built products

Future Battery Demand for Light-Duty Automotive in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

77 GWh
Sector demand in 2030

96 GWh
Sector demand in 2035

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

HEAVY-DUTY AUTOMOTIVE - BACKGROUND

The heavy-duty automotive sector is likely to focus on energy focused, cost sensitive cell supply, although with potentially different attribute requirements to light-duty automotive.

The requirements are expected to drive LFP or LMFP batteries in most applications. It will be important to integrate these efficiently to maximise both the mass and volume carrying ability. Cell cost and durability will be priorities.

The regulations are varied by application but are typically expected to come later than those for light-duty automotive. It is still expected that there will be high BEV penetration in the 2030s.

CURRENT UK MANUFACTURING SECTOR SIZE

2,500*
Component providers [3]

182,000*
People employed [3]

>£1bn
Industry value [7]

£32bn*/4%
of total UK exports [5][6]

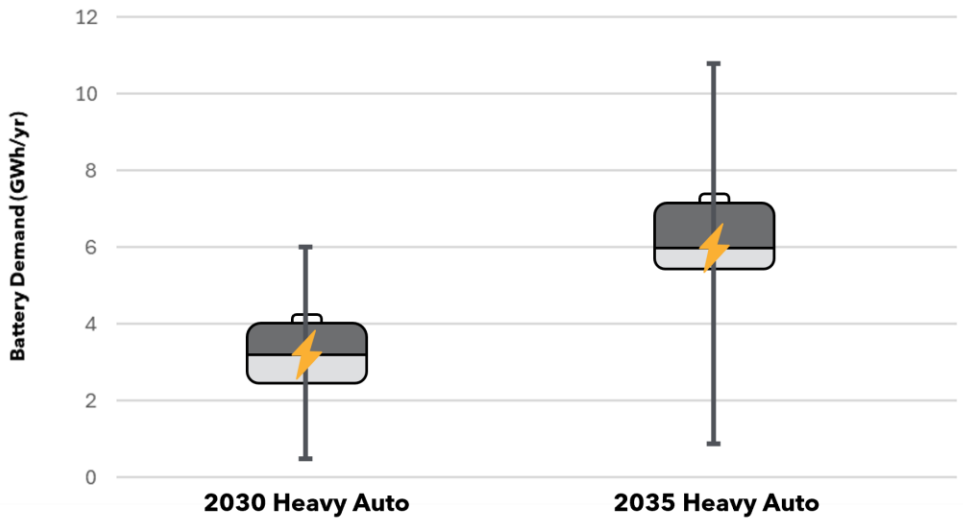
**Figure for the whole auto sector*

HEAVY-DUTY AUTOMOTIVE – DEMAND & DYNAMICS

The main factors expected to impact UK heavy-duty battery demand between now and 2035 are:

- **Increased emissions/sustainability regulations:** e.g. changes to ICE bans
- **Increased/decreased barriers to customer adoption:** e.g. total cost of ownership (TCO)/purchase price/incentives/VAT, charging speed, driving range, charging infrastructure, battery life (with high utilisation and rapid charging)
- **Increased/decreased UK manufacturing base:** loss of a single existing manufacturer due to negative economic conditions could have a bigger impact than whole other industries
- **Quicker plateau in long term battery size:** baseline assumes that battery sizes will be fixed by use cases and therefore vehicle cost will reduce in the longer term
- **Increased/decreased UK production volumes:** changes could be driven by OEM product strategy or global demand for UK-built products

Future Battery Demand for Heavy-Duty Automotive in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

3.2 GWh
Sector demand in 2030

6.0 GWh
Sector demand in 2035

AEROSPACE - BACKGROUND

UK aerospace is largely shaped by its supply chain, rather than the assembly of finished aircraft. Most battery demand is focused on electric vertical take-off and landing (eVTOL) aircraft, although this market is still developing and lacks certainty. Demand for eVTOL batteries has grown quickly, on the assumption that packs will need replacing every six months.

Full electrification of conventional aerospace faces challenges due to battery energy density limitations. Hybrid passenger aircraft studies require high energy density for feasibility, necessitating further research.

Cells will be energy focused, weight and power sensitive, chosen to maximise gravimetric energy density, e.g. NMC. Their format will be determined by energy density and thermal runway mitigation requirements.

CURRENT UK MANUFACTURING SECTOR SIZE

>1,200
Component providers [8]

111,000
People employed [9]

£8bn
Annual GVA [8]

£26bn/3%
of total UK exports [5][9]

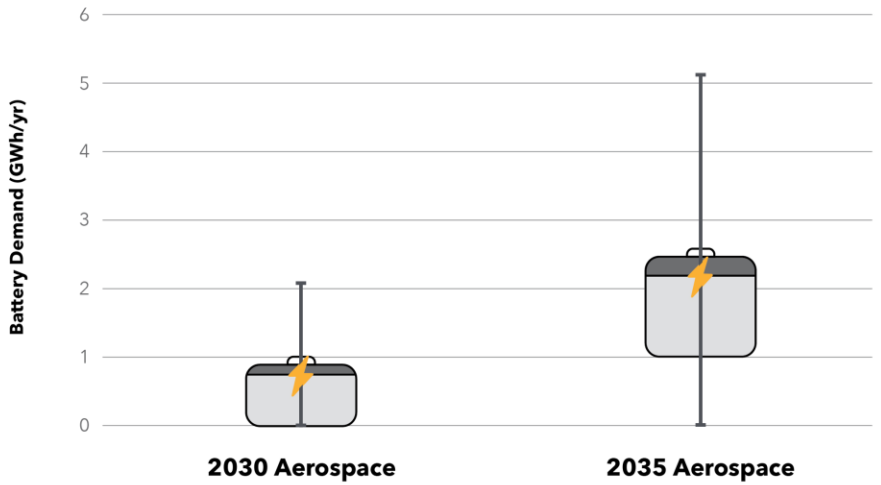
This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

AEROSPACE – DEMAND & DYNAMICS

The main factors expected to impact UK aerospace battery demand between now and 2035 are:

- **Dramatically improved gravimetric energy density:** currently suitable only for specific applications such as eVTOL. Over 1 kWh/kg is likely necessary for regional aerospace market penetration.
- **eVTOL market creation and expansion:** this is a nascent industry, but could create a significant battery demand, especially considering regular battery replacement.
- **Improved fast charging:** high utilisation requires fast charging and can have a big impact on the business case. Pack sizes are likely larger than automotive, meaning there is an increased challenge for infrastructure as well for the battery.
- **Legislation/regulation enforcing hybrid planes:** the financial benefit for hybrid aero is marginal but could have a positive impact on local air quality. Even if this does happen, it won't necessarily benefit UK manufacturing.

Future Battery Demand for Aerospace in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

0.7 GWh
Sector demand in 2030

2.2 GWh
Sector demand in 2035

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

PERSONAL MOBILITY - BACKGROUND

UK personal mobility battery demand is low and likely to remain so in 2030 and 2035. Demand is driven mostly by motorcycles due to the combined production volume and battery size.

The UK personal mobility manufacturing sector is diverse, featuring many low-volume specialist manufacturers that need cell availability but can't justify a battery gigafactory alone. A modular battery supplier or aggregation could greatly support this sector. Some sub-sectors require coordinated regulatory changes to maximise benefits.

The UK sector consists mostly of premium and performance products, meaning that demand is likely to be for energy focused, weight and power sensitive cells, e.g. small cylindrical cells with NMC cathodes.

CURRENT UK MANUFACTURING SECTOR SIZE

>350
Component providers (10)

>3,000
People employed (10)

>£0.2bn
Annual GVA (11)

£0.4bn/0.1%
of total UK exports (5)(10)

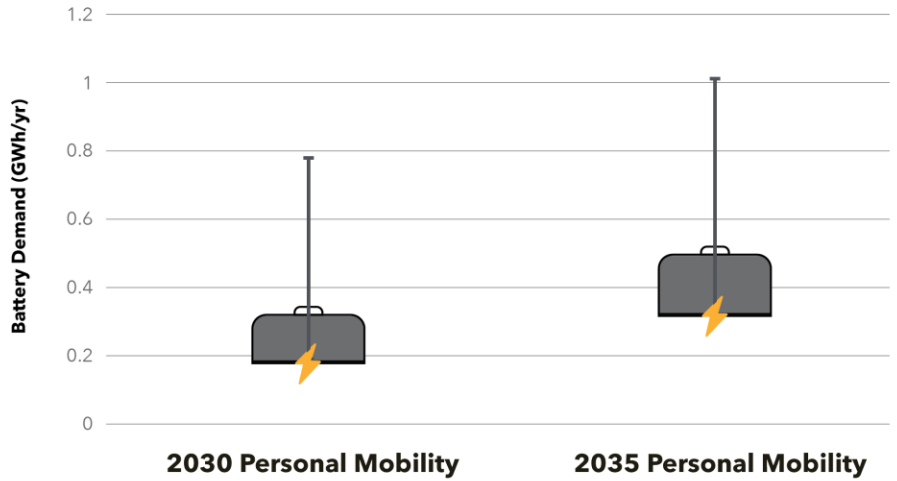
This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

PERSONAL MOBILITY – DEMAND & DYNAMICS

The main factors expected to impact UK personal mobility battery demand between now and 2035 are:

- **Increased regulation and failure of other powertrain technologies (motorbikes):** future regulation could impact the rate of transition to electric motorbikes.
- **New UK regulation to enable wider use (e.g. e-scooters):** market size could grow but would require simultaneous expansion of UK manufacturing for this to have a significant impact on UK battery demand.
- **Rapid expansion of UK manufacturers (e-bikes and e-scooters):** in combination with change in regulation, this could increase battery demand in the UK.
- **Reduced cost of batteries and electrified powertrains:** this is likely to have some impact on demand through an improvement in absolute affordability, but the impact is likely small, especially without other changes made first.
- **Reduced thermal runaway risk:** personal mobility often involves storage in the home and fires are a potential barrier to purchase. Overcoming this would have a positive impact on demand.

Future Battery Demand for Personal Mobility in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

0.2 GWh
Sector demand in 2030

0.3 GWh
Sector demand in 2035

MARINE - BACKGROUND

UK marine battery demand is low, but there is a growing demand for lower performance craft like narrow and day boats. Battery power may not be suitable for craft with longer range requirements; however, zero emission operations may be useful for short periods such as when they are in ports.

Many manufacturers produce very low volumes and will benefit from modular or common battery components to achieve practical and economic viability. In many cases, battery packs are of a similar size to automotive, both for electric day boats and larger hybrids.

For short-range day boats, a low-cost-good-enough cell would likely be suitable. Larger, long-range hybrid craft are likely to have greater cell performance requirements.

CURRENT UK MANUFACTURING SECTOR SIZE

>5,000
Component providers [12]

~90,000
People employed [13]

£3.5bn
Annual GVA [13]

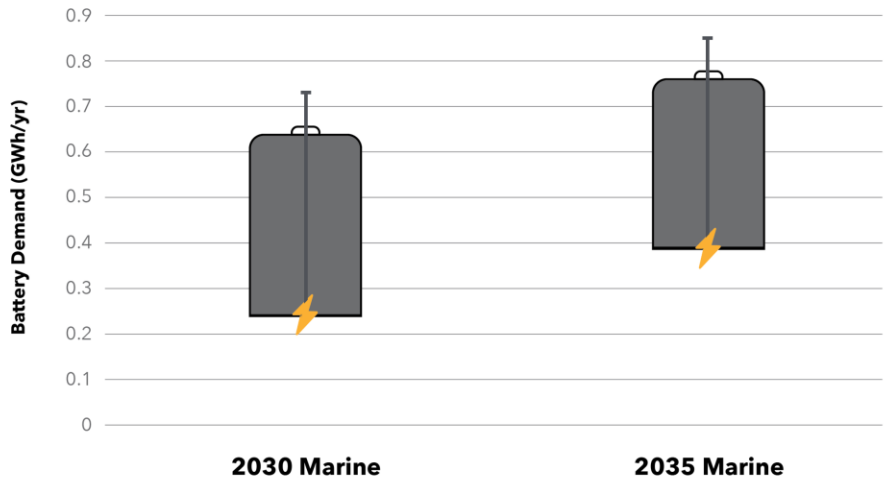
£1.6bn/0.2%
of total UK exports [12][14][15][5]

MARINE – DEMAND & DYNAMICS

The main factors expected to impact UK marine battery demand between now and 2035 are:

- **Increased regulations to promote adoption:** this could increase demand in sub-sectors which are less suited to pure electrification, for example yacht operation in low emission areas.
- **Improved TCO/purchase cost:** sub-sectors such as day or narrow boats already have increased interest for electric powertrains, but changes in cost could accelerate this by increasing accessibility.
- **Failure of other technologies:** especially in combination with regulation, failure of other technologies such as hydrogen could increase battery demand, e.g. hybrids for low emission zones.

Future Battery Demand for Marine in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

0.2 GWh
Sector demand in 2030

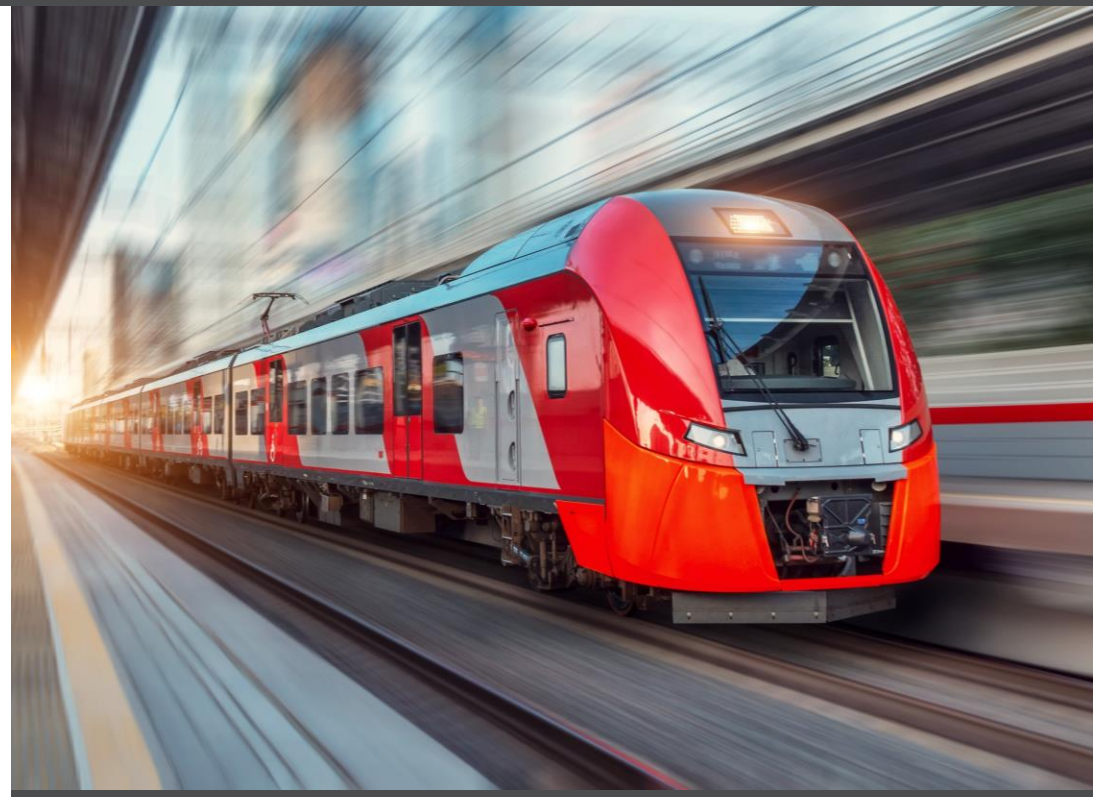
0.4 GWh
Sector demand in 2035

RAIL - BACKGROUND

Although the UK rail sector is large, initial battery demand is expected to be low owing to production volumes. However, demand may rise in future when installed batteries need to be replaced at regular intervals.

Battery electric rail competes with direct electrification via overhead rails. A solution may be bi-modal systems that use both methods where continuous electrification isn't feasible. The Rail Industry Association proposes early implementation of battery electrification, but long cycle life will reduce the rate of replacement.

Lithium titanium oxide cells are usually preferred for their combination of life, low lifetime cost and charge rate capability, which could also present an opportunity for niobium anodes.



CURRENT UK MANUFACTURING SECTOR SIZE

130
Component providers [16]

~7000
People employed [5]

£0.6bn
Annual GVA [17][18]

£43m/0%
of total UK exports [5][18]

RAIL – DEMAND & DYNAMICS

The main factors expected to impact UK rail battery demand between now and 2035 are:

- **Reduced lifetime and purchase cost:** cell design, materials and manufacturing focused on high power and long cycle life, cell-to-pack approaches.
- **Improved charging performance:** faster charging without additional degradation or compromise.
- **Improved safety/thermal runaway (TR) improvement:** TR reduction/elimination, TR propagation reduction/elimination, other safety and insurance risk improvements, cell-to-pack configurations.

Future Battery Demand for Rail in 2030 and 2035, *with likely and feasible variability*

See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

0.1 GWh
Sector demand in 2030

0.2 GWh
Sector demand in 2035

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

OFF HIGHWAY - BACKGROUND

UK off highway battery demand is growing and is likely to be significant in 2030 and 2035. The sector is varied with a wide range of products from compact excavators to very large rigid dump trucks. The applications of these products are equally varied, which makes it challenging to estimate the demand.

There is a trend towards electrification, although some applications are focused on hydrogen for emissions reduction. Smaller vehicles are already starting to be replaced by BEVs, as these are often used in more urban areas with good charging access and relatively short periods of operation. Larger vehicles are more likely to require hydrogen ICEs, but there are exceptions, even for very large vehicles.

Currently, NMC cells are commonly used, but the lower cost and long life of LFP cells appear well suited to these applications, if energy density is sufficient.

CURRENT UK MANUFACTURING SECTOR SIZE

1,500
Component providers [19]

>44,000
People employed [19]

£2.5bn
Annual GVA [19]

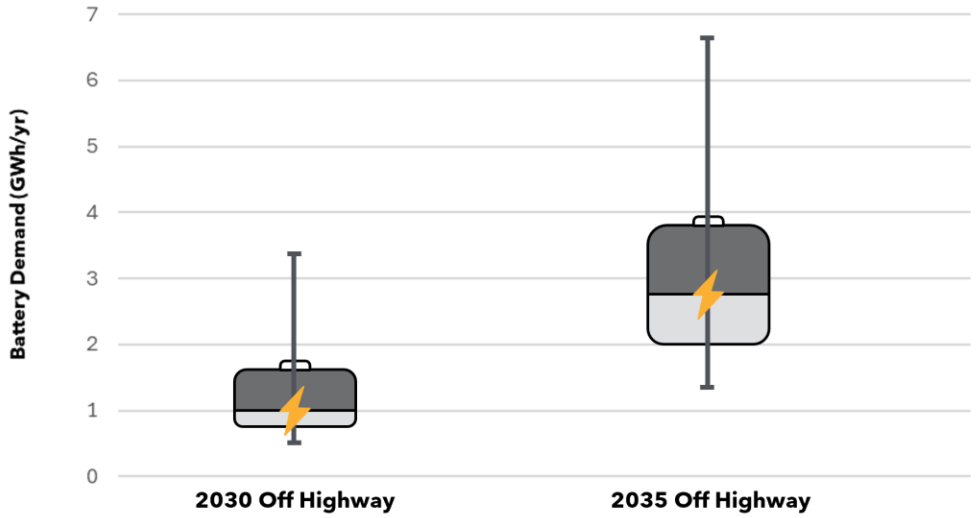
£8.4bn/1%
of total UK exports [19][5]

OFF HIGHWAY – DEMAND & DYNAMICS

The main factors expected to impact UK off highway battery demand between now and 2035 are:

- **Improved TCO/cost reduction:** would help to accelerate roll out in compact products where electrification is already viable. May also help to increase use of batteries in large products where BEVs are a viable option.
- **Failure of other powertrain technologies:** this would result in some increase for BEV demand, but this is likely to be capped by the use cases where BEVs are viable.
- **Increased future regulations to restrict ICE usage (UK and international):** could force some segments to BEVs, especially if this happens before widespread application of hydrogen ICEs.
- **Dramatically improved battery technology:** some sub-sectors are not currently suitable for battery electrification, e.g. where 24-hour operation is required. However, improvements to energy density and charging could increase the viable market.

Future Battery Demand for Off Highway in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

1 GWh
Sector demand in 2030

2.7 GWh
Sector demand in 2035

STATIONARY ENERGY STORAGE – BACKGROUND

The UK energy storage battery demand is relatively low but will grow rapidly towards 2030 and 2035. The use of batteries for stationary energy storage is critical to support decarbonisation of the electricity grid due to the intermittent nature of renewable energy sources.

While levelised cost of energy and levelised cost of storage are important, battery cells themselves form only a fraction of the total cost, likely in the range of 15-20% for small behind-the-meter systems and 25-35% for utility scale.

There is a growing trend for LFP cells in stationary storage, primarily due to their levelised cost of energy storage, along with advantages in thermal runaway and sustainability. However, the UK currently lacks a volume manufacturing industry for stationary energy storage.

CURRENT UK MANUFACTURING SECTOR SIZE

NASCENT UK INDUSTRY

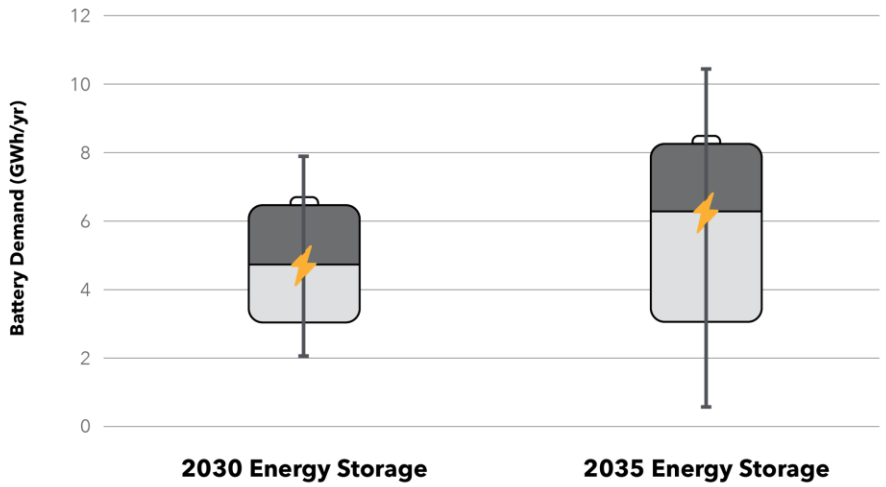
Not currently made in volume in the UK, demand is at system level

STATIONARY ENERGY STORAGE – DEMAND & DYNAMICS

The main factors expected to impact UK stationary energy storage demand between now and 2035 are:

- **Reduced cost in terms of CapEx or CapEx/year:** lifetime cost and investment cost are critical, but cell cost is not the only key factor.
- **Failure of other technologies system-level forecasts:** including batteries, pumped hydro storage (PHS) and other immature technologies such as hydrogen storage in underground caverns. Failure of other solutions may necessitate increased battery storage to support robustness of the electricity grid.
- **Implementation of regulation/tax/incentives:** changes can be made to support investment (e.g. recent announcement on tax breaks for retrofitting residential storage) or regulation/tax breaks on new buildings could transform residential demand.
- **Establishing industry/manufacture:** even if demand were to increase, this would not necessarily mean that UK business would benefit. For this to happen, an industry must first be developed.
- **Higher energy prices (or bigger variation in price to enable arbitration):** higher energy prices will drive more batteries for arbitration and improved efficiency versus other storage methods. Carbon capture, utilisation and storage costs, carbon taxes and fuel costs are likely to be the most sensitive factors.

Future Battery Demand for Stationary Energy Storage in 2030 and 2035, *with likely and feasible variability*



See p.13 for guidance on how to read these graphs

POTENTIAL FUTURE BATTERY DEMAND

4.8 GWh
Sector demand in 2030

6.3 GWh
Sector demand in 2035

SUMMARY

This report covers eight UK sectors and their demand for batteries in 2030 and 2035. It discusses the factors and scenarios likely to have an impact on this, and the associated research work required to maximise demand and ensure that the UK is globally competitive - both for batteries and electrified products.

- A low-cost-good-enough battery alternative to NMC is essential for market growth.
- LFP and LMFP are viable alternatives with cost advantage, currently displacing NMC globally and with potential for European supply chain adaptation.
- The UK needs increased production capacity to meet future manufacturing demands.
- Industrial actions and R&D are necessary for a UK battery strategy to ensure a competitive supply chain supporting economic growth and net zero goals.
- There is potential for UK battery exports, especially in niche automotive markets.

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK

ABOUT THIS REPORT

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.

The report was written and compiled by Warwick Manufacturing Group, which is part of the High Value Manufacturing Catapult.

The report was supported by the Advanced Propulsion Centre.

FARADAY BATTERY CHALLENGE

About Innovate UK

Innovate UK, part of UK Research and Innovation, is the UK's innovation agency.

Innovate UK works to create a better future by inspiring, involving and investing in businesses developing life-changing innovations.

About the Faraday Battery Challenge

UKRI's Faraday Battery Challenge, delivered by Innovate UK is a £610 million programme to develop a high-tech, high-value and high-skill battery technology industry. Its goal is to make the UK a science superpower for batteries by supporting world-class battery facilities and innovative businesses in the battery supply chain.

https://linktr.ee/faradaybatterychallenge

Thank you.

WMG
University of Warwick
Coventry
CV4 7AL
United Kingdom

warwick.ac.uk/wmg

wmgmarketing@warwick.ac.uk

@wmgwarwick

wmgwarwick

wmg-university-of-warwick

This report was commissioned by the Faraday Battery Challenge

Delivered by Innovate UK

REFERENCES

1) https://assets.publishing.service.gov.uk/media/656ef4871104cf000dfa74f3/uk-battery-strategy.pdf
2) https://hvm.catapult.org.uk/wp-content/uploads/2022/06/20201015-WMG-Battery-Manufacturing-Targets-Report.pdfhttps://www.smmt.co.uk/reports/smmt-motor-industry-facts/
3) https://www.parliament.uk/globalassets/documents/commons-committees/Exiting-the-European-Union/17-19/Sectoral-Analyses/4-Sectoral-Analyses-Automotive-Report.pdf
4) https://commonslibrary.parliament.uk/research-briefings/sn02815/
5) https://www.gov.uk/government/statistics/uk-trade-in-numbers/uk-trade-in-numbers-web-version
6) https://www.business-live.co.uk/manufacturing/sales-near-1bn-leyland-trucks-27922806
7) https://bolddata.nl/en/manufacturers/uk/aircraft-manufacturers-uk
8) https://www.sustainableaviation.co.uk/wp-content/uploads/2018/06/SA-Socio-Economic-Report.pdf
9) https://motorcycleguidelines.org.uk/wp-content/uploads/2013/08/Motorcycle-Industry-Manufacturing-Public-Policy.pdf
10) https://www.statista.com/statistics/519576/gross-value-added-of-the-motorcycle-industry-in-the-united-kingdom-by-sector
11) https://britishmarine.co.uk/Services/Growth/Statistics-and-Market-Research/Headline-Statistics-and-Infographics
12) https://assets.publishing.service.gov.uk/media/5a7970f4ed915d07d35b582e/11-1310-strategy-for-growth-uk-marine-industries.pdf
13) https://www.statista.com/forecasts/900146/building-of-ships-and-boats-revenue-in-the-united-kingdom
14) https://www.ibisworld.com/united-kingdom/market-research-reports/shipbuilding-industry/#IndustryStatisticsAndTrends
15) https://www.ibisworld.com/united-kingdom/market-research-reports/railway-equipment-manufacturing-industry
16) Oxford Economics, The Economic Contribution of UK Rail 2018, 2019
17) https://www.railforum.uk/wp-content/uploads/2022/01/How-can-the-rolling-stock-supply-chain-create-greater-value-for-the-UK.pdf
18) https://thecea.org.uk/wp-content/uploads/2023/07/CEA-Report-2023-Final-Download-3.pdf
19) https://www.apcuk.co.uk/wp-content/uploads/2025/03/APC-LFP-Report-v09.pdf

GLOSSARY

BEV – Battery Electric Vehicle
CapEx – Capital Expenditure
CCUS – Carbon Capture Usage Storage
eVTOL – Electric Vertical Takeoff and Landing
GVA – Gross Value Add
ICE – Internal Combustion Engine
LCOE / LCOS – Levelized Cost of Energy / Storage
LFP – Lithium Ferro Phosphate (Cathode material)
LMFP – Lithium Managanese Ferro Phosphate (Cathode material)
LTO – Lithium Titanate (Anode material)
OEM – Original Equipment Manufacturer
NMC – Nickel Managanese Cobalt (Cathode material)
PHS – Pumped Hydro Storage
TCO – Total Cost of Ownership
TR – Thermal Runaway

This report was commissioned by UKRI's Faraday Battery Challenge, delivered by Innovate UK.