

Developing Skills in UK Battery Manufacturing

April 2023

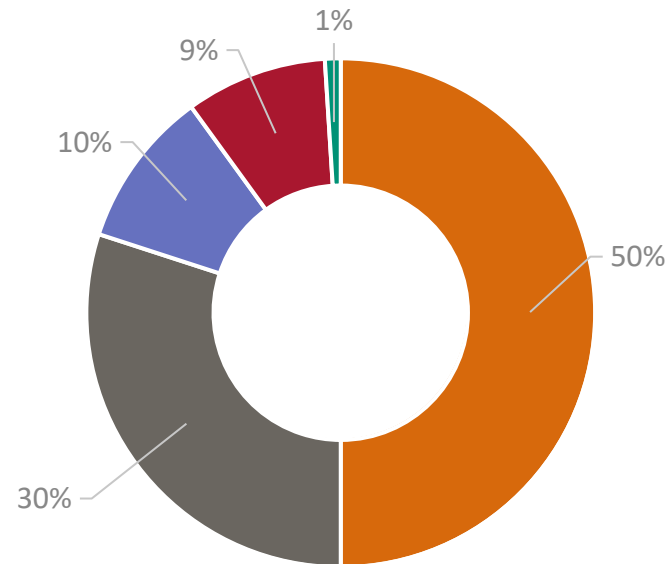
Jonty Deeley-Williamson



- Joined the UK Battery Industrialisation Centre (UKBIC) as Head of Learning and Development (L&D) in December 2021.
- Role – to develop battery manufacturing skills and training courses at all levels for the UK.
 - Currently on part-time secondment to Envision AESC.
- Background
 - A ex-science teacher who has worked in L&D for more than a decade in rail construction, high speed rail, food manufacturing and battery manufacturing sectors.
 - Working on various projects including
 - The Elizabeth line
 - HS2 skill development
 - Installation of a new food manufacturing line
 - Supporting skills from operatives to directors

The scale of the skills challenge

Battery manufacturing workforce



- Production staff
- Maintenance and engineering
- Quality
- Other (including IT and data management)
- Management

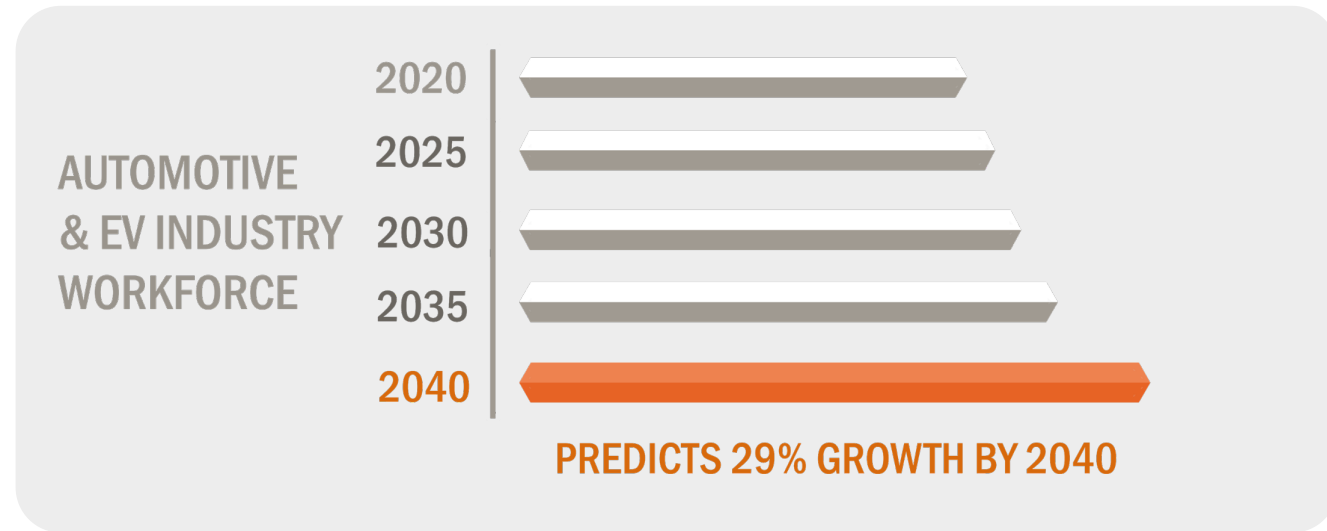
- ~180 battery manufacturing jobs per GWh per year:
 - ~140 jobs/GWh/year for electrode and cell
 - ~40 jobs/GWh/year for module and pack
- By 2040 ~35,000 new jobs in battery manufacturing plants
- A further ~65,000 in the supply chain
- 50% of battery manufacturing workforce are production staff:

Job type	Qualification level
Material handling	L2
Machine loading	L2
Machine unloading	L2
Module assembly	L2
Pack assembly	L2
Logistics	L2/3

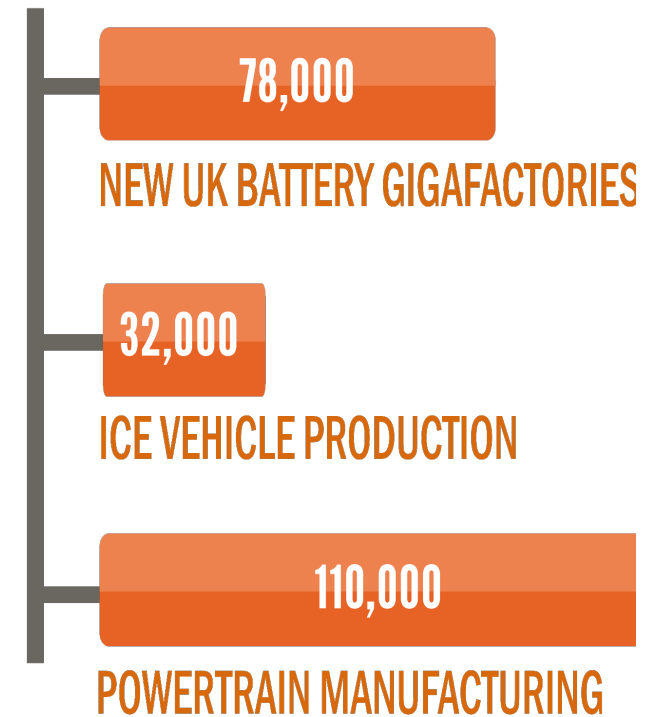
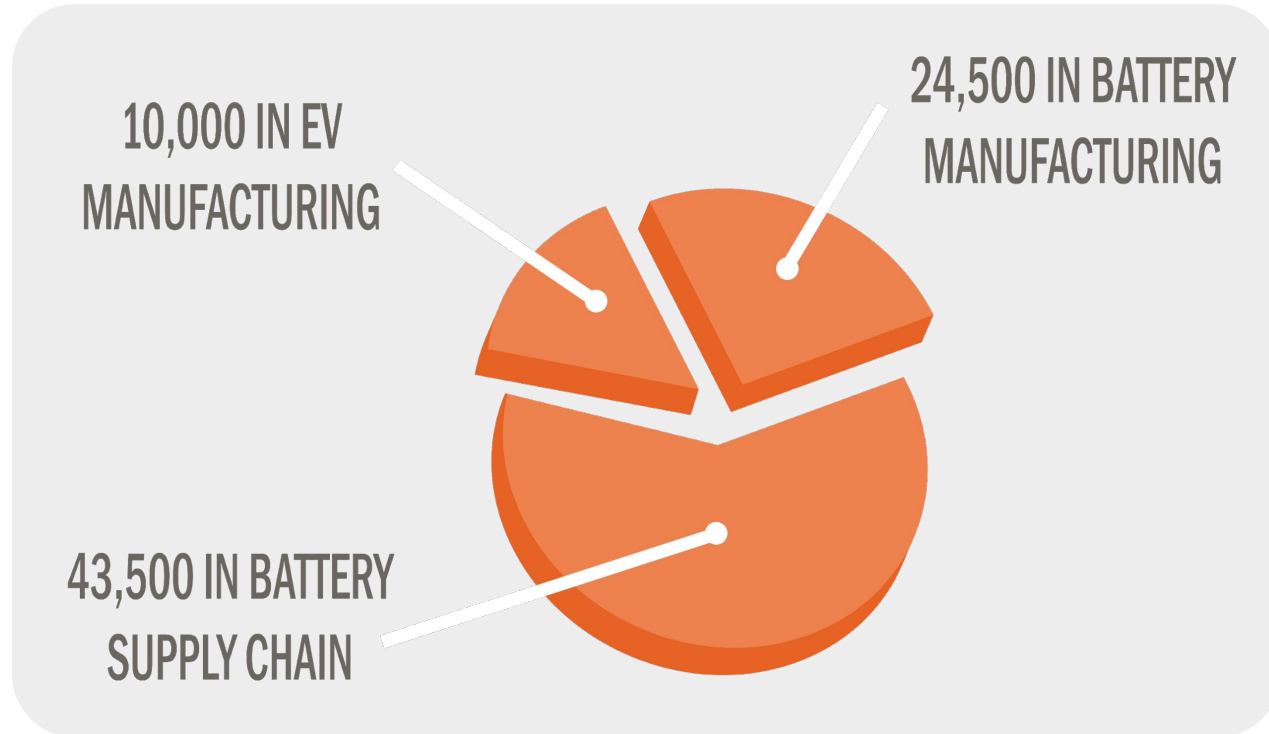


Potential Impact of Electrification on Manufacturing Jobs in the UK

**JOB
CREATION
WILL
OUTPACE
JOB LOSSES
IN THE UK**

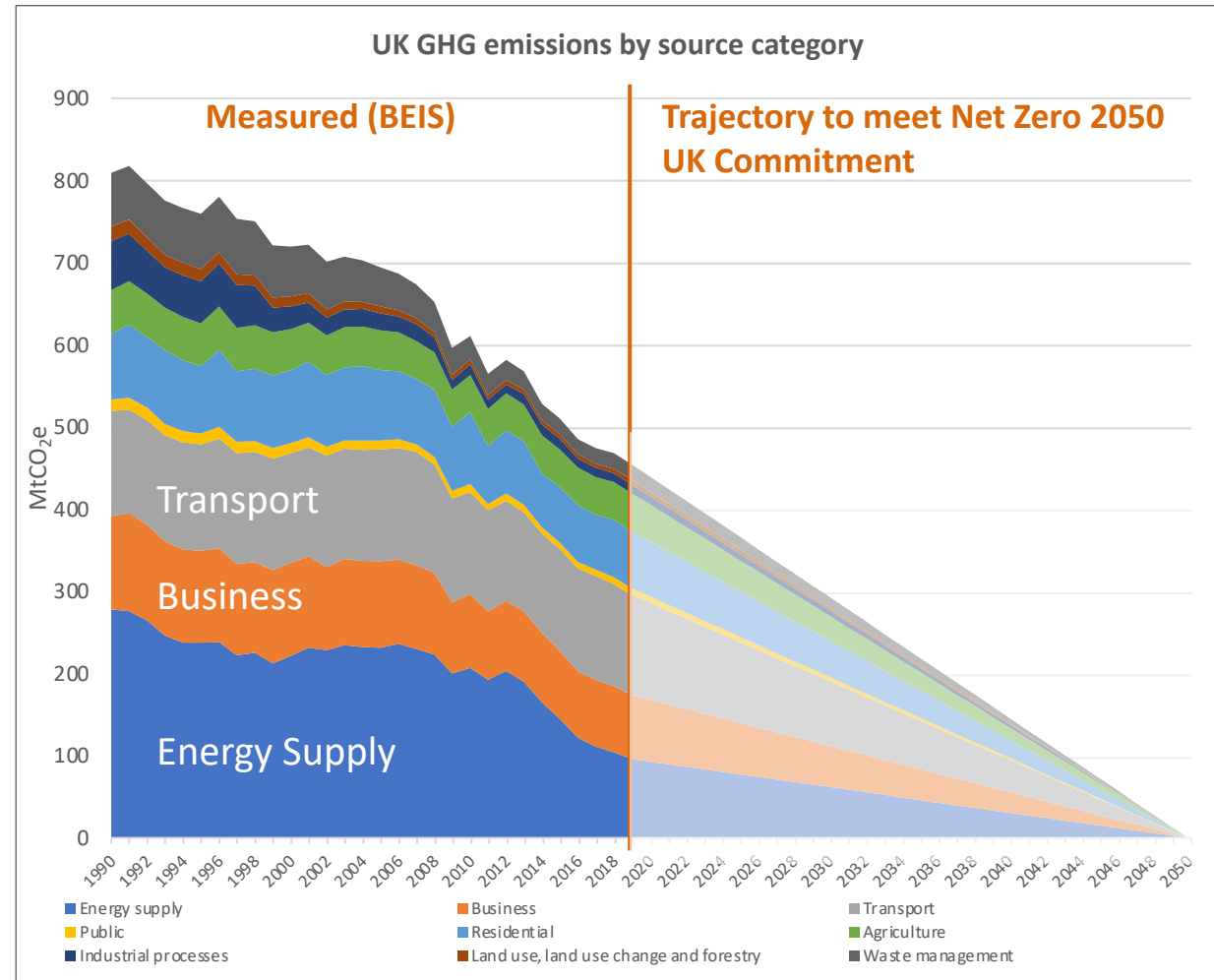


Breakdown



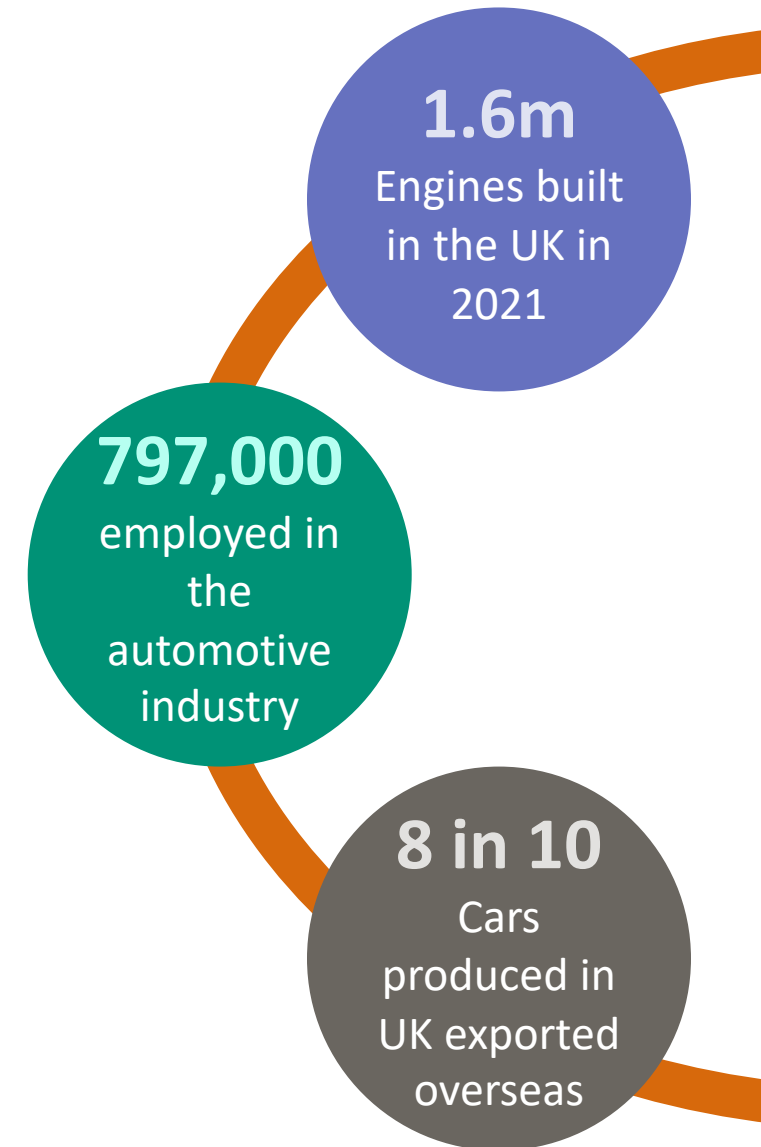
The Road to Net Zero

- Electrification and batteries are key to achieving the UK Government's goal of reaching net zero by 2050 and ending the sale of new petrol and diesel cars by 2030
- The UK govt is now investing £6bn across infrastructure, manufacturing and R&D for electrification



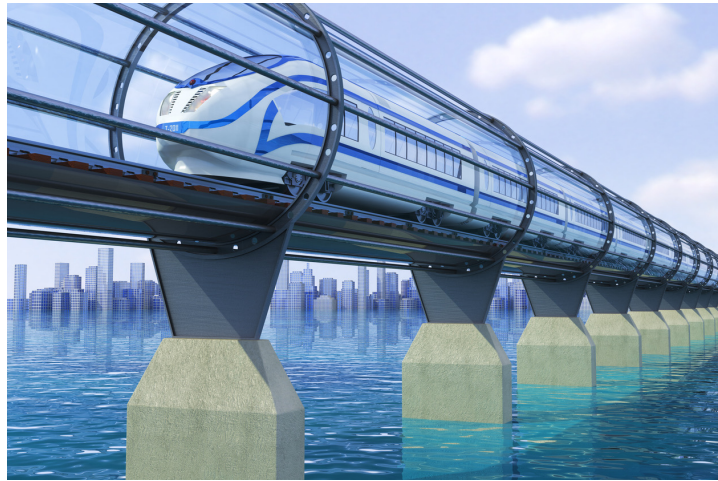
The UK Automotive Industry

- The UK is strong in vehicle and niche vehicle development and manufacture
 - 156,400 people employed directly in manufacturing
 - 797,300 across the wider automotive industry
- Key Facts
 - Vital part of the UK economy worth more than £60.2 billion turnover, adding £11.9 billion value to the UK economy.
 - Sector accounts for 11% of total UK export of goods, worth £42.4 billion, and invests £2.9 billion each year in automotive R&D.
 - Over 859,000 cars , 72,913 commercial vehicles and 1.6 million engines were built in the UK in 2021.
 - Eight out of 10 cars produced in the UK are exported overseas to 140 different markets worldwide



SMMT Motor Industry Facts 2022

Batteries for Decarbonisation



Industries with transferrable skills

Allied industries



Electrode

Electronics



Cell assembly

Data analysis



FA&T

Assembly line



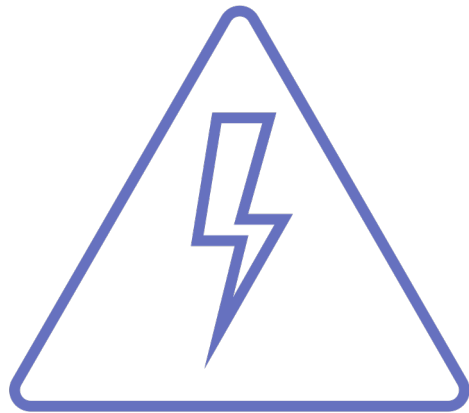
Module
& pack

How are we going to deliver these skills

- State of the art training on state of the art machinery
- Focus on delivery of skills as processes in four steps:
 - Classroom session
 - Observation of trained individual
 - Co-working with trained individual
 - Independent working while being observed



What is the Skills Gap



**Hazardous
voltage**



HSE



Quality



Engineering

What is the UK doing to address the skills gap?



Bridging the Gap from R&D to Mass Production

UKBIC scope

	Gramme Scale			Kilogramme Scale			Tonne Scale			Giga Scale	
	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9	Volume, TRL, MRL	
Technology Readiness	Principles & Research	Explore Applications	Analytical Experiments	Validation & Requirements	Design & Performance	Model & Prototype	Performance & Testing	Test & Demonstrate	Real World & Launch		
Research & Development						Industrial Engineering			Commercialisation		
Manufacturing Readiness	MRL 1	MRL 2	MRL 3	MRL 4	MRL 5	MRL 6	MRL 7	MRL 8	MRL 9	MRL 10	
	Implication & Materials	Identify Processes	Proof of Concept	Identify Technology & Test	Prototype Materials, Tools & Skills	Processes & Detailed Costs	Pilot Line & Materials	Process Maturity Demonstration	Manufacturing Processes Proven	Production Ready	
	Material Solution Analysis				Technology Development		Engineering & Manufacturing Development		Production & Deployment	Operation & Support	

- ### UKBIC Use Cases:
- ‘Make to print’ to enable investment
 - Prototyping at scale
 - Knowledge Transfer & Skills Development
 - Collaborative R&D
 - Consultancy and Advisory Support



What is UKBIC doing – and what could we do?

Introduction to...

- Electrode
- Cell assembly
- FA&T
- Module & pack

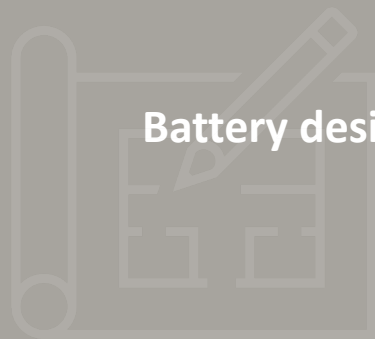


Hazardous voltage Level 1 - 4

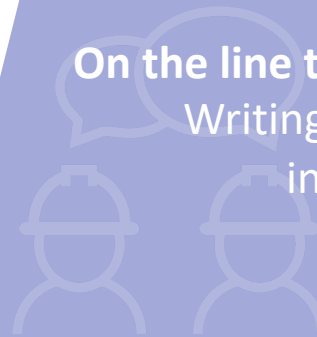


Bespoke What do you need?

Battery design for sustainability



On the line training for operators Writing standard work instructions






UKBIC

 UKBIC

 @UK_BIC

 sales@ukbic.co.uk
training@ukbic.co.uk

 www.ukbic.co.uk



Andrew Britton
Business Development Manager



Jonty Deeley-Williamson
Head of L&D