

Australia-UK Collaboration - Opening remarks and UK Battery landscape

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Faraday Battery Challenge

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Delivered by
Innovate UK



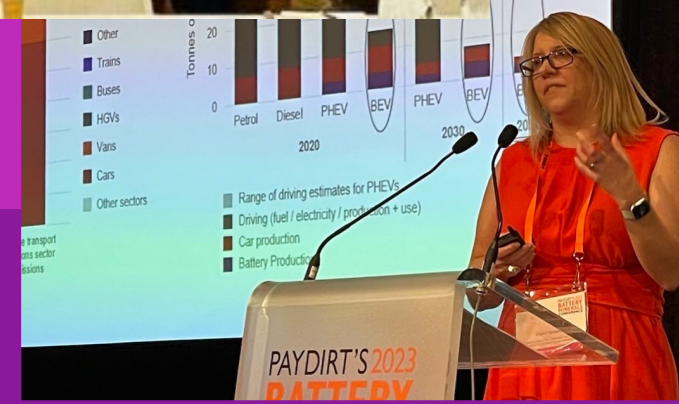
THE FARADAY
INSTITUTION



UK BATTERY
INDUSTRIALISATION
CENTRE



Innovate UK



Global Expert Mission Report Australia

Critical Materials for Electrification

- Help determine how Innovate UK can best support UK businesses more effectively and efficiently when considering innovation partnerships with Australia.
- Review technology and infrastructure gaps in both countries with a focus on critical material processing infrastructure, supply chain and manufacturing processes, business models and circular economy.
- Provide insights into where there are synergies between the countries and determine whether there is an appetite for further collaboration.
- Capture key UK R&I and emerging market opportunities/challenges for developing innovative products and services when considering collaboration with Australia.





UK is Investing Heavily into Electrification

£610m

**Faraday Battery
Challenge ZEV**
battery development

£1.2bn

**Advanced Propulsion
Centre**

£80m

**Driving the Electric
Revolution**
PEMD supply chain

£3.5bn

OZEV funding across
R&D, infrastructure and
purchase grants

Up to
£1bn

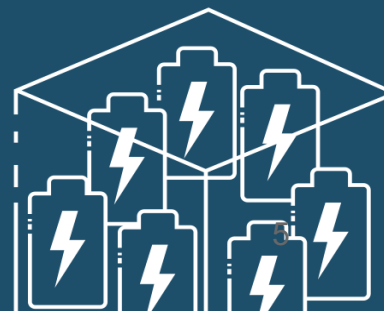
**Automotive
Transformation Fund**
Capital investment

£446m

**Connected Automated
Vehicle Technology**

The UK Government has invested over £6.8 billion in infrastructure, R&D, driving demand and supply-side support

- Creating the right regulatory environment including 2030 Phase Out, ZEV mandate, infrastructure provision
- Learning from industry to understand and develop supply chain plans for key areas
- Encourage innovation, efficiency and keep costs low through funding



UK battery demand growth - Automotive

Tata Group - Agratas

 Announced Capacity

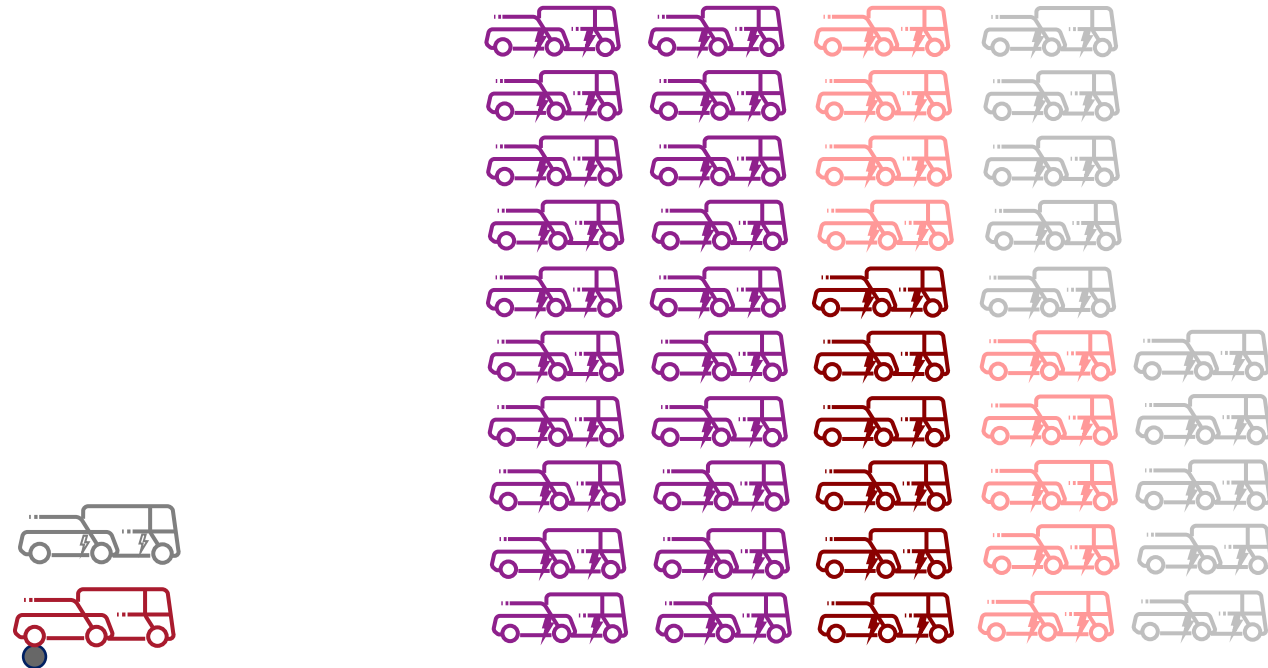
Nissan and Envision AESC

 Committed Capacity

 Potential Capacity

Unfulfilled demand

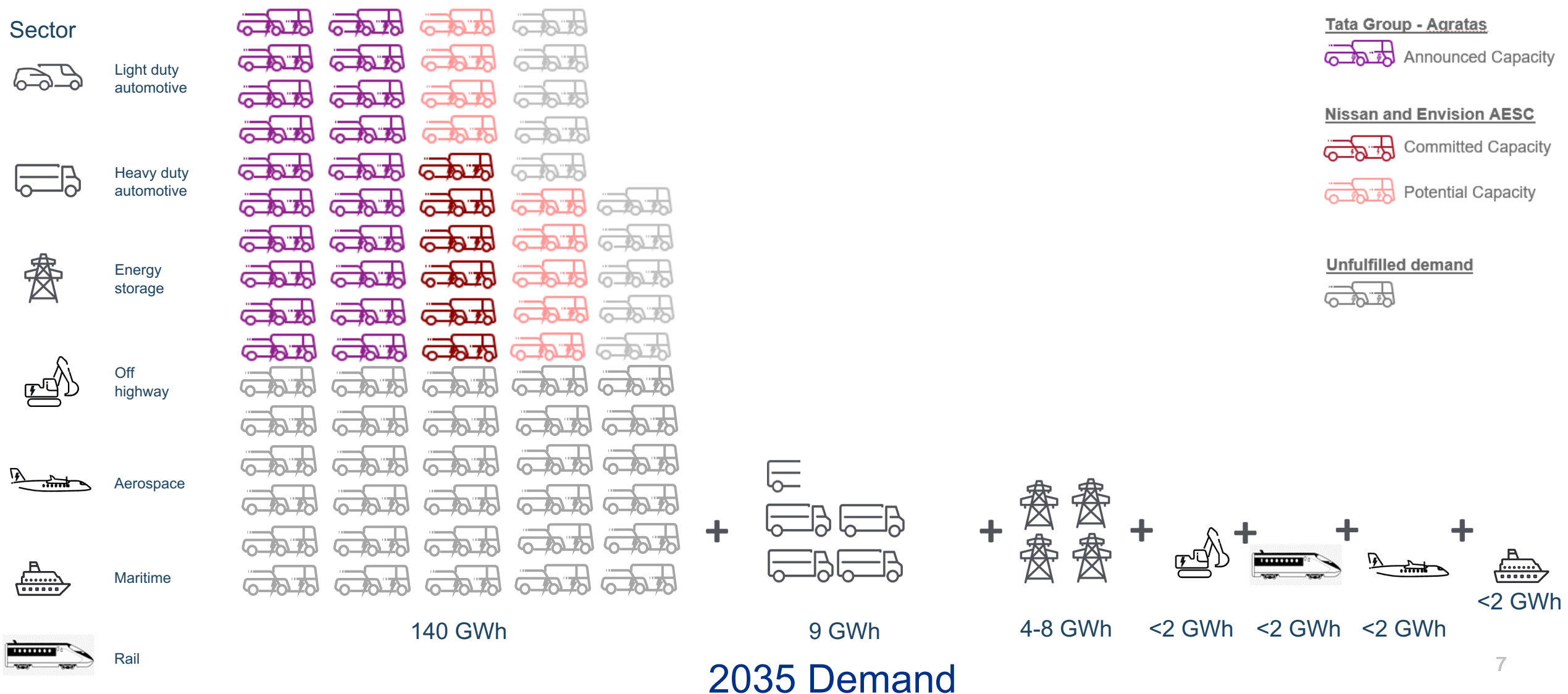




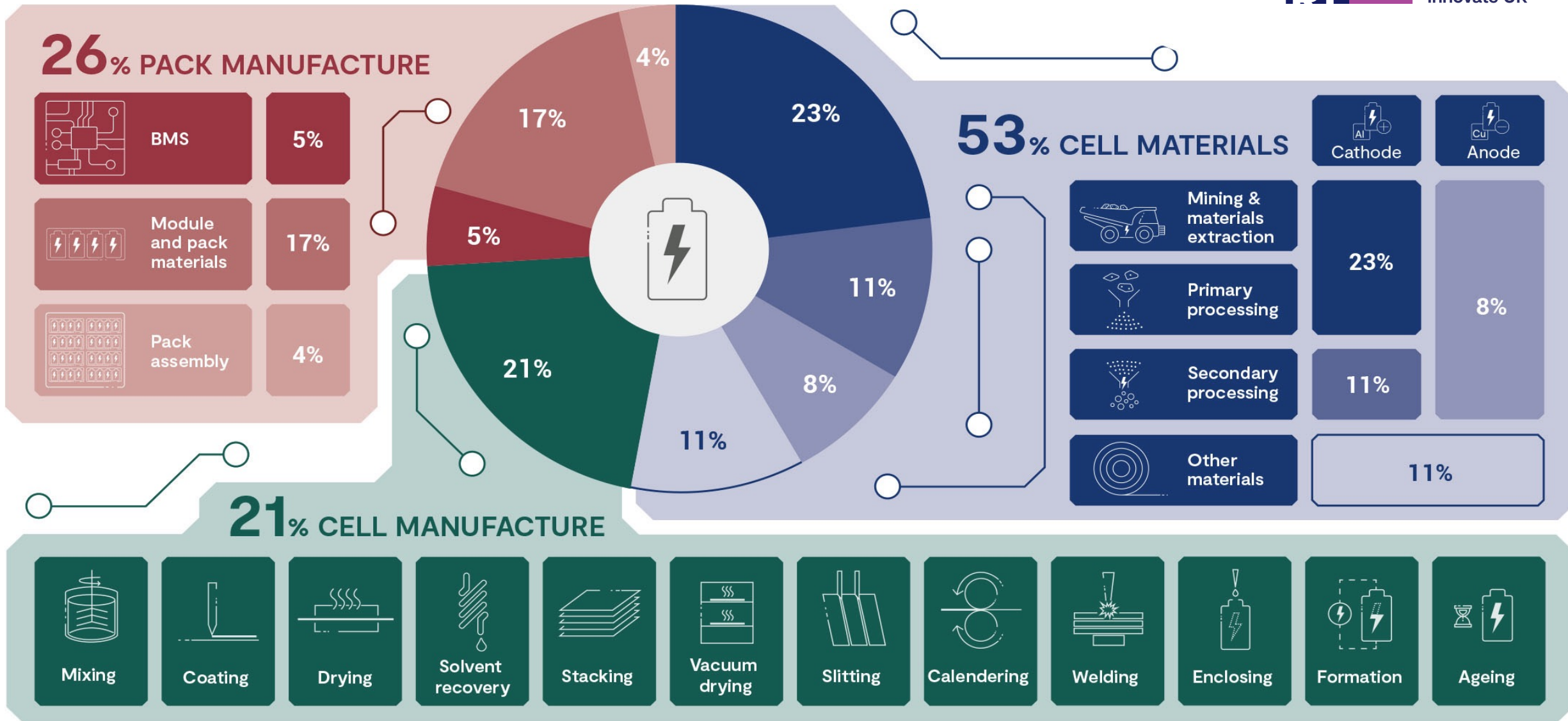
2022
~4GWh/yr demand
2GWh/yr production

2030
~100 GWh/yr demand forecast
13 GWh/yr production committed
41 GWh/yr potential

2035 Projected Annual Battery Demand



Battery Supply Chain Value

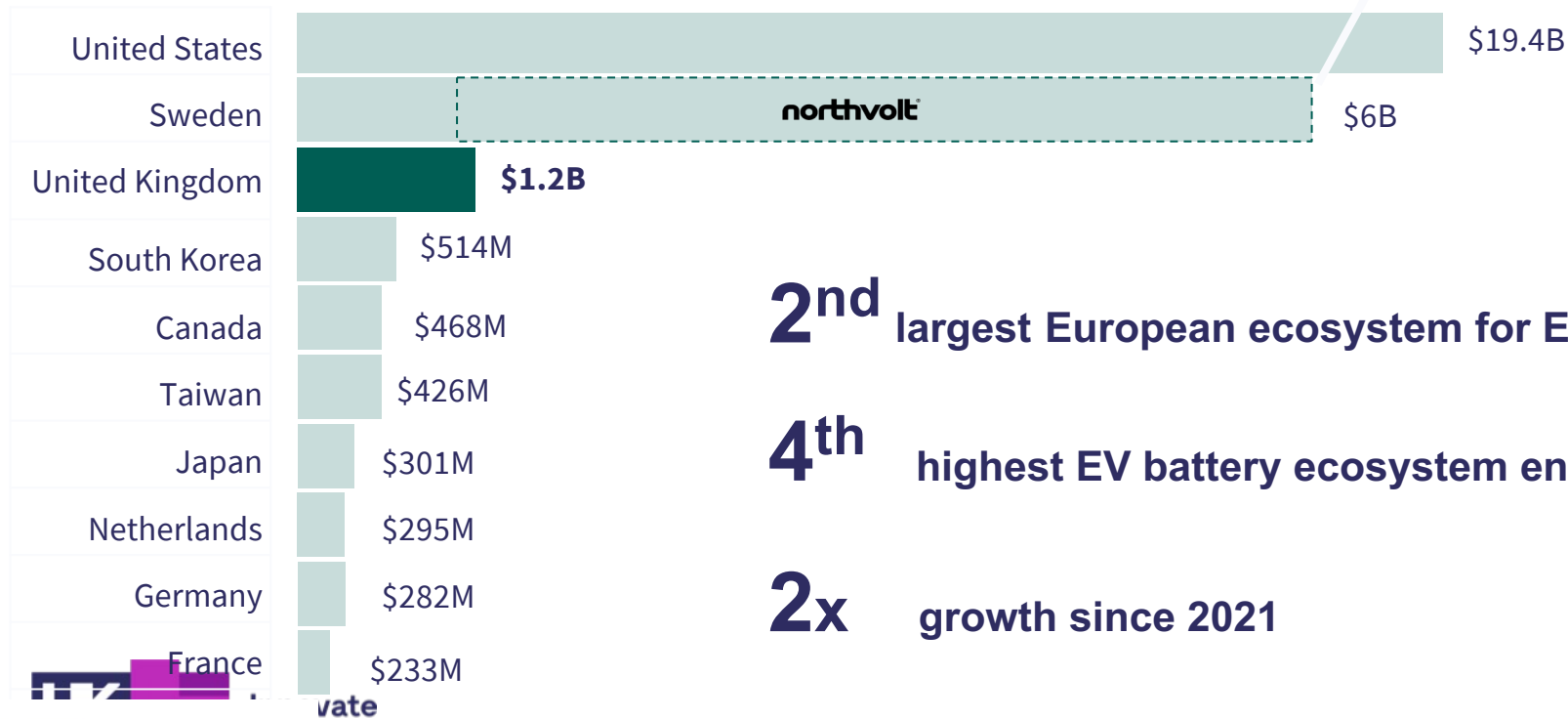


Growth Potential in the UK is Huge

UK battery start-ups growing and competing at an international level



VC investment in EV Battery startups*
Cumulated investment 2018-2022



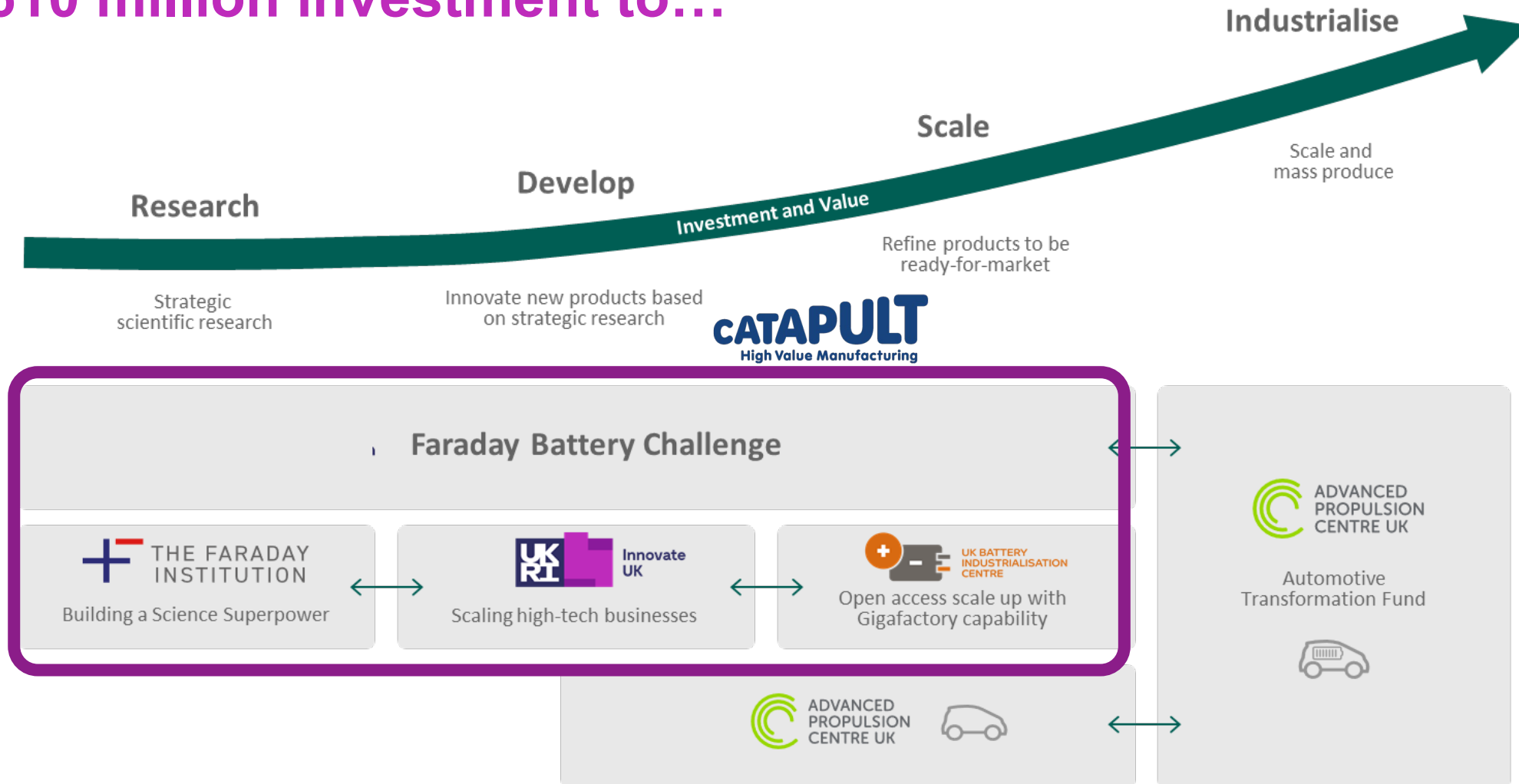
2nd largest European ecosystem for EV Battery investment since 2018

4th highest EV battery ecosystem enterprise value globally*

2x growth since 2021

The Faraday Battery Challenge:

A £610 million investment to...



Why the need for intervention?



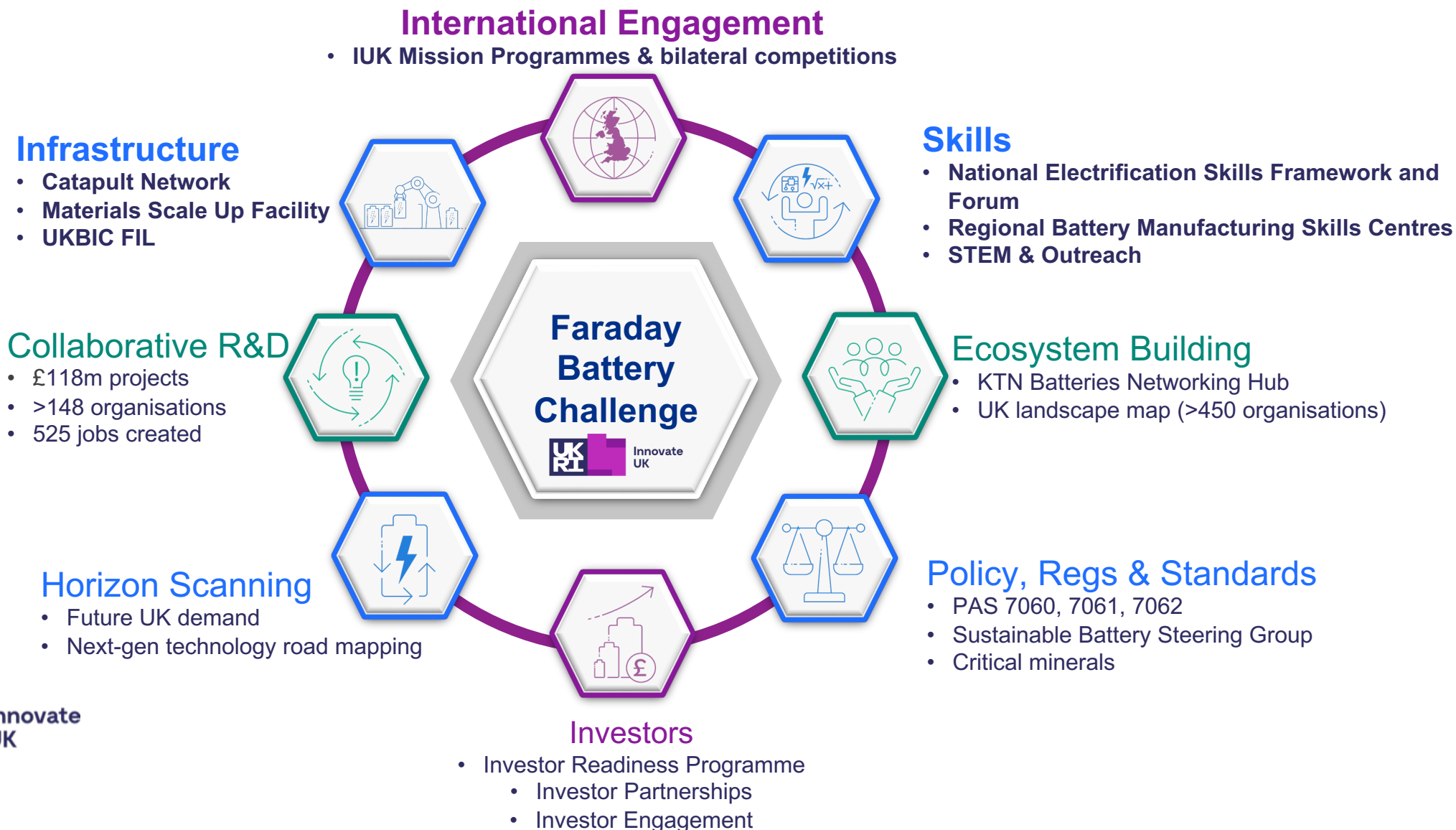
To ensure the UK automotive industry meets its net zero commitments **in the required timescale** by enabling development and scale-up of sustainable battery technologies.



To prosper from a just and fair transition to battery electrification across the nation through the **development of a world class intellectual and physical supply chain.**



Faraday Battery Challenge Activities: What else do we do?



Opportunities for collaboration

Policy

- Australia-UK Working Group on Critical Minerals
- UK-Australia Supply Chain Resilience Initiative
- Australia-UK Free Trade Agreement (FTA)

Supply chain - Across up, mid and downstream activities, for instance

- Opportunities to share early-stage research and scale-up facilities
- Supply chain transparency
- Australia-UK mid-stream development and collaboration
- Lower risk accelerated scale-up
- Bilateral R&D programme

But of course there are key challenges too!

- Barriers to markets
- Global competition
- Restrictive trade arrangements



UK Battery Strategy











DESIGN: Design and develop the batteries of the future that are smaller, lighter, and offer better capacity and value, building on UK world-leading research and innovation.

BUILD: Working closely with our domestic industry and international partners to secure a resilient UK battery manufacturing supply chain that supports our strong domestic growth and thriving export markets.

SUSTAIN: Enable the development of a thriving and sustainable sector, supported by proportionate regulations that drive investment across the supply chain, from raw materials through to end of life and recycling.



Bridging the Gap - Solution

	CPI		WMG		Bridge		FIL	UKBIC	Gigafactory
	Material Scale Up - MSU		Energy Innovation Centre - EIC1 & 2						
	Gram Scale		Kilogram Scale		10s Kilogram Scale		100s Kilogram Scale		Kilotonne Scale
Capacity	 1 litre	 10 litre	 50 litre	 250 litre	 >1000 litre				
Characteristic	<ul style="list-style-type: none"> Typically used during material development to mix small amount of hand-made materials. Basic research and found in many University applications. 	<ul style="list-style-type: none"> Typically used in applied research when the fundamentals designs, materials etc.. have been established, for small quantities of cells 10s-100. Key for validating designs at lower maturity, scale and cost. 	<ul style="list-style-type: none"> Needs when during early stage commercial product development. Capable of producing 100s-1000s of cells which are used to; validate a product, for test and certification, or to secure commercial funding. 	<ul style="list-style-type: none"> Automated material feed/dosing systems which improve accuracy at scale. Typically used during Scale-up development, for large quantities of cells >1000-100,000s 	<ul style="list-style-type: none"> Multiple tonne scale equipment are used to fulfil high volume demand. Processes are optimised for specific products or families, to offer high repeatability and quality. Typically used during high volume manufacturing, for large quantities of cells >10,000,000s 				
Cell Output	 Coin Cells	 10s-100 Cells	 1000s Cells	 10,000s Cells	 1M0+ Cells				

£12m Advanced Materials Battery Industrialisation Centre (AMBIC)

AMBIC will bridge the gap between laboratory research and commercial production for battery material synthesis and processing, as well as facilitating equipment and skills development.

Dual located at CPI's Sedgefield site in the North-East of England and WMG's facilities at the University of Warwick

Alongside UKBIC will enable "powder to pack" and "lab to factory" scale up support



National Electrification Skills Framework and Forum

The Faraday Battery Challenge (FBC) has awarded Coventry University £700k to lead the National Electrification Skills Framework and Forum in collaboration with Enginuity, Warwick Manufacturing Group (WMG) and the UK Battery Industrialisation Centre (UKBIC).

NESFF will:

- Identify UK manufacturing competitive advantage in all aspects of electrification by ensuring that the right skills are available when and where they are needed across sectors and nations
- Coordinate a national approach to the development of workforce in parallel to technology to address the net zero agenda
- Champion the need for electrification workforce development programmes across all skills levels
- Advocate the expansion of the talent pool to encourage greater inclusion and diversity

CU Management Services Limited
a wholly owned subsidiary of Coventry University



The Battery Workforce Training Initiative

The Faraday Battery Challenge (FBC) has awarded £2.5m to Newcastle University and University College Birmingham to support the UK's growing regional battery industries and to deliver innovative vocational and technical training that bolsters local workforces with enhanced skills, diversity and qualifications.

£1.2m The 'Digital Enhanced Battery Ubiquitous Training-West Midlands' (DEBUT-WM) project

University College Birmingham will lead a regional partnership that will deliver a training programme aimed at supporting the local workforce with skills development via a blend of traditional physical training alongside advanced immersive digital technologies such as augmented, virtual and mixed reality.

£1.3m National Battery Training and Skills Academy

Newcastle University will lead in supporting and engaging those in the North-east with education and skills initiatives, retraining schemes and battery degree apprenticeships.



Thank you

- **Join the KTN Cross Sector Battery Systems Innovation Network!**
 - www.ukbatteriesnetwork.org
 - Access resources such as: Cross Sector Targets, The Battery Gap Investment Report, Networking Hub, Battery Systems Landscape Map
 - Keep up to date with funding announcements!
- **Contact the Faraday Battery Challenge**
 - Faradaybatterychallenge@innovateuk.ukri.org

