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Innovate UK



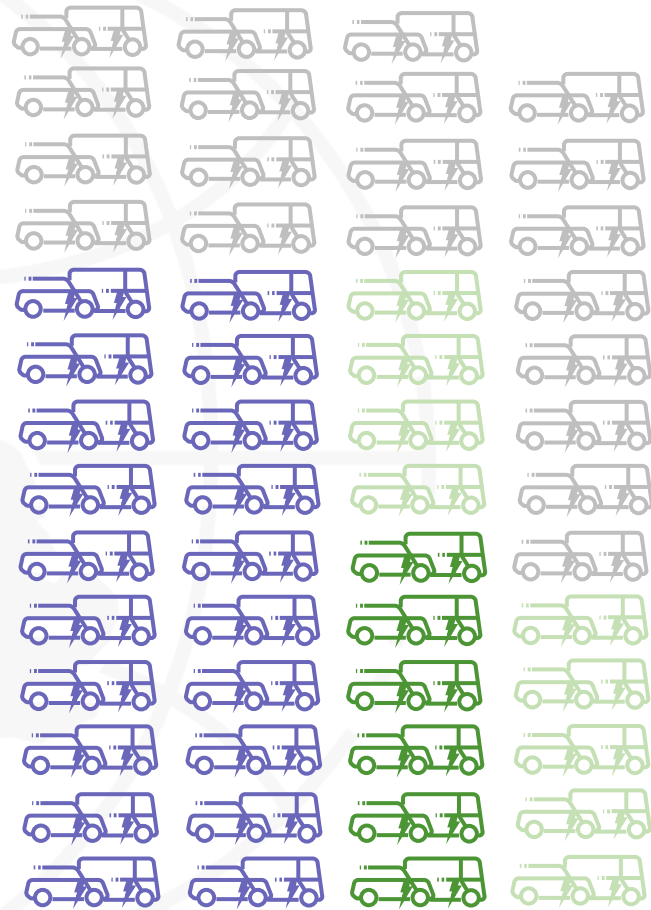
UK BATTERY
INDUSTRIALISATION
CENTRE

UK Battery Industry Overview









Thomas Bartlett
Deputy Director – Faraday Battery Challenge



November 2024

UK 2035 Projected Annual Battery Demand



110

	Light duty automotive		Aerospace
	Heavy duty automotive		Maritime
	Energy storage		Rail
	Off highway		Personal mobility

	Uncommitted Capacity
Agratas	
	Announced Capacity
Nissan and Envision AESC	
	Committed Capacity
	Potential Capacity



6 + 6 + 5 + 2 + 0.4 + 0.3 + 0.2

UK Production Demand (GWh)

EV Battery Industry Driving Forces



Emissions Legislation

- 2035 ICE ban
- ZEV Mandate



Localisation

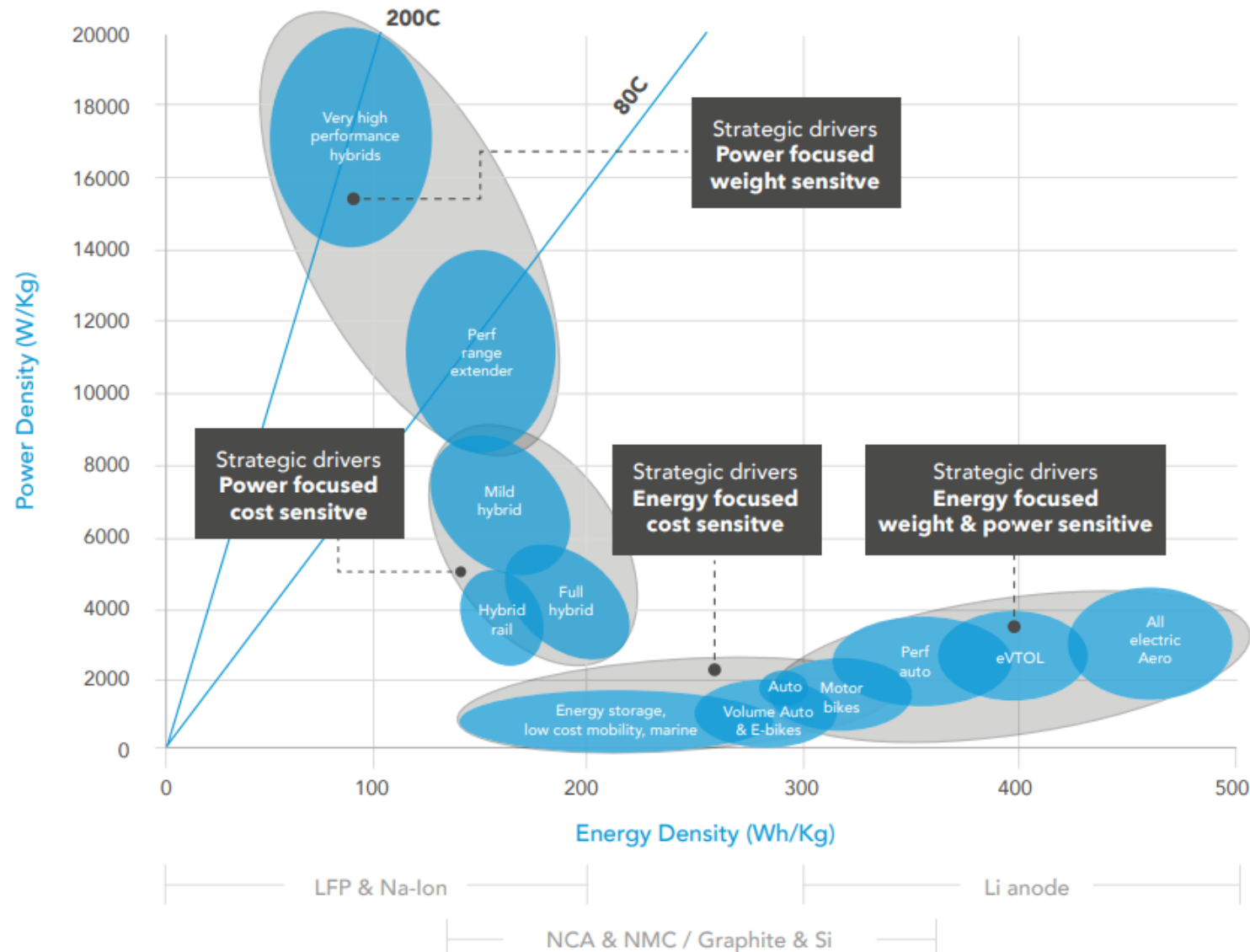
- TCA Rules of origin
- Battery regulations:
 - Carbon footprint



Innovation

- Competition & consumer expectation
- Battery regulations:
 - Carbon footprint
 - Recycled content
 - Recycling efficiency
 - Performance and durability
 - Digital battery passports

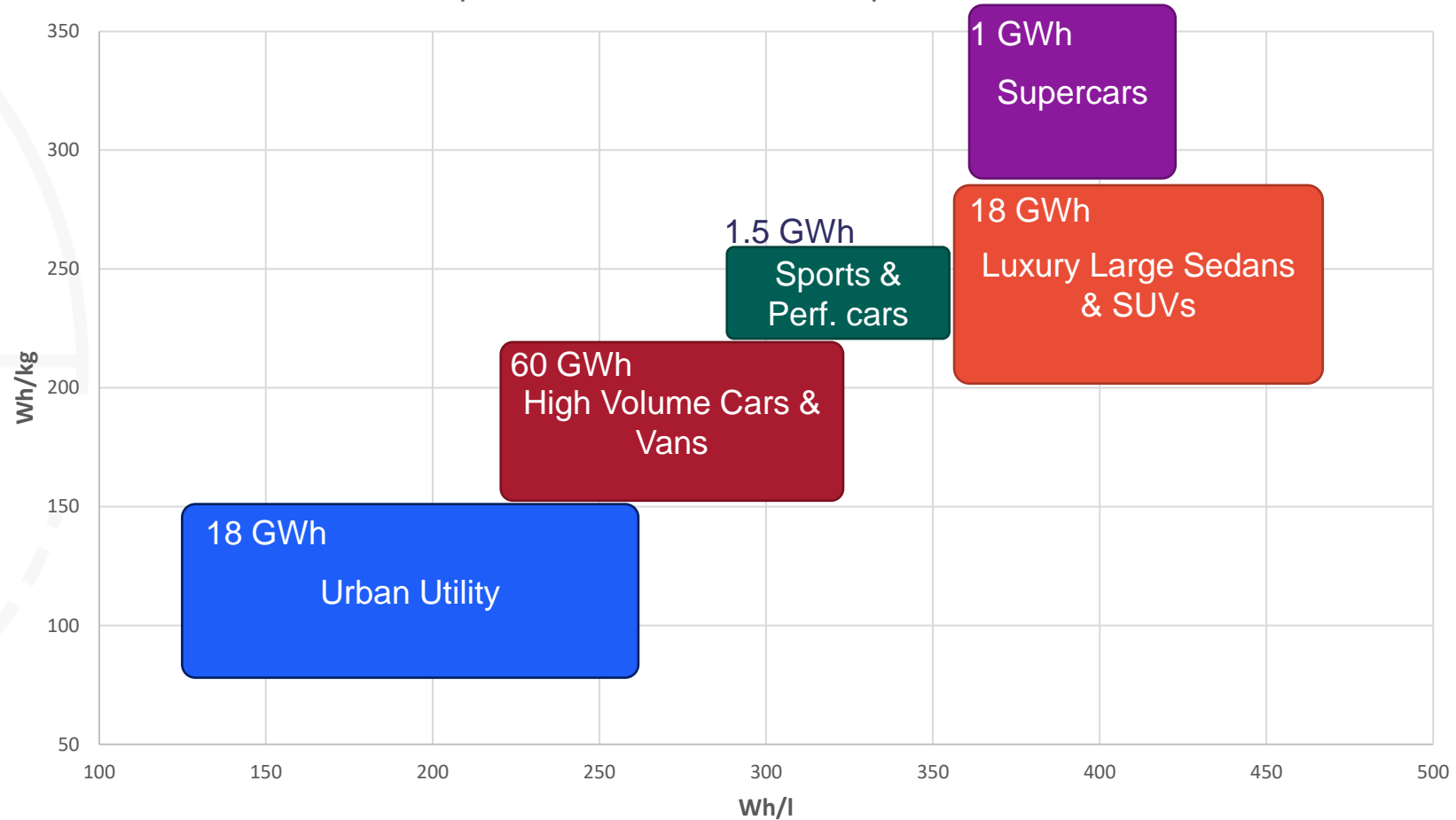
Battery technology is diverging to meet sector specific requirements



Seeing divergence even within Automotive

Circa. 90GWh annual production required by 2030

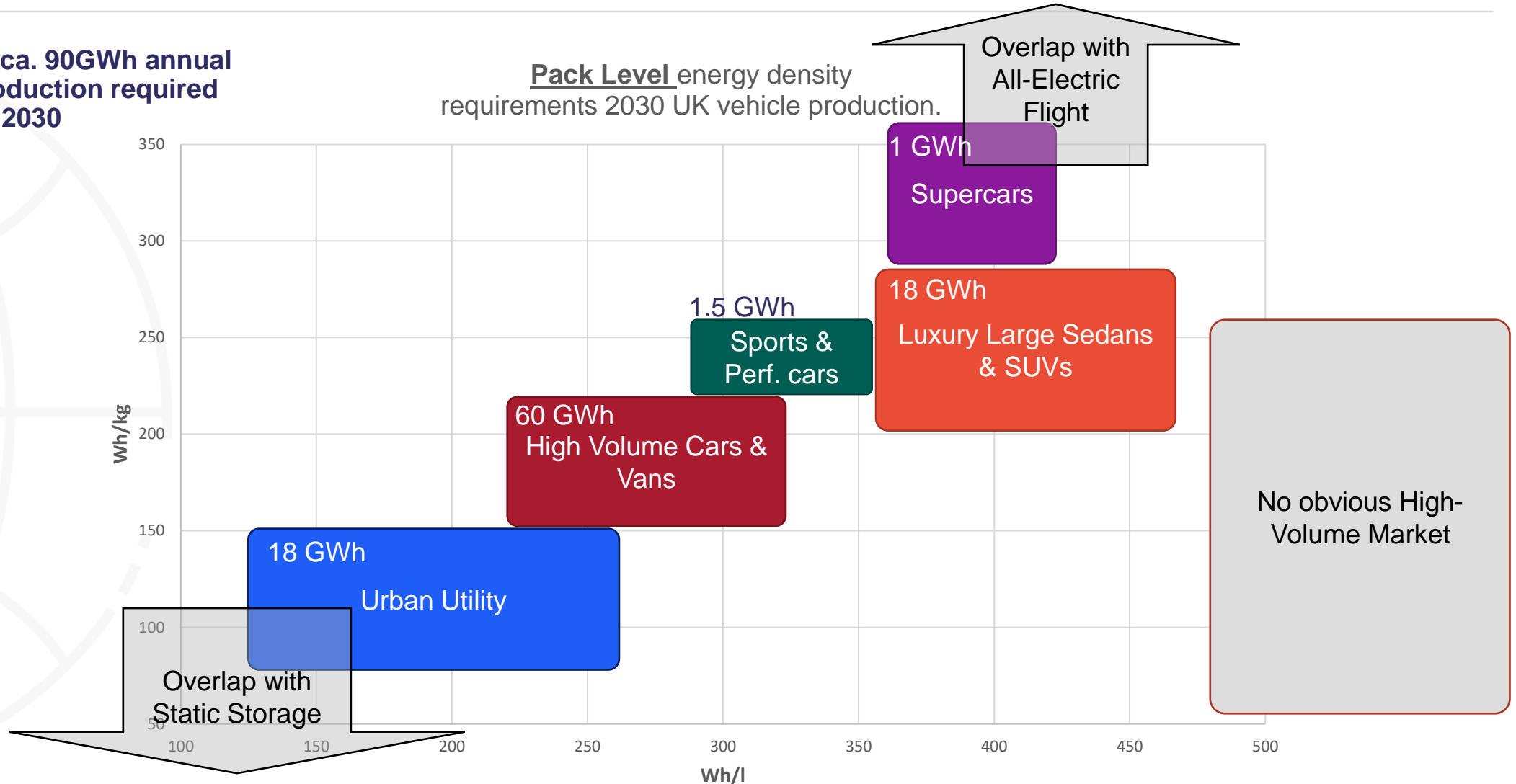
Pack Level energy density requirements 2030 UK vehicle production.



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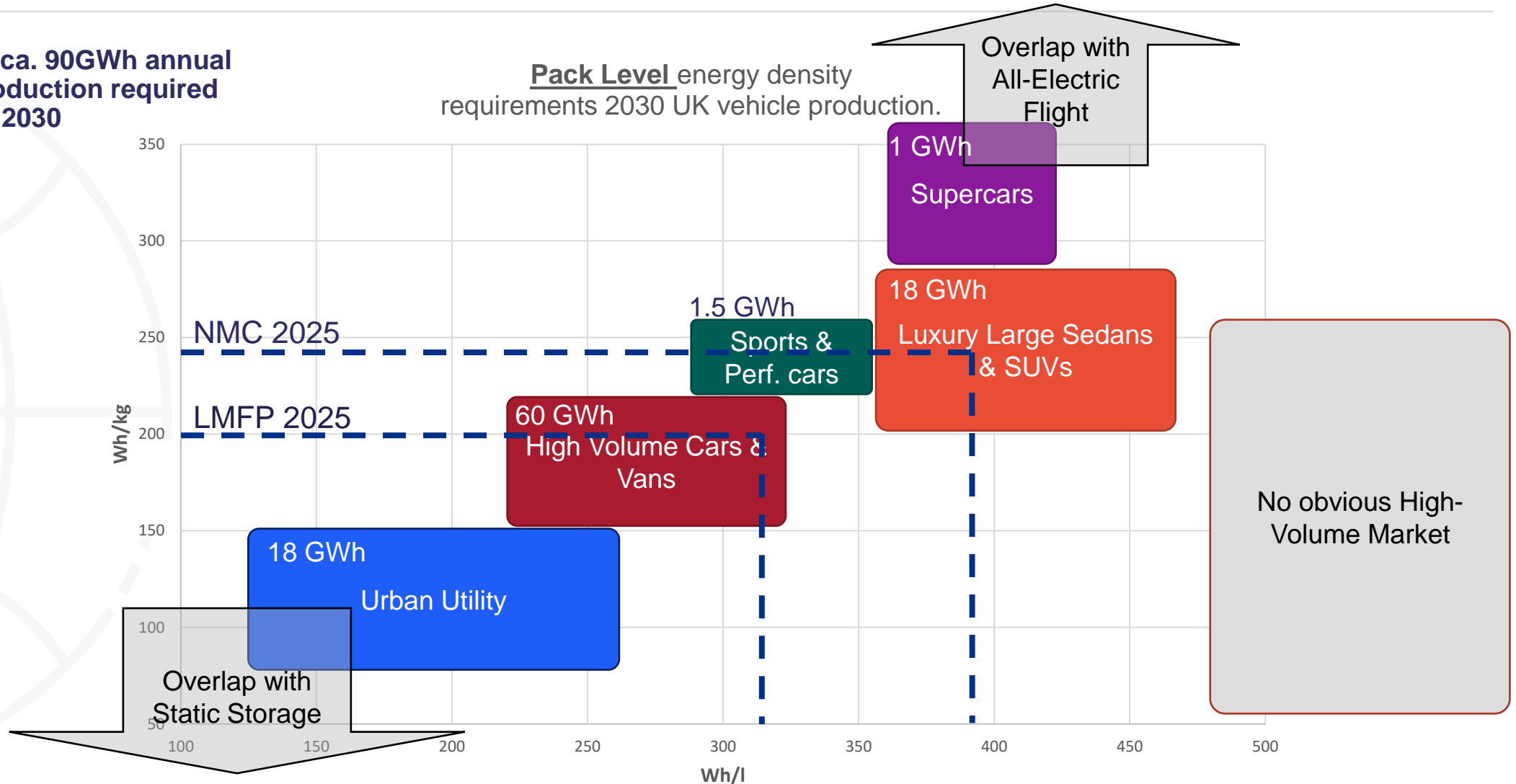
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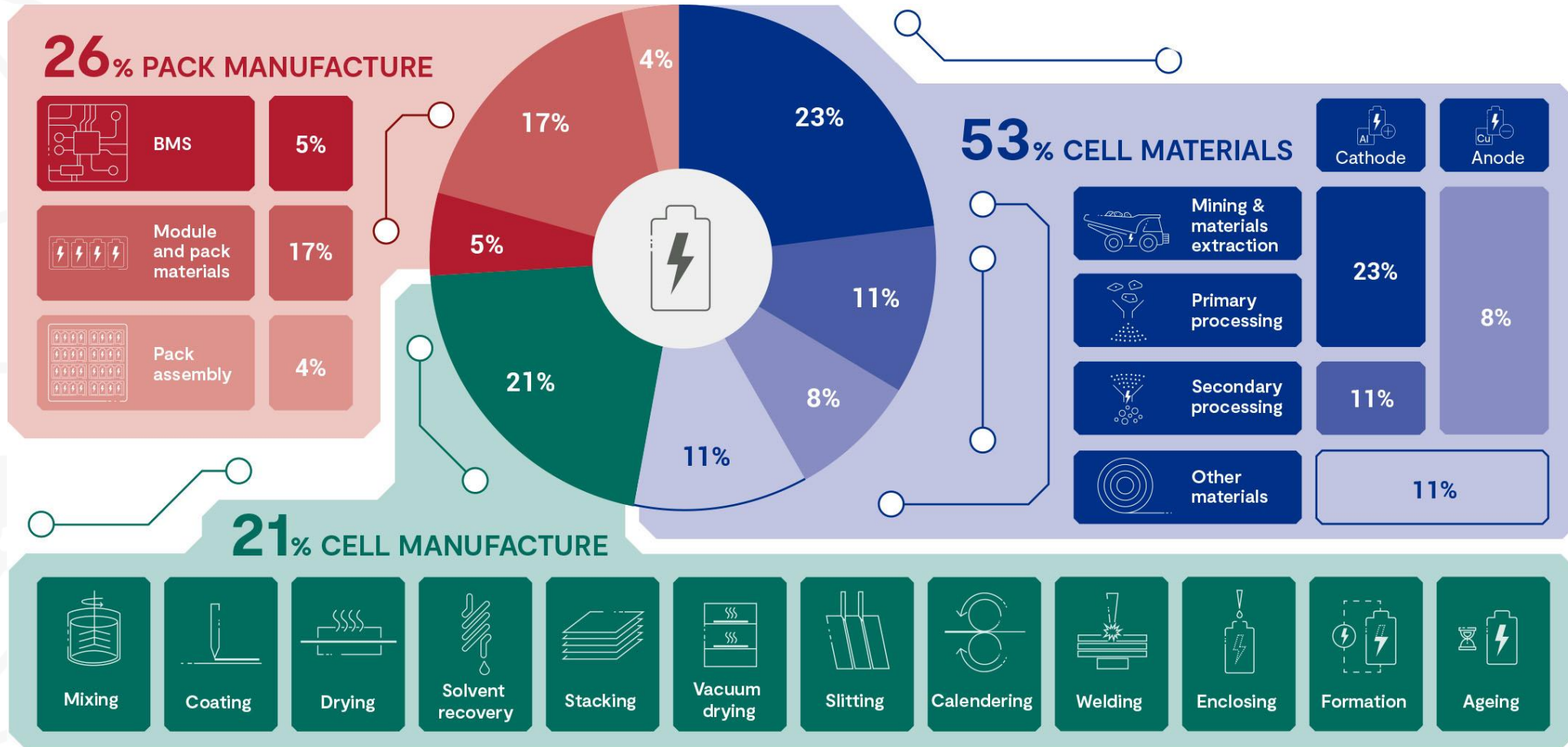
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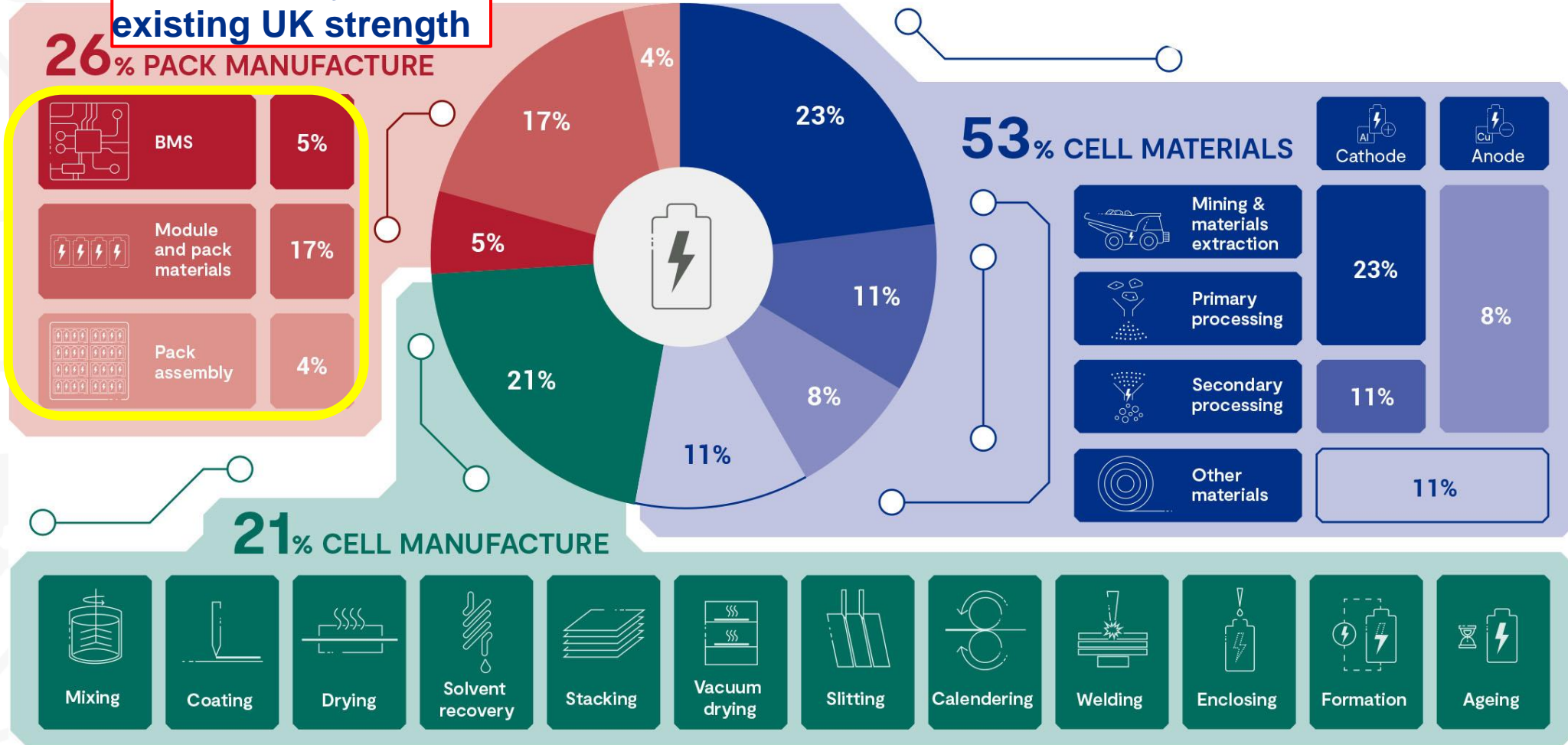


Where is the value for the UK battery industry?



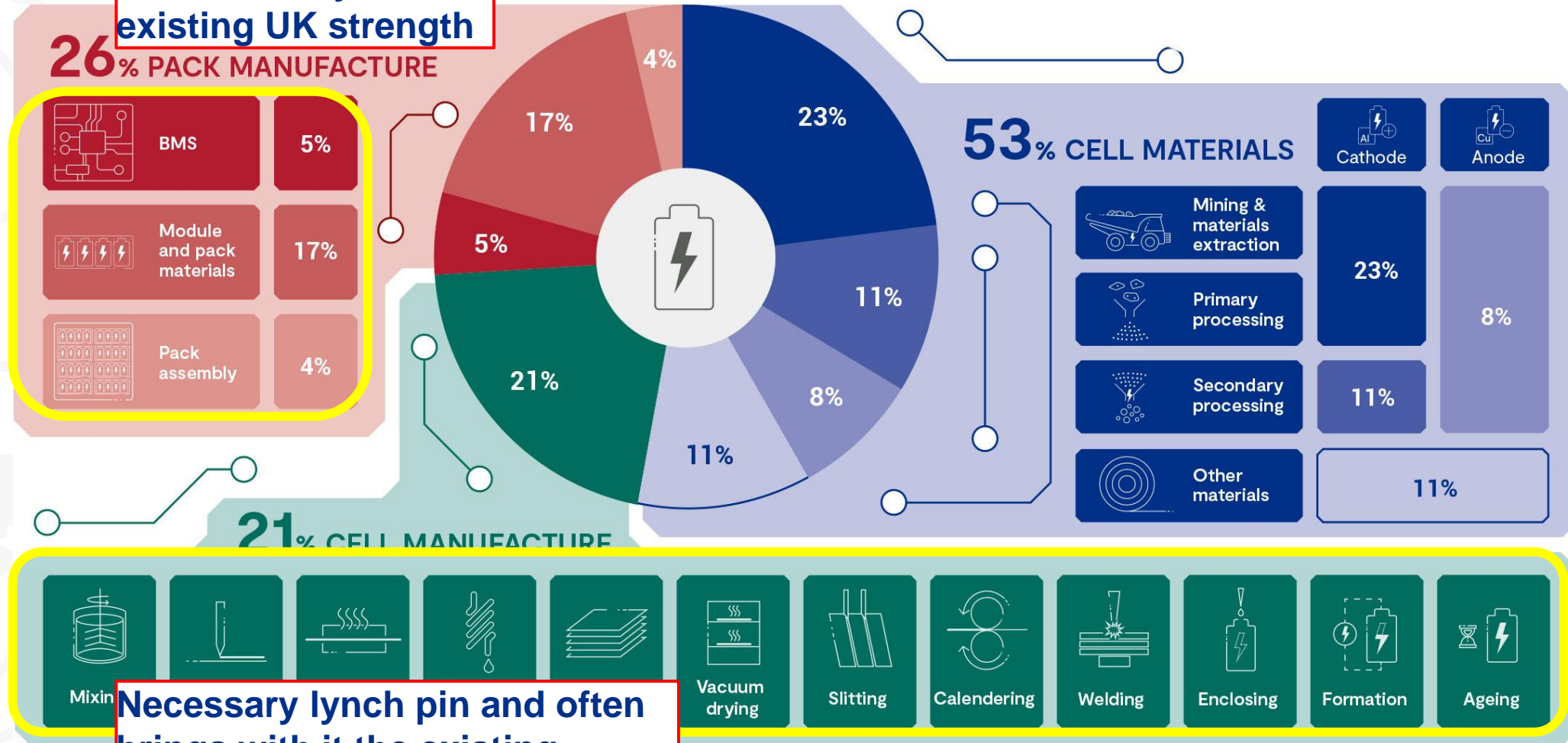
Where is the value for the UK battery industry?

Higher "value" than cell assembly + existing UK strength



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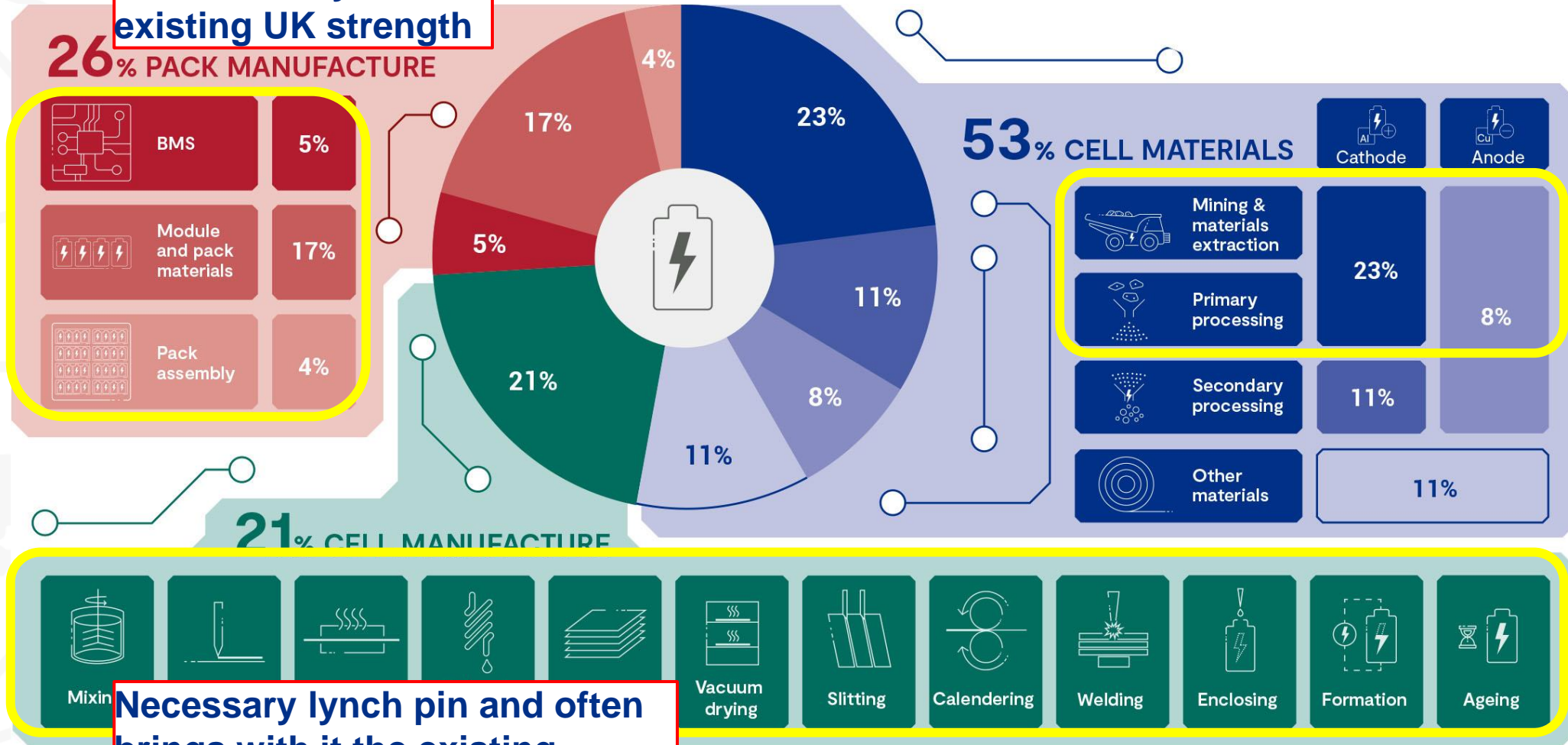
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Necessary lynch pin and often brings with it the existing upstream supply chain

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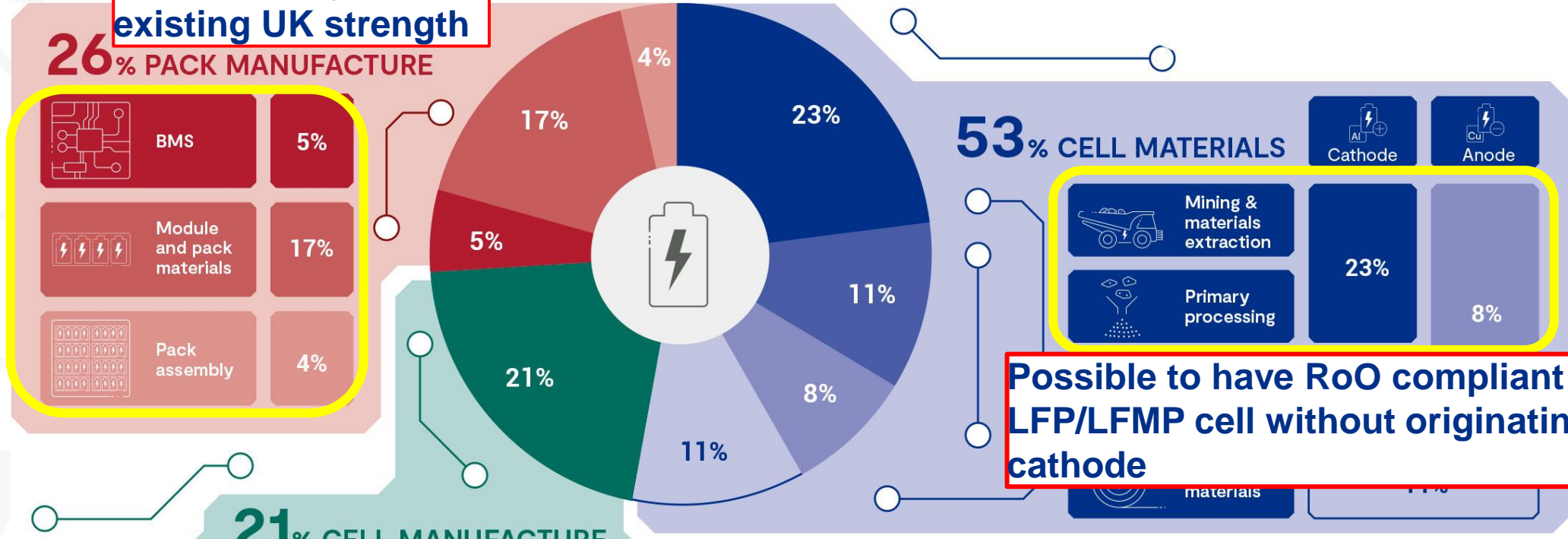
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Where is the value for the UK battery industry?

Higher "value" than cell assembly + existing UK strength

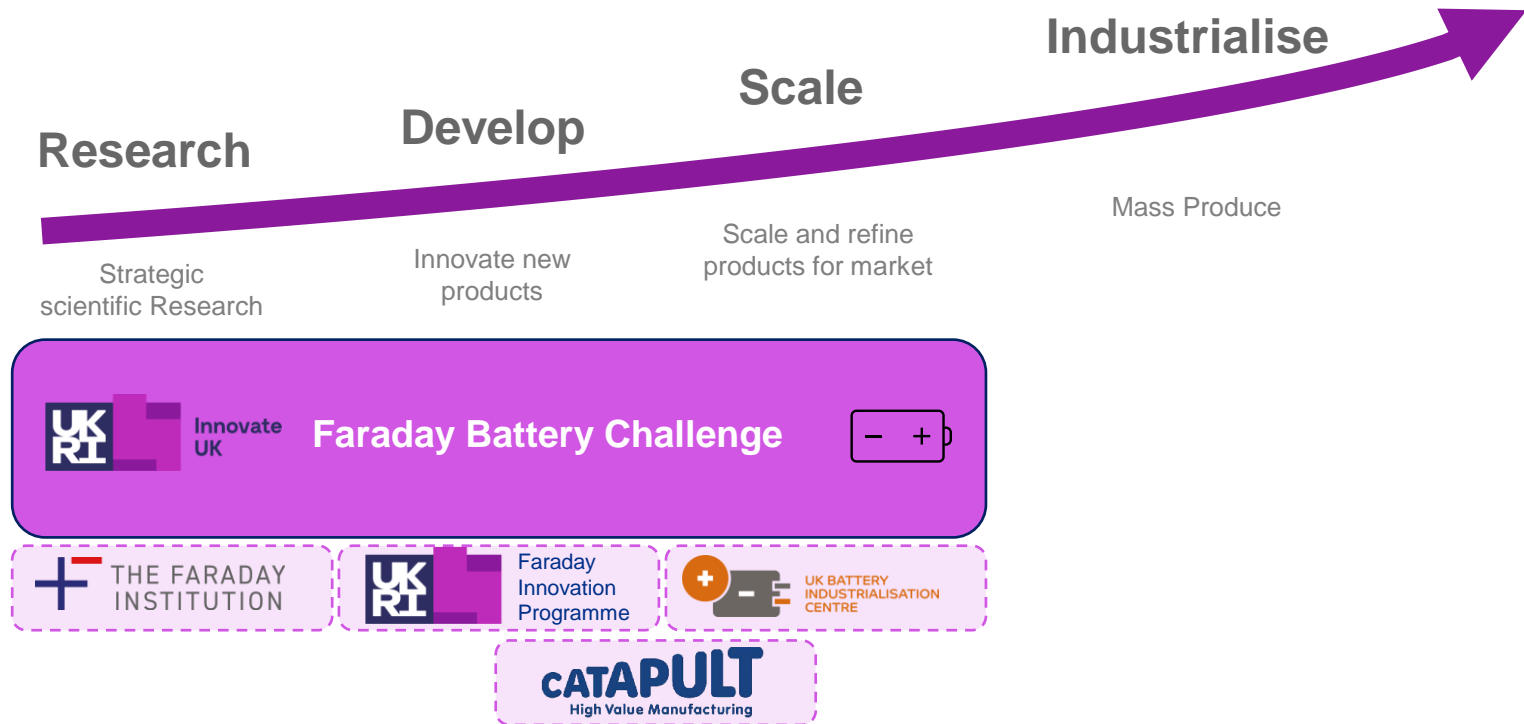


Possible to have RoO compliant LFP/LFMP cell without originating cathode

Necessary lynch pin and often brings with it the existing upstream supply chain

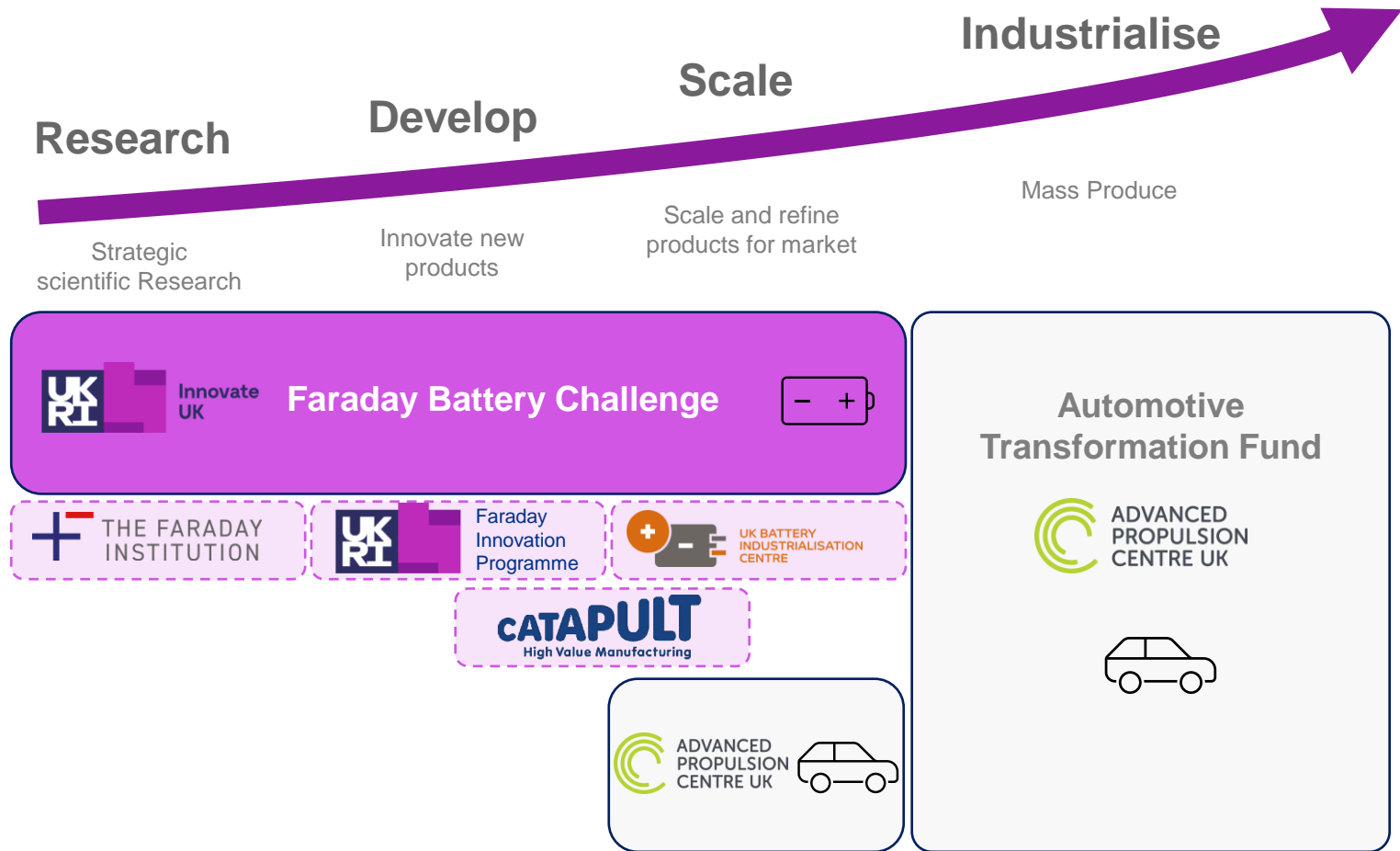
Faraday Battery Challenge

A £610 million investment to grow a world class UK battery industry



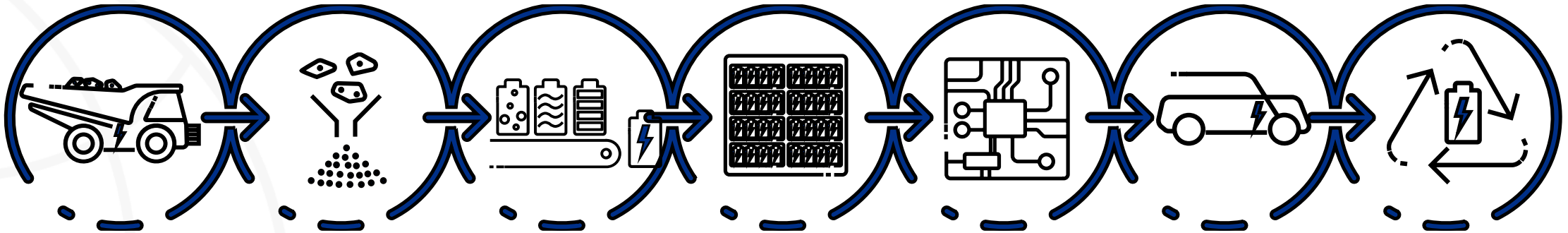
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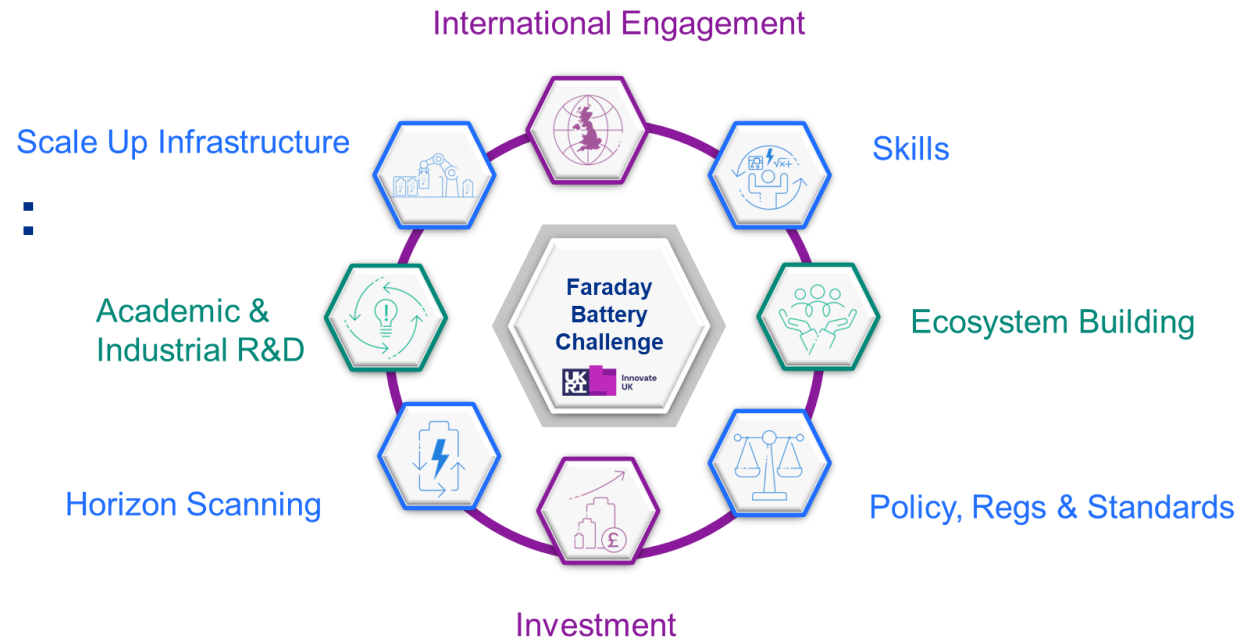


What do we support?

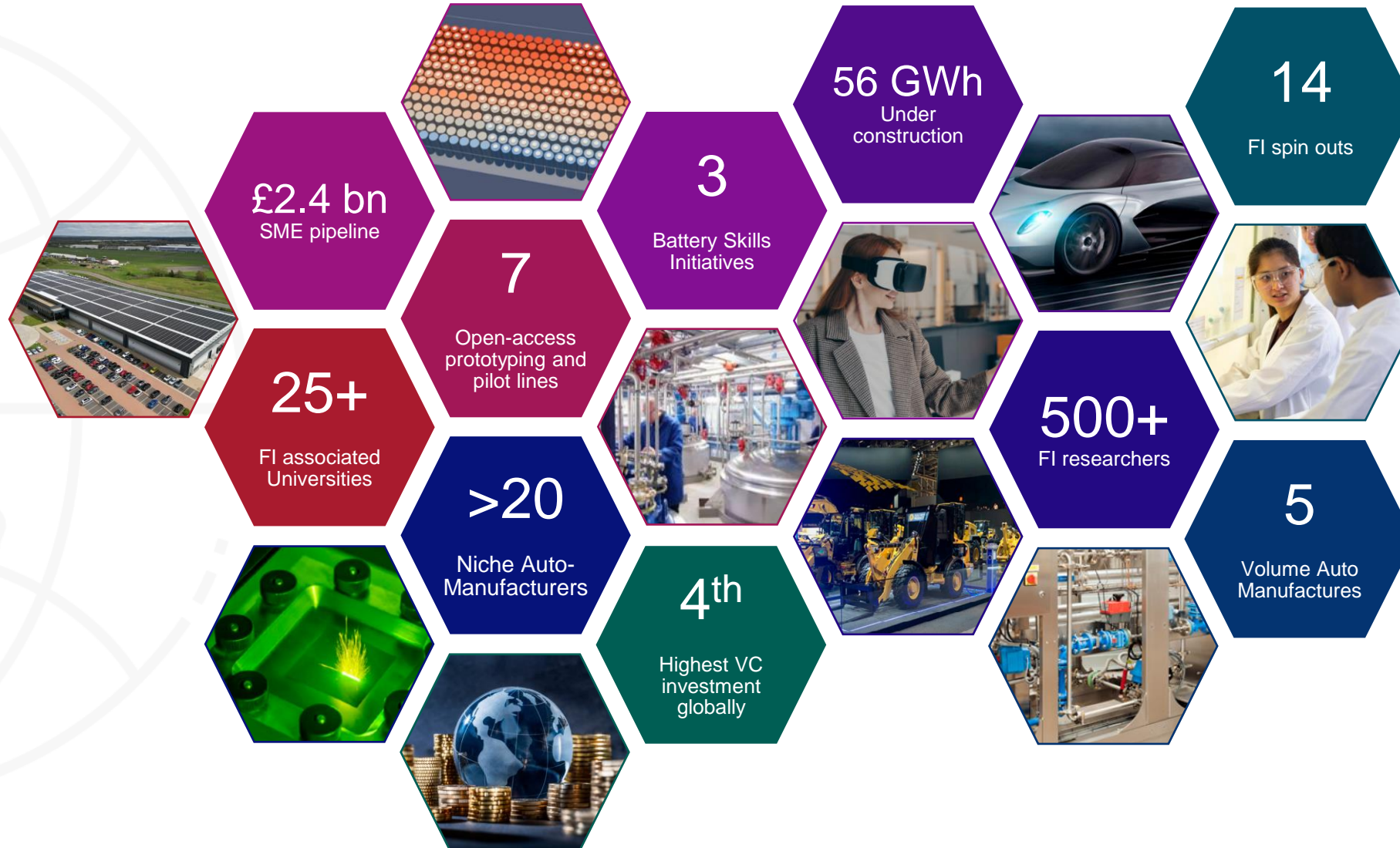
Battery technologies from mining to recycling:



Mission Approach :



UK Battery Ecosystem



The West Midlands Battery Ecosystem

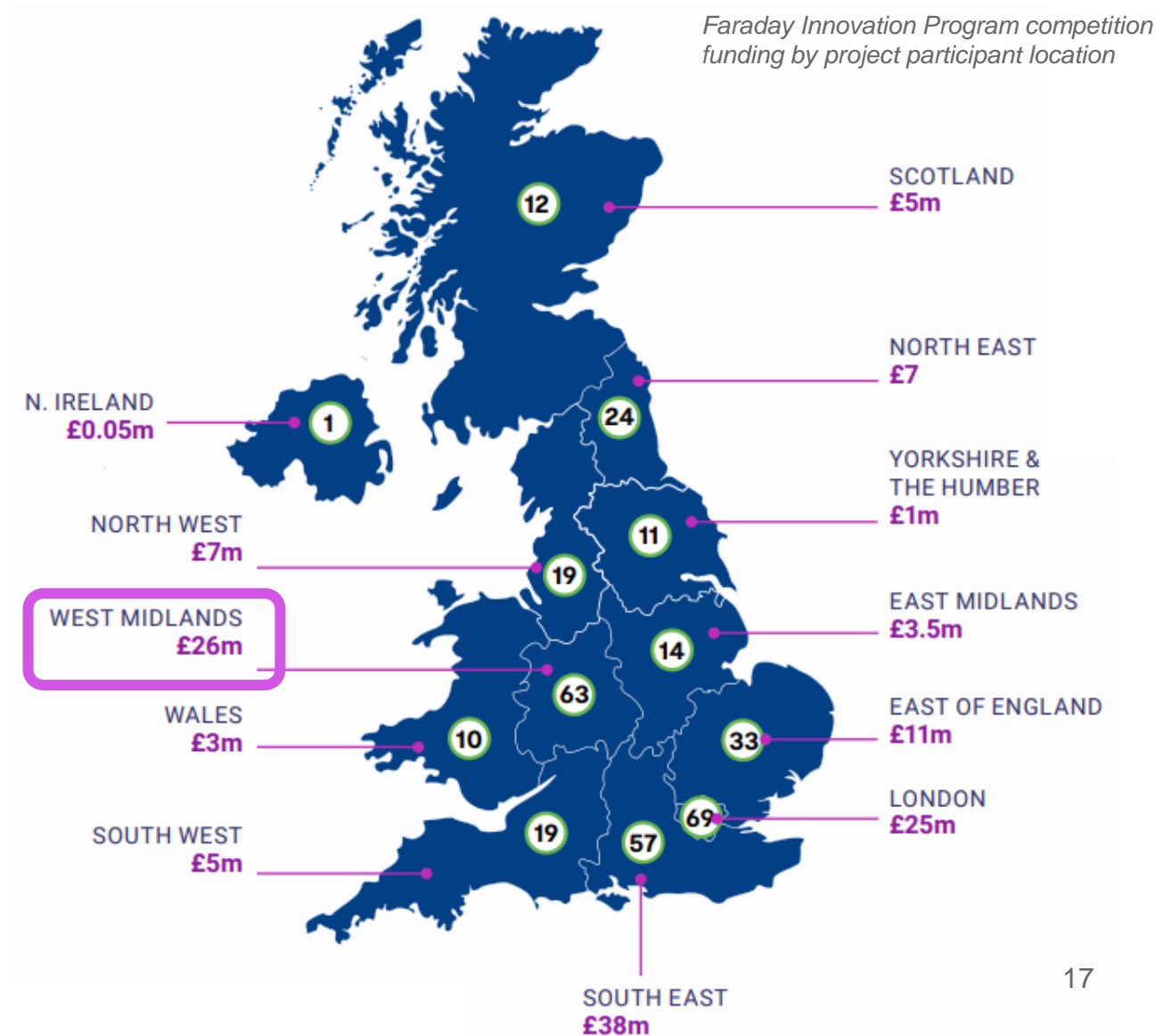
2nd highest region for competitive innovation funding through the Faraday Innovation Program

Universities leading on 2 major Faraday Institution Projects

3 Open-access facilities supporting cell development from early-stage prototyping to industrial scale

1 National skills network for battery and PEMD skills (ESN)

1 Battery Manufacturing Skills Delivery Centre





DEBUT-WM : A leading battery skills initiative by FBC



Delivering level 2 and 3 battery manufacturing training targeted at assembly, maintenance, logistics and production engineers

Supported by:

- **Jaguar Land Rover**
- **Delta Cosworth**
- **GBSioT**
- **WMCA**
- **Microsoft**
- **Zytek**



**UNIVERSITY
COLLEGE
BIRMINGHAM**



WMG
THE UNIVERSITY OF WARWICK

Growing Scale-up Capability across the UK

Coming 2025



UKBIC

£74m to enhance capabilities at UKBIC including:

- Flexible Pilot Line (FPL)
- Battery Development Laboratory
- Cell Characterisation
- Clean & Dry Zone

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Coming 2025



AMBIC

£12m to establish a UK battery materials scale-up centre “AMBIC” :

- From 1 kg – 50 kg batches at CPI
- Enhanced process capability at WMG
- Larger scale cell formats for material validation & cell prototyping at WMG

Part of a UK wide network supporting industry from prototyping through to industrialisation

West Midlands

CVC

Scale: Cell Prototyping (semi-automated)
 No. Cells: ~10
 Dry Room: 8 x 14m (coater non-dry)
 Technology Focus: Li-ion / Na-ion (Nexgenna)
 Cell Types:

N/A Variable

GEIC

Scale: Cell Prototyping (semi-automated)
 No. cells per campaign: <100
 Dry Room: Yes
 Technology Focus: Li-ion / 2D materials
 Cell Types: A9 Pouch

N/A A9 (variable)

CECG

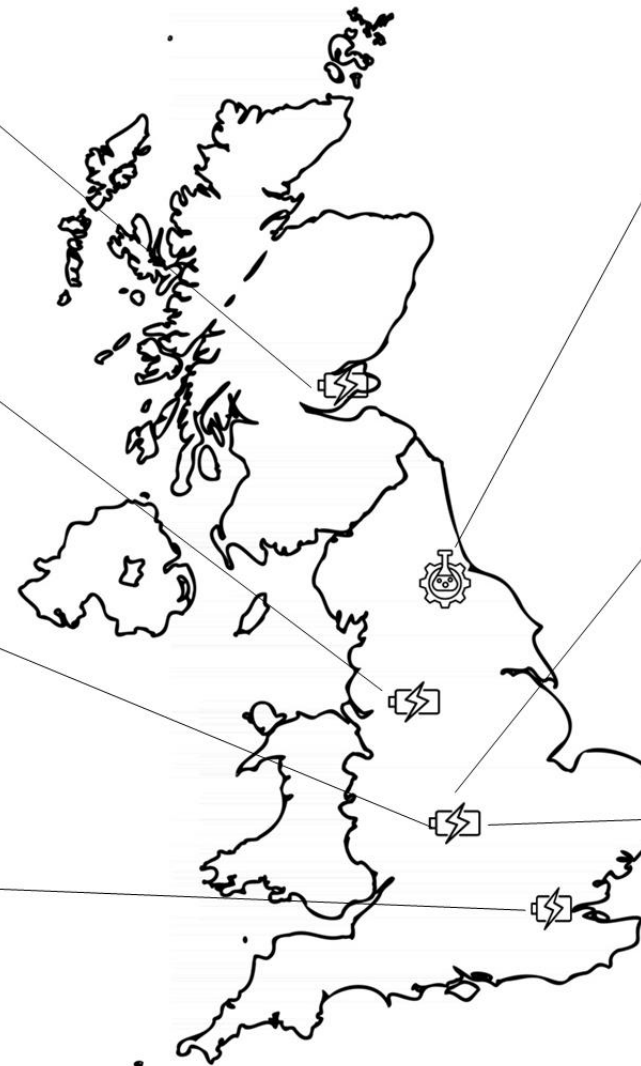
Scale: Cell Prototyping
 No cells per campaign: ~10
 Dry Room: No
 Technology Focus: Li-ion / Li-S (LISTAR)
 Cell Types:

18650 / 21700 A7

UCL Advanced Propulsion Lab

Scale: Cell Prototyping
 No cells per campaign: ~10
 Dry Room: 100 m² (coater non-dry)
 Technology Focus: Li-ion / Li-S (LISTAR)
 Cell Types:

N/A A5/A7



cpi AMBIC – Materials Scale Up (due Spring 2025)

Scale: Material Prototyping & Pilot Line
 Material Batch: 10's gram to <20 Kg
 Technology Focus: CAM (Ni-based, LF(M)P), AAM (Nb, LTO, Si, SiOx, Si-C composites), SSE (oxide), Na-ion CAM (LMO, poly-anion),
 Synthesis methods:

Precipitation Mechanochemistry Hydrothermal Thermal treatment Particle Coating

WMG AMBIC / Energy Innovation Centre

Scale: Cell Prototyping (semi-automated)
 No. Cells: <100
 Dry Room: Yes (coater localised drying)
 Technology Focus: Li-ion / Na-ion
 Cell Types:

18650 / 21700 Variable
 4680 (commissioning)

UKBIC

Scale: Cell Industrialisation Line & Cell Pilot Line (due Summer 2025)
 No. Cells: Industrialisation Line (>5000) & Pilot Line (100 – 1000)
 Dry Room: Yes including 800m² industrialisation room
 Technology Focus: Li-ion / Na-ion
 Cell Types:

21700 300x100 VDA

West Midlands

West Midlands

The Faraday Battery Challenge



Delivered by
Innovate UK



THE FARADAY
INSTITUTION



UK BATTERY
INDUSTRIALISATION
CENTRE

Find out more
about the
Faraday
Battery
Challenge

