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Overview for UPSIGN

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Head of Technology Transfer
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THE FARADAY INSTITUTION

THE FARADAY INSTITUTION

Our mission

Accelerating breakthroughs in energy storage technologies to benefit the UK in the global race to electrification

OUR COMMUNITY – ACADEMIC PARTNERS

University of Oxford
UCL
University of Birmingham
University of Cambridge
Lancaster University
University of Portsmouth
Newcastle University
The University Of Sheffield.
Manchester 1824 The University of Manchester
University of Bath
University of Southampton
University of St Andrews
Science & Technology Facilities Council
University of Surrey
Warwick
The University of Nottingham
University of Liverpool
Oxford Brookes University
Imperial College London
The University of Edinburgh
University of Leicester
Cardiff University

TWO YEARS OF IMPACT

Committed £71 million
to energy storage research, training and analysis

Launched 9 major research programmes
across 22 UK universities and 50 industrial partners

United a community of over 310 researchers
to solve battery challenges

Published 58 scientific papers

Funded 4 entrepreneurial fellows

Awarded £3 million
to explore energy storage solutions for developing countries and emerging economies

Filed 1 patent
and made 4 IP disclosures

Authored 4 Faraday Insights

Training 30 PhD Researchers
Increasing knowledge, skills and aspirations

Hosted 3 Royal Institution panel discussions
educating 150,000 online viewers

FARADAY BATTERY CHALLENGE

Exploit vehicle electrification with world-leading batteries developed, designed and manufactured in the UK

INDUSTRIAL STRATEGY | UK Research and Innovation

FARADAY BATTERY CHALLENGE

£108m

UK Battery Industrialisation Centre

Open access, scale up centre, rapidly moving products to market

UK BATTERY INDUSTRIALISATION CENTRE

ADVANCED PROPULSION CENTRE UK

£78m

The Faraday Institution

Harnessing the strengths of the UK research base

THE FARADAY INSTITUTION

EPSRC

£88m

Collaborative R&D

Creating new solutions and demonstrations

Innovate UK | UK Research and Innovation

THE FARADAY INSTITUTION

THE FARADAY INSTITUTION

The UK’s independent institute for electrochemical energy storage science and technology, supporting research, training and analysis

OUR VALUES

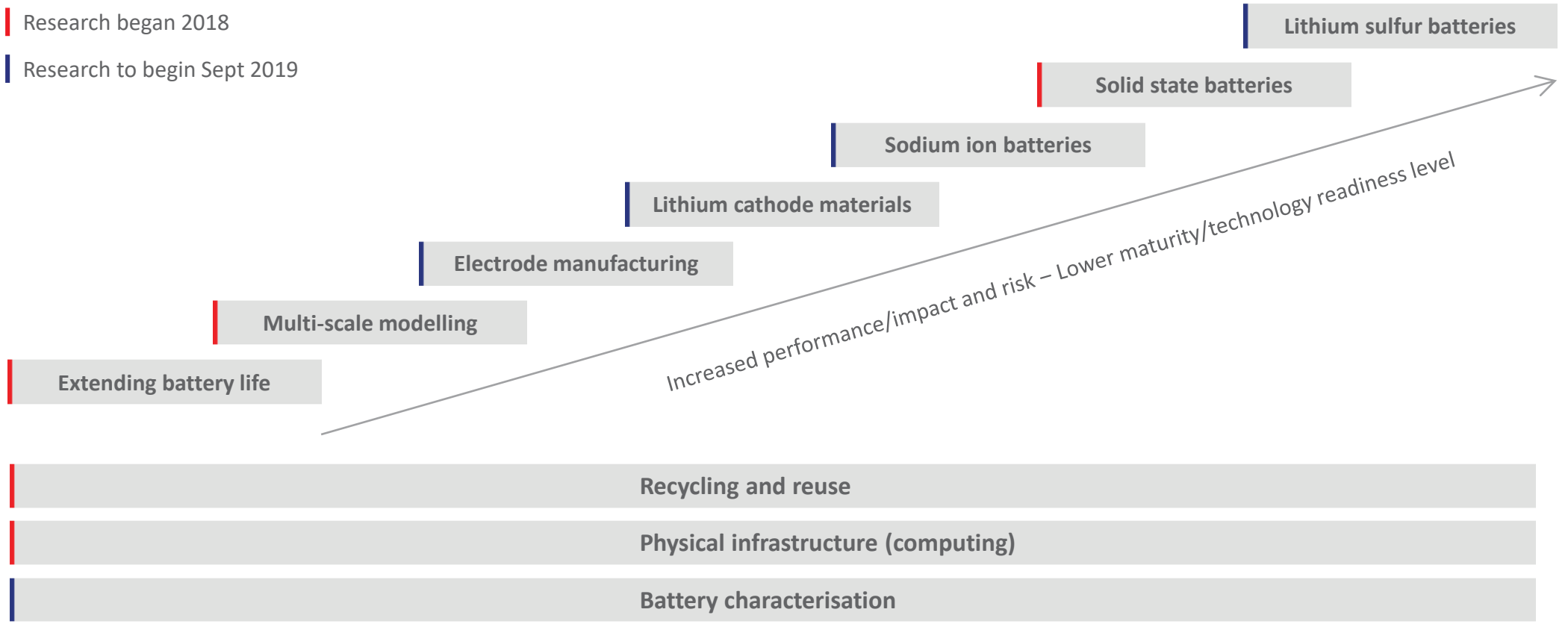
We are collaborative

We are pioneering

We make a difference

Scientific research

Application-inspired research to address known technical performance gaps



OUR REMIT

Insight studies

To inform government and other stakeholders

UK electric vehicle and battery production potential to 2040

UK skills study

Battery storage in developing countries

High energy density materials and markets

International comparison of battery cell costs

Capability and skills

To build a diverse pool of talent

PhD researcher training

Continuing professional development for researchers

Undergraduate internships

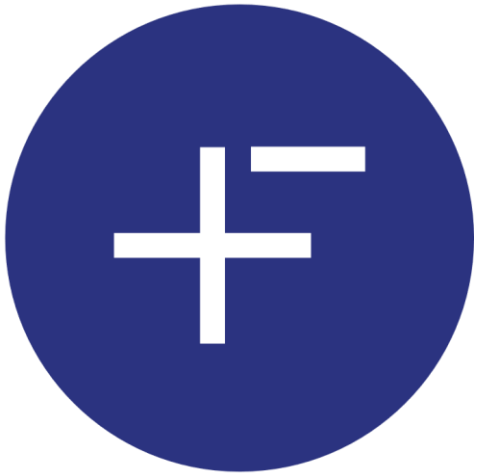
STEM attraction programmes for under-represented groups

AREAS OF IMPACT

Creating new scientific knowledge

Growing economic value for industry

Redefining the research model



Developing a national and international reputation

Building capabilities

Enabling the transition to a fully electric UK

OUR METHODS

Creating new scientific knowledge

Accessing the best UK researchers and universities

Driving cutting-edge research focused on industry-defined goals and materials

Leaving a lasting legacy upon which others can build

OUR METHODS

Redefining the research model

Bringing together academics and industry partners in large, coordinated multi-disciplinary research teams

Funding teams to allow them to work faster

Close monitoring for commercial opportunities and to adapt quickly as priorities change

OUR METHODS

Building capabilities

Developing a diverse pool of talent through outreach, training and engagement

Encouraging young people to consider STEM careers

OUR METHODS

Growing economic value for industry

Supporting the pitch to attract battery cell manufacturers to invest in the UK

Setting scientific discoveries on a path to commercialisation

Fostering entrepreneurship in the energy storage sector

OUR METHODS

Developing a national and international reputation

Increasing collaboration with leading international research groups

Taking a leading role in defining the need for energy storage in emerging economies

Working on international efforts – World Economic Forum's Global Battery Alliance

OUR METHODS

Enabling the transition to a fully electric UK

Independent, third-party source

Providing evidence-based understanding of battery science, economics and UK capabilities

Bridging knowledge gaps across industry, academia and government

NEW PROGRAMME ANNOUNCED TODAY

- Three calls for proposals are being published by the Faraday Institution:
- **Scientific research projects** to reduce the cost and improve the performance of battery technologies for use in developing countries and emerging economies. The programmes will focus on pre-commercialised technologies such as flow batteries, zinc-air and copper-zinc batteries. Two to four such projects will be funded. A budget of up to £1,000,000 ex VAT is available for this activity. 2-4 projects, each of up to two and a half years in duration, will be funded. The application deadline is 11th May. Tenderers should quote their price using a template that will available on this webpage shortly.
- **A techno-economic analysis** of the costs and prospects for replacing generators running on fossil fuels with battery storage technologies in developing countries and emerging economies.
- **A socioeconomic analysis of the energy transition.** This study will uncover political, economic and social insights that would have implications for a successful transition from use of diesel generators to energy storage. One key objective will be to reveal underlying interests, incentives and institutions in order to enable change and to inform realistic expectations of what can be achieved, and the risks involved.

Call for proposals: scientific research to improve battery technologies for use in emerging economies

THE FARADAY INSTITUTION

UKaid
from the British people

"We are pleased that the Faraday Institution is in a position to effect global change, helping communities with low or no connectivity to have reliable access to energy sources and bringing economic, social and environment benefits to developing countries and emerging economies"

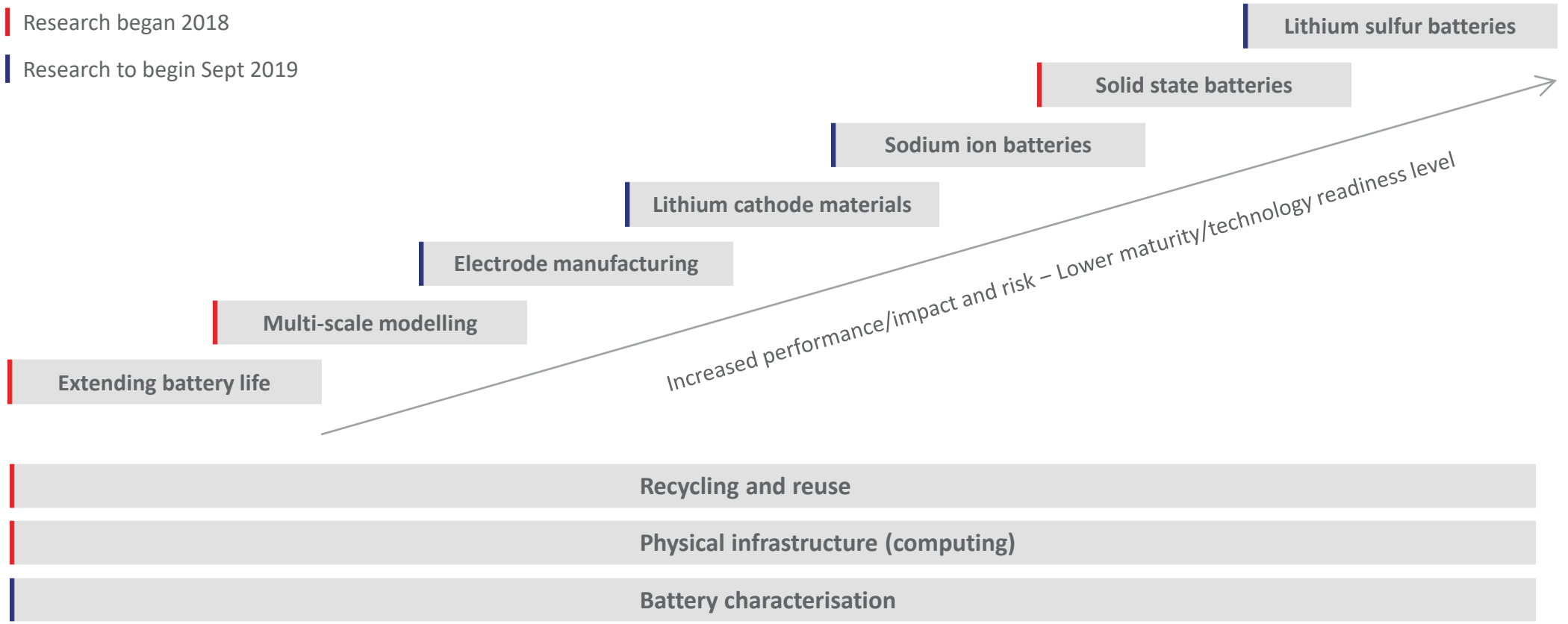
Ian Ellerington, Head of Technology Transfer, The Faraday Institution

Thank you

THE FARADAY INSTITUTION

Scientific research

Application-inspired research to address known technical performance gaps



FARADAY BATTERY CHALLENGE

Cost

2/3 cost reduction

Now	2035
$130/kWh (cell) $280/kWh (pack)	$50/kWh (cell) $100/kWh (pack)

Energy Density

2x energy density

Now	2035
700Wh/l, 250Wh/kg (cell)	1400Wh/l, 500Wh/kg (cell)

Power Density

4x power density

Now	2035
3 kW/kg (pack)	12 kW/kg (pack)

Safety

Battery packs 'inherently safe'

2035
Eliminate thermal runaway at pack level to reduce pack complexity

1st Life

Pack life equivalent to life of the car

Now	2035
8 years (pack)	15 years (pack)

Temperature

50% increase in operating temp. range (°C)

Now	2035
-20° to +60°C (cell)	-40° to +80°C (cell)

Predictability

Full predictive models

2035
Full predictive models for performance and aging of battery

Recyclability

Closed-loop recycling system in place

Now	2035
10-50% (pack)	95% (pack)

ENTREPRENEURIAL FELLOWS

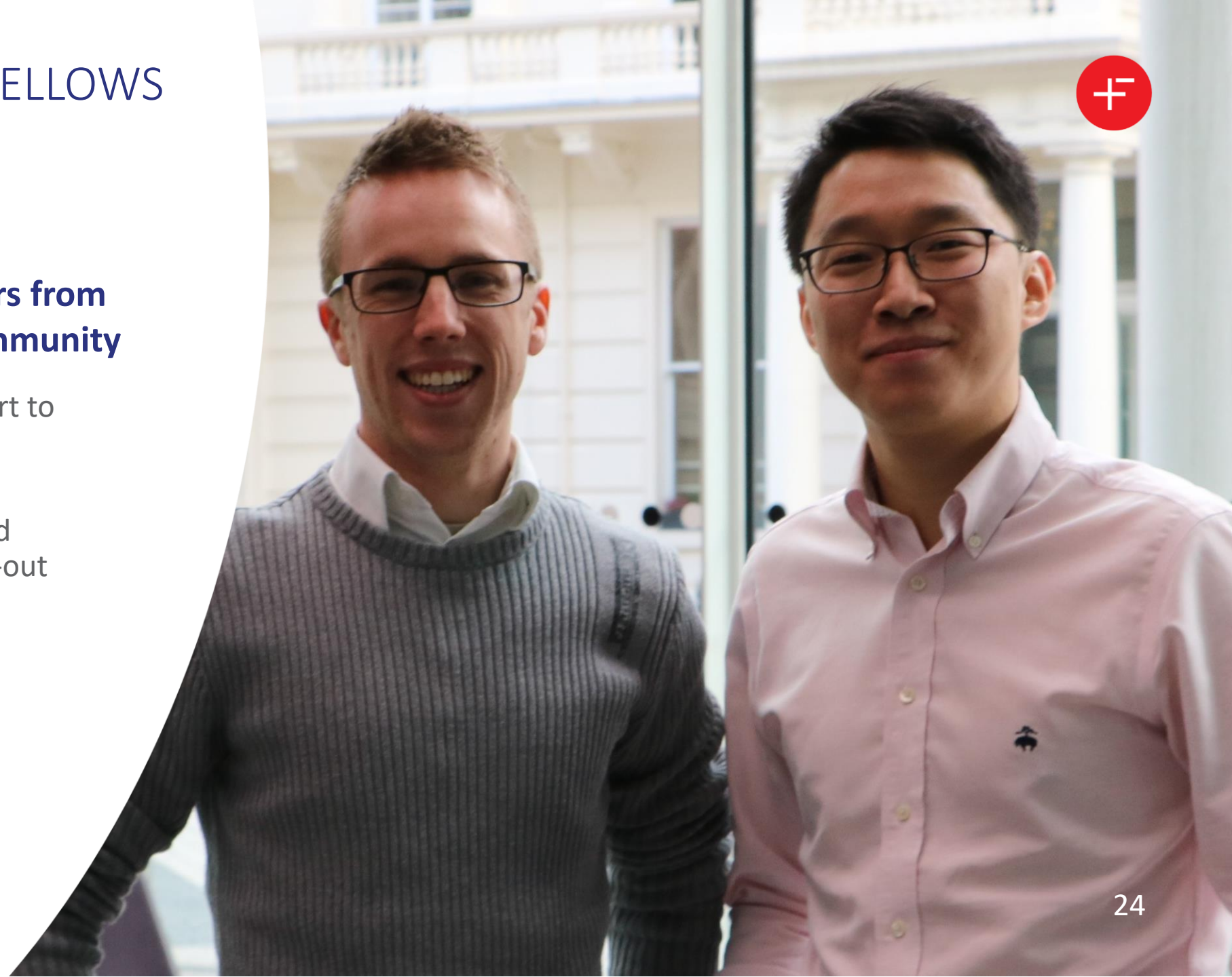
Supporting entrepreneurs from the battery research community

Financial and business support to research teams to accelerate commercialisation

Seed funding, networking and mentoring to accelerate spin-out process

Three fellowships awarded

Applications remain open



OUR VALUES

We are collaborative

We actively collaborate to achieve shared and focused objectives.

We build connections within and between project teams, and externally with industry, government and other influencers.

We foster a sense of belonging.

We work together to develop a diverse pool of talent.

We are pioneering

We are pioneering, visionary and resilient.

To make game-changing breakthroughs our aspirations are bold.

We challenge conventional thinking.

We strive to work in new and smarter ways.

Our operating model is progressive and agile, and we adapt quickly to research results.

OUR VALUES

We make a difference

We are driven to leave a legacy.

Our research is cutting-edge and mission-driven.

We are energetic, tenacious and creative in the way we make discoveries that turn research into reality.

We feel a strong sense of urgency to improve the world's economic and environmental future.

OUR COMMUNITY – INDUSTRY PARTNERS

Johnson Matthey
Inspiring science, enhancing life
BenevolentAI
Envision AESC
FARADION
talga
cap hpi
FOR SMARTER AUTOMOTIVE DECISIONS™
AGM
AGM Batteries Ltd
JAGUAR
LAND ROVER
BBOXX
oxis ENERGY
nexeon
arcola energy
Echion Technologies
LMA
williamblythe
Excellence in chemistry
BMW
TOYOTA
KUKA
NPL
National Physical Laboratory
LG Chem
Shell
ilika
accelerated materials innovation
Rolls-Royce
UK BATTERY INDUSTRIALISATION CENTRE
Intellegens
MIRA
QinetiQ
POTENZA
umicore
CLAYTEX
Morgan Advanced Materials
HUNTSMAN
Deregallera
Lianhetech
McLaren
SIEMENS
IMERYS
ECOBAT TECHNOLOGIES
cpi
USGS
science for a changing world
AXION energy
Continental
CAT
DENCHI POWER
PIV3 TECHNOLOGIES
ThermoFisher SCIENTIFIC
WILLIAMS ADVANCED ENGINEERING
exawatt
SAMSUNG