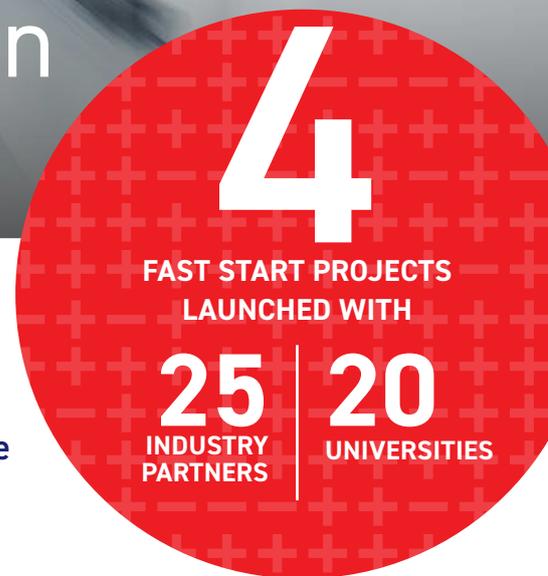


# The Faraday Institution

## POWERING BRITAIN'S BATTERY REVOLUTION

The Faraday Institution is powering one of the most exciting scientific developments of the 21st century—Britain's battery revolution. As the world competes to define the future of energy and automation, the Faraday Institution is accelerating the fundamental research needed for future battery development to power the automotive and energy revolution for the UK.



A £78 million research institute located at the Harwell Science and Innovation Campus, the Faraday Institution brings together experts in science, business, and policy making to help make the UK the world leader in battery technology. By helping to promote battery research, we will create new jobs, new industries, and develop tomorrow's technologies. Doing so will make the UK the go-to place for research into the development, manufacture and production of new battery technologies. The UK's

independent institute for electrochemical energy storage science and technology, the Faraday Institution was established in 2017 as part of the government's £246 million investment in battery technology through the ISCF Faraday Battery Challenge.

### A Critical Need for an Electrified and "United" Kingdom

Battery technology is the future. And the Faraday Institution wants to ensure that future starts in Britain.

Despite recent developments in energy storage, battery technology is still far from its potential. Shortcomings in battery life, power density, and energy efficiency impede the introduction of next-generation batteries to the marketplace. The high cost of raw materials, materials processing, cell and module packaging, and manufacturing also hold us back.

Large scale energy storage is a cornerstone to the Government's green

energy strategy. Science in the UK needs to be up-scaled, so that the UK can stay ahead of the curve and that manufacturers, designers and inventors can be supported.

To meet these challenges, the Faraday Institution aims to unify energy storage research across the UK and set leading university battery researchers to these challenges. The Faraday Institution will invest funds in collaborative research to reduce battery cost, weight, and volume; improve performance, efficiency, and reliability; develop scalable designs; improve our manufacturing abilities; develop whole-life strategies; and accelerate commercialization.

Energy storage can reduce carbon emissions, increase energy efficiency, and accelerate deployment of renewable electricity on the national grid, lowering energy costs. Safe, efficient, and dependable energy storage could spur changes in transportation, electric power, and buildings. To be successful, the Faraday Institution will fund excellence



competitively, work with industry to solve great challenges, and proceed pragmatically using every tool available.

**The Power of Collaboration**

The Faraday Institution represents a new way of working. We bring together the best scientific minds in the field, draw on others from different disciplines, and link intimately with industry, innovators and

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government to ensure we keep the pipeline of fundamental science to innovation flowing. The core of the Faraday Institution is in the power of collaboration, enabling science, industry and government to work together.

The value of the Faraday Institution is the delivery of focused, substantial and managed research projects in areas defined by industry and delivered by consortia of businesses and universities.

**Empowering the Next Generation of Scientists**

Because next-generation energy storage will come from the next generation of scientists and engineers, the Faraday Institution is committed to developing a pipeline for diverse talent. Faraday will launch a national curriculum in energy storage research to nurture students from

secondary school to advanced degrees. Faraday's investment in training and technical education will address inequalities of opportunity that endure on the basis of race, gender, and class and work with industry to bring secure, well-paying jobs to the whole of the country.

**What is the ISCF Faraday Battery Challenge?**

The Faraday Battery Challenge is part of the Industrial Strategy Challenge Fund, wherein government will invest £246 million to support the development of new battery technologies.

It will fund research, innovation and scale-up facilities for batteries for the electrification of future vehicles and other applications that support an electrified economy. This goal is to lower carbon and help to tackle air pollution while creating new opportunities and industries. By focusing on the automotive sector initially, the challenge will allow the UK to realise its commitment to move to full electrification and zero emissions vehicles.

It will also make the most of the growing batteries market—estimated to be worth £5 billion in the UK and £50 billion across Europe by 2025.

Innovate UK and the Engineering and Physical Sciences Research Council will deliver the challenge on behalf of UK Research and Innovation.

There are 3 activities within the Faraday Battery Challenge:

- The Faraday Institution
- Funding for research and innovation projects
- The UK Battery Industrialisation Centre

Richard Parry-Jones, chair of the Faraday Challenge Advisory Board said: "The power of the Faraday Challenge derives from the joining-up of all 3 stages of research from the brilliant research in the university base, through innovation in commercial

**About the Faraday Institution Board of Trustees**

Our Board of Trustees brings multifaceted perspectives and experiences from academia, industry, and public service to the role of advising the Faraday Institution. Board members serve as ambassadors and advisers in support of the Faraday Institution's aims.

**The members of the Faraday board include:**

- Peter Littlewood, Chair
- Stephen Heidari-Robinson, Vice-Chair
- Stefan Berger
- Jeff Chamberlain
- Johny Green Jr.
- Julie Maxton
- Alan E. Nelson
- Jorge Pikunic
- Mark Spearing
- Pam Thomas

applications to scaling up for production. It will focus our best minds on the critical industrial challenges that are needed to establish the UK as one of the world leaders in advanced battery technologies and associated manufacturing capability."

**About the Fast Start Projects**

Four initial projects were launched in 2018 engaging 20 universities and over 25 industry partners to look at:

- Extending battery life
- Battery system modelling
- Battery recycling and reuse
- Next generation solid state batteries.

These projects will support the enormous market pull to develop better battery technologies of the future, chosen because of their potential for immediate, short-term impact.