

## Call for Research and Development Proposals: UltraStore Aluminium - Aluminium Batteries for Low-Cost Long-Duration Storage

**Call type:** Invitation for Proposals

**Closing date:** 11:59pm on Monday 27<sup>th</sup> April 2026

**Funding available:** The initial funds available will be approximately £1.9 million in total, divided across up to six 18-month Research Sprints, each funded at up to £350,000. The Research Sprints will run between 1<sup>st</sup> July 2026 and 31<sup>st</sup> December 2027. Subject to satisfactory progress during the first 12–18 months, additional funding may be made available. This could include extending one or more projects through to March 2028, as well as a further £3 million for the period April 2028 to March 2030 (at £1.5 million per year).

**How to apply:** Submit applications via the [Flexigrant portal](#) selecting the **UltraStore Aluminium** programme.

**Research areas:** This call for proposals is focused on the development of low power aqueous aluminium-ion batteries. It may be particularly relevant for (but is not limited to) researchers with experience in aqueous electrochemical systems, multivalent battery chemistries, suppression of hydrogen evolution, aluminium (or other metal) deposition and stripping, passivation layers, aqueous electrolyte design and manganese oxide cathodes that could be applied in order to address the fundamental issues of aqueous aluminium-ion batteries.

**Assessment process:** Applications will be reviewed by an independent panel and the Faraday Institution. Following recommendations from the panel as guidance, and in line with UltraStore programme requirements and ensuring a broad portfolio of projects across areas of interest, the Faraday Institution make a final selection of successful applicants. Further details are in the Assessment Criteria section of this document.

**Expected Key Dates** (subject to change):

Activity	Date
Call launch	Tuesday 24 <sup>th</sup> March 2026
Deadline for applications	11:59pm Monday 27 <sup>th</sup> April 2026
Successful applicants notified	May 2026
Grant start date	From 1 <sup>st</sup> July 2026

The UltraStore programme management team can be contacted at:  
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Tel: 01235 425300

The Faraday Institution's UltraStore Programme is funded by the Battery Innovation Programme, through the Department for Business and Trade and delivered by Innovate UK.

## Contents

Call for Research and Development Proposals: UltraStore Aluminium - Aluminium Batteries for Low-Cost Long-Duration Storage .....	1
Background .....	3
Objectives of the UltraStore Transformational Challenge Research Programme .....	3
UltraStore Aluminium Programme Objectives.....	4
UltraStore Aluminium Programme Scope of Work .....	4
1. Cathode-Electrolyte Research Sprints.....	5
2. Anode-Electrolyte Research Sprints.....	5
Collaboration and Product Development – Applies to all Applicants.....	6
How to Apply.....	6
Eligibility .....	7
Funding and Duration .....	7
Conditions of Applying .....	7
Submission Outline .....	8
Deadline for Submission .....	9
Assessment Process .....	9
Assessment Criteria.....	9
Intellectual Property, Trusted Research, Export Control and National Security Investment Act.	11
Equality, Diversity and Inclusion .....	11
Conflicts of Interest.....	12
Confidentiality & Privacy.....	12
Training Budgets.....	13

## Background

Ultra-long-duration energy storage (ULDES) is fundamental to a renewables-dominated electricity system, where energy supply must be shifted over days or months rather than over minutes or hours.

Lithium-ion batteries today are optimised for high power and frequent cycling applications. But the ultra-long-duration energy storage use case has fundamentally different requirements: exceptionally low cost, low power output, high energy density, and a tolerance for long idle periods while charged. Meeting these demands requires a shift away from the batteries of today towards new chemistries. By transferring learning, tools, and manufacturing know-how from lithium-ion technology, other emerging battery chemistries (based on abundant, low-cost materials) can be re-evaluated and enabled for long duration grid storage.

The low-power operating regime relaxes constraints around cell and pack design, opening opportunities for new materials and architectures that are unsuitable for higher-power applications. Exploiting these opportunities could unlock innovation pathways, strengthen UK manufacturing capability, and support UK economic growth.

This is the focus of one of the Faraday Institution's new Transformational Challenge programmes - UltraStore. Each of these challenges consists of a targeted research programme, designed to achieve a breakthrough that will address new multi £billion global markets where the UK has the potential to move ahead of the competition in other countries. Because the UK has limited time to gain a significant strategic advantage in these areas, the Transformational Challenges are being approached through a set of highly directed, time limited, stage-gated, 18-month Research Sprints rather than through the more traditional Faraday Institution core research project structure. Researchers responsible for successful Sprints will have the opportunity to expand their scope into a larger programme. In parallel, the Faraday Institution will work to develop suitable strategies around manufacturing, system integration, installation, IP and commercial pull-through, to support the potential to bring successful solutions rapidly to market and maximise positive economic impact for the UK.

## Objectives of the UltraStore Transformational Challenge Research Programme

The UltraStore research programme aims to develop new ultra-low-cost rechargeable batteries that will be suitable to connect to the UK grid by 2035 to provide low-cost long-duration energy storage at a large scale.

These batteries must have:

- Extremely low cost: The underlying cost of the cell's active materials must be <\$5/kWh
- Discharge periods of around 100 hours: Discharge power could be (but is not restricted to) as low as 0.01C

- Low self-discharge: Minimal cell degradation at full charge for at least 6 months
- Infrequent cycling: The equivalent of at least 150 full cycles across a calendar life of at least 30 years
- High energy density: to minimise total system costs per kWh stored by reducing packaging, manufacturing, transportation, land and installation costs.

A phase of discovery and co-creation work for this programme commenced in 2025, which identified several candidate battery chemistries warranting further research and development.

The Faraday Institution is now inviting researchers to apply to work on the initial candidate battery chemistry via the **UltraStore Aluminium** programme, a group of parallel 18-month projects that aim to produce an aqueous aluminium-based battery to fit the UltraStore programme's goals. If successful, this could develop into a major breakthrough technology, opening TWh-sized markets.

It is likely that additional research projects and work packages will be added later to the UltraStore programme, to develop batteries of different materials, and/or to introduce additional researchers or consultants to the UltraStore Aluminium programme.

## UltraStore Aluminium Programme Objectives

The objectives for the **UltraStore Aluminium** programme are to:

- Address the fundamental barriers facing aqueous aluminium-ion batteries across the anode and cathode by rapidly screening multiple potential mitigation strategies;
- Down-select and combine the most promising solutions to develop into a prototype cell that can meet the UltraStore Programme targets (above); and
- If a successful prototype cell can be developed, the project will then focus on scale-up of the prototype to validate performance in a concept demonstrator.

## UltraStore Aluminium Programme Scope of Work

Researchers will work on parallel 18-month Research Sprints, applying a range of mitigation strategies to the fundamental scientific barriers preventing the commercialisation of aqueous aluminium-ion batteries.

Each Research Sprint will address challenges at either the **cathode** or the **anode**. If successful, the most promising Research Sprints will be extended beyond the original time and scope of the project to be combined into prototype cells for further technology validation, and then potentially for manufacture at scale.

The **UltraStore Aluminium cathode** and **anode** work areas are described below. See also the Collaboration and Product Development section of this document, which applies to all programme participants.

Researchers can apply for multiple Research Sprints in the UltraStore Aluminium programme. For example, they may apply to work simultaneously on multiple methods to resolve the issues at the anode and/or simultaneous anode and cathode Research Sprints. They should complete a separate application form on Flexigrant for each Research Sprint applied for.

## **1. Cathode-Electrolyte Research Sprints**

Applications are invited from researchers proposing methods to develop and optimise a combination of a manganese-dioxide-based cathode material and an aqueous electrolyte for an aluminium-based battery.

Applicants should propose an 18-month programme of work (experimental and any supporting computational, characterisation or other studies) to produce and begin to optimise a cathode-electrolyte combination. Proposals should include specific strategies to address:

- Minimising manganese dissolution and side reactions in the primarily aqueous electrolyte.
- Suppressing structural instability of manganese oxides.

This may include composition or morphology changes, additives, manufacturing techniques or other solutions to develop a cathode and electrolyte combination that has the potential to enable the production of a low-cost, high-energy-density cell with adequate cycle life and low levels of degradation.

Researchers should note that:

- This cell is likely to be discharged at a low power, potentially as low as 0.1-0.01C.
- The underlying cost of the cell's active materials must have the potential (when mass-manufactured) to cost less than \$5/kWh – extremely low cost.

## **2. Anode-Electrolyte Research Sprints**

Applications are invited from researchers proposing methods to develop and optimise a combination of an aluminium-based anode material and an aqueous electrolyte.

Applicants should propose an 18-month programme of experimental work (and any supporting computational, characterisation or other studies) to produce and begin to optimise an anode-electrolyte combination. Proposals should include specific strategies to address:

- Minimising hydrogen evolution and side reactions in the primarily aqueous electrolyte, extending the electrochemical stability window.
- Achieving sustainably reversible plating and stripping of aluminium on the anode.

This may include composition or morphology changes, additives, interface engineering, composite electrodes, manufacturing techniques or other solutions to develop anode and electrolyte combination with the potential to enable the production of a low-cost, high-energy-density cell with adequate cycle life and low levels of degradation.

Researchers should note that:

- This cell is likely to be discharged at a low power, potentially as low as 0.1-0.01C.
- The underlying cost of the cell's active materials must have the potential (when mass-manufactured) to cost less than \$5/kWh

## **Collaboration and Product Development – Applies to all Applicants**

Fundamental electrochemical research is at the core of the UltraStore Aluminium programme, but the work will also have a strong focus on advancing towards developing a grid-connected demonstrator comprised of extremely low-cost materials, and research will be directed towards this goal.

It is likely that a number of different teams will produce strategies that would create the best impact when used in combination. Therefore, a portion of all programme participants' time will be allocated to working closely with other programme participants, sharing expertise to ensure compatibility between materials, and contributing to the design and development of prototype cells.

This process will be supported by the coordination of the Faraday Institution programme manager, including through regular review and stage-gate meetings and the convening of workshops, subject matter experts and industry participation. To facilitate cross-institution work it may be necessary for some or all programme participants to sign a collaboration agreement. If so, this will be a requirement of funding.

If the research demonstrates satisfactory progress towards the programme goals, it is likely that a further programme of work will be commissioned, with a larger team, to optimise the materials, build prototype cells, and work to ensure manufacturability of electrode materials. Concurrently with the Research Sprints, the Faraday Institution will run a programme to develop suitable strategies around manufacturing, system integration, installation, IP and commercial pull-through, to support the potential to bring successful solutions rapidly to market and maximise positive economic impact for the UK.

## **How to Apply**

Applications should be submitted through the [Flexigrant portal](#).

Applications are invited from both individual and teams of researchers to apply for one or more projects. The programme is open to part-time and job-share applicants and supervisor-researcher teams.

If supervisors will need to recruit to complete their team, they should indicate this on the project plan and in the budget template, which they will attach to their application, including an

indication of the seniority level (e.g., PDRA) and experience of their planned recruit, plus the time they would expect recruitment to take.

## Eligibility

To be eligible for funding, the individuals and research organisations applying must meet the eligibility criteria for UKRI funding. Please refer to [UKRI guidance](#) for details.

## Funding and Duration

The initial funds available will be approximately £1.9 million in total, divided across up to six 18-month Research Sprints, each funded at up to £350,000. The Research Sprints will run between 1<sup>st</sup> July 2026 and 31<sup>st</sup> December 2027. Subject to satisfactory progress during the first 12–18 months, additional funding may be made available. This could include extending one or more projects through to March 2028, as well as a further £3 million for the period April 2028 to March 2030 (at £1.5 million per year).

Funding beyond March 2027 for this programme is subject to confirmation by the Department of Business and Trade and the Battery Innovation Programme of continuation of funding for the Faraday Institution.

## Conditions of Applying

Projects must:

- Facilitate the work of the Faraday Institution by allowing participating staff the freedom to work solely on the Institution’s mission, allow participating staff on occasion to work at the headquarters of the Institution and to free up staff time to focus on specific Institution projects, where relevant.
- Accept and comply with specific terms and conditions that will accompany the grant offer letter, as well as adhere to general Faraday Institution terms, conditions and management principles. Applicants should note the content of the [Intellectual Property, Trusted Research, Export Control and National Security Investment Act](#) section in this document

[Terms and Conditions of Faraday Institution FEC Grants](#)

[Faraday Institution Management Plan](#)

- Provide access to facilities to other institutions funded by the Faraday Institution.
- Work with others in the innovation chain, specifically across innovation and scale-up activities.
- Be prepared to work with the Faraday Institution HQ and to be directed by the overarching governance structure on the research challenges under focus.

Industry sub-contractors are permitted up to a value of 15% of the total project cost.

If applicants intend to request significant equipment costs (more than 15% of the total application costs) they should contact the Faraday Institution on [ultrastore@faraday.ac.uk](mailto:ultrastore@faraday.ac.uk) at least one week before the application deadline to discuss this before submitting their application.

All applicants must acknowledge acceptance of the terms and conditions of the Faraday Institution within their application. These include conditions specifically relating to the management of the outputs from this programme, such as intellectual property. Applicants will be expected to agree to such terms and conditions as part of the funding process.

To facilitate cross-institution work, it may be necessary for some or all programme participants to sign a collaboration agreement. If so, this will be a requirement of funding and stated in the Grant offer letter.

Applicants will complete a project plan, using the template provided, which includes project objectives, work packages and milestones. The template includes quarterly review meetings and six-monthly stage-gates. Work packages, milestones and objectives should align with these dates where it is feasible to do so. This will enable the whole programme to move rapidly and support collaboration between teams. This project plan will be reviewed by the Faraday Institution, which may request changes before awarding funding to successful candidates. Any proposed changes would be discussed with the applicant(s) in order to reach mutual agreement on the Research Sprint's goals and objectives. The final agreed project plan would then form part of the terms of a grant offer letter.

## Submission Outline

Proposals should be submitted through [Flexigrant](#), including the information below. Further details are available on Flexigrant.

- Names of the individual organisations and researcher(s) who would be responsible for each work package. Where this would involve recruiting team members, this should be indicated, including the expected time required for recruitment;
- A description of the aims of the project, the planned work, the scope and the specific activities (work packages) that will be undertaken. This should include a clear indication of how the researcher(s) plan to approach the challenge, the resources required and how the project will be managed on a monthly basis, and should align with the project plan described below. Dependencies between work packages should be identified (for example if one objective must be met before a second work package can be completed);
- Current state-of-the-art in this area and details of how the proposed research will improve on this;
- A project plan, [using the template provided](#). This is a core part of the application. The template includes quarterly review meetings and stage-gates. Work packages, milestones and objectives should align with these dates where it is feasible to do so;

- A detailed budget plan, [using the template provided](#);
- A summary of the proposed researcher(s)' experience in the technical area(s) applied to;
- CV for the principal applicant and any additional team members;
- A letter confirming support from their organisation (this is typically from a University Head of Department, but this will depend on your organisation's internal procedures).

Researchers can apply for multiple Research Sprints in the UltraStore Aluminium programme. For example, they may apply to work simultaneously on multiple methods to resolve the issues at the anode and/or simultaneous anode and cathode Research Sprints. They should complete a separate application form on Flexigrant for each Research Sprint applied for.

## Deadline for Submission

All proposals must be submitted by 11:59pm on Monday 27<sup>th</sup> April 2026.

For further inquiries, please contact [UltraStore@faraday.ac.uk](mailto:UltraStore@faraday.ac.uk).

## Assessment Process

- The Faraday Institution will convene an independent review panel to work with the Faraday Institution to assess the applications received, against the specified criteria for this funding opportunity.
- The role of the panel will be to review and provide recommendations to the Faraday Institution executive team for final funding approval.
- Upon submission of applications, the Faraday Institution will undertake an eligibility criteria and completeness check before distributing applications to the members of the panel for review, along with appropriate review guidance and briefing notes.
- A chair from the Faraday Institution will be appointed to convene and facilitate a panel review meeting, to impartially lead the discussions and to gather feedback from the reviewers.
- Using recommendations from the panel as guidance, the Faraday Institution will select successful applicants in line with the programme requirements and the Faraday Institution's portfolio requirements.
- The final decision on projects to be funded will be made by the Faraday Institution, which will consider the review recommendations and assessment criteria (below) and apply the context of achieving a broad portfolio of projects across areas of interest.

The Faraday Institution may contact applicants at any stage during the review process to clarify aspects of their applications.

## Assessment Criteria

The Independent Panel will review applications on the criteria of:

### **Likelihood of Success**

- Scientific & technical feasibility: Are the hypotheses well-grounded in existing literature? Is the methodology robust and achievable?
- Innovation and novelty: Does the project propose a genuinely new approach or build meaningfully on existing research?
- Research team expertise: Do the principal investigators and collaborators have the necessary expertise, track record, and experience in this area of research?
- Risk assessment and mitigation: Has the team identified potential risks and outlined strategies to manage them?

### **Impact if Successful**

- Scientific advancement: How significantly is this research likely to advance the specific goals of the UltraStore Aluminium programme? Does it address the specific challenges of the relevant Research Sprint and is it reasonable to expect the approach to make meaningful progress in the proposed time frame?
- Practical application: Is the proposed solution likely to lead to a solution that could be applied to a low-cost, high-density mass-manufactured product that fits the UltraStore programme goals?
- Economic and commercial potential: If successful, will this solution be cost-effective, specifically when considering the <\$5/kWh active material cost target for UltraStore?
- Societal benefit: Could this research be commercially exploited without causing issues in environmental sustainability, working conditions or toxicity?

### **Project Management and Organisation**

- Clear objectives and milestones: Are the project goals well-defined with clear, measurable milestones?
- Resource allocation & budget justification: Is the budget reasonable, justified, and well-allocated?
- Timeline & feasibility: Is the proposed timeline realistic and well-structured? Are all team members named and able to commence work in July 2026, or is there a plan to recruit promptly?
- Communication: Has the applicant demonstrated an appropriate communication style for a collaborative project, for example by clearly communicating (1) the challenges, existing research and their strategies, with justification for their approach and (2) Their understanding of the existing landscape in this area of research?
- Collaboration: Has the applicant demonstrated the ability to work collaboratively in a multi-team programme?
- Application-focused research: Has the applicant evidenced an ability to work at pace towards specific goals in an application-focused programme, for example through experience or awareness of commercial or other deadline-driven work?

## Intellectual Property, Trusted Research, Export Control and National Security Investment Act

The UltraStore challenge aims to achieve breakthroughs that will provide the UK with competitive advantage to address new multi £billion markets. Because the UK only has limited time to gain a significant strategic advantage, it is fundamental to success that any IP generated by the challenge is readily available to support an IP strategy that seeks commercialisation of the technology with a goal of maximising the economic impact for the UK.

So, while the UltraStore Aluminium Research Sprint grant terms and conditions will broadly follow the Faraday Institution's standard terms and conditions, with arising IP ownership residing with the grant recipient, they will also provide the Faraday Institution with:

- an exclusive license to the arising IP (with the ability to sub licence) in the event that the grant recipient fails to take reasonable steps to commercialise the arising IP within 6 months, and in any event
- a non-exclusive global licence to the arising IP, with the ability to sub licence to UK entities.

The UltraStore challenge is targeting breakthroughs in battery technologies that have potential to provide the UK with competitive advantage and may be covered by UK Export Controls. The Faraday Institution therefore need to ensure that the Research Sprint awards and their subsequent delivery comply with the legal requirements of the UK's Trusted Research rules, Export Controls and National Security Investment Act.

## Equality, Diversity and Inclusion

The Faraday Institution aspires to create a truly inclusive environment where all its researchers can thrive and feel a sense of belonging whilst empowering everyone to have a voice. We celebrate individuality and know that combining the skills and talents of a dynamic and diverse community brings great strength. [The Equality, Diversity and Inclusion Working Group](#) is looking at positive ways to ensure these values are lived out throughout our community.

The long-term strength of the UK research base depends on harnessing all the available talent and the Research Councils have together developed the ambitious UK Research and Innovation Equality, Diversity and Inclusion Action Plan.

The Faraday Institution expects that equality and diversity is embedded at all levels as set out in our [EDI charter](#) and in all aspects of research practice. We are committed to supporting the research community in the diverse ways a research career can be built with our investments. This includes career breaks, support for people with caring responsibilities, flexible working and alternative working patterns. With this in mind, we welcome applications from academics who job-share, have a part-time contract or need flexible working arrangements.

## Conflicts of Interest

The Faraday Institution is committed to maintaining the highest standards of impartiality, transparency and fairness in all aspects of its work. From time to time a situation can arise where there is a conflict of interest. This is particularly the case where the Faraday Institution requires expert advice and those best placed to provide the required expertise may be actively involved in the field. These situations will be managed by adopting a clear policy for dealing with potential conflicts.

The Faraday Institution requires all individuals involved in such activities to agree to act according to our [policy on conflicts of interest](#).

Reviewers should declare any potential conflict of interest and panel members will not be present during any discussions of proposals in which they are conflicted.

Below are a set of guidelines that all reviewers (be they academics, from industry or Faraday Institution management) will be expected to comply with.

- A conflict of interest shall be defined as any personal, business or academic interest that may, or may be perceived by a reasonable member of the public to influence their judgement in performing their functions and obligations as part of existing Faraday Institution research commitments.
- It is expected that reviewers inform the Faraday Institution in advance of any new appointments that may give rise to a conflict of interest as described above and affect the performance of their functions and obligations as regard the continuation of the Faraday Institution research areas.
- Where a conflict of interest becomes apparent in the course of the application review process, they are required to inform the Faraday Institution and other parties at the earliest opportunity.
- Reviewers are required to withdraw from any discussions where they have any interests that may, or maybe perceived to, influence their judgement or give rise to a personal, business or academic gain of detriment to other parties.
- All information on potential conflicts of interest will be held by the Faraday Institution and could be disclosed to stakeholders and funders of the activities of the Faraday Institution (and potentially also the public).

## Confidentiality & Privacy

The [Faraday Institution Privacy Policy](#) describes how we manage personal data.

The Faraday Institution assesses all grant applications through a review process and such applications are sent to reviewers for comment. Applications are treated confidentially and only supplied to reviewers who have previously signed confidentiality agreements with the Faraday Institution.

Reviewing panel members are asked not to share or discuss reviewer comments/identities outside of the Faraday Institution management. Reviewers are asked for feedback forms. The content of applications, proposals and feedback forms are all kept confidential. If reviewers have any paperwork or have any additional notes, they are required to keep these secure and delete them as soon as the information is no longer required.

Whilst we ask within their submissions that applicants describe their proposed project in sufficient detail for reviewers to assess the application, potentially patentable results should not be included in a proposal until after a patent application has been filed. Under no circumstances should any applicant contact individual panel members.

Reviewers are required to notify us immediately if any applicant contacts them directly. Under no circumstances should any Review Panel member contact bidding individuals.

## **Training Budgets**

Applicants must include, within their application, a provision of £2k per year per Post Doctoral Research Associate (PDRA), to support personal development and training for Faraday Institution-funded PDRAs. Provision for the training is to be included in the relevant section of the finance template that applicants should download from the Finance Section of the Flexigrant portal.