UK Energy Research Centre

Funded by UK Research and Innovation

Call for Expressions of Interest: Environmental and Economic Impacts of Inter-Seasonal Long-Duration Energy Storage

Overview

The UK Energy Research Centre (UKERC) is inviting **Expressions of Interest** (EoIs) to conduct research on the **environmental and economic impacts of inter-seasonal long-duration energy storage (LDES)**. EoIs should be submitted by **17:00 on Friday 26 September 2025**.

The authors of the successful EoI will be invited to co-create, along with UKERC's Director and research theme leaders, the details of a research proposal that would form part of UKERC's research programme on Operating a Highly Renewable and Largely Electrified Energy System, working in collaboration with other UKERC research programmes on Responsive Research, Affordability, Justice and Economic Impact, Delivering Energy Infrastructure and the Public Engagement Observatory.

The co-created research, led by the authors of the selected EoI and conducted by their teams, should start no later than 30 March 2026, and should conclude by 30 June 2028. The maximum budget available for the research is **£312,500 at 100% Full Economic Cost (FEC)**, i.e. £250,000 at 80% FEC.

Eligibility

Expressions of Interest (EoIs) are invited from eligible UK researchers, i.e., applicants based in UK Higher Education Institutions (HEIs), Research Council Institutes and Centres, and Independent Research Organisations (IROs) approved by any of the Research Councils. Please refer to the UK Research and Innovation (UKRI) website for details on funding eligibility.

Organisations not eligible to receive Research Council funding directly (e.g., industry, government agencies, third sector organisations) may participate as project partners. Individuals may submit no more than one EoI as Principal Investigator plus one as Co-investigator, or two as Co-Investigator, to this call.

Membership of UKERC

Contributors to the new project will be considered full members of the UKERC consortium and should contribute fully to UKERC activities. This includes participation in relevant research theme meetings and the UKERC annual assembly, submission of quarterly reports, and contributions to stakeholder engagement events, blogs, and consultation responses. In turn, UKERC offers access to a large network of parties interested in energy system research, opportunities for dissemination of work, insights into the full range of UKERC research and the forging of new relationships with other energy researchers.

Context and scope

The UK's strategic energy planning increasingly recognises the essential role of large-scale LDES in enabling a highly renewable and largely electrified energy system. Inter-seasonal LDES technologies (operating over days to weeks), such as thermal, mechanical, chemical, and electrochemical storage, are critical to managing prolonged periods of low renewable output and meeting electricity demand reliably and affordably.

Building on existing efforts including the Centralised Strategic Network Plan (CSNP), Strategic Spatial Energy Plan (SSEP), and parallel investment planning across hydrogen, heat, and electricity networks, this call invites research that explores how LDES can contribute to decarbonisation goals. In particular, we seek to understand the environmental and economic impacts of deploying inter-seasonal LDES systems, and the role they can play in reducing curtailment, deferring network reinforcement, improving flexibility provision, and enhancing overall system resilience.

This research will provide valuable insights into trade-offs and co-benefits across whole-system infrastructure, informing how different LDES technologies may best be supported within evolving UK policy, regulatory and market frameworks.

Where we want to build new understanding and evidence

The successful project will advance understanding of how large-scale, inter-seasonal LDES technologies affect both the environment and the economy across their full lifecycle, from siting and resource use, to operation, decommissioning, and integration into the UK energy system.

Proposals should specify which environmental and economic dimensions they address and provide justification for their focus. We anticipate proposals will explore some or all of:

- **Lifecycle sustainability and environmental impact**: Analyse land use, material intensity, emissions, biodiversity risks, and end-of-life treatment of LDES technologies. Address uncertainties and emerging evidence around environmental externalities.
- **Investment proposition and system value of inter-seasonal LDES:** Assess the financial viability and investability of LDES technologies that operate on seasonal timescales (days to weeks), focusing on the distinctive challenges of high-capex, low-utilisation assets. This includes examining potential revenue streams, financing mechanisms, and regulatory enablers needed to unlock private investment. Analyse how the deployment of large, dispatchable LDES assets could interact with, complement, or displace other flexibility providers across the system. Emphasis should be placed on understanding the long-term role of LDES in providing resilience and strategic flexibility, and on identifying policy and market frameworks that could support their bankability and integration.
- **Policy, regulatory, and social dimensions**: Assess siting challenges, planning and permitting barriers, social acceptability, and potential frameworks for embedding environmental and economic impacts in investment and regulatory decisions.

Proposals should demonstrate awareness of ongoing policy developments and engage with relevant stakeholders throughout the research process. Work should be cognisant of key planning milestones including the development of the CSNP, electricity and gas price control periods (RIIO-2/3), and DESNZ's LDES strategy evolution under the Clean Energy Superpower Mission.

Questions for the expression of interest

- Principal Investigator (PI) details.
- List of co-investigators, their email addresses and their organisations
- List of project partners – individuals, their email addresses and their organisations. (A project partner is a contributor to the project that does not receive UKRI funding via the award for this project)
- What questions you will address on the subject of environmental and economic impacts of inter-seasonal LDES, the methods you will use to address them, team roles and key outputs. Please make clear how your approach will build on and extend existing literature and engage with relevant live policy and regulatory processes. *(1000 words max)*
- Please summarise your experience of researching long-duration energy storage, energy system modelling, lifecycle assessment, and/or technoeconomic analysis, and your track record of engaging with local, regional and national stakeholders. *(500 words max)*
- Please describe the types of impact your proposed research is expected to achieve and how you intend to realise them. This could include contributions to policy, practice, community engagement, or LDES planning and operation. Outline key mechanisms, partnerships, or engagement strategies you will use to maximise the impact. *(300 words max)*
- Please outline what you will bring to UKERC's research community if you are asked to lead the invited research and become part of UKERC. *(300 words max)*
- Please outline how you have employed principles of equality, diversity, inclusion and intersectionality in the proposed research/team setup and any specific objectives planned with respect to EDI. *(300 words max)*
- Budget details. Including travel and accommodation costs to attend a minimum of two UKERC meetings per year.

Evaluation procedure

EoIs will be evaluated by a review panel convened by UKERC, which will make a recommendation as to which EoI should proceed to the co-creation and submission of a full proposal.

Please see below the scoring matrix against which EoIs will be assessed:

Section	Criteria	Aspects for evaluation	Score guidance (0–10)
Research questions, methods, team roles, and outputs (1000 words)	Quality and coherence of proposed research	- Clarity and relevance of research questions - Appropriateness of methods - Clear team roles - Extent to which proposal builds on and extends literature and UKERC research	0–3 = vague or off-topic 4–6 = coherent and feasible but not innovative 7–8 = strong with sound rationale and fit 9–10 = outstanding innovation, excellent fit with UKERC goals
Experience researching LDES (500 words)	Team's relevant experience	- Evidence of prior research on LDES with a focus on environmental and economic impacts - Relevance to the current topic - Demonstrated	0–3 = minimal or unrelated experience 4–6 = some relevant examples 7–8 = clearly relevant experience, good depth

		competence in lifecycle and technoeconomic assessment	9–10 = strong, directly aligned track record
Pathways to impact (300 words)	Clarity and feasibility of impact strategy	- Relevance and ambition of expected impact - Clear and realistic mechanisms to deliver impact - Stakeholder or policy engagement plans - Letters of support - Alignment with UKERC's impact goals	0–3 = vague or generic; lacks mechanisms 4–6 = plausible but limited detail 7–8 = well-articulated strategy with good alignment and strong letters of support 9–10 = compelling, strategic, and targeted approach
Contribution to the UKERC community (300 words)	Added value to UKERC	- Willingness and ability to engage across UKERC's wider activities - Evidence of collaboration, leadership, or capacity building - Complementarity to existing UKERC members	0–3 = minimal contribution beyond own project 4–6 = some potential for engagement 7–8 = clear added value 9–10 = strong UKERC ambassadorial potential
Equality, diversity, and inclusion (EDI) (300 words)	Integration of EDI and intersectionality	- Attention to EDI in team composition and recruitment - Inclusive and ethical research design - Specific objectives or actions on EDI	0–3 = generic statements or absent 4–6 = basic awareness, some actions 7–8 = thoughtful and embedded approach 9–10 = model example of inclusive design
Budget and justification	Appropriateness of budget	- Budget is realistic and aligned with project activities - Value for money - Inclusion of required UKERC participation costs	0–3 = incomplete or unjustified 4–6 = mostly appropriate 7–8 = clearly justified 9–10 = excellent cost-effectiveness and clarity

Timeline

- EoI call opens: week commencing 11 August 2025
- Submission of EoIs: by 17:00 on 26 September 2025
- Assessment of EoIs completed: 24 October 2025
- Development/Co-creation of full proposal: until 19 December 2025
- Decision on award of funding: 2 January 2026
- Start of project: no later than 30 March 2026

Submission

Please submit your EoI using the form available on the UKERC website, to ukerc@imperial.ac.uk no later than 17:00 on Friday 26 September.