

EPSRC Supergen Offshore Renewable Energy (ORE) Hub Flexible Fund – 4th Call for Proposals – July 2023

Contents

- 1) Summary of call details
- 2) Context
- 3) About the Supergen ORE Hub
- 4) About this call
- 5) Scope of second Flexible Funding call
- 6) Additional partner funding
- 7) Eligibility
- 8) Application process
- 9) Review criterion and assessment process
- 10) Funded projects required outputs.
- 11) Terms and conditions
- 12) Additional information
- 13) Appendix

1. Summary of call details

Maximum Value per Proposal	£100,000 at 80% FEC*
Funding level available	80% of FEC
Total resource available for this 1st call	Up to £700,000 at 80% FEC**
Expression of Interest call opens	1 st August 2023
Closing date for Expressions of Interest	5pm (BST) – 11 th September 2023
Call for Full Proposals opens	29 th September 2023
Call for Full Proposals closes	5pm (GMT) 3 rd November 2023
Peer reviews of full proposals	3 rd November 2023 to 1 st December 2023
Meeting of Review Panel	w/c 11 th December 2023
Notification of successful and unsuccessful Proposals	w/c 18 th December 2023
Period for exchange of Flexible Fund grant conditions	w/c 1 st January 2024 to w/c 29 th January 2024
Anticipated start date of successful proposals - post award	c. early February 2024
*Please see section 5 - Scope of Flexible Funding Call for further details	
**If all monies are not allocated in the round, the Supergen ORE Hub Board retains the right to re-allocate funds	

2. Context

The UK is at the forefront of the development, adoption, and export of ORE technologies. To sustain this advantage, the UK must spearhead research and innovation in ORE, which will accelerate its adoption worldwide and widen the applicability of this technology. There are various organisations involved in coordinating this process, extending across the industry-academia spectrum, and the Supergen ORE Hub will integrate with these activities to guide and deliver fundamental and applied research to advance the ORE sector.

3. About the Supergen ORE Hub

The Supergen ORE Hub provides research leadership to connect academia, industry, policy, and public stakeholders, inspire innovation and maximise societal value in offshore wind, wave, and tidal energy. The Hub vision is to bring together and stimulate synergistic adventurous research that supports and accelerates the development of offshore wind, wave, and tidal technologies for society’s benefit.

The Hub is central to the UK ORE community, bringing together shared skills and expertise, allowing transfer of fundamental knowledge, shared learning, and use of resources for inter-disciplinary research, taking a whole systems approach. Differing maturities of wave, tidal and offshore wind allow rapid advances towards deployment and societal benefit through timely sharing of expertise, strategies, and best practice between the three sectors. More detail regarding the Supergen ORE Hub can be found at: www.supergen-ore.net

4. About this Call

This is the fourth call for proposals from the Supergen ORE Hub Flexible Fund. We are seeking research proposals from Universities or other institutions eligible to hold UKRI awards to facilitate a programme of co-ordinated UK led ORE research projects aligned with, and in partnership with the Hub.

Many industry roadmaps have been developed for ORE. These roadmaps are generally on a sectoral basis (for offshore wind and marine, with wave and tidal often considered together). To develop the area strategy for the Supergen ORE Hub and its associated programme of Core and Flexible Fund supported research, research themes and challenges are summarised in the [Supergen ORE Hub Research Landscape](#) and accessible via the web tool. The challenges and themes have been synthesised from consultation across the sector and in collaboration with related roadmapping and prioritisation exercises:

Key Research Challenge Themes	Description
A	Resource and environment characterisation
B	Fluid structure seabed interaction
C	Materials and manufacturing
D	Sensing, control, and electro-mechanics
E	Survivability, reliability, and design
F	Operations, management, maintenance, and safety
G	Environmental and ecosystem aspects
H	Marine socioeconomics and governance

This Flexible Fund call will seed areas that complement existing research, fill gaps, or add cross cutting activities to explore the transfer of research findings between sectors within ORE. **Proposals are invited across themes A to F that fit within the EPSRC remit, and where appropriate are encouraged to include elements of environment and socio-economics research themes G and H.**

A detailed list of research challenge titles under each of these themes for this call is provided in the Appendix. More detail regarding the outputs of the Hub 'Core Research Workstreams' can be found [HERE](#).

5. Scope of the Flexible Funding call

Applicants are asked to make submissions for work **up to a maximum of £100k of EPSRC funding at 80% FEC that MUST be delivered within 1 year, i.e., successful proposals can claim up to £100k from the Flexible Fund, which is 80% of the Full Economic Cost (FEC) of the proposal, i.e., £125k.**

Project awardees can invoice 80% of the full economic costs in three equal instalments during the period of the Flexible Fund Project, with the final payment being made on delivery of the outputs as detailed in section 10 of this call document. Costings for the proposals should be in accordance with standard UKRI rules¹. Eligible costs are as defined in the standard UKRI terms and conditions of grant awards and Flexible Funding can be used to cover the same cost categories.

Consortium bids with industry engagement and collaboration in proposals and delivery is expected with financial match on a one-to-one basis. The funding is primarily for researcher salary costs but funding for equipment may be allowed if a fully justified case is made that demonstrates that equipment expenditure is a fundamental requirement to the research proposed. If purchased equipment is expected to outlast the project an explanation of how this will be of longer-term value to the ORE research community is required.

6. Additional partner funding

In this call for Flexible Funding proposals we have additional funding available from the Offshore Renewable Energy (ORE) Catapult [Floating Offshore Wind Centre of Excellence \(FoW CoE\)](#), and [Wave Energy Scotland \(WES\)](#).

We are asking applicants to the Flexible Fund to select **only one option per project proposal** from the list below, to indicate which form of proposal they wish to put forward to the Supergen ORE Hub. You will be able to select one of these three options at the Expression of Interest (EOI) stage as set out in section 8 of this call document:

- **Option 1 - EPSRC standard academic scheme (as per the scope in section 5 of this call document)**
Up to £100k funded by EPSRC (at 80% FEC for HEI) with industry involvement and matching cash/in kind contributions expected.
- **Option 2 - EPSRC/FoW CoE scheme**
For projects in FoW CoE priority areas. Proposals within this scheme can access up to £50k funded by EPSRC (at 80% FEC for HEI) and be supplemented with up to £50k by the FoW CoE **which must be matched on a one-to-one basis by industry partner funding.** See full details in the following section.

¹ <https://epsrc.ukri.org/funding/applicationprocess/fundingguide/>

- **Option 3 - EPSRC/WES scheme**

Wave Energy Scotland (WES) has identified a specific R&D scope to drive radical innovation in wave energy technology, namely the concept design and development of electrostatic power conversion technologies. These technologies have potential application as generator modules in wave energy and transferability as transducers, energy harvesting and actuation in many other sectors.

Proposals within this scheme must respond specifically to the WES R&D scope to access up to £50k funded by EPSRC (at 80% FEC), supplemented by up to £50k of funding from WES. See further details in the following section and the Appendix.

EPSRC/FoW CoE scheme – Additional Details

Successful proposals within this scheme will directly address research within five key focus areas of the FoW CoE programme and must clearly demonstrate a strong requirement for the additional funding requested. The five key areas the FoW CoE are looking to address are:

- Moorings & Anchoring Systems
- Dynamic Cable Systems
- Environmental Interactions
- Construction, Operations and Maintenance
- Substructure Design, Manufacture and Assembly

Further guidance regarding FoW CoE match funding can be found [HERE](#)

Applicants to the Flexible Fund will be able to indicate their requirement to access the EPSRC/FoW CoE scheme fund option at the Expression of Interest (EOI) stage of the application process (as in section 8 of this call document). A clear outline of the proposed use of FoW CoE match funding will be required at the EOI stage and a detailed plan at the full proposal stage. Detailed plans should clearly indicate which deliverables are supported by FoW CoE funding. Additional reporting and monitoring conditions will be applied to the FoW CoE element of the research as arrangements will be treated separately from EPSRC funds.

Assessment of Flexible Fund proposals in the EPSRC/FoW CoE scheme will follow the application process as set out in section 8 of this call document and will be reviewed and assessed as per the criteria set out in section 9 of this call document.

EPSRC/WES scheme – Additional Details

Recent research has shown that achieving the European Commission's SET-Plan cost target of 150 €/MWh by 2030 will result in a deployment of at least 6GW of wave energy capacity by 2050². This represents a valuable contribution to net-zero, especially with the growing understanding of the value

² K. Grattan and H Jeffrey, "Delivering Net Zero: Forecasting Wave and Tidal Stream Deployment in UK Waters by 2050," Policy and Innovation Group, July 2023

of wave energy to a high-renewables-penetration energy system³ and to the UK economy⁴. While the current cohort of wave energy devices and subsystems are on a pathway to commercialisation, the achievement of these cost targets requires continued innovation, the cumulative cost of which would be vastly reduced by more radical innovation which can drive a step-change in learning rates⁵.

For the current cohort of technology, there is potential for valuable cost reductions through sharing of ocean space, infrastructure, services, and supply chain with the floating offshore wind sector⁶.

Alongside this pathway, there is a need for continuous, longer-term improvements in cost, performance, and reliability, beyond that likely to be available from more conventional technologies. Wave Energy Scotland is driving the development of a next generation of wave energy technology, based on electrostatic power conversion technologies - a promising vehicle for those future step-change improvements. WES has carried out investigative studies into these direct, distributed, and flexible technologies, and has identified that they could enable the creation of a completely new class of wave energy technology.

Further details of the scope of eligible WES projects and technologies can be found in section 13. Appendix.

Applicants to the Flexible Fund will be able to indicate their requirement to access the EPSRC/WES scheme fund option at the Expression of Interest (EOI) stage of the application process (as in section 8 of this call document). A clear outline of the proposed approach to the WES scope will be required at the EOI stage and a detailed plan at the full proposal stage. Additional reporting and monitoring conditions will be applied to projects selected under the EPSRC/WES scheme with additional terms and conditions applied.

Assessment of Flexible Fund proposals in the EPSRC/WES scheme will follow the application process as set out in section 8 of this call document and the eligibility defined in section 7. Proposals will be reviewed and assessed as per the criteria set out in section 9 of this call document in addition to alignment with the defined WES scope.

7. Eligibility

For this call, full proposals 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 UKRI. Potential applicants should contact the Supergen ORE Hub in advance of the submission deadline if they have any queries concerning their eligibility. **Sub-contracting is not permitted – please see our FAQ section of the Hub website [HERE](#) for our definition of sub-contracting.** Individuals may submit no more than one Proposal as Principal Investigator plus one as Co-

³ S. Pennock and H. Jeffrey, “What are the UK power system benefits from deployments of wave and tidal stream generation?,” Policy and Innovation Group, 2023.

⁴ C. Cochrane, S. Pennock and H. Jeffrey, “What is the value of innovative offshore renewable energy deployment to the UK economy?,” Policy and Innovation Group, 2021

⁵ P. W. Wong, K. Grattan and H. Jeffrey, “Ocean Energy and Net Zero: Policy Support for the Cost Effective Delivery of 12GW Wave and Tidal Stream by 2050,” Policy and Innovation Group to Policy and Innovation Group and SuperGen ORE Hub, 2023.

⁶ <https://www.waveenergyscotland.co.uk/news-events/shared-floating-wind-and-wave-projects-offer-12-combined-lcoe-reduction-to-uk/>

investigator, or two as Co-Investigator, to this call. Principal and Co-Investigators within the Supergen ORE Hub may not apply.

8. Application process

This Flexible Funding Call has three stages:

Stage 1 – Expressions of Interest

- 1) The first stage is a call for Expressions of Interest (deadline for submissions 11th September 2023 @ 1700 hrs BST). **Expressions of Interest (EOI) are to be submitted electronically via completion of an online EOI form which can be accessed [HERE](#).**
- 2) EOIs **must be anonymised** and will be assessed by the Hub Co-directors and members of the Industrial Advisory Board, FoW CoE and WES, based on criteria 1 to 4 as set out in section 9 of this document. EOIs received will be shortlisted to proceed to the second stage, which will be an invitation to submit a full proposal. **Due to the volume of applications, there will be no feedback provided to applicants who do not proceed past the EOI stage.**

Stage 2 – Full proposals

Full proposals received (**deadline for submissions 3rd November 2023 @ 1700 hrs GMT**) will go through a double anonymised peer review process and will be assessed based on criteria 1 to 4, as set out in section 9 of this document. Second stage proposals should consist of the following evidence*:

- 1) Track record and additionality - **2 pages maximum.**
- 2) Case for support including – a clear identification of the research challenge/s the proposal is looking to address, novelty and timeliness, aims and objectives, programme of work including methodology, management including integration into Supergen ORE Hub, impact and dissemination, budget, and schedule** - **4 pages maximum.**
- 3) Project Partner letters of support, including a statement of the financial value of support offered.

Second stage full proposals should be emailed to SupergenORE.Flexi@plymouth.ac.uk, with the subject line: **“Supergen ORE Hub Flexible Funding Call Round 4 – ‘Proposal Name’ – (plus Principal Investigator surname)”**.

The Track Record, Case for Support and project partner letters of support should be submitted as individual documents in PDF format.

*Please note: The Case for Support in full proposals are required to be **fully anonymised** when submitted by applicants and page limits must be strictly adhered to, or the proposal will not be considered.

**Applicants applying for Flexible Fund option 2 or 3, i.e., EPSRC/FoW CoE scheme or EPSRC/WES scheme, must clearly indicate and delineate which deliverables and budget within the proposed research are supported by the additional contribution of funds.

Stage 3 – Review Panel

Peer reviewed proposals will then be submitted to a review panel, drawing on the Hub Co-Directors, Industry Advisory Board, EPSRC, FoW CoE and WES. Peer reviewed proposals at this stage will be shortlisted by the panel against criteria 1 to 5 and ranked to select the final research proposals that will

receive the Flexible Fund Awards. Final award decisions will be made using the resulting panel ranked order by the Hub Director, Co-Directors and EPSRC.

9. Review criteria and assessment process

Proposals will be assessed against the following criteria:

- 1) Quality of the research to include novelty, ambition, and appropriateness of the proposed methodology.
- 2) National importance of the research, including the ability of the research to promote, support and advance the identified research priorities within ORE.
- 3) Complementary or supplementary fit to the Supergen ORE Hub portfolio of [core research](#)
- 4) Identified opportunity for impact including the extent of industry engagement and potential for policy engagement.
- 5) The capability of the project team to deliver the research proposed and management of the resources (balance of risk).

10. Funded projects required outputs.

- 1) For EPSRC funds, a final, publicly disclosable, report and slide pack (5 to 10 slides) that summarises key impacts, findings and follow on work enabled from the research, which will be used to verify completion and inform future activities.
- 2) A project summary which can be published on the Supergen ORE Hub website on announcement of the Flexible Funding award.
- 3) A summary of funding opportunities that the investigators expect the award to enable.

Please note that the research undertaken as part of the Supergen Flexible Funding call is also subject to:

- 1) Discussion and feedback from the Industrial Advisory Board at their 6-monthly meetings.
- 2) Successful applicants attending the Supergen ORE Hub Annual General Assemblies (or other dissemination events as required) to present the findings, impact and follow on work from their research.
- 3) The PI of flexible fund research projects reporting on the research outcomes to the Supergen ORE Hub to input into ResearchFish and attending intermediate project meetings (in person or remotely) to report on project progress as required.
- 4) Any additional reporting and monitoring requirements as determined by additional contributors, i.e., [FoW CoE](#) and WES (See 13. Appendix).

Use of the Flexible Fund, subsequent outcomes, and activities to support Early Career Researchers and/or Equality, Diversity and Inclusion will be monitored via the EPSRC annual reporting requirement and periodic reporting to the Hub Industrial Advisory Board.

11. Terms and Conditions

- Terms and conditions of standard UKRI FEC grant awards apply⁷.
- In addition, all successful projects must engage with the Supergen ORE Impact Hub and should describe in their application how they plan to do this.

⁷ <https://www.ukri.org/funding/information-for-award-holders/grant-terms-and-conditions/>

- All project outputs and engagement should be branded as ‘Supergen ORE Hub’. Brand materials and guidance will be provided to successful applicants. For published papers EPSRC reference: EP/Y016297/1 must be quoted.
- Where proposals are accessing additional partner schemes, project outputs and engagement should also be branded with the relevant partner logo, i.e., ORE Catapult FoW CoE and Wave Energy Scotland as relevant. Brand materials and guidance will be provided to successful applicants.

12. Additional information

Equality, Diversity, and Inclusion

Supergen ORE Hub supports the value of the diversity of its staff and stakeholders, enabling all to realise their full potential by valuing the contribution of everyone and recognising and harnessing the benefits that differences can bring. Supergen ORE Impact Hub is committed to eliminating unlawful discrimination and promoting equality of opportunity and good relations across and between the defined equalities groups in all their relevant functions. Accordingly, no eligible funding applicant will receive less favourable treatment on the grounds of gender, marital status, sexual orientation, gender re-assignment, race, colour, nationality, ethnicity or national origins, religion, or similar philosophical belief, spent criminal conviction, age or disability. Equally, all proposals will be assessed on equal terms, regardless of the sex, age and/or ethnicity of the applicant. Proposals will therefore be assessed and graded on their merits, in accordance with the criteria and the aims and objectives set for the call. If you are employed by an eligible UK institution and satisfy EPSRC’s current regulations on investigator eligibility you are eligible to submit a proposal, regardless of your nationality or ethnicity.

Management of Flexible Fund

Each call for proposals is developed by the Supergen ORE Hub Management board, guided by the advice of the Advisory Board and Research Alignment Group. The Advisory Board and Research Alignment Group comprises of independent chairs and industrial, policy and academic experts. The membership represents a range of disciplines and sectors relevant to the Supergen ORE Hub ‘whole systems approach’ research.

Details about the Supergen ORE Hub Management Board, Advisory Board and Research Alignment Group membership can be found at: <https://supergen-ore.net/about/people>

Point of Contact for queries

Flexible Funding Enquiries – Supergen ORE Hub

Email: SupergenORE.Flexi@plymouth.ac.uk

Subject line: “Supergen ORE Hub Flexible Funding Call Round 4 – July 2023 – Queries”

Please note that all queries regarding the Supergen ORE Hub Flexible Fund must be directed via email to maintain a clear audit trail for reporting purposes where required and will be answered publicly via a FAQ area on the Supergen ORE Hub website.

Please check the FAQ section of the Supergen ORE Hub website [HERE](#) in advance of submitting queries, as your question may already have been answered

For specific queries regarding the use of additional funding from the FoW CoE or WES, all questions received at SupergenORE.Flexi@plymouth.ac.uk will be forwarded to the relevant contact within FoW CoE and WES. All queries will also be answered publicly via the FAQ area on the Supergen ORE Hub website.

13. Appendix

	Theme and Research Challenge Description
Research Challenge	A - Resource and Environment Characterisation
A1	Better measurement techniques for forecasting and resource characterisation
A2	Improved modelling tools for resource assessment.
A3	Resource and environmental characterisation in physical modelling facilities.
A4	Long-term sediment transport measurement and modelling
	B - Fluid-structure-seabed interaction
B1	Realistic fluid-structure-seabed design tools that work together, not in isolation
B2	Novel device concepts – rethinking the mechanism of energy extraction
B3	Moorings, anchors, and foundations
B4	Multi-purpose hybrid systems for ORE and ocean resources.
B5	Design of reliable cabling systems.
	C - Materials and Manufacturing
C1	Integrity in the marine environment (corrosion, fatigue, coatings etc.)
C2	Serial (volume) manufacturing of complex structural systems
C3	Design for safe and cost-effective installation methods
C4	New materials and coatings
C5	Recycling/reuse of composites
	D - Sensing, Control and Electromechanics
D1	Control of ORE farm
D2	Smart sensor system use
D3	Drive train design
D4	Power Electronic Conversion

E - Survivability, Reliability and Design	
E1	Higher and more consistent reliability through risk-based design
E2	Extending limits to operation or performance by mitigating extreme actions
E3	Innovative subsystems to provide higher and more consistent reliability and / or performance
E4	Sustainable whole-life design method
E5	Design tools for arrays
E6	Whole systems approach to operate large scale ORE
F - Operations, Management, Maintenance and Safety	
F1	Analysis of remote sensing and condition monitoring data
F2	Use of autonomous systems for inspection
F3	Data and digital cyber security
F4	Increased use of automation to reduce risk in installation and operation (O&M)

G - Environmental and Ecosystem Aspects	
G1	Fit for purpose approaches to environmental monitoring
G2	Development of population level environmental impact models
G3	Ecosystem Modelling
H - Marine Socioeconomics and Governance	
H1	Communication: Ocean literacy and public perception of ORE
H2	Interaction with other marine users
H3	Development of market mechanisms for ORE
H4	Reducing uncertainty of both technology and social costs of ORE

Wave Energy Scotland - Scope of the 2023 EPSRC/WES Flexible Funding call

WES is building a package of collaborative R&D activities to drive the development of Direct Generation Technologies. Building on the Direct Generation Concept Design Competition, WES is supporting the [Flexible Funding programme delivered under the Supergen ORE Hub](#) by providing up to £50k additional funding for a project within a specific scope of Direct Generation module development, below. The Supergen ORE Hub, funded by EPSRC is accessible to 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 UKRI.

The scope of the 2023 EPSRC/WES Flexible Funding call is specific to WES R&D priorities related to [Next Generation Wave Energy](#). The scope is described below:

- Concept design and development of cell-based or segmented direct generation (Dielectric Elastomer Generator, DEG, or Dielectric Fluid Generator, DFG) modules that could form the building block of a new class of distributed, flexible wave energy converter.
 - Design/selection/characterisation of metamaterial, cell and module concepts which deliver the functional characteristics required by potential future direct, distributed, flexible wave energy converter concepts (e.g., shape or volume changing with variable capacitance and conversion of mechanical power to electricity)
 - Manufacture and functional demonstration of multi-cell direct generation solution in laboratory conditions, at functionally representative scale, while also demonstrating the approach to mass-multiplication of cells
 - Definition and prioritisation of requirements for further enabling R&D and pathways for future development, manufacture and characterisation of high-performance materials and metamaterials.

Throughout delivery of the above scope, decision-making should adopt the following general principles:

- Scalability by multiplication of cells rather than scale-up of single cells
- Compatibility with repeatable, low cost, mass production processes
- Environmental acceptability and compatibility with a circular economy (e.g., biodegradability or recyclability)
- Demonstration of a clear pathway to commercial, industrial exploitation in wave energy applications
- Maximum compatibility of resulting products and processes with other sectors and applications beyond wave energy generation e.g., sectors such as automotive, aerospace, robotics, and applications such as sensing and actuation. Can there be similarity or interchangeability in material, manufacturing process, metamaterial architecture, module architecture to exploit the product widely?
- Projects shall engage with other research activities such as, but not limited to, successful projects in the [WES Direct Generation Concept Design Competition](#), to share and inform R&D requirements.
- Proposals with meaningful industrial engagement will be viewed favourably.

WES intends to support annual EPSRC/WES Flexible Funding calls. The R&D requirements for future years will evolve as the technology progresses, depending on the outcomes of the 2023 call and activity in other sectors.