



Supergen



Offshore
Renewable
Energy

SIXTH ANNUAL ASSEMBLY

Professor Deborah Greaves OBE
Director of the Supergen ORE Hub

*Professor of Ocean Engineering,
University of Plymouth*

www.supergen-ore.net | [#SupergenORE23](https://twitter.com/SupergenORE23)

UK
RI

Engineering and
Physical Sciences
Research Council

Welcome and introduction

Six research centres will lead innovation towards a fully sustainable energy sector

UKRI Press Release: 00:01AM Wednesday 12th July 2023

£53 million in funding awarded by UK Research and Innovation to boost knowledge, innovation and new technologies to decarbonise the energy sector

Supergen ORE Impact Hub 2023

Led by Professor Deborah Greaves, University of Plymouth

£7.5 million from EPSRC.



News





Professor Deborah Greaves
OBE
Director of the Supergen ORE Hub
(University of Plymouth)

Professor Tim Stallard
Co-Director of the Supergen ORE Hub
(University of Manchester)

Professor David White
Co-Director of the Supergen ORE Hub
(University of Southampton)

Henry Jeffrey
Co-Director of the Supergen ORE Hub
(University of Edinburgh)



Professor Richard Willden
Co-Director of the Supergen ORE Hub
(University of Oxford)

Professor James Gilbert
Co-Director of the Supergen ORE Hub
(University of Hull)

Professor Philipp Thies
Co-Director of the Supergen ORE Hub
(University of Exeter)

Professor Beth Scott
Co-Director of the Supergen ORE Hub
(University of Aberdeen)



Professor Byron Byrne
Co-Director of the Supergen ORE Hub
(University of Oxford)

Professor Xiaowei Zhao
Co-Director of the Supergen ORE Hub
(University of Warwick)

Professor Feargal Brennan
Co-Director of the Supergen ORE Hub
(University of Strathclyde)

Core and Flexible Fund Research



Find out more:
www.supergen-ore.net/flexible-funding

Core, Flexible Fund and ECR Research



Find out more:
<https://supergen-ore.net/ecr-community/ecr-research-funding>

Our Impact Highlights (2018 – 2023)

Working with Industry

- 51 industry partners in Flexible Funded projects
- 38 strong world leading advisory board

Working with Policy

- Producing 8 policy briefings
- Contributing to COP26 and the G7 Summit
- Influenced the ORE sectors across UK

Equality, Diversity, and Inclusion

- Children’s book - over 500 copies distributed
- 30% Annual Assembly speakers identified as women
- EDI surveys across the Supergen programme



Early Career Researchers

- 200+ members in the community
- £150,000 invested into 37 projects developing research and skills

Flexible Funding

- £3m invested into 30 projects
- £2.9m total industry match
- 240+ research publications
- Improved gender split in funding applications (30% female)

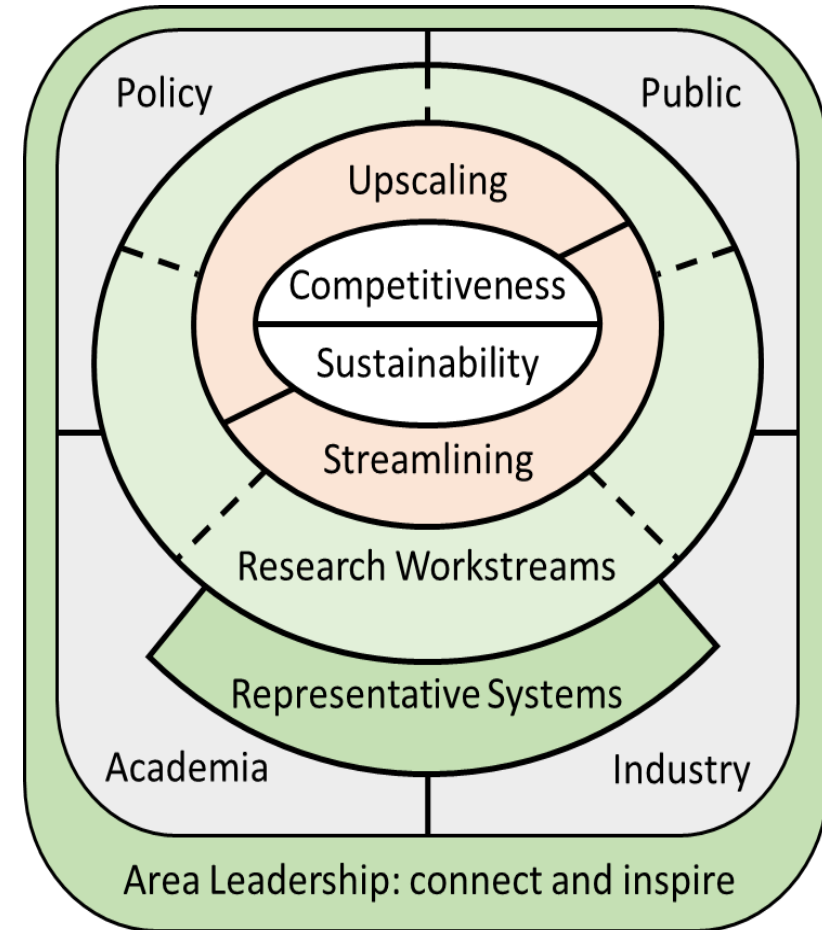
Research Leadership

- Engaging 95 UK Universities
- Sharing UK ORE research through a single platform and shared voice

Supergen ORE Hub 2023: Vision

Rapid Offshore Renewable Energy (ORE) expansion is essential to the UK for (i) Net Zero and climate change mitigation, (ii) energy security, (iii) green growth and jobs.

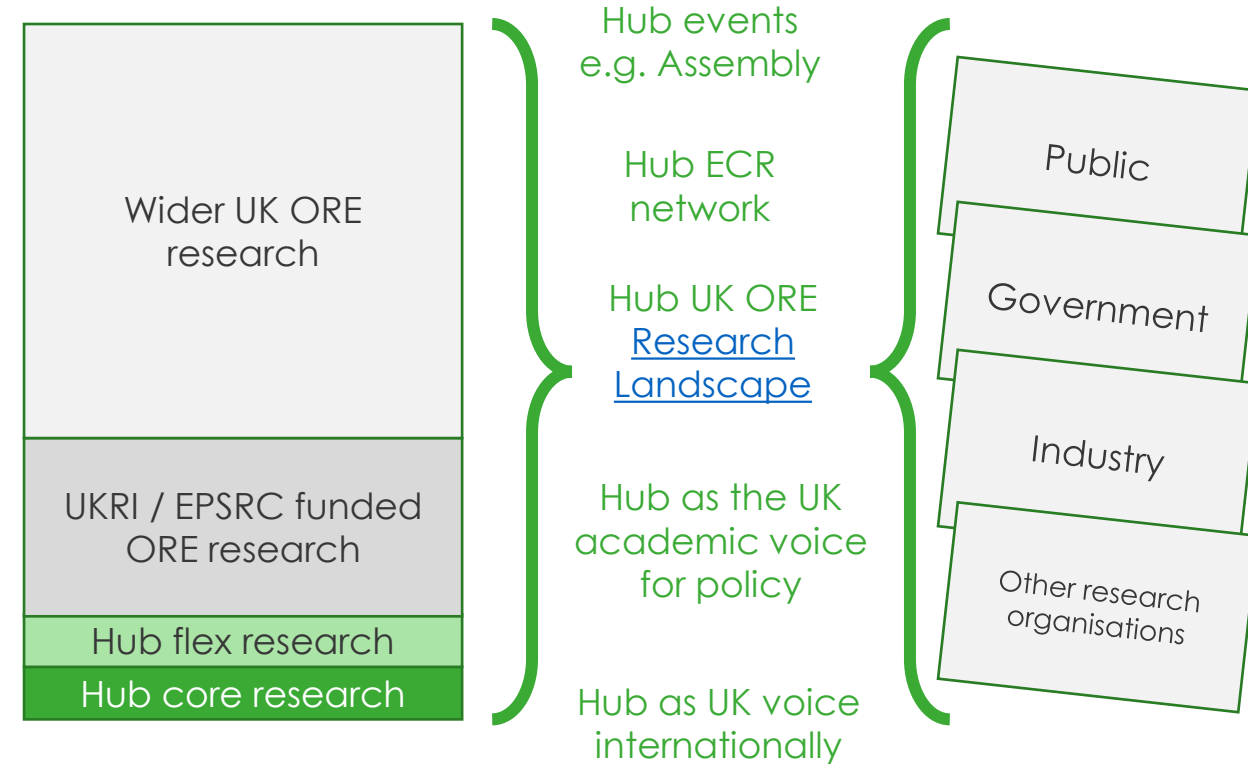
- *Streamlining* ORE projects, by accelerating planning, consenting and build out timescales
- *Upscaling* the scale and efficiency of ORE devices and systems, and the ORE workforce
- *Competitiveness*: maximising ORE local content and ORE economic viability in the energy mix, to maximise UK benefits of the drive to Net Zero
- *Sustainability*: ensuring positive environmental and societal benefits from ORE



Supergen ORE Hub 2023

Deliver vision and lead the contribution of ORE to Net Zero via Core Research and Area Leadership

- Core Research and Supergen Representative Systems for community collaboration and research translation for key ORE challenges.
- Area Leadership to **connect and inspire** as a trusted voice for the sector, through events, training, policy advice, flexible funding, outreach, curation of the research landscape, and as a beacon for EDI.



Research Landscape

Interactive web-based landscape tool to enable industry, government and researchers to share opportunities and challenges across challenge themes, and allows researchers to promote ORE projects to the wider community.

www.supergen-ore.net/research-landscape

Advisory Board members



Work streams from Supergen ORE Hub Phase 2, with their research focus mapped against the sector challenges identified in:

Supergen ORE Hub
Phase 1 Research
Landscape themes

BEIS UK net zero
research and innovation
framework challenges

BEIS Energy Innovation
Needs Assessment
priority innovation areas

ETIP Ocean Strategic
Research and Innovation
Agenda challenge areas

Offshore Wind
Innovation Hub Roadmap
innovation priorities

Work stream

Challenges

Impacts

WS 1 – ORE expansion -
policy and scenarios

Marine planning
and governance

Integration in the
energy system

Commercial
and strategy

Environmental and
ecosystem impacts

WS 2 – Data for ORE design
and decision-making

Resource and
environment
characterisation

Digital optimisation, design and artificial
intelligence to optimise the electricity system

Data collection
and analysis

Fluid-structure
seabed interaction

WS 3 – ORE modelling

Developing and
Demonstrating earlier
stage renewables

modelling tools

Rotors and powertrains

WS 4 – ORE design
methods

Sensing, control and
electromechanics

Accelerating the
deployment of offshore
wind capacity

Design and validation of
ocean energy devices

WS 5 – Future ORE
systems and concepts

Health monitoring
development

Innovations for offshore wind
e.g. new blade technologies

Integration of design
Survivability,

Operations management,
maintenance and safety

and turbine components

Reliability and design

Unlocking deep water
offshore wind sites

Foundations
Integration in the
energy system

Develop floating or
long-reach foundations
to access deeper waters

Policy

Civil Society

Upscaling

Competitiveness

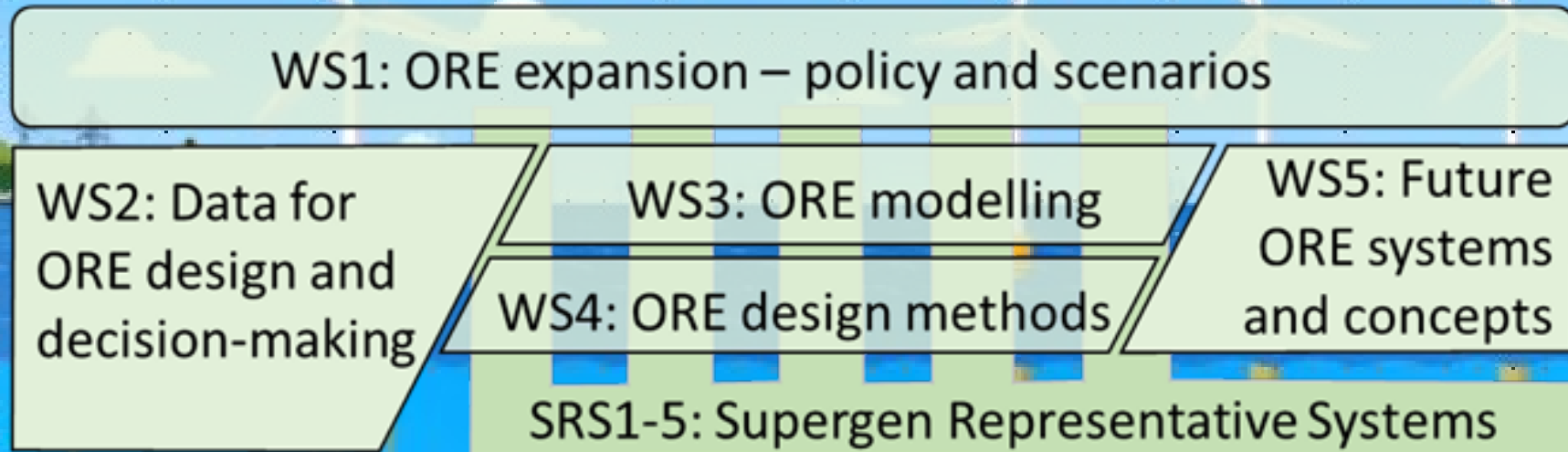
Sustainability

Streamlining

Industry

Academia

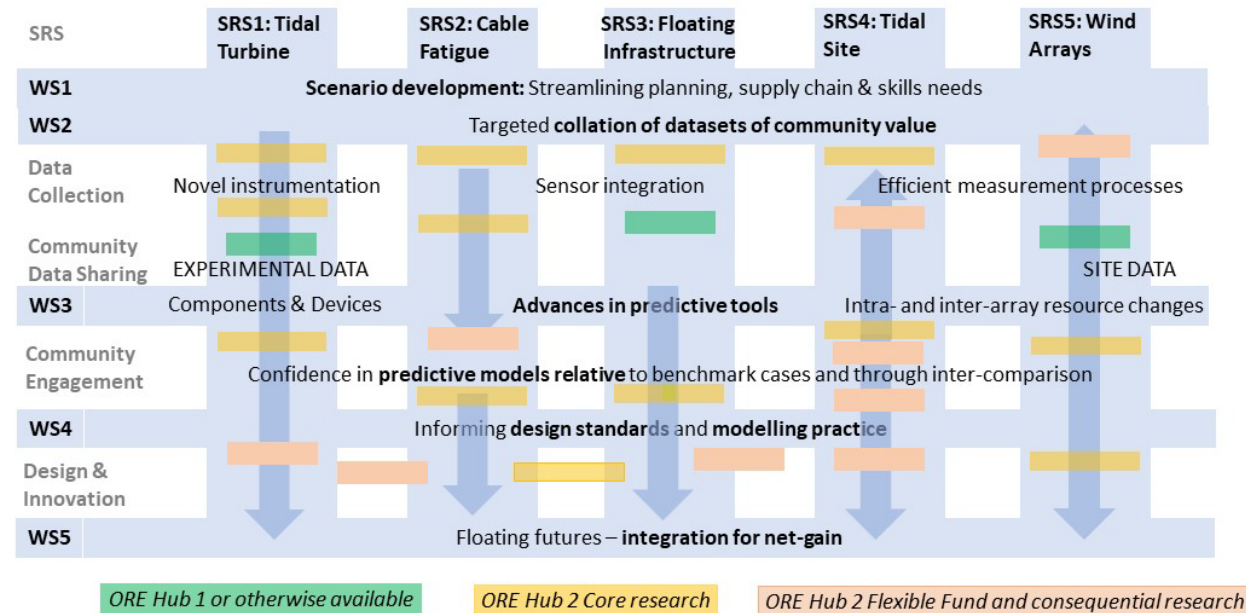
Core Research



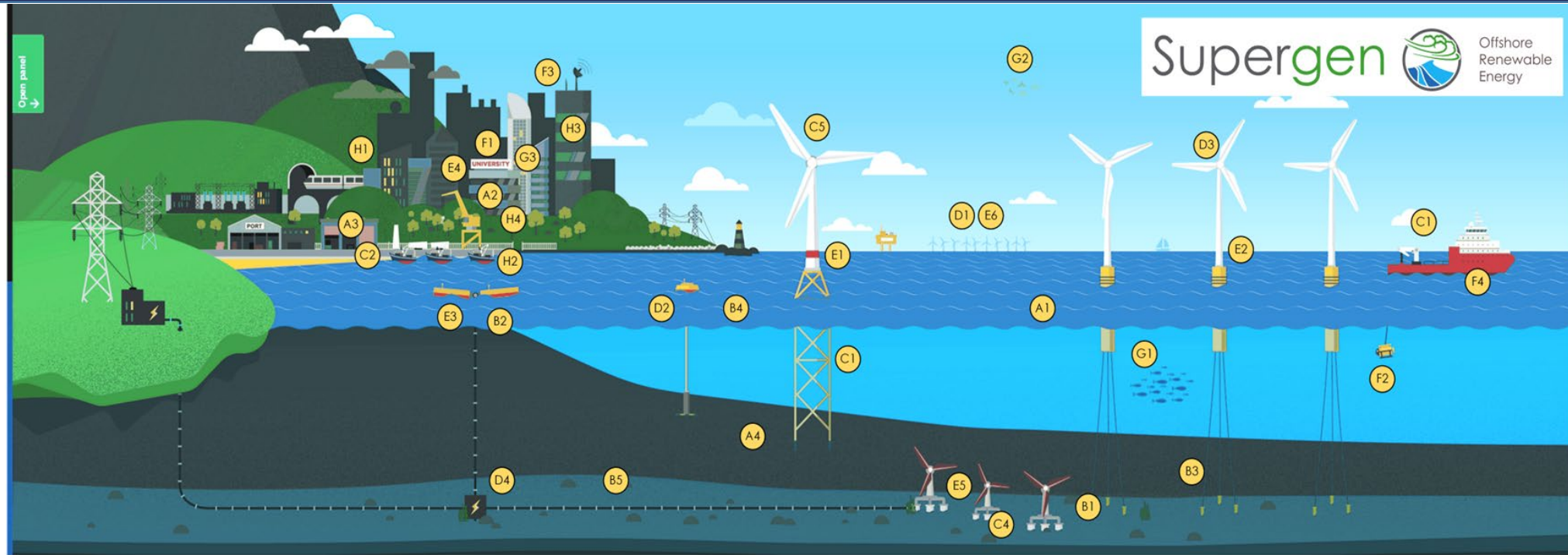
Supergen Representative Systems

Open metadata sets shared with the community, built through Core and Flexible Funded research

- Academic and industry community engagement
- Comparative reference cases for testing and comparing modelling tools and approaches
- Assessing applicability of emerging technology to existing standards and codes and making recommendations for updates and data gaps
- Assessing data processing techniques and packaging to provide informative and de-sensitised datasets



Research Landscape



Theme A: Resource and environment characterisation

- A1. Better measurement techniques for forecasting and resource characterisation
- A2. Improved modelling tools for resource and loading assessment
- A3. Resource and environmental characterisation in physical modelling facilities
- A4. Long-term sediment transport measurement and modelling

Theme B: Fluid-structure-seabed interaction

- B1. Realistic fluid-structure-seabed design tools that work together, not in isolation
- B2. Novel design concepts – rethinking the mechanism of energy extraction
- B3. Mooring anchors and foundations
- B4. Multi-purpose hybrid systems for ORE and ocean resources
- B5. Design of reliable cabling systems

Theme C: Materials and manufacturing

- C1 Structural 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

Theme D: Sensing, control and electromechanics

- D1. Control of ORE farms
- D2. Smart sensor use
- D3. Drive train design
- D4. Power electronic conversion

Theme 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 sub-systems to provide higher and more consistent reliability and better performance
- E4. Sustainable whole-life design methods
- E5. Design tools for arrays.
- E6. Whole systems approaches to operation of large-scale ORE

Theme 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)

Theme G: Environmental and ecosystem aspects

- G1. Fit-for-purpose approaches to environmental monitoring
- G2. Development of population level environmental impact models
- G3. Ecosystem modelling.

Theme H: Marine planning and governance

- H1. Communications: 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

Impact Focus

- *New Impact Officer role*

Provided jointly by OREC and SMB host universities to work together identifying research and matching impact opportunities



Impact Focus

- *New Impact Officer role*
- *New parallel funding option for industry-funded research*

Alongside the annual Flexible Funding calls with separate leveraged funding targeted towards specific challenges



Impact Focus

- New *Impact Officer* role
- New *parallel funding* option for industry-funded research
- New option for *buy-out of PDRA time*

For fast turn-around short-term (1 to 3 month) projects directed to a specific industry problem



Impact Focus

- *New Impact Officer role*
- *New parallel funding option* for industry-funded research
- *New option for buy-out of PDRA time*
- *New Placement Scheme*, providing exchange/ placements for researchers

Industry co-funded placements and exchanges offered into industry or into academia, targeted both at senior post-doctoral and academic level



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- *Impact Workshops, Themed Research Webinars and Focus Group Workshops*



Enhancing strategic engagements across academia, industry and government. Approximately monthly events, each with a specific focus: (i) research impact; (ii) a key sector focus (e.g. skills, R&D funding), (iii) policy and (iv) themed research highlights

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- Expansion of the ECR network to include fee-paying *Early Career Industry* participants



Attending networking events, including Masterclasses, training courses, Workshops, Seminars and mini conferences. ECI places purchased on an individual basis or through a new subscription scheme

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- *UK ORE Innovation Ecosystem Forum – quarterly meetings*



Via the ORE Innovation Ecosystem Forum and Policy Round Tables, we will advise on innovation funding to provide joined-up approach over the full TRL range

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- *A new fee membership* model open to all in the ORE sector



Annual subscription providing:
 Masterclass/training course places a year
 for ECI / ECR Network and activities, and
 research match making service

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£4m (>53%) industry £1.7m (>23%) HEI leverage on EPSRC investment

Equality Diversity and Inclusion

The Supergen ORE Hub seeks to be a ‘Beacon for EDI’.

We want to understand our community and ensure we are responsive to the different challenges we all face.

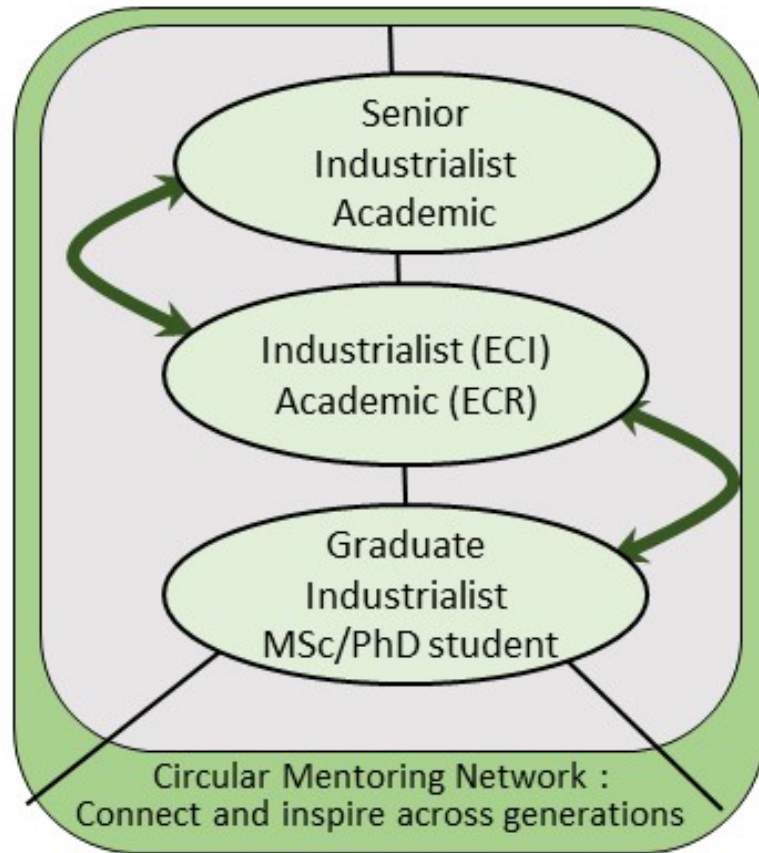
EDI Questionnaire – What is your experience of interacting with the Supergen ORE Hub? Please scan the QR code and complete the survey (later).

EDI Interviews – More in-depth discussion about issues with EDI in the Network – confidentially carried out by Equal Engineers.



EqualEngineers

SuperGen-erations Mentoring Scheme



- **Reciprocal** – Learning from each other’s experiences
- **Intergenerational** – easier to relate to someone nearer your own age
- **EDI Sensitive** – seeking to pair common characteristics
- **Networking** – the mentoring group will meet regularly – helping build a wider network
- **Industry and Academia** – open to both academic and industry participants

We are recruiting participants at all levels – if you are interested in getting involved please get in touch

Flexible Funding

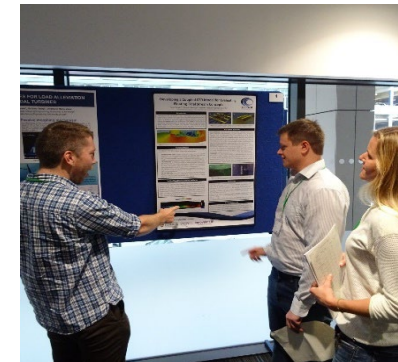
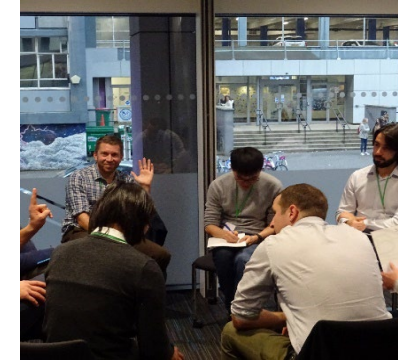
- Annual calls launched in July with a deadline in September
- The funding available will be extended through co-funding in specific areas with external bodies
 - Floating Offshore Wind Centre of Excellence
 - Wave Energy Scotland
- Flexible Fund proposals will be invited in three stages
 - Stage 1: Expressions of Interest: anonymised and assessed by members of SMB and AB
 - Stage 2: Full proposals: double-anonymised peer review by SMB, AB and wider Network
 - Stage 3: Review panel drawn from SMB, AB, EPSRC observer and co-funding partners.

FLOATING OFFSHORE WIND CENTRE OF EXCELLENCE | Delivered by **CATAPULT** Offshore Renewable Energy

 wave energy SCOTLAND

Early Career Researchers

- A specialist, flexible research and travel fund for ECRs totalling £150k FEC and limited to £5k per application.
- The ECR network will support the wider dissemination of ORE activities and skills training, as well as showcase the high-quality research being completed by ECRs.
- Development of the ECR network, expanded to include activities with ECIs, allowing ECRs to link up with industry colleagues, enabling translation of research ideas and outputs at an early stage and establish links for future collaborations.
- A range of specialist skills training will be made available, advanced masterclasses and career advancement skills training, including cross-hub activities and training with Supergen Bioenergy and Energy Networks.
- Seeking Supergen ORE Hub Lead ECR



09.00 - 09.20	Welcome Address - Prof. Deborah Greaves
09.20 - 10.30	Panel session 1: Unlocking growth targets: What changes are needed within policy and practice to enable targets for 2030 and beyond to be achieved within the context of ORE? What is the role of the Supergen ORE Hub in providing research leadership for ORE to achieve these targets for 2030 and beyond?
10.30 - 11.00	Refreshment break and networking/poster exhibition
11.00 - 11.30	Supergen ORE Hub Core Research updates
11.30 - 12.30	Flexible Funding Awards and EPSRC Wave Energy Projects Research Showcase
12.30 - 13.30	Lunch break and networking/poster exhibition
13.30 - 14.30	Panel Session 2: People power: How to grow and sustain the workforce needed to deliver net zero and ensure that Equality, Diversity and Inclusion is a core element of the journey to 2030 and beyond?
14.30 - 15.00	Supergen ORE Hub Core Research updates
15.00 - 15.30	Refreshment break and networking/poster exhibition
15.30 - 16.30	Panel Session 3: The global local industry: How do we best share best ORE practice through international collaboration? and how do we ensure all communities and regions can benefit from ORE growth?
16.30 - 17.00	Poster prize giving and close
17:00 – 18:30	Networking/poster exhibition with refreshments

SpotMe Platform



Supergen



Offshore
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Energy

Welcome to the Annual Assembly

To access the agenda visit the SpotMe Platform.
See the activation link in your email.

Stay in touch



www.supergen-ore.net



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Keep up-to-date with news and events by joining our mailing list
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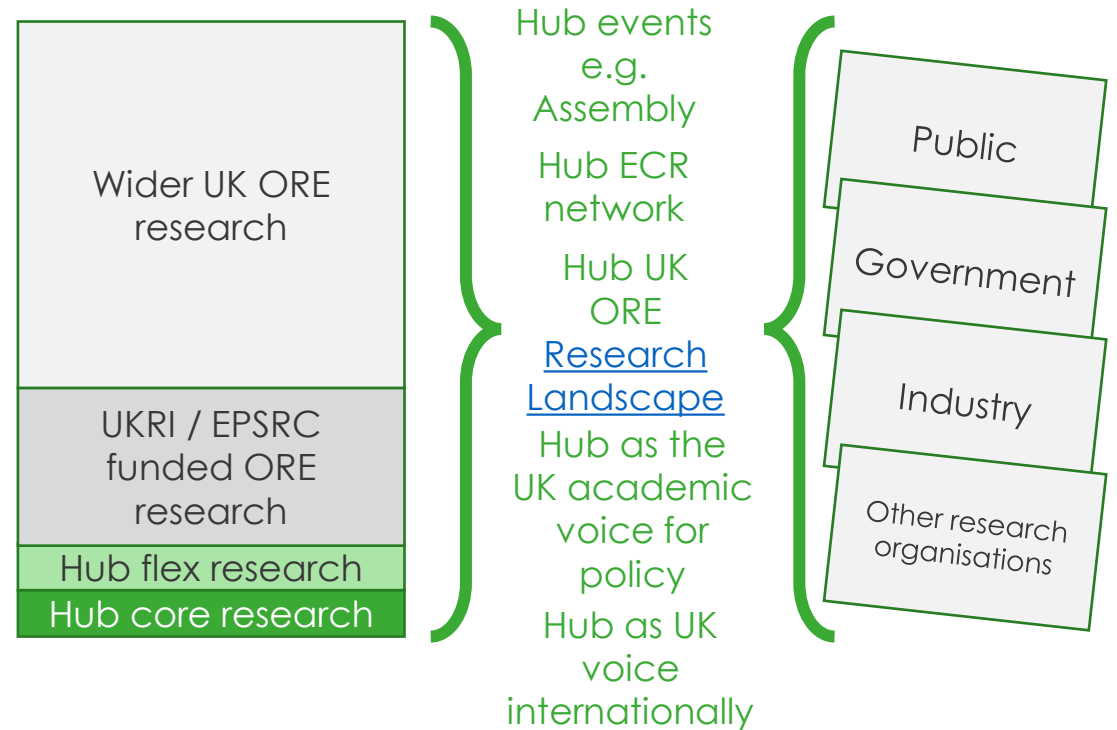
Research Activities

Inspire

- Research Landscape
- Flexible funding
- Resource prioritisation

Connect

- Assembly and events
- ECR network
- Research Alignment Group
- Advisory Board
- Influence policy – voice for sector

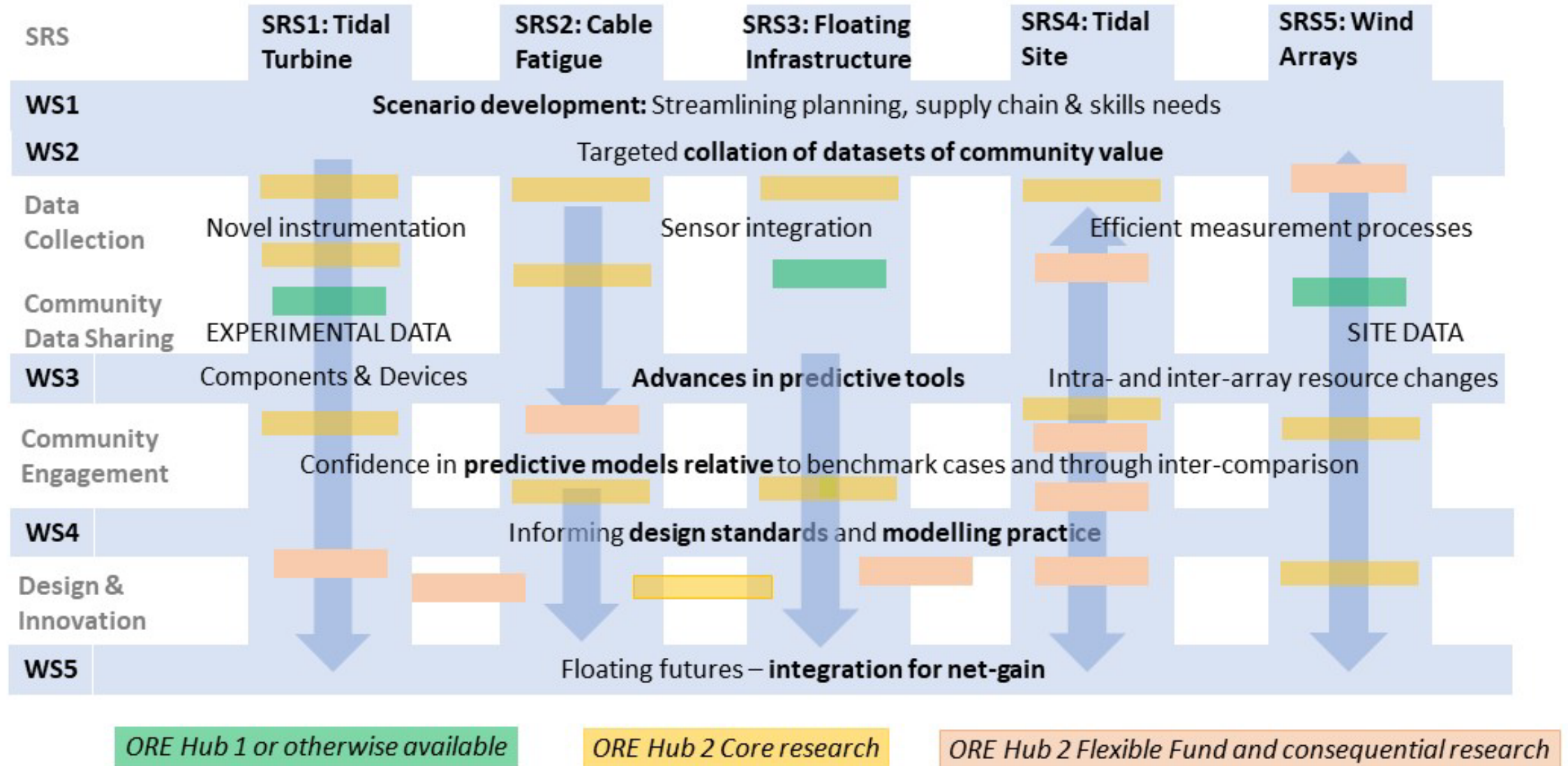


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www.supergen-ore.net/research-landscape

Supergen Representative Systems



Significant developments since proposal submission

- EDI Survey and Focus Groups, working with EqualEngineers
- Research Landscape update underway
- March 2023: NREL launches InDEEP competition for Wave Energy
- March 2023: Consent for Erebus floating offshore wind project
- March 2023: Tidal energy developer Orbital Marine Power Option Agreement for 30MW project in the Westray Firth.
- May 2023: North Sea Summit declarations: Developing the North Seas as a green power plant of Europe
- May 2023: Scottish Offshore Wind Energy Council's Strategic Investment Model launched at All Energy in Glasgow.



Blue Gem Wind