

ORE Supergen



Offshore Renewable Energy

New Supergen Hubs

- Advisory Streams endorsed the 2016 review process findings and recommendations
- Respected voice for Policy makers
- Trusted partner for industry
- International collaboration
- Whole systems approach
- Programme to become a 'beacon for E&D'
- Development of ECR
- Supergen Programme should provide 'Visible Research Leadership'
- Three tier structure (Programme, hub and spoke)
- Clustering of synergic areas: combination of Wind and Marine in new ORE Supergen

Marine (wave and tidal)

- The UK has a leading position in marine energy with almost 200 MW of installed capacity of wave and tidal stream projects, that are either operational, under construction or in development. For the UK, wave and tidal energy is seen as having the potential to provide 15 – 20% of current electricity demand by 2050.
- Meygen is the world's first multi-turbine tidal stream energy project; the first four turbines with total capacity of 6MW were installed in 2016, and will be increased to 398MW by the early 2020s.
- Wave energy is at a much earlier stage of development, with many different devices under investigation. There has been no convergence of design concept so far, partly because the technology concepts are naturally location-specific.



Offshore Wind

- OW is a well-developed and fully commercialised technology. It has already seen considerable cost reduction and the development of gigawatt farms around UK shores.
- With one of the best OW resources in the world, 1,497 OW turbines; 28 Operational projects; 5.35GW OW Operational capacity, OW contributes approximately 4% of the UK's power. The cost of OW has seen significant reduction over recent years with strike price going as low as £57.50/MWh. Furthermore, the first floating OW farm, the 30MW Hywind pilot located off the coast of Scotland, is now under development.
- Floating OW is at a much earlier stage of development than fixed OW and there are some clear similarities and synergies with wave energy



Offshore Renewable Energy SuperGen Hub

- EPSRC will create a new Supergen ORE hub and will consult the research community on how best to put this together and identify a coordinated programme of multidisciplinary research.
- It is recognised that the specific research challenges facing offshore wind, tidal and wave technologies are quite distinct and that the work in synergic areas would be in addition to existing research and expertise.
- Whole systems approach to energy research, drawing on engineering, economics and the physical, environmental and social sciences.
- Two stage call process

Offshore Renewable Energy SuperGen Engagement Project

- 6 month Engagement Project
 - Consortium Building and Strategy Development
 - ORE Network with Stakeholder Mapping >200 members already signed up
 - Key Stakeholder Engagement
 - ORE Challenge Workshops
 - Eol invitations to select ORE Hub Co-Directors and Workshop Attendees
 - Stakeholder survey
 - Have your say in helping to set the agenda for ORE Research
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- Deborah Greaves, University of Plymouth
 - Working with Annie Linley and Ross Wigg



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**ENGINEERING
WITH
PLYMOUTH
UNIVERSITY**

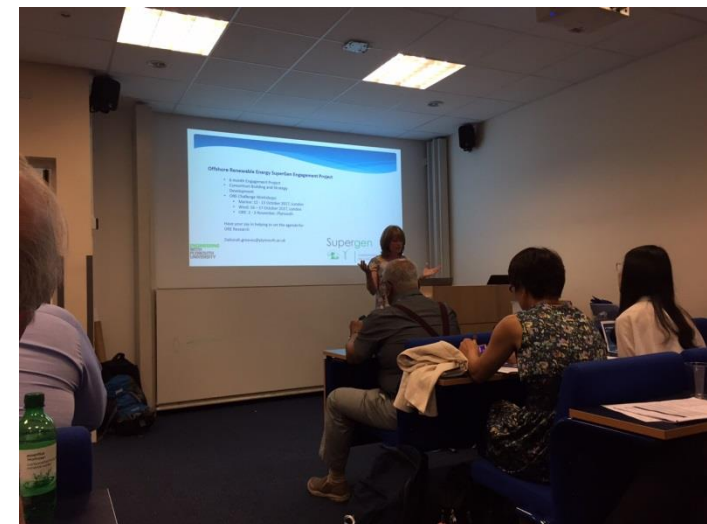
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Key Stakeholder Meetings

- ORE Catapult - NCL
- Supergen Wind
- Carbon Trust
- Wildlife Trusts
- MAREI - UCC
- EPSRC SAT
- UKERC low carbon network
- REMS - Cranfield University
- Scotlink
- UKCMER
- BEIS conference
- RCUK Energy Programme SAC
- Marine Scotland Science
- UK-China ORE Projects
- UKERC
- Renewable UK
- WES
- Offshore Wind Innovation Hub
- MASTS
- DBEIS (head of renewables)
- Crown Estate
- Renewable Energy, DIT
- FCO
- Super Wind General Assembly
- ETI Conference & Exhibition
- UKCMER Annual Assembly
- NERC
- Carbon Trust Steering Committee
- Marine Energy Wales
- LCRI
- East of England Energy Group
- Gplus
- EPSRC HLG

Community Engagement

- “ORE Supergen Initial Engagement Event” at the 4th PRIMaRE Conference 2017, Southampton on 7 July 2017.
- INORE/ORE Supergen thematic debate on: “Existing barriers in the ORE sector: How can PhD/early career researchers (ECRs) help to break down these by doing things differently?” at the INORE European Symposium, Co. Clare (Ireland) on 24 August 2017.
- INORE/ORE Supergen/MaREI workshop on: “The Future of ORE Research: The early career researcher (ECR) Perspective” at the EWTEC 2017, Cork (Ireland) on 30 August 2017.
- “Marine (wave/ tidal range and stream) Challenge Workshop” in London on 12-13 October 2017.
- “Offshore Wind Challenge Workshop” in London on 16-17 October 2017.
- “Transformation of ORE System Challenge Workshop” in Plymouth on 2-3 November 2017.
- Re-engagement Virtual Workshop



ORE Challenge Workshops

Marine Workshop

Attended:	39	Academic	62%
		Industry	38%
On Line:	11	Academic	82%
		Industry	8%
Grand Total:	50	Academic	66%
		Industry	34%

Wind Workshop

Attended:	51	Academic	63%
		Industry	37%
On Line:	5	Academic	80%
		Industry	20%
Grand Total:	56	Academic	64%
		Industry	36%

ORE Workshop

Attended:	60	Academic	67%
		Industry	33%
On Line:	10	Academic	90%
		Industry	10%
Grand Total:	70	Academic	70%
		Industry	30%

High level	Mid Level	MARINE
Minimising human intervention (safety)	Autonomy	9.14
	Control	
Improving communication/resolving conflicts	Data/information/knowledge sharing/exchange	2.03
	Providing reassurance / informing / educating	3.05
Reducing uncertainty/risk	Better data/ understanding	10.15
	Reducing policy uncertainty	
	Reducing financial risk	
	Public acceptance / perception	
Innovation (in design/methods)	Improved design (cost effective)	21.83
	Better/ alternative materials	
	Better manufacturing methods	
	Better design methods	
	Numerical modelling	17.77
	New management strategies	
	New financial / commercial models	
Identifying opportunities	Cost reduction	6.09
	Identifying market opportunities	
	Socio-economic opportunities and benefits	8.63
	Recycling / relieving	
	Environmental benefits	7.61
	Knowledge exchange opportunities	5.08

High level	Mid Level	MARINE	WIND
Minimising human intervention (safety)	Autonomy	9.14	11.29
	Control		
Improving communication/resolving conflicts	Data/information/knowledge sharing/exchange	2.03	9.68
	Providing reassurance / informing / educating	3.05	6.45
Reducing uncertainty/risk	Better data/ understanding	10.15	20.43
	Reducing policy uncertainty		
	Reducing financial risk		
	Public acceptance / perception		
Innovation (in design/methods)	Improved design (cost effective)	21.83	19.35
	Better/ alternative materials		
	Better manufacturing methods		
	Better design methods		
	Numerical modelling	17.77	11.29
	New management strategies		
	New financial / commercial models		
Identifying opportunities	Cost reduction	6.09	9.14
	Identifying market opportunities		
	Socio-economic opportunities and benefits	8.63	5.91
	Recycling / relieving		
	Environmental benefits	7.61	5.91
	Knowledge exchange opportunities	5.08	

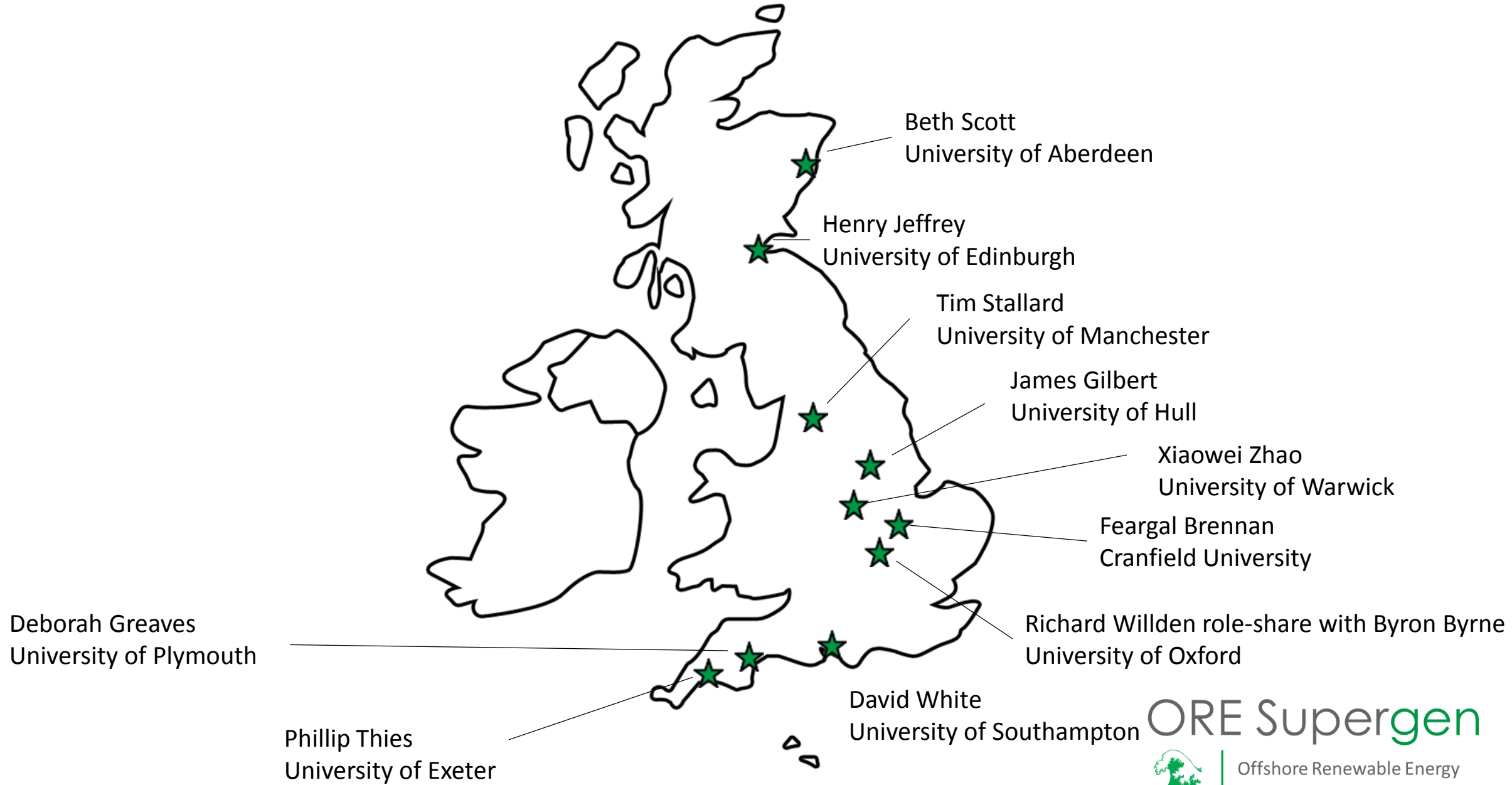
High level	Mid Level	MARINE	WIND	ORE
Minimising human intervention (safety)	Autonomy	9.14	11.29	11.37
	Control			
Improving communication/resolving conflicts	Data/information/knowledge sharing/exchange	2.03	9.68	4.39
	Providing reassurance / informing / educating	3.05	6.45	3.36
Reducing uncertainty/risk	Better data/ understanding	10.15	20.43	10.85
	Reducing policy uncertainty			0.78
	Reducing financial risk			0.52
	Public acceptance / perception			1.03
Innovation (in design/methods)	Improved design (cost effective)	21.83	19.35	26.10
	Better/ alternative materials			5.68
	Better manufacturing methods			0.78
	Better design methods			3.10
	Numerical modelling	17.77	11.29	20.41
	New management strategies			0.52
	New financial / commercial models			1.55
Identifying opportunities	Cost reduction	6.09	9.14	2.58
	Identifying market opportunities			0.26
	Socio-economic opportunities and benefits	8.63	5.91	2.07
	Recycling / relieving			
	Environmental benefits	7.61	5.91	3.10
	Knowledge exchange opportunities	5.08		

ORE Supergen Hub

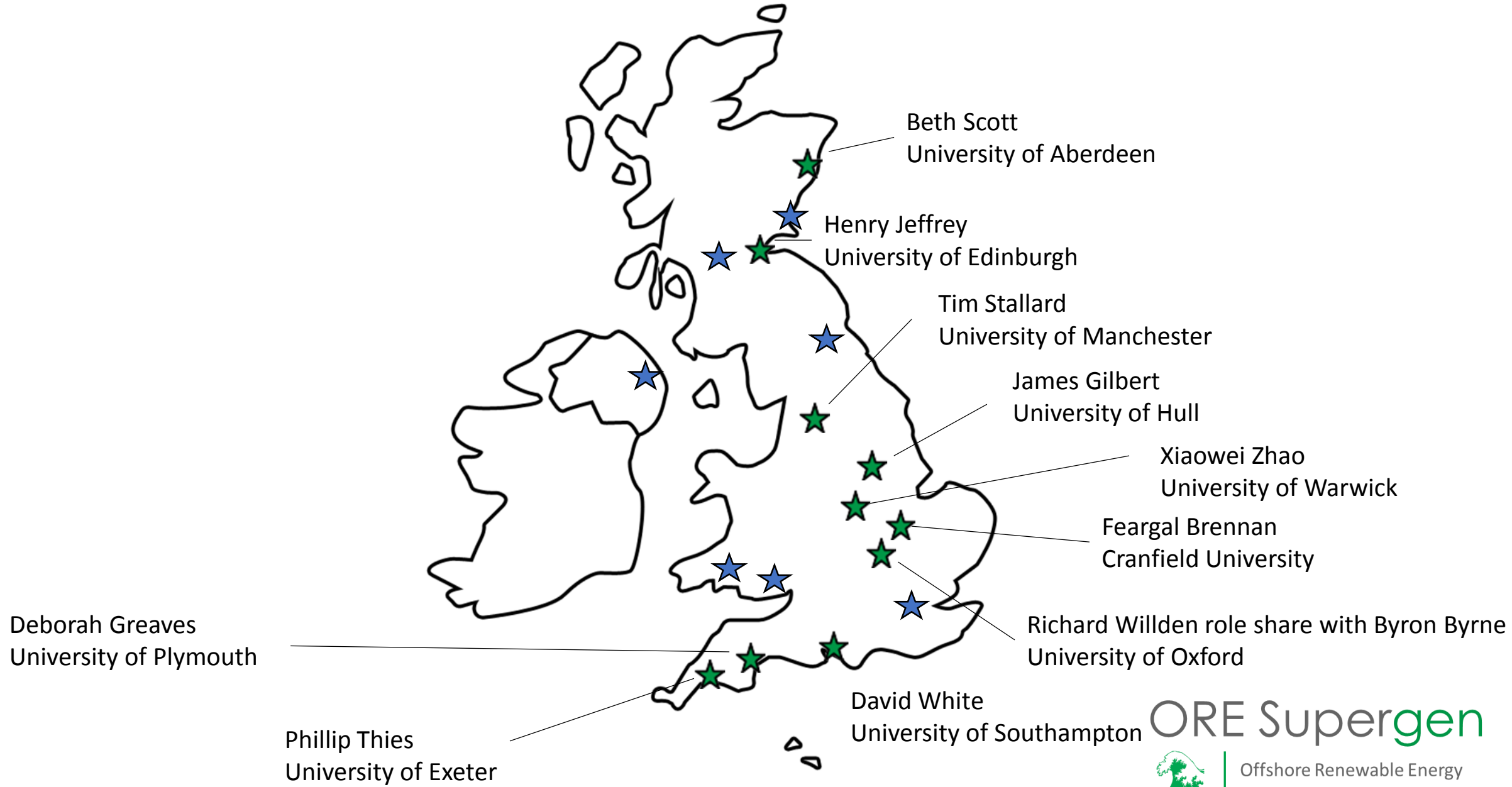
- The ORE Hub Co-Directors will be selected by blind EoI to reflect expertise and leadership from each of the sectors: Offshore Wind, Wave, Tidal, Environment, ECR Development, E&D and International.
- ORE Network with Stakeholder Mapping >200 members already signed up.



ORE Supergen Directors



ORE Supergen Steering Group



Survey and contact details

- The ORE Supergen stakeholder and workshops feedback survey provides an additional opportunity for the ORE community to help set the agenda for the new ORE Hub and to give feedback on the outputs from the ORE Challenge Workshops.
- You can access the online survey and find a document summarising the outputs from the challenge workshops, and register to join the ORE Supergen Network here:
- <https://www.plymouth.ac.uk/research/coast-engineering-research-group/ore-supergen-hub>

- Contact:
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