SuperGen Marine Energy Research Phase 2 - Overview

Prof. Robin Wallace
Institute for Energy Systems
University of Edinburgh

Partners

Core

- University of Edinburgh
- Queen's University Belfast
- Heriot Watt University
- Lancaster University
- University of Strathclyde

Affiliate

- University of Durham
- Southampton University
- The Robert Gordon University
- University of Manchester
- University of Exeter
- UHI Millennium Institute

Overseas

- HMRC Cork, TU – Delft, ECN - Nantes
- Dalhousie University - Canada
- Oregon State University, Florida Atlantic University, UMass – USA
- Universities of Osaka City and Hokkaido – Japan
- Harbin Engineering University, Guangzhou Institute for Energy Conversion (CAS) and Dalian University of Technology - China

Aims and objectives

EPSRC-funded 4 year collaborative project at end of year 1

Generic research with long-term objectives to:

1. To increase knowledge and understanding of device-sea interactions of energy converters from model-scale in the laboratory to full size in the open sea.
2. Reduce risk and uncertainty for stakeholders in the development and deployment of technology;
3. Enable progression of marine technology and energy into true positions in future energy portfolios.

Additional aims

to build capacity in and for the sector

to internationalise effort and connections

Workstreams

WS1	Numerical and physical convergence
WS2	Optimisation of collector form and response
WS3	Combined wave and tidal effects
WS4	Arrays, wakes and near field effects
WS5	Power take-off and conditioning
WS6	Moorings and positioning
WS7	Advanced control and network integration
WS8	Reliability
WS9	Economic analysis of variability and penetration
WS10	Ecological Consequences of Tidal & Wave Energy Conversion
WS11	Doctoral Training Programme
WS12	Inreach, dissemination and outreach

Workstreams

	Leader	16 Core research staff	Affiliate	32 Students and rising
WS1	Ingram	Payne, Sellar, Topper, Taylor, Gretton		Macguire, Atcheson, Finlay
WS2	Aggidis	McCabe	Johnstone, Bahaj	Winchester, Rose, Harrison
WS3	Whittaker	Folley	Stansby	Alexandre, Good
WS4	Bryden	Couch	Owen	Pascal, Okorie, Taylor, Lucas
WS5	Mueller	Shek		Crozier, Bedford, Caraher
WS6	Linfoot	Krivstof	Johanning	Euridge, Vickers
WS7	Wallace, Linfoot, Taylor	Forehand, Krivtsof, Stables	Smith	Nambiar, Theis, Cross
WS8	Val	Iliev	Tavner	Delorm
WS9	McGregor	Allan		Gilmartin, Winning
WS10	Side Savidge	Want, Kregting		Behari Scullion, Good
WS11 WS12	Ingram Jeffrey			Alexander, Black, Easton, Harendza, McLeod, Miller

Research Advisory Forum (RAF)

Representatives from

Marine Current Turbines, Open Hydro,
Pelamis Wave Power, Ocean Power Technology,
Scottish & Southern Energy, Scottish Power, EdF,
E-On, NPower
ETI, Carbon Trust,
EMEC, NaREC,
Crown Estates, Scottish Natural Heritage

Feedback from last year

- Wave resource: Reduce uncertainty in lifetime energy projections;
- Tidal resource: Influence of turbulence and wave interaction;
- Control: More development of time domain models over frequency domain.
- Machines and PTOs: Focus on arrays & network integration.
- Moorings: Need a standard fit-for-purpose design guide;
- Installation, Maintenance etc: Need to share failure data within IP structure; accelerated testing of components.
- Tank testing: Need a tank test forum so consensus from the community can be shared.
- Test centres: There is a spectrum of needs that must evolve with sector
- Environment: Share information from Scotland; develop environmental capacity approach; determine acceptable levels of impact; increase socio economic breadth.