Marine Renewable Research:
The SuperGen Marine Energy Research Consortium

Ian Bryden, Robert Gordon University
Robin Wallace, University of Edinburgh
Julian Wolfram, Heriot-Watt University
George Aggidas, University of Lancaster*
Peter McGregor, University of Strathclyde

* Historically part of Scotland!
Collaborators

- EMEC Orkney,
- Talisman Energy,
- The Clean Energy Company,
- Umitech,
- Corus,
- Marine Current Turbines,
- The Engineering Business
- IT Power,
- Power Technologies (UK),
- Artemis Intelligent Power Ltd,
- South West Electrolysers,
- Natural Power Company,
- Conoco Europe Gas Ltd,
- INEOS Chlor,
- Scottish Power,
- Scottish & Southern Energy,
- Qinetiq,
- SEPA,
- SNH,
- CEFAS,
- HIE,
- Crown Estates
- Met Office
- Sgurr Energy
Aims

• To increase knowledge and understanding of the extraction of energy from the sea
• To reduce uncertainties for future stakeholders in the development and deployment of the technology
• To enable progression of new marine energy concepts and devices into true position in a future energy portfolio.

Generic outcomes 3-10 yr horizon leading on to paths to equipment and energy markets.
Work packages

1. Appraisal of marine energy resource and interaction between converters and fluid environment.
2. Development of methodologies for device evaluation and optimisation.
3. Engineering Guidance
4. Offshore energy conversion and power conditioning
5. Chemical conversion and transport of marine energy
6. Network Interaction of Marine Energy
7. Lifetime economics
Work packages

8. Moorings and Foundations
9. Novel control systems for marine energy converters
10. Full-scale Field Validation
11. Establishment and Assessment of Laboratory Testing Procedures of Tidal Current Energy Devices
12. Economic, Environmental & Social Impact of New Marine Technologies for the Production of Electricity
13. Dissemination and Outreach
1. Appraisal of marine energy resource and interaction between converters and fluid environment.

Understanding of the nature and magnitude of the recoverable, sustainable and deliverable energy resource to reduce investment risk.

Tidal speed modelling

![Graph showing speed reduction with energy extraction](image)
Tidal Flow Modelling in the Pentland Firth
1. Appraisal of marine energy resource and interaction between converters and fluid environment.

Modelling energy loss from wave environment

High Absorption  Low Absorption

Wave characterisation
3. Engineering guidance

Will establish robust procedures for the design, development and evaluation of MECs.
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Will advance the science of performance measurement.
Will develop testing protocols to underpin evolving international codes and standards.
10. Full Scale Field Validation

Will provide field data and in-situ device test results from large scale and/or long term exposure to the marine environment to validate outcomes from Supergen and other projects.
11. Establishment and assessment of laboratory testing procedures of tidal current energy devices

Will produce robust Codes of Practice for testing of TECs in tow tanks and moving flow channels within defined limits of scale.
13. Inreach, outreach and dissemination

Many opportunities for inreach from academia, agencies, government and industry.

Will
- add value by including and adding to other research groups’ activities.
- broadcast new knowledge from marine research.
- widen industrial/academic network
- establish travel bursary for external/young researchers and staff exchange

Web site is at http://www.supergen-marine.org.uk
Observations

- Open collaboration new way of working
- Outward facing and inclusive
- Inter-dependent WPs require close management but offer geometric sum of effort
- Research staff and student mobility excellent
- Many new academic and industrial collaborators
Noteworthy Marine Renewable Research Outside of Supergen

- Turbine Development at the University of Strathclyde
- Sea Snail at Robert Gordon University
- Research in Support of EMEC
- Environmental Assessment Research and Systematic Resource Assessments (please and in a scientifically valid manner)