

# Briefing Notes

ORE Supergen Challenge Workshop (Marine)  
12-13 October 2017, London, UK

## BACKGROUND/CONTEXT

The new Offshore Renewable Energy (ORE) Supergen Hub is a synergistic clustering of the previous Marine and Wind hubs (as recommended by an independent review in 2016). As part of the ORE Supergen Engagement Project, three ORE 'Challenge Workshops' are planned with the objective of promoting engagement with the community, consortium building and the strategic development of the new Hub. These briefing notes represent a summary of existing relevant scoping documents produced following engagement with key stakeholders<sup>[i,ii,iii,iv,v]</sup> and are designed to inform the discussions in the first Challenge Workshop (aimed at the marine energy sector).

## STATE OF THE INDUSTRY

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, with the plan being to increase the deployment to 398MW by the early 2020s. However, despite significant cost reduction achieved for the third phase, the Meygen project was not awarded a Contract for Difference (CfD) in the recent auctions due to fierce competition from more established renewable technologies. 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.

## RESEARCH CHALLENGES AND R&D NEEDS

Cost reduction, risk management and urgency are the over-arching themes for the R&D challenges facing the wave and tidal industry. In general, it is perceived that significant cost savings will be made with increased deployment and, in order to retain interest from the supply chain, the new 2020 targets must be delivered. The main challenges are as follows:

- **Technology** – reliability and survivability are both still issues; the identification of failure modes needs improvement. Increased yield and reduced OPEX through durability, operability and maintainability is required. Design optimisation and tool development is needed to predict and deliver improved performance. High definition testing/modelling is required and needs to consider entire devices as well as be valid in real conditions (including deployment). Developments need to be made to ensure electricity generation is grid-compliant.
- **Installation, operation and retrieval** – both installation and O&M processes need to be optimised in terms of safety, practicality and cost.



- **Commonality/convergence** – in order to increase the market for the supply chain the industry could benefit significantly from utilisation of existing infrastructure/processes, convergence on, for example, appropriate design solutions for installation and O&M practices and a commitment to use certain products. This would also aid in the CAPEX reduction of manufacture and installation of components, sub-systems and technologies. The challenge is to achieve this without reducing the level of innovation or the IP power held by developers. Furthermore, there is a drive for standardisation, of the industry, leading to certification.
- **Knowledge transfer** – the sector needs to promote knowledge transfer and sharing of best practices both internally and externally to take advantage of lessons learnt from other sectors and access skills from complementary industries. There is also a strong push towards interdisciplinary research to ensure interaction between economic, social and environmental sectors.
- **Infrastructure** – there is a requirement for grid upgrades in key areas and transparency in the grid application process in order to enable secured access to adequate grid connections in a timely manner.
- **Policy** – a key challenge politically is to level the playing field in terms of funding by continued technology push support mechanism for early stage ocean energy R&D as well as large scale deployment and market pull schemes. The acquisition and characterisation of development sites needs to be appropriate and the route to access needs to be more transparent. It is crucial that government gains an understanding of the correct enabling technologies and policy frameworks.
- **Economic** – justification of progress needs a common metric with no bias towards a particular technology type. The divide between investor expectations and technology development needs to be bridged; high CAPEX requires upfront capital availability.
- **Environmental** – A number of key environmental and ecological risks need to be resolved and the uncertainties reduced. The issues include: collision risk, underwater noise, displacements and impacts on various physical processes.
- **Social** – potential impacts and synergies with other marine sectors, including commercial fisheries, shipping and navigation and the potential socio-economic benefits for local communities, all need to be better understood.
- **Risk management** – an attitude of responsibility for risk sharing is needed to ensure deployment funding for the MW-scale array projects required to meet targets.

---

<sup>i</sup> MacGillivray, A., Jeffrey, H., Hanmer, C., Magagna, D., Raventos, A., Badcock-Broe, A., 2013, Ocean Energy Technology: Gaps and Barriers, Published by SI Ocean; [www.si-ocean.eu](http://www.si-ocean.eu).

<sup>ii</sup> RCUK (2016). Supergen Marine Horizon Scanning Report, Supergen Programme Review, September 2016.

<sup>iii</sup> RCUK (2016). Supergen Marine Impact Report, Supergen Programme Review, September 2016.

<sup>iv</sup> Ocean Energy Forum (2016). Ocean Energy Strategic Roadmap 2016, building ocean energy for Europe.

<sup>v</sup> ORJIP Ocean Energy (2016). The Forward Look; an Ocean Energy Environmental Research Strategy for the UK.