MASTS Marine Renewable Energy Forum: Workshop on Environmental Impacts Research Funding

Raeanne G. Miller

Hosted by the MASTS Marine Renewable Energy Forum in association with the MASTS Annual Science Meeting

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Workshop Overview

On October 18th, 2016, the Marine Alliance for Science and Technology Scotland (MASTS) Marine Renewable Energy Forum, in association with the Offshore Renewables Joint Industry Programme Ocean Energy (ORJIP), brought together 18 experts to address questions of funding for environmental impact-related funding for the marine renewable energy industry. The experts represented a broad range of interests, including industry representatives, consultants, academics, and funding agencies.

The key objectives for the day were:

- To better understand why it has proven to be difficult to obtain funding to address well-defined questions about the environmental impacts of marine renewables; and,
- To identify opportunities to improve the current situation.

Expected outcomes of the day included:

- A better understanding of the key issues affecting funding;
- A recognition of the strengths and weaknesses of the marine renewable energy network;
- Steps towards a vision for effective environmental impact research in the marine renewable sector; and,
- Potential innovative ideas to help focus efforts towards funding effective environmental impact research in the marine renewable energy sector.

A detailed overview of issues addressed and ideas generated from the workshop can be found in the following sections (Detailed Overview).

Key Workshop Outcomes

Over the course of the day, four actionable outcomes were agreed:

1. Production of a white paper or similar publication which quantifies the value of environmental impact research to the industry.
2. Development of an industry-led, cross-council joint strategic research programme for marine renewable energy.
3. Development of a strategic plan or roadmap for environmental research and marine renewable energy, based on wide consultation across the sector. The plan should reflect future development needs of the industry, and should be regularly reviewed and updated according to shifting priorities.
4. Creation of a forum to specifically broker industry-led environmental research projects to meet the needs of specific funding calls.

Next steps:

In the short term, the MASTS Marine Renewable Energy Forum has agreed to coordinate a plan to develop a roadmap for environmental research within the sector, while the ORJIP Ocean Energy secretariat has agreed to outline a plan of action for industry funding to support these endeavours.

The group has agreed that a follow-up meeting to this workshop should occur in February 2017, to maintain momentum for the initiatives outlined in this workshop report. This workshop will be coordinated by the MASTS Marine Renewable Energy Forum, and a date will be confirmed in November 2016.

Detailed Overview: MASTS Marine Renewable Energy Forum workshop on Environmental Impacts Research Funding

Eighteen experts from across the marine renewable energy sector gathered on October 18th, 2016, at the Technology and Innovation Centre in Glasgow to explore ways to

The workshop was split into four main sessions: (1) scoping and identifying the key issues affecting environmental impact research funding; (2) analysis the strengths and weaknesses of the existing marine renewable energy network with respect to environmental impact research; (3) identifying 'great outcomes' for environmental impact research in the coming 5-10 years; and, (4) identifying innovative ideas to focus efforts towards funding effective environmental impact research in the marine renewable energy sector.

Key issues:

In small groups, workshop attendees were asked to identify what they perceived as key issues preventing access to adequate funding for environmental research to support marine renewable energy developments. Many issues were common across groups, and there was good general agreement around five key themes:

- Uncertainty in government policy
- Wider industry context
- Enabling improved access to research funding
- Developing a sector-wide research strategy
- Communicating the value of environmental research

Within each theme, a number of specific issues were identified, which are summarised in Table 1.

Table 1: Specific issues associated with environmental research funding for the marine renewable energy sector, as identified by workshop delegates.

Theme	Key issues
Government policy	• Following the creation of BEIS, it is not clear whether there is a strong strategy for renewable energy. • Environmental objectives and drivers need to be common across all marine industries – this needs to be better joined up.
Industry Context	• Uncertainty pervades many aspects of this industry, including: availability and sources of funding, priorities for funding, political will, and long-term investment. • Uncertainty around the UK sector is driving money overseas. • Mixed messaging by the media is a source of confusion and general misunderstanding about the merits and risk associated with the industry. • The allocation of responsibility with regards to environmental research, assessment, and long-term environmental monitoring is unclear. • Developers struggle to fund environmental research, particularly when it is strategic, rather than site-specific, and must fully understand the benefits and advantages to them of being involved.
Funding access	• Access to research funding is dependent on government policies which guide allocation towards specific topics and themes. • Funding for the industry as a whole is dependent on Westminster policy

	and the allocation of Contracts for Difference. Meanwhile, dedicated funding streams within devolved nations create mismatch in strategy across regions – this is not perceived to be strategic. • There is a lack of funding for larger scale strategic research, which reflects a clear disjoint between what a company needs to obtain consent at a site, and what the industry needs as a whole to move forward. • The perceived priorities for environmental research are conflicting. Research must be at once: exciting, innovative, competitive, but must also provide useful data and incremental knowledge to companies. Often, this balance is hard to strike within current funding streams. • The distribution of research funding by the Research Councils is not a transparent process to industry stakeholders.
Research Strategy	• Short-term environmental issues are being addressed, but there is a need to identify longer-term issues, and develop a plan to assess them. • At present, a strategic plan for environmental research in the sector does not exist. In response, a roadmap could be developed which includes projected environmental science needs across the coming 5-10 years. • The Research Councils need to identify better pathways for engaging industry, policy, local government, and academic stakeholders to shape a research agenda which fits the needs of the industry.
Communicating Value	• Research-based environmental understanding is of economic importance to the marine renewable energy industry, but this needs to be quantified and communicated in terms of scale, monetary value, and overall benefits. • The community has not yet firmly identified the audiences which need influencing in order to draw down further funding for environmental research. • The community also needs to identify who, at government level, to lobby, as well as who, from the community, should undertake that lobbying.

Many of the issues described above stem from mismatches in priorities and needs between different stakeholder groups. For example, there is movement towards enabling open access to data and databases, which can simultaneously be perceived to present a risk to individual companies' competitive advantage. Furthermore, the marine renewable energy industry currently necessitates incremental research focussing on applying existing concepts to new species and/or areas, but this type of work is difficult to fund under current funding schemes. There is a disjoint in research needs and prioritisation not only between academia, industry, government, and policymakers, but also across regions with interests in this industry, and between the marine renewable energy industry and wider stakeholders in the marine environment.

Context setting: strengths and weaknesses of the network

The network of marine renewable energy industry stakeholders across the UK This workshop brought together stakeholders from diverse backgrounds and sectors interested in the development of the marine renewable energy industry in the UK, to discuss scope for improving environmental research workstreams for industry benefit. It was clear that workshop attendees and the wider marine renewable energy community is united behind the common goal of getting machines in the water and developing a sustainable industry.

The marine renewable energy community was described as both 'familiar' and 'receptive', and members seem willing to meet and to discuss new ideas and innovations. However, the overall UK community was perceived to be less well connected than those within individual nations, which has led to fragmentation of priorities within each group. In Scotland, Marine Scotland was seen as an essential member of the community, with the capacity to both participate in and guide environmental research priorities (through Marine Scotland Science), but also to ensure that environmental research is aligned with the consenting requirements of Marine Scotland's Licensing and Operations Team.

The restricted funding environment was cited as a hurdle for improved collaboration and communication. Competition for limited resources is high not only across developers, but also across the academic and consultancy communities, and in many cases has become a source of division. Across these sectors, the desire to collaborate and share data and knowledge is in direct conflict with the perception of risk associated with these activities, lest competitors gain an advantage in research funding or commercial development. While this competitive undercurrent is pervasive, there was also a keen desire to overcome it by influencing policy and funding bodies to improve funding opportunities for the sector. For example, it was highlighted that the individual research councils could become more aligned in their activities around marine renewable energy. The precise pathways to influencing key players, however, were unclear, and it was suggested that this network was missing high-level champions at government level who could promote the industry.

It is evident that marine renewable energy is well supported at the regional level, with well-connected communities of stakeholders establishing in UK localities with a strong physical resource. Many of these regions (e.g. Highlands and Islands, SW England, Wales) have been supported by EU regional funding, but this has led to disjointed progress across the UK, as it is perceived that the UK lacks a national vision for marine renewable energy, supported by national funding streams. There is an urgent need to remedy this situation now, and to address associated challenges with developing industry-led projects to benefit the industry. As some delegates noted, by acting now, we may still be able to avoid the technical export path which offshore wind energy development took, where technology developed in the UK is taken abroad to be developed up the TRLs, and then bought back by the UK.

Great Outcomes

Looking forward, delegates were asked to identify what 'great outcomes' for the system would be in 5-10 years, if these issues were able to be overcome. Pulling together and summarising these great outcomes, an overarching vision might be:

> *A growing, UK based, marine renewable energy industry, which sustainably and responsibly managed on the basis of sound environmental science, and embedded within a wider understanding of the marine environment and its capacity to support marine industry as a whole.*

This vision would be enabled by:

- A strong Government policy and vision for marine renewable energy as a part of the UK energy mix.
- An integrated, sector-led approach to environmental research which is linked to a strategic plan or road map, and which is reviewed regularly and developed iteratively.
- A road map for environmental research for marine renewable energy development which:
    - Defines a strategic research programme which meets the needs of industry, academia, regulators, and other stakeholders;

    - Provides a level of scientific understanding to support a simplified process for environmental impact assessment;
    - Guides data collection and dissemination strategies which benefit all stakeholders;
    - Reduces uncertainty by defining what 'acceptable' levels of impact are; and
    - Provides a better understanding of the marine environment's capacity to accommodate offshore renewable energy.
- Open communication pathways among industry stakeholders, research councils, regulatory bodies, academics, and other stakeholders to enable effective flow of information from science, to applied science, to integrating science outcomes within appropriate end-user groups.

Numerous constructive actions which could be undertaken to achieve the above outcomes were identified, and divided into three groups: research, strategy, and networking. These are discussed in the following section.

Innovative Ideas for Action

The group proposed numerous ideas to enable our vision for integrated environmental research in the next 5-10 years, some of which were applicable to a single stakeholder group within the network, and some of which necessitate cross-sector cooperation. These ideas were then collated and prioritised, leading to a handful of key outcomes.

Research

Ideas in the research group centred around redefining the way environmental research for marine industry is funded, and improving communication across stakeholders to illustrate the importance of sound science to underpin industry. To drive research streams, it is important not only to make the case for research which addresses the environmental risk posed by marine renewable energy developments, but also for research which quantifies the commercial risk (e.g. to structures) arising from environmental unknowns.

The first key action in this area will be the production of a white paper or similar publication which quantifies the value of environmental impact research to the industry.

The publication will quantify and qualify environmental research in a meaningful way which links the tangible benefits of marine renewable energy R&D to wider marine science and marine use questions. This document would collate the impact of investments so far, which would also input into a future business case for environmental research for funding agencies, for example NERC.

The community as a whole was encouraged to work towards redefining the way environmental research is funded. The group highlighted duplication in current funding schemes, where similar projects tend to get funded through different schemes.

A further key action should be taken by existing research funders, with input from industry and other stakeholders, to develop an industry-led cross-council joint strategic research programme (e.g. NERC-EPSRC-InnovateUK, etc).

This strategic research programme should include a strong element of knowledge and data sharing to feed further research. Specific funding calls within the programme might include:

- Seed-funding to help researchers sufficiently develop new ideas before linking them with industry (£10-£20K);
- Opportunities for match-funded directed research in partnership with government agencies such as Marine Scotland;
- Opportunities to fund placements, sabbaticals, and secondments between industry and academic staff;
- Co-funding of EU projects; and
- Cross-industry opportunities which take a more holistic approach to impacts on the marine environment from multiple user groups, including marine renewable energy.

Underlying the development of this strategic research programme is a need to understand which agencies or organisations are responsible for contributing to different stages of environmental research, redefining the boundaries between what is commercial, academic, or statutory in nature. Such an initiative would provide more clarity to stakeholders around what a successful environmental research funding bid for a wave and tidal energy project might look like, fostering better engagement from both the industry and its stakeholders.

Strategy

The strategy element of this session focused on developing a more unified approach to environmental research across the sector, which ensures that resources are available at the right time to enable specific, timely projects to advance the industry. With this in mind, increased coordination between devolved governments with regards to unifying strategy around marine renewable energy would be helpful to the UK as a whole, recognizing that this industry is not Scottish or Welsh, but British. Ongoing consultation across industry, devolved and UK governments, academics and funders will be essential to prioritize needs for research, though this consultation must be guided by an over-arching vision for the industry.

The ORJIP Forward Look document represents a useful starting point for this consultation, as it focusses on immediate research needs. However, this document needs to be expanded to include post-deployment issues which will be faced as the industry matures, and to outline an approach to standardisation of data acquisition, analysis, interpretation, and sharing. This will enable outcomes to be compared and benchmarked across the sector, and will ensure that any monitoring or measurement is cost-effective and appropriate.

With the above in mind, a key achievement for this group would be development of a strategic plan or roadmap for environmental research and marine renewable energy.

Developed through inclusive, iterative consultation process, the roadmap will make a case for strategic research and highlight the resources needed to achieve these research goals. It will also outline and develop the tools needed to enable data-sharing across the marine renewable energy community. Such a roadmap will not only provide the community with a timeline for R&D and funding needs, but it will also prioritize the tools needed to enable success. It may also provide the foundation for gaining the support of a high-level champion within the devolved and UK governments (DBEIS) for marine renewable energy.

In tandem with this roadmap, there was a substantial desire to develop a new, inclusive sector ‘body’ whose remit would be to coordinate industry and regulatory needs with science capacity, in the context of distributed calls for research. However, there was some concern that such a body might succumb to ‘self-interest’ by its membership, leading to poor distribution of funding, bias in the types of project which are taken forward, and overlooking of innovative ‘outside the box’ ideas.

Networking

While there are many steering groups and other players in the UK marine renewable energy sector, it is unclear how these groups link together, or whether they communicate effectively. Much of this topic's discussion focussed on ways to enable better linkages across the whole of the sector, which would, in turn, enable the sector as a whole to better make a case for further coordinated research efforts. To strengthen the network in the future, however, there is a need to understand existing linkages and pathways between its various players. The ICES Working Groups on Marine Renewable Energy and on Marine Benthal and Renewable Energy Developments are already taking forward an initiative to map the marine renewable energy network. Led by Dr. Raeanne Miller at SAMS, this project is currently gathering data to enable a social network analysis of the marine renewable energy sector, initially from an environmental research perspective.

Several ideas centred around better outreach and 'selling' marine science research in a joined up way, reiterating ideas from within the Communication theme, above. For example, the need to get beyond project- or development-specific research and to encourage an industry-wide approach to scientific research was highlighted, which could also enable wider opportunities for interactions across other marine industries. This approach could also help to encourage improved support from the UK government, as discussed in the previous section, and might be facilitated by encouraging all stakeholders project a common voice to external industries, regulators, funding bodies and beyond. This messaging should communicate the excitement of the ocean energy race along with opportunities for cutting-edge science and innovation, across different media types and channels.

Within the sector, numerous options were proposed for bringing stakeholders together to improve links. It is widely acknowledged that funding streams for industry-led research projects are available, but that often difficulties arise when stakeholders try to broker industry-led projects with specific funding calls in mind.

To address this challenge, a forum could be pulled together to specifically broker industry-led environmental research projects to meet the needs of specific funding calls.

The forum should include the research councils and InnovateUK, and might take a similar format to the Low Carbon Innovation Co-ordination Group (www.lowcarboninnovation.co.uk), which brings together major public sector organisations, including funding agencies, to support low carbon innovation in the UK. In the marine renewable energy sector, however, this group might include membership beyond the public sector, including industry representatives from groups such as Renewable UK and Scottish Renewables.

Following on, the group agreed a need to develop new mechanisms to encourage knowledge transfer between research councils, industry, regulatory, and research committees. This might include sabbaticals, placements, and secondments of staff (not just PhD students and early career) between NERC, the industry, regulators, and research organisations. Funding for these initiatives might be included in the strategic research programme described above.

Summary of outcomes and actions

At the conclusion of the workshop, the group together summarised key outcomes and next steps, to which all participants agreed to contribute. From a research perspective, these outcomes addressed the need to make a convincing case for financial support of environmental research and to work towards redefining the way environmental research for marine industries is funded. Two tangible actions were identified:

1. Production of a white paper, discussion paper or similar publication which quantifies the value of environmental impact research to the industry.
2. Development of an industry-led, cross-council joint strategic research programme for marine renewable energy.

Underlying the development of a new strategic research programme is the need to better define the roles and responsibilities of various types of organisations in joint research projects at different stages of renewable energy development. Currently, development of industry-led research projects is perceived to be overly difficult, so highlighting the benefits of such projects and streamlining how they are funded could greatly simplify the development process.

In a similar vein, environmental research projects need to be developed and properly resourced at the right time for industry development. Bringing stakeholders closer together across the regions, and expanding current research prioritisation to post-deployment issues would improve allocation of targeted environmental science research. A willingness to support these activities would enable the following two additional tangible actions.

3. Development of a strategic plan or roadmap for environmental research and marine renewable energy, based on wide consultation across the sector. The plan should reflect future development needs of the industry, and should be regularly reviewed and updated according to shifting priorities.
4. Creation of a forum to specifically broker industry-led environmental research projects to meet the needs of specific funding calls.

Additionally, numerous smaller actions were highlighted which could contribute to enabling successful environmental research programmes in the marine renewable energy sector. These included finding a champion(s) at government level, within DBEIS or Scottish Government, and undertaking an analysis of the existing marine renewable energy network – presently underway within ICES working groups.

To maintain progress and momentum, the group agreed to meet again in February 2017.

In the short term, the MASTS Marine Renewable Energy Forum has agreed to coordinate a plan to develop a roadmap for environmental research within the sector, while the ORJIP Ocean Energy secretariat has agreed to outline a plan of action for industry funding to support these endeavours.

Attendees

Name	Institution
Annie Linley	
Ben Wilson	University of the Highlands and Islands / SAMS
Beth Scott	University of Aberdeen
Bill Cooper	ABPMer
David Pratt	Marine Scotland
Douglas Watson	Scottish Crown Estate
Francesca Marubini	Hartley Anderson
Ian Davies	Marine Scotland
Ian Hutchinson	Aquatera
John Horne	University of Washington
Jonathan Hodges	Energy Technology Partnership
Judith Woolf	National Oceanography Centre
Paul Ellsmore	Offshore Renewable Energy Catapult
Rachel Leader	Natural Environment Research Council
Raeanne Miller	Scottish Association for Marine Science
Rosie Scurr	Main Stream
Sue Barr	Open Hydro
Tom Walsh	MeyGen / Atlantis