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Establishing an agenda for social studies research in marine renewable energy

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HIGHLIGHTS

- Existing marine renewable energy (MRE) research fails to address many social issues.
- Social acceptability is essential to the future viability of the MRE industry.
- An agenda is established for social science research into MRE.

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ABSTRACT

To date, academic research relating to Marine Renewable Energy (MRE) has largely focused on resource assessment, technical viability and environmental impact. Experiences from onshore renewable energy tell us that social acceptability is equally critical to project success. However, the specific nature of the marine environment, patterns of resource distribution and governance means experiences from onshore may not be directly applicable to MRE and the marine environment. This paper sets out an agenda for social studies research linked to MRE, identifying key topics for future research: (i) economic impacts; (ii) wealth distribution and community benefits; (iii) communication and knowledge flow; (iv) consultation processes; (v) dealing with uncertainty; (vi) public attitudes; and (vii) planning processes. This agenda is based on the findings of the first workshop of ISSMER, an international research network of social scientists with interests in marine renewable energy. Importantly, this research agenda has been informed by the experiences of developers, regulators and community groups in Orkney. The Orkney archipelago, off the north coast of Scotland, is home to the most intense cluster of MRE research, development and deployment activity in the world today.

1. Introduction

Marine renewable energy (MRE), in the form of wave and tidal current technology, has potential to become a major contributor to global energy needs (IEA, 2007). Full scale prototypes are now being tested with sea space being allocated for commercial deployment. This activity is distributed globally. The UK, in particular Scotland, finds itself at the vanguard of this new industry. A combination of political support, significant resources and technical expertise have contributed to this emerging situation. Within Scotland this activity is focussed on the archipelago of Orkney, home to the world's first full-scale grid connected test facility (European Marine Energy Centre—EMEC). The waters around Orkney have been designated as one of the UK's two

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Fig. 1. Workshop participants discuss the 'washing line'.

Marine Energy Parks and work is now underway to prepare sites for 1.6 GW of commercial development. In addition Marine Spatial Planning (MSP) processes are being developed in parallel with the technologies that they will ultimately regulate. Orkney, together with many maritime communities around the world, is now looking to the future in an attempt to understand the social, economic and environmental change that will accompany this new industry.

It is important to recognise that MRE is more than a technically challenging extension of onshore renewable energy development. The policy environment, governance, patterns of resource use, conservation values, and distribution of ownership rights are all substantively different from the situation onshore. This difference is evident in the emerging MSP framework, which recognises that approaches adopted on land may not be appropriate at sea (Jay, 2010; Kidd and Ellis, 2012). Furthermore marine energy development may play an important role in the redistribution of ownership rights in the marine environment. Increasingly, society looks to the sea to meet its growing resource needs and to stimulate economic growth. The European Union's 'Blue Growth' agenda typifies this aspiration (EU, 2012).

New technology offers both *access* to resources (e.g. fishing, oil and gas, aquaculture, marine energy, deep sea mining) and the ability to exercise *control* over marine space (e.g. radar, sonar, GPS, and satellite tracking). This underpins an on-going process whereby public rights and freedoms are supplanted by private rights, firstly by the creation of sovereign rights (e.g. Exclusive Economic Zones), then by the creation of private rights (e.g. sea bed leases, planning permission, and tradable quotas). Wave and tidal energy development is part of this evolving picture (Johnson et al., 2012). MRE developers require access to significant areas of sea and this will impact on the rights and privileges of other users of the marine environment.

To date, research into MRE has focused on resource assessment, device design, and environmental impact. Environmental research has concentrated on cetaceans, pinnipeds and birds. This is largely a consequence of statutory responsibilities and lobby groups promoting environmental issues. Consequently, social science research into marine energy has been given low priority.

The current balance of research effort, and funding, does not reflect the role of society in the development of MRE or its potential impact on coastal communities. Even if technical challenges are overcome and environmental impacts minimised, the development process may still be compromised by a failure to understand social issues. In direct response to this situation the International Network for Social Studies in Marine Energy (ISSMER) has been convened to bring together academics interested in social aspects of marine energy.

The first ISSMER workshop was held on 6–7 September 2012 in Orkney with the main aim to develop a research agenda for social studies in MRE. An important secondary aim was to exploit the location and industry/community links in the Orkney islands, Scotland, site of the European Marine Energy Centre, to develop a new kind of workshop process to make social issues present and visible.

2. Methods and context

The ISSMER Workshop took advantage of the Orkney location as a key site in MRE development. It employed a novel format, with the aim of allowing local experts to have the primary voice. Academic presentations were avoided so that outcomes could develop from local MRE knowledge rather than prior assumption. The workshop organisers are embedded with the Orkney community through the International Centre for Island Technology (ICIT) Campus of Heriot-Watt University in the islands and on-going fieldwork. The organisers invited experts from the local community to enter into conversation with small groups of academics. The guest experts were briefed with a set of topics but were invited to shift topic and express their views freely. The conversations were akin to ethnographic interviews. Delegates listening and participating were encouraged to use the conversations to create notes about issues requiring more research. Notes took the form of individual observations, opinions and new research needs, which were collected and pinned up on a 'washing line'; 132 notes were recorded in this way and then classified into themes (see Fig. 1). These notes became the core data from which the agenda presented in this paper was developed[1].

Twelve guests entered into conversation with 25 invited delegates from 10 countries. The guest experts reflected the unique position of Orkney in marine energy research and development and represented: research and testing in the MRE industry; MRE developers with interests in specific technologies and sites; central and local government with responsibilities for planning; traditional industries of fishing and farming; and members of the local arts and literary community. All the guests had direct experience of MRE. The farmer, for example, was being asked to sell his land for the construction of onshore sub-stations taking power generated at sea. These expert guests were all known personally to the organisers and a high degree of trust existed between them all of which facilitated a relaxed and open discussion. It is worth noting that the results presented here are not intended to be a representative survey of stakeholder opinion. The purpose of the workshop was to create a reflexive process through which academics could learn from the individual experiences of stakeholders. A range of academic delegates contributed to the event including geographers, economists, social scientists, anthropologists, planners and business experts.

In all, twenty set piece conversations were held on the two days of the workshop. These were supported by field trips to the EMEC test facilities. Plenary sessions identified possible research questions and themes arising from the conversations, drawing on the notes pinned on the 'washing line'. These themes and questions are described in this paper under the 8 headings of Economic impacts; Wealth distribution and community benefits; Communication and

[1] The workshop report and the washing line comments can be viewed at www.issmer-network.org.