



Executive Summary of Qualitative Interviews

for

Firm research, development, and commercialization in the emerging offshore marine energy sector: a mixed method study of the triple helix interactions

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by

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Executive Summary

1.1 Introduction

A firm's journey through the innovation process is uncertain, non-linear, and impeded by numerous unanticipated challenges. The firm frequently turns to external sources for assistance, and most firms now routinely engage in exploratory or exploitative interactions with external parties. In the developing and emerging offshore marine energy sector in Western Europe, this article explores the significance of triple helix interactions between industry, academia, and government. We use the technological level readiness (TRL) methodology to model the firm's development status and use a mixed method of both quantitative survey data and qualitative interview data. Our objective is firstly to uncover the relationship between the firm's technological development stage (i.e., research, development, and commercialization) and triple helix interactions. And second, to identify what factors induce and limit the formation of the triple helix system in the marine energy sector. As part of this study, 35 qualitative interviews were conducted. The interviews provide interesting depth unveiling the mechanisms of action between the helices and the factors currently preventing effective triple helix formation in the marine industry. In the following sections we outline the principal findings from the qualitative analysis and below is a Table that summarises these findings from the perspective of the firm.

1.2 Table of Principle Findings

<i>Table of Industry Motivations for Interactions</i>			
	Industry about Industry	Industry about University	Industry about Government
Why firms interact with their innovation partners?	Industry interaction is crucial to obtain diversified and tacit knowledge	Critical knowledge provided to solve industry needs	Government is critical for providing finance and regulatory guidance and support
Challenges in the Sector	Asymmetric Information is a key problem between actors	Misaligned timelines between University and Industry	There is a lack of belief in the viability of ORE
	Firm size impacts flexibility in responding to firm needs	Differing objectives between University and Industry	Bureaucracy is a key issue in some national contexts

1.3 Industry about industry

Across the ORE sector, there is extensive evidence of TH interactions among industry actors.

Diversified Knowledge of a Tacit Nature

Developing an ORE device requires an enormous volume of diverse knowledge, much of which is tacit in nature. As these “innovators” of ORE devices are almost exclusively SME’s, external interactions are essential in realising their innovation ambitions. Interacting with other industry is ubiquitous among all industry actors.

Industry Actor 10 notes *“[Our] system... looks very simple, but some of the technologies are pretty sophisticated. And then, let's say, we need a special type of gearbox, we are not experts in gears, then we find somebody who really knows about this.”*

Industry Actor 2 illustrates how external industry interactions play a role in a device’s development: *“Well, one of the group is an engineering consultancy and they will help on the structure, which is the finite element analysis, a lot of the tricky computing and modelling. Another partner... are specialists in moorings, anchoring, towing things out to site, setting them up right on moorings. They've plenty of experience in that. And Company X have tons of experience in a whole range of offshore renewables and a lot of other stuff as well they're a big company. At the end of the day, who's actually welding the steel or bolting it together, that'll be a contract managed probably by Company X rather than ourselves.”*

Asymmetric Information

For actors wishing to engage with industry, there were considerable knowledge obstacles. Many of these concerned an asymmetric information problem between the innovator and the industry player. Firms could be unaware of the rigours required of developing components for the ORE sector, or innovators could be unaware of the actual capacities of firms to achieve their objectives.

An industry Actor noted: *“I think my experience is that one needs to be extremely careful of those who you start working with.”*

Another issue actors faced were firms not interested in working in the ORE sector with another industry Actor noting *“There were certain industry players that just weren't interested in speaking to you if you were a renewables company at that time, because you were too small a fish for them to engage with at that time.”*

Firm Size

The size of the business an actor worked for can also have an effect, with bigger businesses being less flexible than SME innovators.

An Industry found that *“working with smaller companies is better than bigger companies because they're kind of more nimble and they spend more time kind of figuring out what you want and trying to get it, rather than just applying what they've done before.”*

1.4 Industry about Academia

Benefits of working with academia are much more uniform, and innovative actors frequently engage with universities.

Critical Knowledge

Interaction with universities offers the business the chance to pursue important knowledge that does not already exist within the organization. This knowledge may be attained through tank-testing, projects or numerical modelling. University interactions were also useful for businesses to source interns and students who could work on for the company.

An industry Actor sums up the benefits of working with universities: *“Universities have got incredible facilities, clever guys to support you and that are willing to support you. And they're really interested in in what you're doing”*.

Misaligned Timelines

However, there were also a number of much more common obstacles and difficulties while working with universities. Many businesses mention how slowly universities move in comparison to business.

An industry actor notes *“All the PhD[s] for example in France start in September, and if you want to start a project in, I don't know, in April, you need to begin the work before they have their team in place.”*

Another industry actor notes why urgency is so important for the ORE innovator: *“The big difference is from an entrepreneur's point of view you have so much cash and no more than that until you get a deliverable and that's to bring you on to the next bit of funding. So it's very important to get the work done quickly.”*

Differing Objectives

Another problem noted with university interactions is the inherent conflict between the differing objectives of industry and academia. This was summed up quite succinctly by an industry actor who noted *“[Industry and academia are] basically trying to achieve different things. They want to get grants and publish papers and we want to progress the engineering as fast as possible and they're just not the same thing”*. This led to some actors noting the need for quite strict oversight of their academic interactions to ensure that university actors achieved and aligned with the goals of the business.

1.5 Government

Finance

Government interactions clustered around a singular objective: finance. Every innovator noted that at least part of their interactions with government concerned obtaining finance to enable innovation. The necessity of finance to innovate in offshore renewables is made clear by one industry actor: *“You need to have a lot of hours of generation on the machine and then implement operational maintenance manuals and until you can you are not able to sell this to utilities or government. So there's some years you need to pass with only financial funding to not die on the way”*

This finance generally needs to come from government because, as industry actor notes *“Private funding is not actually interested because it's too risky actually to invest in tidal*

energy because there's not enough experimentation and the cost is too high but this is due to the low level of commercial development.”

Regulation

Industry actor's interactions with government also concerned regulatory matters including consenting permission for firms to place their prototypes into the ocean. Some were also able to benefit from the mentorship and business support that Government enterprise departments provide.

Bureaucracy

Bureaucracy proved to be an issue with government, a problem that reared its head with universities and larger industry players. One industry actor noted *“the bureaucracy is very... it's very hard, very complicated, to overcome”* and these issues can be compounded dealing with the different levels of local, national, and European government (Industry Actor 8; 16).

The speed at which things were completed in government also came under fire from industry players.

“The length they take to reply sometimes, it's very... discouraging”

“I suppose the other thing about the Irish setup is, there isn't going to be a deadline on them... the Irish outfit seemed to have the luxury to go back and forth with questions forever and ever and ever you know”

Lack of Support/Belief in (certain facets) of the ORE sector

The last common complaint made about government interaction was on a lack of understanding and support for wave and tidal energy from various levels of government. These were common complaints from actors operating in different countries:

“There's an energy conference coming up in Croke Park early next month...there's no mention in that whatsoever of ocean/wave energy... Ireland's EEZ (exclusive economic zone) is ten times Ireland's land area. Now look at France, look at Spain, look at the UK, they've nothing like that, and when you...see that energy resource in the context of our population and our GDP, it's mega.”

“We couldn't overcome our challenges. Because without a feed-in tariff to support you don't have a business case, and if you don't have the business case then you don't have a viable business.”

“We were only asking for authorization for an experimentation of three years... but it's as difficult to receive as having a program for 20 years”

Every actor interviewed cited problems in their government interactions except one industry actor 10, who explained *“we have a big advantage. I don't know how it is in Ireland, but you know here in Denmark, we are a relatively small country, the amount of red tape is minimal. So it's very easy to work with the government.”*