

Shellfish Aquaculture in Welsh Offshore Wind Farms - EFF Project

Overview of findings and Final Project Partner Meeting (Friday, 19th July 2013)

A study investigating the viability, compelling opportunities, potential barriers – and how they might be overcome has been on-going since Autumn 2012. The preliminary study is near completion. A draft final report had been circulated to participants in advance of the meeting.

The purpose of the meeting was to bring together key stakeholders representing the aquaculture and fisheries industries, the wind-energy industry, Welsh Government, Crown Estate, marine regulators, Marine Management Organisation, Natural Resources Wales (formerly CCW), and academics, to:

- Review together some of the findings of the co-location study and explore what themes raised by the research participants found most insightful, surprising, or interesting, and to identify any critical gaps in understanding, perspectives not explored, and / or critical assumptions
- Hear from as many perspectives as possible what [if any] compelling opportunities exist for Wales / the UK, associated with co-location – what potential benefits are associated with these opportunities; whether there are any associated “disbenefits” / issues relating to the development of co-location projects in Welsh / UK waters
- Agree next steps

The style of the meeting was participatory and deliberative. Andy FitzGerald and Martin Syvret, principal researchers and main authors of the draft report, presented their key findings over the course of the day. A power point of the presentation they gave is available.

The following notes describe the key points contributed by participants, during plenary discussions at the beginning of the day.

Areas of particular interest and points raised by participants in response to the draft report

- Several participants congratulated the principal researchers on the study, and draft report.
- There are parallels between the issues and opportunities identified by the co-location study and those encountered by projects encouraging collaboration between different sectors and or business interests, for example between water companies and aquaculture practitioners. A significant issue is one of **trust** and of being able to develop **high levels of confidence** that agreements made in response to potential risks associated with co-location (or exacerbated by co-location), are adhered to by all relevant parties. It is important that levels of uncertainty regarding co-location partner actions in both reactive and proactive situations can be reduced. Location tracking technology described in the report, providing real time evidence of the aquaculture boats’ operations, can alert all relevant parties in a timely manner, for example to any transgressions into restricted zones.

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- The significance of the pilot co-location operation undertaken by Deepdock Ltd., described in the study was heralded as important, because of the **evidence** it provided – distinction was made between theoretical considerations of risk and benefits, versus observed outcomes.
- Several participants referred to the soon to be initiated aquaculture project in Lyme Bay and the useful insights into the environmental and practical implications of offshore aquaculture it will provide. What this operation will not provide however, is evidence regarding the **interaction** of co-located offshore wind farm developments / operations and aquaculture.
- It was noted that little consideration had been given to the presence of **European Marine Sites** (EMS including Special Areas of Conservation SACs and Special Protections Areas SPAs) designations in the marine environment and how these might be affected by co-location activities nearby. Issues associated with SAC were not regarded as “deal breakers” with respect to co-location.
- While cultivation of a number of species is feasible and from an aquaculture perspective could present different economic potentials (e.g. oysters, abalone, lobsters), the **Blue Mussel** is **physiologically robust**, hence **low-maintenance** from the perspective of an aquaculture business, not requiring feeding nor cleaning regimes. This minimises vessel activity within the co-location zone made by aquaculture practitioners, and in turn reduces the risk of interference in routine wind farm operations.
- **Aquaculture operations’ seasonality and adverse conditions:** There is no need for aquaculture operations to be conducted in poor weather conditions – harvesters cannot work in rough seas, thus for WFO risks associated with co-location do not increase in bad weather and sea conditions. There are variations in perceived risk to WFO associated with ground culture (shallower waters) versus suspended aquaculture in deeper waters. From an aquaculture (and food security) perspective, the development of zones of suspended aquaculture (feasible in wind farm development zones because of reduced shipping and navigation) is preferable because it will extend the harvesting season, beyond the short warm-season to which shallower water production is limited.
- The potential for enhancing the **social and economic value** to be derived from the marine space was cited as important, and requiring further study.
- Estimates of the space covered by offshore wind farm developments (operational, consented and planned) indicate approximately 200,000 hectares of space with the potential to produce huge **animal protein contributions to UK food supply**. More work needs to be done to quantify the potential financial contribution to aquaculture GDP this represents – it is potentially very significant!
- The study has identified some potential areas that may represent competitive advantage for wind farm developers, however, there is as yet no agreement on who the “pitch” should be made to, i.e. **who are the final decision-makers in the wind energy industry** who will agree to develop co-location projects, or not? In order for co-location to become a reality does the concept and the evidence of feasibility need to be presented to **shareholders?**
- Should there be **public dialogue** regarding co-location in marine environments? This type of public dialogue is going on now, with respect to land use planning. If public opinion viewed co-location as beneficial for example in terms of conserving and enhancing the capacity of marine environments to provide the ecosystems goods and services we require now, and to secure reasonable conditions for future generations, would this knowledge facilitate the creation of political space to encourage co-location? Would energy industry decision-makers become more open to the potential benefits / creative possibilities of co-location? Essentially public dialogue should seek to ascertain a collective need [if any] for co-location – **“is there a / what is the problem that co-location solves?”** It should also consider the imperative [if any] for political intervention to encourage co-location.

Issues that merit / need further exploration

Policy and Legislation as driver for change

- The study draws attention to developments in *Marine Planning in Germany*. No substantive trials for co-location were undertaken in Germany, however now, WFD are required to provide evidence of whether there is an opportunity for co-location with aquaculturists; if co-location is feasible, it becomes a planning condition; no investigation – no permit for WF.
- Implementation is not retrospective.
- German case therefore indicates that **legislation may be required to encourage and enable co-location** in order to make best use of the Marine resource. Similar marine spatial planning is taking place across many EU member states.
- Marine Policy Statement and Energy National Policy statements offer main encouragements for integration of complimentary activities.

Marine licensing, secure tenure and the role of The Crown Estate

- The Crown Estate plays a **unique role** in the licensing process c.f. other EU nations.
- Several Orders and Regulating Orders restrict the public right to fish in certain areas, and protect the rights of anyone who has an interest in an area under consideration. Applications are made to the Department for Environment, Food and Rural Affairs (Defra) in England or to the Devolved Administrations in Scotland and Wales. These fisheries orders currently cover from the shore to 6nm.
- TCE lease can be used for fixed-gear out to 12nm.
- Beyond 12nm, licensing seems uncertain for both seabed and fixed-gear operations. WF are licensed by TCE, but there is no lease (defined in Energy Act).
- The lease for a wind farm, granted by TCE, covers **the entire area**, not just the turbine locations and areas over which wires run to shore. The **lease is for a particular activity / purpose** (energy generation involving wind turbines). It does not necessarily exclude other activity; however agreements would have to be secured to change the conditions of existing leases before **additional commercial activities involving fixtures on the sea-bed** within the area covered by the lease, could take place.
- WF leases span periods in the order of **50 years**. It is likely to be difficult for third parties – including government and TCE – to exert influence on existing leases to encourage co-location. For co-location, in these circumstances a **business to business agreement** is the simplest solution – and while there are advantages for the aquaculture project, it's not clear that there are equally compelling advantages in existing wind farms to invite a second commercial operation to share their lease site.
- What is the compelling case that needs to be pitched to WFD/WFO in order for them to re-negotiate their agreement with TCE, and thus permit/enable aquaculture to co-exist or even compliment their main operation?
- Where no lease is in existence yet, it is easier to structure the lease so that it accommodates more than one activity (requiring gear fixed to the sea floor). However, even here, dealing with WFD, concerns were expressed regarding the possibility [probability?] that having to accommodate additional activity reduces the attractiveness of the WFD investment, so putting at risk or delaying current Round 3 WFD. Additional uncertainty and complexity may preclude future investment and development. As WFD/WFO investment represents significant earnings to the UK, not currently matched by fisheries / aquaculture, TCE in particular suggest **more certainty, not less** is required to maintain and increase levels of WFD investment in the UK.
- Might the cost of leasing be reduced to WFD in exchange for allowing aquaculture to co-locate? Unlikely, if the [administrative] hassle increases, without appropriate financial compensation to the TCE.
- **Liability and insurances:** WFD / WFO feel they will have to accept responsibility for incidents occurring within the area they lease, for example risk to life and property resulting from

entanglement with power cabling, as well as incurring the cost of break downs in power export from the site – what can be done to allay these fears? **Can the aquaculture sector share in underwriting or insure against these liabilities?**

- **Risk assessment and public navigation rights:** Co-location might help to reduce some of the risks that currently WFO need to be planning for. **Proximity agreements** need to be drawn up on a case-by-case basis, however the study and the North Hoyle trial indicate that this is possible.
- While **screw anchors** may represent a **technological leap** for fixed gear aquaculture, they may also have additional implications in a co-location context: if it is not possible to remove the screw anchor, once no longer deployed (marked and monitored) by the aquaculture operation, they may represent an on-going liability for which the aquaculture industry / individual company would be liable.

Other potential benefits to WFD / WFO – technology, corporate-social-responsibility, energy futures

- What **technological advances** can co-location help to hasten, for example in terms of improving safety and risk minimisation, rescue and maintenance operations, monitoring? What are the **corporate-social-responsibility** / PR benefits? What might be longer-term benefits for the wider energy sector – many renewables companies are elements of a varied energy portfolio – e.g. might they be interested in looking ahead at co-location involving **bio-fuels futures** to supply [modified] coal-burning power stations? WFD need to be encouraged to take part in open, creative and divergent exploration of positive futures involving off-shore sites.
- It was noted with collective disappointment that although some had been intending to attend the meeting, no representative of the wind farm developers / operators was able to contribute to the discussions. Their perspective on the findings of the study would surely have enhanced the understanding of the challenges associated with co-location and if opportunities exist from the perspective of the WFD / WFO to benefit from co-location, what conditions would have to be met in order to realise potential benefits?

Operations: compatibility of co-located operations

- The study refers to a report by the MMO on co-location, and a matrix established to aid risk identification, and appropriate voluntary restriction zones. The study concludes the matrices have place in high level discussions, but are **not suitable as a filter for decision-making for planning / during operations**.
- WF operators are exposed under UN convention on the law of the sea (UNCLOS) 1982 for culturists if their boat snags and is damaged by exposed WF cables. In reality, **exclusion zones > 50 m may be required** because of the level of uncertainty regarding cable location and other factors.
- The presence of **aquaculture within WF may act as a deterrent to third party vessels** entering the area – **a definite benefit for WFO**, as working collaboratively with co-location partner facilitates risk management and minimisation. Conversely, aquaculture may attract [unscrupulous] harvesting activities by third parties – but the associated risk is considered small as the likelihood of third party “poaching” is small.
- To operate safely, and behave appropriately, vessel owners need a very detailed knowledge of gear and WF operations must be understood. North Hoyle trial shows that WF operators are able to open up to plan for cable snagging if approached in right way.
- **Accurate asset positioning and activity monitoring can facilitate better operations and build mutual trust** between co-location partners.

- AIS/VMS/Succorfish tools could be a critical part of de-risking activity and demonstrate responsible activity. Technology exists and at reasonable cost, to establish composite Geofences. Risk for navigation and towing gear is monitored by responsible agency and provides real time proof of location. Succorfish can also transmit location and activity to WF operators via internet, through a tiered access to information system. Available >20nm offshore. **The kit is small, robust, and inexpensive:** initial outlay is £650, and for data gathered and relayed every 10min, a year's reporting costs less than £120.
- Furthermore, this type of technology may also encourage greater collaboration within the fisheries / aquaculture sector, as it is adopted more widely – and irresponsible activity can be monitored and regulated more effectively. This too is likely to result in **benefits to WFO/WFD who gain collaborative, mutually constructive relationships with the sector as a whole**, e.g. via co-location projects.

The economic argument for aquaculture collocated at wind farm sites

Aquaculture is one of the fastest growing aquatic food production sectors in the world. Over the past three decades outputs have substantially increased within most EC countries. This development was accompanied by a drastic decline in fishery yields while public demand for aquatic products has constantly risen.

The Alfred Wegener Institute (AWI), Germany ascribes the relatively slow growth of this food production sector c.f. it's potential in Germany to the highly competitive use of German North Sea areas, restricted access, environmentally unfavorable conditions in most of the coastal waters, and a lack of a sufficient regulatory framework. The AWI highlights the need of new alternative strategies to maintain the well-being of the marine ecosystem, to meet the increasing market demand of the food sector and at the same time to provide alternative livelihood schemes for the local populations, and suggests some crude numbers that can be used in order to consider the potential value of this food production industry in a given area.

While co-location is particularly attractive in German North Sea areas because the marine area Germany has to exploit is very limited, co-location offers protection for the aquaculturist's [significant] investment, and gear, as shipping and navigation in WF sites is restricted and therefore risk (both accidental and resulting from predation by third parties) is significantly reduced.

See below, the very crudely estimated benefit (using AWI tools and assumptions), implying revenue to the national and local economy, to be derived from aquaculture at scale within WFO areas in Dogger Bank:

Dogger Bank - total licenced area 8660 km sq. = 866,000 ha. Assuming only 80% of the area can be developed for aquaculture activities, we're looking at 694,000 ha * 10t/ha = 6.9million tonnes of mussel production.

If this could be sold at the break even prices suggested by AWI of €500 /t, first sale – it would be valued at some **€3.5 billion!!**

In the **Irish Sea** the total licensed area is 2200 km sq. or 220000 ha.

Assuming, according to the EFF study's more **conservative estimates** of the area likely to be utilized for aquaculture in collaborative co-location projects is **only 40% of the total area, this equates to 88,000 ha, producing 0.8 million tonnes of mussels**, and an annual production valued at **€440 million**.

For some context, consider that current UK total capture fisheries + aquaculture is ca. 800,000 t/yr. and total global production of mussels is <3 million t/yr.

Naturally, these figures need to be refined, and the economic and social value to national interests, and local communities need to be estimated more accurately.

Equally, more information and transparency is required regarding the current contribution made by WF developments and operations to the national and local economies, so that there can be a

thorough appraisal of how to maximize the benefits for all, consider any necessary trade-offs and compromises, undertake effective cost benefit analyses and take into account any currently externalized costs, e.g. absorbed by the marine environment.

Conclusions and recommendations

The following conclusions and recommendations appear in the draft report, and were deliberated and supported by participants at the meeting

A **commercial-scale offshore farm trial** is sorely needed to prove the viability of co-location.

Cefas & TCE are to carry out South West offshore finfish trials, which may act as a demonstration model. It is important to disseminate the findings of any trials effectively and vigorously. Scientific studies documenting growth trials in WF's / WF conditions will also be persuasive. Some relevant data will be derived from the Lyme Bay pilot project.

Given, it is not likely that co-location will be a condition of planning for offshore WF's for some time, it will be better as a first step, to go on laying mussel (*Mytilus edulis*) than deploying fixed gear – working from inshore bottom culture to offshore long line – WF operators will find this option less challenging, and it's also the path of least resistance from an aquaculture perspective.

Co-Location of Aquaculture & Welsh Offshore Wind Farms – proposals to scope a **Socio-economic modelling** study have been drawn up and await comment.

Welsh Government marine planning division can facilitate consideration of the benefits associated with co-location, however the energy and fisheries departments are the decision-makers. Currently Welsh Government capacity to influence wind farm developers is not strong, so **persuasion is the most effective means to encourage energy companies to listen**.

The concept must be **taken to the Energy Industry**. Opportunities associated with aquaculture, and the findings of the study should be presented at the 'All Energy Conference'. 'FLOWW' is also a good forum.

Public dialogue should be considered, to help establish whether there is a need for intervention at all, and if so, provide a mandate for political change. For example, can a review of the CFP accommodate encouragement for co-location?

An **Aquaculture & OWF Co-Location Stakeholder Forum** is proposed, to act as a vehicle to take the recommendations forward.

Seafish has agreed to adopt a secretariat role. Cefas supports the proposal. The work of the forum could be developed by small working groups, to cover topics including, technical issues / developments, licencing and permissions, dissemination and advocacy.

The forum can seek funding opportunities. A further round of EMFF funding may be sought to facilitate research (e.g. socio-economic study) and advocacy work. Science-wise (BIS) may also be a source of funding to enable wider public dialogue in relation to policy action.

Co-Location stakeholder forum to seek clarification from TCE on:

- The Permissions and Licencing required to operate beyond 12nm from shore.
- The legal status of multifunctional use of a leased area.
- Investigate fishery order for an existing wind farm site.

Action: all participants to submit comments on Draft Report by July 31st.

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