

WP8.3 – Strategic Report- C6. Aquaculture + Oil & Gas (Baltic/North Sea)

1 Introduction

This strategic report deals with the suitability for combination of two very different economic activities in the North Sea/Baltic Sea basins: aquaculture and Oil & Gas industry. In this Multi-Use of Space concept, Oil & Gas infrastructures (platforms, pipelines, etc...) would serve as supporting facilities for the development of offshore aquaculture.

In general terms this concept presents a series of advantages, such as the minimisation of the environmental impacts from aquaculture in areas close to the coast, the boost and expansion of aquaculture towards offshore areas, and improving the image of the Oil & Gas industry. However, given the differences between both industries (functioning, structure, regulation, etc...) the development of this combination poses a number of challenges:

1.- Dominance of the Oil & Gas industry: Oil & Gas activities are highly-risky in technical, environmental and financial terms. Thus, Oil & Gas companies may be reluctant to cede/share their facilities with activities that will add risk to their operations, without obtaining any benefit. As already occurred in previous attempts (Gulf of Mexico, Kaiser et al., 2011), when combining aquaculture and active platforms, the interests of the Oil & Gas industry predominate at the expense of aquaculture.

2.- Spatial distribution of the activity: Spatially, this combination can have a number of limitations, since the environmental conditions around the Oil & Gas infrastructures may not be suitable for the development of aquaculture (hydrodynamics, water quality, etc...).

In line with the above points, although the North Sea and the Baltic Sea have been considered together, they present important differences for the possible development of this concept. The North Sea is the principal Oil & Gas production area in Europe. In this area, a large proportion of its infrastructure is (or will be in the short term) in decommissioning process (RAE, 2013). The use of nearly or completely obsolete platforms would make it possible to avoid the dominance situation of the Oil & Gas industry. However, the area is subject to a strict regulation in this aspect: despite a few exceptions, OSPAR Decision 98/3 establishes the complete withdrawal of all the obsolete infrastructures once the use for which they were originally deployed finishes (OSPAR, 1998). In contrast, Oil & Gas activities in the Baltic are much more limited in space and volume (ie., the Polish coast). The regional Convention of the area (HELCOM) does not have specific guidelines for decommissioning activities, with the London Convention and its Protocol being the main regulatory framework (IMO, 1996). Unlike OSPAR, this regulatory framework allows for the exceptional reutilisation of platforms for new uses.

In socio-economic terms, this concept is adjusted to the characteristics and needs of the area. In addition to the availability of skilled labour force, the increase of aquaculture activities, may have as a result an increase in food production as well as job creation. Regarding technical and environmental aspects, most of the problems may arise from the combination with an active Oil & Gas facility (leakages, restricted access to certain zones, noise, etc...). Finally, due to eutrophication problems sustainable culture measures (IMTA) and/or low nutrient emission cultures (bivalves, seaweeds, aquatic plants) appear as more appropriate for the Baltic area.



2 Products

Description of products/services

The environmental differences between the North Sea and the Baltic (eutrophication problems) influence the kind of products that can be farmed.

Baltic: Marine aquaculture is not a widely extended activity in the Baltic countries. The main produced species is the large trout (>1.2 kg). The largest producers of large trout using the marine cage technology are Denmark (10500 t), Sweden (9436 t) and Finland (12448 t).

North Sea: UK and Norway are the most important aquaculture countries in the North Sea, with marine fishes as main product (e.g., salmonids, seabrass). Atlantic salmon is the most consumed aquaculture product in the EU, the UK (mainly Scotland) being the second largest producer (after Norway).

Current and near-term planned

From a sector-specific point of view, the aquaculture and the Oil & Gas industries show very different trends. Due to the low prices of oil products, the high exploitation costs, the depletion of the most accessible reserves and the development of cheaper onshore production processes (e.g., fracking), offshore Oil & Gas is in decline. By contrast, an overall increase in the aquaculture production is expected in the EU-28. Recent estimates predict an increase in volume from 2010 to 2030 of 772.000 tonnes (56%). Such a large expansion will require new aquaculture sites, the improvement of already existing farms and the adoption of adequate spatial management measures (Lane et al., 2014).

From a combination point of view, the development of this concept in the Baltic/North Sea basin may imply a series of additional challenges: (i) the location of the new aquaculture sites will be driven by the spatial distribution of Oil & Gas platforms (in which environmental conditions may not be appropriate for the development of aquaculture), and (ii) Oil & Gas production activities in the Baltic are mainly developed along the Polish coast (limited locations available for potential combinations).

3 Market Analysis

In 2011, the consumption of seafood products in the EU amounted to 12,3 million tonnes (52,2 billion €). From that total value, farmed products represented around 24%. As a result of the economic crisis the expenditure on seafood has decreased across the EU. However, accounting for 24% of total world exchanges in value, the EU is still the first importer of seafood products. Tuna, cod and salmon are the main species consumed in volume, whilst shrimp are the most valuable imported species ahead of salmon, tuna and cod. The imports of salmon and cod from Norway and shrimps from China are particularly relevant.

EU's self-sufficiency for aquaculture products (i.e. the production relative to its internal consumption) only accounts for 10%. Considering the importance of the seafood market in the EU, this combination can support the expansion of the aquaculture industry. This will contribute to meet the demand and improve the food security of the economy.

In the North Sea alone, 7% of the existing facilities are in the decommissioning process, and it is estimated that over the next 30 years this process will affect to 500-690 additional infrastructures (RAE, 2013). Overall, these figures highlight the potential of the area for the development of this combination and the boost of the offshore aquaculture sector is clear.



4 Customers

Given the high demand for seafood of the EU, there is no doubt that the expansion of the aquaculture industry may help to supply the overall demand of EU's national markets. However, the preferences for seafood vary between countries. Baltic and North Sea countries (e.g., Sweden, Germany, France, Denmark, Poland and the UK) are in the top 10 of countries that import salmon and trout. In contrast, in Atlantic and Mediterranean countries (e.g., France, Spain, Italy, Belgium) the import of molluscs dominates. Considering these preferences and the fact that salmonids and large trout are the principal species farmed in the Baltic/North Sea, the internal markets of the basin emerge as primary key customers.

5 Competition

The main competitors to the combination may arise from the aquaculture industry itself and the pressure from specific social groups (fishermen, ecologists, general public). These are summarised in the table below

Table 1: Competitors to Concept

Competitors	Key differentiators	Rating (1-10) 10 is most competitive/desirable
Green NGOs	Claims for a more natural environment. Push towards full decommission of platforms. Potentially high public acceptance and support	7
Sales of decommissioned platforms	Oil and gas operators may be interested in selling the platform to a third part/activity, transferring this way decommissioning obligations. Not facilitated by regulation	3
Building new aquaculture sites	Increased market competition	8
Onshore/nearshore aquaculture	Normal and proven practice. Lower transport costs	10
Fisheries industry	Traditional practice. In spite of the overexploitation of the stocks may have a greater policy/public support.	8

6 Revenue

Both the aquaculture and Oil & Gas industries are bound to the rules on competition determined by the Treaty on the Functioning of the European Union. As such, any public support that can distort the internal market of the EU is incompatible with the Treaty. In the specific case of the Oil & Gas industry, the EU characterises by the low level of public support to fossil fuels (Bárány and Grigonyt , 2015). Thus as shown in the table below the principal public support measures are derived from the aquaculture activity. Despite this public support, private investors predominate for both industries.



SUPPORT SCHEMES		
Sector	Type	Activities covered
Aquaculture	European Maritime and Fisheries Fund (EMFF)	<ul style="list-style-type: none"> • Sustainable development of aquaculture • Sustainable development of fisheries and aquaculture areas • Marketing, processing and storing related measures • Technical assistance at the initiative of MS • Control and enforcement systems (e.g., IT for traceability of products) • Data collection for implementation of CFP • Shared management measures with IMP
	State aid rules	<ul style="list-style-type: none"> • <i>De minimis</i> aid: small sums that are unlikely to have a significant impact on competition (Commission Regulation 717/2014) • Aids compatible to the Fishery and Aquaculture Block Exemption Regulation (Commission Regulation 1388/2014)
Oil & Gas	National support	<ul style="list-style-type: none"> • Tax breaks for oil and gas production (UK)
INVESTMENT		
Sector	Typical investor profile	
Aquaculture	<ul style="list-style-type: none"> • Intra-sector investments (the industry invests on itself) • Investment funds 	
Oil & Gas	<ul style="list-style-type: none"> • Funding through own reserves • Equity funds • Bank loans/bonds 	

7 Strategic Roadmap

All the sectors considered in this combination operate at the commercial scale. In this case, the combination of both industries does not imply significant technical challenges, since the proximity to an Oil & Gas platform does not influence the procedure for the deployment of aquaculture infrastructures (even less if it is obsolete). Therefore, the commercial development of this combination is not influenced by technical aspects, but by factors related to the availability of funds, interest from companies or permissions. In addition, there exists some aspects that require a more in-depth investigation before the development of the combination which relate to: (i) suitability of the platforms as aquaculture supporting structures; (ii) environmental suitability for aquaculture and farmed specific species; (iii) cost-effectiveness of maintenance and transportation activities. These latter aspects may differ between projects and as such, they should be studied on a case-by-case basis.



8 Conclusion

A series of concluding remarks are given below:

- The use of an obsolete Oil & Gas infrastructure is the most viable option for the development of this combination: minimisation of technical, financial and environmental risks; avoidance of situations of dominance of the Oil & Gas industry
- In a basin-specific context the development of the combination faces two main types of challenges: regulatory challenges (North Sea) vs. spatial challenges (Baltic sea)
- North Sea: area with great potential in terms of resource availability. However, the stricter regulation in decommissioning may be a barrier for the combination
- Baltic Sea: regulation in decommissioning may give more opportunities for combination but resource availability is very spatially limited (Polish coast)
- Improvement of the EU's self-sufficiency for aquaculture products can be an important driver for the combination concept. Internal markets around the basin emerge as important potential customers
- The sectors involved in the combination operate at commercial scale. Regulatory or financial barriers may have a higher influence than technical constraints in the development of the concept.

98 References

- Bárány, A., Grigonytė, D., 2015. Measuring fossil fuel subsidies. ECFIN Economic Brief. European Commission, Directorate General for Economic and Financial Affairs, Issue 40, March 2015. (http://ec.europa.eu/economy_finance/publications/economic_briefs/2015/pdf/eb40_en.pdf).
- Kaiser, M.J., B. Snyder, and A.G. Pulsipher. 2011. Assessment of opportunities for alternative uses of hydrocarbon infrastructure in the Gulf of Mexico. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation and Enforcement, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEMRE 2011-028. 278 pp. (<http://www.enrg.lsu.edu/files/images/publications/online/2011/2011-028.pdf>)
- Lane, A., Hough, C., Bostock, J., (2014). The long-term economic and ecologic impact of larger sustainable aquaculture, Study for the European Parliament's Committee on Fisheries, European Union, 2014. ([http://www.europarl.europa.eu/RegData/etudes/STUD/2014/529084/IPOL_STU\(2014\)529084_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2014/529084/IPOL_STU(2014)529084_EN.pdf))
- RAE (2013). Decommissioning in the North Sea. A report of a workshop held to discuss the decommissioning of oil and gas platforms in the North Sea. Royal Academy of Engineering, London. 15 pp. (<http://www.raeng.org.uk/publications/reports?q=decommissioning>).

