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Co-location of activities and designations: A means of solving or creating problems in marine spatial planning?

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ABSTRACT

Worldwide demand for energy is growing and predicted to increase by up to three times by 2050. Renewable energy will play a vital role in meeting this demand whilst maintaining global climate change targets. Around the British Isles, development of wind farms has entered Round three, with large, high capacity wind parks being planned to enhance energy security and achieve 2020 renewable energy targets. Such developments place additional pressure on existing sea space and may result in conflicts with other marine activities and users. Co-location of certain activities, marine protected areas, aquaculture and commercial fishing in particular, has therefore been proposed as an option to ease demands on space. Using the UK guided by EU and regional policy, as a case study, following the criteria-based planning system, co-location is legally feasible. Crucially, co-location options will depend on site specific characteristics and site management plans. The biology, ecology and hydrology of the site as well as consideration of important commercial and economic factors will be determining factors of success. For marine protected areas compatibility with conservation objectives for the site will be fundamental. Where possible, it is suggested that activities suitable for co-location will develop in tandem with renewable energy projects. The importance of developing joint projects in this manner is particularly true for aquaculture projects to ensure tenure security and commercial viability. Adaptive management will be a basis for evolution of the concept and practice of co-location. Pilot projects and continued monitoring will be essential in shaping the future of co-location of activities. As the Marine Management Organisation continues the development of marine plans for the English inshore and offshore waters, a study into potential solutions for resolving sea use conflicts is timely. This paper therefore provides a concise overview of the current regulation affecting co-location of key marine activities within wind farm zones and provides suggestions on how co-location projects can be adopted and taken forward, using the UK as a case study.

1. Introduction

As new marine activities are realised and existing ones developed and expanded there will be increased competition for marine space resulting in further pressure upon traditional users such as fishing and navigation. In the past, minor use conflicts were handled in a discretionary manner. Now due to the scale of the issue, a systematic approach is required to avoid conflicts and resolve competing demands. This systematic approach will require a coordinated, integrated and complementary planning and management system [1] to prevent spatial or temporal conflicts in marine space use. Marine spatial planning will therefore have to consider concurrent activities in time or space, hereafter defined as co-location.

One of the key drivers for marine spatial planning in Europe is regional conservation legislation [2]. There has been a focus at both the international level and within the EU on better environmental management of the oceans and protection of marine species which, in turn, has determined the direction of domestic environmental law and policy. The introduction of the EU Marine Strategy Framework Directive [3] and the aim of 'good environmental status' for all Member State coastal seas by 2020 provides legally binding targets for Member States [4]. This also requires increased attention on the development of a network of marine protected areas in inshore and offshore waters. Recent legislative developments have established a framework for action through marine planning. As countries begin the process of preparing marine plans, guided by the Marine Management Organisation (MMO) for English inshore and offshore waters, co-location is emerging as a preferred means of tackling spatial conflicts [5].

Worldwide demand for energy is expected to increase by up to three times by 2050 [6] and the worldwide energy-related carbon dioxide emissions are predicted to increase from 30.2 bn metric tonnes in 2008 to 43.2 bn mt by 2035 [7]. For example, in 2009 only 3% of the UK energy was from renewable sources and the

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European Union (EU) 2009 Renewable Energy Directive set a target for the EU to achieve 20% of its overall share of energy from renewable sources by 2020 [8]. Across Europe, member states have set targets in National Action Plans in support of the EU goals; Denmark and Germany have targets of 20% of energy consumption from renewable sources and Finland has a target of 38% [9]. In July 2011, the UK Government increased its target for the deployment of offshore wind generation by 2020 from 13 GW to 18 GW as part of the plan to generate 15% of energy from renewables by 2020 [10]. Scotland has more ambitious targets, with aims to source 50% of its energy demand by 2015 and the equivalent of 100% of the country's energy demand by 2020 [11]. It is clear that offshore wind energy generation will play a significant role in EU and UK Government strategy, with strong commitments to development of wind energy in the Renewable Energy Strategy [12] and the Renewables Roadmap 2011 [13]. The UK Government has, in its recent Energy Bill, reinforced its focus on renewables, through increased incentives and financial stability within the Levy Control Framework [14].

Offshore renewable energy is expanding together with a growth in marine activities. Potential new initiatives in aquaculture represent further demands on marine space. In order to enhance food security and assist in production of raw non-food materials for biofuel production, offshore aquaculture is becoming increasingly attractive [15]. This is particularly the case for macro-algae cultivation for sustainable biofuels where offshore production negates the potentially damaging effects of converting agricultural land from food to fuel production [16].

This will increase pressure on a finite sea space and thus requires marine spatial planning to manage activities in an efficient and sustainable manner. As well as legal recognition at the national level, this is recognised at European level through the Commission proposal for legislation on Maritime Spatial Planning and Integrated Coastal Management [17]. Although proposed and established offshore wind farm zones occupy a significant proportion of the marine landscape in countries such as the UK, Denmark, The Netherlands and Germany, it is suggested that a mere 3% of the total area leased for an offshore wind farm is occupied by the piles and foundations in place to support the turbines [18]. Proposed co-location of marine activities is therefore an attractive option for marine planners and stakeholders seeking to reduce the conflicts in use of the sea.

In general, stakeholders seem to be amenable to co-locating activities within and around wind farms [19], although displacement of fishing by wind farms is of concern. Stakeholder consultations indicate that within the UK, for example, Round 3 developers are keen to consider co-location of activities within offshore wind farms [19]. The frequency with which an individual visits or uses the coastal zone has an influence on how much discomfort they experience from wind farms within sight. In general, a greater frequency of coastal use (e.g. recreation, fishing, etc.) results in more discomfort [20]. Anticipated visual distance to proposed wind farms also affects the level of opposition by local residents, with developments that are expected to be “out of sight” being considered in more general terms and therefore more acceptable [21]. A choice experiment performed on tourists to the region of Languedoc Rousillon in France showed two acceptable [to the tourists] policy options in terms of the siting of wind farms: (1) irrespective of other factors, wind farms should be >12 km from shore to avoid loss of tourism revenues and (2) a minimum distance of 5 km from the shore can be achieved without loss of tourism revenues if the farm is associated with recreational activities and is accompanied with a coherent environmental policy [22]. Therefore developers may need to consider the amount a particular area of coast is used for industrial, residential and recreational purposes when planning the location of wind farms, and hence co-locating recreational or fishing activity, for example, may assist in making renewable projects more acceptable to the public.

Using UK implementation of EU law and policy as a case study, this paper seeks to assess the compatibility and legal and environmental constraints of co-locating three key marine activities with wind farm developments: marine protected areas, offshore aquaculture, and fishing. This allows us to conclude whether co-location is a feasible option for addressing competing marine demands.

2. Marine protected areas (MPAs)

Marine protected areas are promoted and governed under the EU Birds, Habitats and Marine Strategy Framework Directives, the Convention on Biological Diversity 1992 (CBD) and, in the UK, the Marine and Coastal Access Act 2009. An increase in such areas puts additional pressure on an already heavily populated sea space. Within UK territorial and offshore waters there are 102 SACs for marine habitats or species and 107 SPAs for birds that have a marine component [22]. Nearly a quarter of English inshore waters[1] are now under European site protection [23].

In the UK, the main types of MPA are:

- Marine Conservation Zones (MCZs) for nationally important habitats and species, [Marine and Coastal Access Act].
- European Marine Sites (EMS); as Special Areas of Conservation (SACs) for habitats of European importance, [Habitats Directive].
- European Marine Sites (EMS); as Special Protection Areas (SPAs) for birds (also know at Natura 2000 sites), [Birds Directive].
- Sites of Special Scientific Interest (SSSI) and RAMSAR sites are mostly terrestrial or intertidal areas but some extend into the marine environment below the low water mark.

The Marine Strategy Framework Directive (MSFD) aims to achieve *Good Environmental Status* (GES) in EU waters by 2020 [4]. The MSFD supports the creation of Natura 2000 sites, implemented through the Habitats Directive, in order to support the conservation objectives necessary for the achievement of GES [24]. The Marine and Coastal Access Act introduces specific provision at domestic level to support the creation of such a network within UK waters, covering an area of the sea bed or subsoil within the limits of the UK sector of the continental shelf, EEZ and territorial sea[2] in what will be known as Marine Conservation Zones [25]. The creation of these zones will contribute to fulfilling UK obligations under the CBD as well as other regional non binding instruments such as the recommended coherent network of MPAs under the OSPAR Recommendation 2003/3 [26]. Implementation is similar across Europe, for example, in the Netherlands this is done under the 1998 Nature Conservation Act.

The operational phase of an offshore wind farm development is thought to have minimal environmental impacts [27] and scour protection may lead to habitat enhancement and therefore be actively beneficial. In addition to officially designated MPAs, wind farm sites can create an informal MPA as they often become an effective no-take-zone for fish. These MPAs occur, because the nature of the licensing and operational legislation for the wind

[1] The English inshore areas means the area of sea within the seaward limits of the territorial sea (12 nm limit) adjacent to England, Marine and Coastal Access Act 2009, s 322(1).

[2] NB. As a devolved matter, MCZs will not apply to the Scottish or Northern Irish Inshore region—Marine and Coastal Access Act 2009 s. 116(3)