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Marine governance in an industrialised ocean: A case study of the emerging marine renewable energy industry

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ABSTRACT

The world's oceans are currently undergoing an unprecedented period of industrialisation, made possible by advances in technology and driven by our growing need for food, energy and resources. This is placing the oceans are under intense pressure, and the ability of existing marine governance frameworks to sustainably manage the marine environment is increasingly being called into question. Emerging industries are challenging all aspects of these frameworks, raising questions regarding ownership and rights of the sea and its resources, management of environmental impacts, and management of ocean space. This paper uses the emerging marine renewable energy (MRE) industry, particularly in the United Kingdom (UK), as a case study to introduce and explore some of the key challenges. The paper concludes that the challenges are likely to be extensive and argues for development of a comprehensive legal research agenda to advance both MRE technologies and marine governance frameworks.

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1. Introduction

An 'industrial revolution' of the oceans is underway [1–3]. A growing human population and appetite for resources, coupled with innovation and technological advancement, is driving unprecedented exploitation of the marine environment. This is not only placing further pressure on already exhausted ocean ecosystems [4], but also challenging existing legal and regulatory frameworks and changing the way we think about marine governance. Growing demand for private rights to marine resources and ocean space, coupled with the declining health of the oceans, necessitates the evolution of marine governance frameworks that can facilitate innovation and economic development, while also ensuring environmental sustainability.

This paper aims to advance the contemporary discourse on marine governance through a case study of the emerging marine renewable energy (MRE) industry. MRE is of particular interest as it sits at the confluence of a number of discourses, challenging all aspects of marine governance frameworks. At the same time, the marine governance discourse provides a framework for considering issues relating to the deployment of MRE technologies.

The paper first briefly explores the history of marine governance, from early conceptions, freedom of the seas and single-sector management, to the development of an increasingly integrated and holistic paradigm. The paper draws attention to the emergence of 'Blue Growth', which seeks to sustainably progress industrialisation of the oceans to meet economic and social objectives. The key themes of modern marine governance frameworks are then identified and elaborated, namely: rights and ownership; resource management; environmental sustainability; and management of ocean space.

The paper provides a preliminary discussion of the key issues and challenges facing marine governance frameworks, using the emerging MRE industry as a case study. This discussion shows that both marine governance frameworks, and the innovative marine industries subject to their regulation, face considerable challenges in an increasingly industrialised ocean. It is further suggested that the marine governance discourse provides a suitable starting point for developing a legal research agenda for MRE. Some concluding thoughts are offered, highlighting potential directions for future research.

2. Marine governance: a brief history

This section provides a brief overview of the key developments in marine governance, from terrestrial planning and early single-sector governance models, to the recent calls for a paradigm shift

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in thinking around marine spaces and the ongoing transition towards more integrated and holistic governance models.

2.1. From land to sea: onshore planning

Terrestrial land use and planning is a well-developed and central component of Western legal systems. The traditional permit-by-permit approach to land planning has been augmented by an overarching layer of planning processes that provide a strategic vision for future development. This combination of project-centric permitting and high-level strategic guidance and has become the standard model for onshore land-use planning and management [5].

While different planning systems have varied origins, two watershed events drove the emergence of modern planning regimes in many countries. Firstly, the industrial revolution precipitated enormous economic and social change that necessitated an overhaul of governance structures. Similarly drastic social and political upheavals then took place in the aftermath of World War II. In the UK, for example, the new socialist government committed to common ownership of the means of production and nationalised many industries [6]. This was not feasible in relation to general land ownership, and most land ultimately remained in private hands.[1] The planning system evolved to meet this context, allowing the interests of private landholders to be subordinated to the wider public good [7].

There is a strong parallel between the industrial revolution and the ongoing industrialisation of the oceans. While private rights in marine spaces have historically been rare, demand for private or quasi-private property rights is increasing, again challenging policymakers to ensure that such rights are subordinated to the public interest. It is therefore "tempting, but naïve" to suggest that land planning regimes can simply be replicated at sea [8]. The marine environment is inherently different to the terrestrial one, and marine planning mechanisms must be "built at sea" [9].

Nonetheless, the interrelationship between terrestrial and offshore planning has been the focus of some research, which has considered: the potential use for land planning tools in the marine context [10]; the integration of land and sea planning [11]; the interface between land and sea planning for activities that cross the land-sea divide [8]; using terrestrial planning as a basis for understanding marine planning [12]; and using experience with novel marine governance mechanisms to inform and improve terrestrial planning systems [13].

2.2. Early marine governance

As far back as the Roman Empire, marine spaces were 'owned' as an extension of terrestrial territory (*Mare Clausum* or *Mare Nostrum*) [14,15]. That conception was fundamentally changed by Grotius' 1609 work, *Mare Liberum*, which introduced the 'freedom of the seas' concept. Nations' rights to the sea were limited to a specified band of water extending from the coastline; all waters beyond national boundaries were considered open to all nations, but property of none.[2] Independence of colonial states, industrialisation, expanding fisheries, and the discovery of mineral resources beneath the seabed subsequently provided the impetus for a widening of state jurisdiction. Beginning in 1958, three United Nations Law of the Sea conferences were held to decide upon the rights and duties of nations regarding ocean space.[3]

The process towards the 1982 United Nations Convention on the Law of the Sea (UNCLOS) represented a milestone in the development of modern marine governance, and is widely considered to be one of the longest and most complex treaty processes in the history of international law.[4] This process pushed states to think more systematically about their interests in ocean space and consider more systemic approaches to management of the oceans. It also underscored the need for increased coherence in marine governance, and thereby played a catalysing role the development of integrated marine policy.

Legal scholarship regarding marine governance has generally focused on the international ramifications of UNCLOS, however UNCLOS was also significant at the national level in three key ways [16]. Firstly, in recognising the rights of states in relation to the various parts of the ocean, particularly by creating Exclusive Economic Zones (EEZ),[5] UNCLOS substantially increased the scale of national jurisdiction and management of ocean space. This recognition of sovereign rights over both living and non-living resources provides an impetus for effective management in the form of self-interest. Secondly, the Convention also established some responsibilities for the management of the marine environment: by ratifying, states accept obligations to "protect and preserve the marine environment" and to undertake a range of actions to achieve this.[6] Thirdly, the preamble the Convention explicitly expressed the understanding that "the problems of ocean space are closely interrelated and need to be considered as a whole", endorsing a systems perspective for marine governance.

2.3. Towards modern marine governance

The imperative to develop institutions and policies for an integrated approach to marine governance is a relatively recent one. During the 1960s the 'systems' view of the world began to predominate, grounded in the growing understanding of marine ecology and an increasing appreciation of the impacts of human uses on the marine environment. In many places, the level of participation and influence of civil society increased at all levels of policymaking during this period [17,18], which went "hand in hand with the increasingly multi-level character of politics and policy making" [19].

Two major innovations occurred in marine governance, starting in the 1970s. Marine Protected Areas (MPAs) emerged as a tool for restricting human uses in the interests of conservation, and Integrated Coastal Zone Management (ICZM) emerged as the main multi-use management paradigm [20].

The use of MPAs for conservation has grown exponentially, particularly over the last two decades. The World Summit on Sustainable Development in 2002 highlighted the importance of MPAs in conservation and called for the "establishment of marine protected areas consistent with international laws and based on scientific information, including representative networks by 2012".[7] In 2010, States pledged to protect 10% of marine and coastal ecosystems by 2020 (Aichi Target XI).[8] Yet despite studies suggesting a level of effectiveness [83–85], particularly for MPAs following best practice [86], the conservation benefits are far from universal.

[1] Though some compulsory purchase powers were introduced.

[2] Note that though only a general overview is considered here, this conception does not acknowledge the many kinds of traditional management systems that treated marine resources as common-property.

[3] 1958, 1960 and 1973.

[4] Negotiations lasted almost a decade (1973–1982) and addressed the full spectrum of human uses of the marine environment known at the time.

[5] The EEZ stretches from the low water mark out to 200 nautical miles. The EEZ gives States a sovereign right to exploit the resources below the surface of the sea.

[6] Article 192. This is in addition to more specific obligations, such as in relation to fisheries (Article 194).

[7] Paragraph 32(c) of the Johannesburg Plan of Implementation.

[8] For more details, see 'Quick guide to the Aichi Biodiversity Targets: Protected areas increased and improved', http://www.cbd.int/doc/strategic-plan/targets/T11-quick-guide-en.pdf.

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