TESTING THE LIMITS OF UNCLOS: OFFSHORE RENEWABLE ENERGY INSTALLATIONS AND ENVIRONMENTAL GOVERNANCE IN THE EEZ

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ABSTRACT

The rapid expansion of offshore renewable energy has created new legal and environmental governance challenges within Exclusive Economic Zones, particularly where large scale installations interact with navigation, fisheries, submarine cables and marine ecosystems. This article examines whether the existing framework under the United Nations Convention on the Law of the Sea is sufficiently equipped to regulate these competing uses while ensuring effective environmental protection. It argues that although UNCLOS provides the foundational legal framework for offshore renewable energy development, its existing provisions do not fully address the cumulative spatial and environmental effects of modern projects. The article adopts a doctrinal and analytical approach, examining the UNCLOS alongside relevant international jurisprudence, academic commentary and selected domestic and regional regulatory practices. Particular attention is given to the limitations of Article 60 in addressing cumulative occupation of maritime space, environmental impact assessment obligations under Article 206, and the nature of the due regard obligation in resolving competing uses of the EEZ. The article contends that UNCLOS remains an essential legal foundation but increasingly requires supplementary regional and domestic governance mechanisms. It contributes to the broader discussion on sustainable ocean governance by identifying areas where greater regulatory clarity and coordination are required for the effective governance of offshore renewable energy development.

Keywords: UNCLOS, Exclusive Economic Zone, Offshore Renewable Energy, Environmental Impact Assessment, Due Regard, Marine Environmental Protection.

Introduction

Offshore renewable energy (ORE) has become an increasingly important component of the climate regime, as states invest in large-scale wind farms located within their Exclusive Economic Zones (EEZs)[1]. Although these developments are crucial for meeting decarbonization targets, they pose complicated governance questions in an already contentious maritime space. The United Nations Convention on the Law of the Sea[2] (UNCLOS) offers a governing regime for the EEZ, stipulating the sovereign rights of coastal nations in exploiting the resources of their zones.

Nevertheless, there are limits to these rights as nations must take responsibility for the environmental protection in the zone while respecting *"due regard"* for the interests of other states[3]. As such, a critical legal question here is how to balance resource exploitation against shared governance of the zone. This article argues that although UNCLOS provides the legal foundation for offshore renewable energy development in the Exclusive Economic Zone, the obligations under this regime provide insufficient guidance for addressing cumulative environmental impacts and competing uses of the maritime area.

Legal and Conceptual framework

Nature of EEZ

The Exclusive Economic Zone, as provided for by Articles 55-75[4] of UNCLOS, is a *sui generis* maritime zone where coastal states have certain sovereign rights coexisting with the rights and freedoms of other states. According to Article 56, coastal states have sovereign rights to conduct activities like exploration, exploitation, conservation, and management of natural resources. On the other hand, Article 58 provides that coastal states have certain freedoms of navigation, overflight, and laying of submarine cables. It is inherent in the EEZ that there will be both the exercise of sovereign rights of the coastal State as well as the retention of some rights and freedoms for other States.

[1] Paul Elsner & Suzette Suarez, Renewable Energy from the High Seas: Geo-Spatial Modelling of Resource Potential and Legal Implications for Developing Offshore Wind Projects Beyond the National Jurisdiction of Coastal States, 128 ENERGY POL'Y 919 (2019).
[2] United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397.
[3] Rolf Einar Fife, Obligations of "Due Regard" in the Exclusive Economic Zone: Their Context, Purpose and State Practice, 34 INT'L J. MARINE & COASTAL L. 43 (2019).
[4] UNCLOS, supra note 2, arts. 55–75.

Coastal State Rights over Energy Installations

The basis for coastal state jurisdiction over renewable energy located in the offshore region arises from Articles 56 and 60. Article 56[5] specifically acknowledges the entitlements to develop renewable energy sources from water, currents, and wind. Furthermore, Article 60[6] describes in greater detail the rights of coastal states over the construction, operation, and regulation of artificial islands, installations, and structures, as well as establishing safety zones around such installations. Such rights, though, should be applied with reference to other provisions of the UNCLOS.

Environmental Obligations

The UNCLOS also places some environmental responsibilities upon all the states. Article 192[7] establishes the responsibility to preserve and protect the environment, while Article 194[8] requires states to take necessary steps in order to prevent, reduce, and control any form of marine pollution. Further, article 206[9] requires environmental assessment if any project or activity conducted by the states in the zones are likely to result in considerable damage to the marine environment.

Critical analysis

Functional Limits of Article 60

Article 60 of UNCLOS which provides for the establishment of safety zones for artificial islands and installations does not seem to take into account offshore projects on the same scale as offshore renewable energy installations as the focus was primarily on the regulation of individual artificial islands, installations and safety zones, while modern infrastructures can involve large clusters whose cumulative spatial effects are not addressed. Specifically, large-scale offshore wind farms, by virtue of being a complex of several units deployed over large

[5] UNCLOS, supra note 2, art. 56.
[6] UNCLOS, supra note 2, art. 60.
[7] UNCLOS, supra note 2, art. 192; see also Responsibilities and Obligations of States with Respect to Activities in the Area, Case No. 17, Advisory Opinion of Feb. 1, 2011, 11 ITLOS REP. 10, ¶ 145.
[8] UNCLOS, supra note 2, art. 194; *see also* Pulp Mills on the River Uruguay (Arg. v. Uru.), Judgment, 2010 I.C.J. 14 (Apr. 20).
[9] UNCLOS, supra note 2, art. 206; see also Responsibilities and Obligations of States with Respect to Activities in the Area, Case No. 17, Advisory Opinion of Feb. 1, 2011, 11 ITLOS REP. 10, ¶ 145.

stretches of the marine environment, have unique regulatory characteristics.[10]

Here, the extent of functionality of Article 60 is to be assessed. While the purpose of the safety zones is to secure installations and promote safe navigation, these zones may fall short of the mark when considering the cumulative impact on shipping lanes, fishing grounds, and competition for use of the marine space in this case. The regulation is concerned with individual installations but not with the issue of cumulative occupation.

Scholars support this claim. Tsamenyi and Herriman[11] state that the UNCLOS regime was negotiated under the assumption that conventional uses of oceans would prevail and thus cannot deal with new energy technologies. According to Woolley[12], offshore renewable installations create spatial conflict since they take up large portions of marine space and overlap with legal uses of other actors. Therefore, even though Article 60 legally allows states to regulate offshore energy installations, its form does not reflect the realities of modern offshore renewable projects.

Environmental Impact Assessment & Ecological Risks

Article 206 of UNCLOS requires states to conduct an EIA where there are reasonable grounds to believe that planned activities may cause substantial pollution or significant and harmful changes to the marine environment. As per international jurisprudence, there is an obligation to carry out environmental impact assessments in cases where there is a likelihood of a serious environmental impact, as recognised in *Pulp Mills*[13] and reinforced by ITLOS[14]. However, the provision remains framed in broad and open-textured terms, providing no clear guidance on thresholds, methodology, or scope.

While such ambiguity may be manageable for conventional marine activities, it becomes particularly problematic in the context of offshore renewable energy (ORE) installations. Unlike traditional single-site projects, large-scale offshore wind farms involve expansive

[10] Claire L. Szostek et al., Spatial Conflict in Offshore Wind Farms: Challenges and Solutions for the Commercial Fishing Industry, 200 ENERGY POL'Y 114555 (2025).
[11] Martin Tsamenyi & Max Herriman, Ocean Energy and the Law of the Sea: The Need for a Protocol, 29 OCEAN DEV. & INT'L L. 3 (1998).
[12] Olivia Woolley, Renewable Energy and the Law of the Sea, in EMERGING TECHNOLOGY AND THE LAW OF THE SEA 35 (James Kraska & Young-Kil Park eds., 2022).
[13] Pulp Mills on the River Uruguay (Arg. v. Uru.), Judgment, 2010 I.C.J. 14, ¶ 204 (Apr. 20)
[14] Responsibilities and Obligations of States with Respect to Activities in the Area, Case No. 17, Advisory Opinion of Feb. 1, 2011, 11 ITLOS REP. 10, ¶ 145.

spatial footprints and interconnected infrastructure[15]. Their environmental impacts are often cumulative, as multiple installations form part of wider regional developments; diffuse, arising from noise, seabed disturbance, habitat fragmentation, and interference with migratory species; and cross-sectoral, affecting fisheries, navigation, and marine biodiversity simultaneously[16].

As Woolley[17] observes, offshore renewable infrastructure occupies extensive marine areas and interacts with multiple ocean uses, generating ecosystem-wide impacts. Similarly, Tsamenyi and Herriman[18] note that UNCLOS was negotiated with traditional ocean uses in mind, rather than emerging energy technologies. Consequently, Article 206 appears ill-equipped to address the scale and complexity of contemporary offshore energy development. The broadness of Article 206 is not necessarily an inherent flaw. The permissive reading of the provision might be a consequence of the UNCLOS characterisation as a framework convention open to future amendments by means of developments in international law, regional conventions, and national regulations.

This concern is reinforced by precautionary approaches in international environmental law, which encourage regulatory action where serious environmental harm is possible despite scientific uncertainty. The absence of clear EIA standards risks inconsistent implementation and highlights the broader fragmentation of environmental governance, where regulatory responses increasingly occur outside the UNCLOS framework.

"Due Regard" and Conflict of Uses

The EEZ does not belong exclusively to the coastal state; rather, it is a sui generis maritime zone wherein the rights of the coastal state regarding natural resources coexist with the retained freedom and rights of other states[19]. Under such conditions, the principle of *"due regard"* fulfills a role of coordination, requiring the coastal state, while pursuing its rights in connection with offshore renewable energy sources, to consider the legitimate rights of other states. Due regard is treated by the Tribunal [20]as an obligation that depends on circumstances, including

[15] Stephen C.L. Watson et al., The Global Impact of Offshore Wind Farms on Ecosystem Services, 249 OCEAN & COASTAL MGMT. 107023 (2024).
[16] Catherine Ann Caine, The Race to the Water for Offshore Renewable Energy: Assessing Cumulative and In-Combination Impacts for Offshore Renewable Energy Developments, 32 J. ENV'T L. 83 (2020).
[17] Woolley, supra note 12.
[18] Tsamenyi & Herriman, supra note 11.
[19] Delimitation of the Maritime Boundary in the Bay of Bengal (Bangl. v. Myan.), Case No. 16, Judgment of Mar. 14, 2012, 12 ITLOS REP. 4.
[20] Chagos Marine Protected Area Arbitration (Mauritius v. U.K.), PCA Case No. 2011-03, Award (Mar. 18, 2015).

consultation and balance; in the South China Sea Arbitration[21], the Tribunal also stressed that states should exercise their rights with due regard to the rights of other states in the EEZ.

The principle becomes highly relevant to the construction of offshore wind farms since these kinds of projects require vast expanses of water area, safety zones, and might affect fishing, shipping, and submarine cables[22]. Whereas fishing and maritime navigation are dynamic in nature and do not involve fixed structures, the construction of an offshore wind park is a static enterprise that might exclude or alter the manner in which other legitimate activities are carried out within the marine zone. It is no longer a question of the coexistence of different uses but of how the exercise by one nation of its rights would seriously hamper other freedoms within the EEZ.

The requirement of due regard is, by its nature, situational since it requires states to weigh their rights in relation to the EEZ against the rights of other states. However, UNCLOS does not determine the priorities among conflicting uses of the EEZ, such as offshore renewable energy, shipping, fishing, and submarine cables. Moreover, there is no established procedure for dealing with conflicts arising from the exercise of rights and resulting in the substantial interference in the exercise of the other rights. As a result, the application of due regard depends on the particular circumstances, consultations, and other mechanisms of regulation. Therefore, there is significant uncertainty regarding the situation when major offshore energy projects impact various uses of the EEZ.

The practice by states indicates that such uncertainty is dealt with through coexistence arrangements domestically and regionally. In the United States, the Bureau of Ocean Energy Management (BOEM) has provided guidelines for mitigating the effects of offshore wind power on commercial and recreational fishing industries, including those related to project location, navigation, access, safety, and compensation. The Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) in the United Kingdom is an organization that promotes coordination and communication between the fishing community and the offshore renewable energy community. The State-wide Strategy for the Coexistence of California Fishing Communities and Offshore Wind Energy has been developed in California for mitigating the effects of offshore wind power on fisheries and fishing communities to achieve

[21] South China Sea Arbitration (Phil. v. China), PCA Case No. 2013-19, Award (July 12, 2016).
[22] Niels Krabbe, The Strained Relationship of Offshore Wind Energy and Shipping: Promoting Coexistence Under the Law of the Sea, 56 OCEAN DEV. & INT'L L. 595 (2025).

coexistence.

These examples provide evidence of how domestic and regional governance regimes are increasingly performing the task of detailed coordination which is lacking in the general due regard requirement under the UNCLOS regime.

Viewed through the no-harm principle and notions of equitable use of shared maritime spaces, the obligation appears normatively insufficient to resolve conflicts arising from offshore renewable energy development. It offers no clear standard, hierarchy, or enforceable outcome. Consequently, states rely on fragmented domestic and regional mechanisms to manage these tensions, revealing that UNCLOS lacks a coherent framework for addressing the spatial and functional conflicts generated by large-scale offshore energy installations.

Overall, these problems point toward a systemic deficiency of the treaty. In particular, Art. 60 provides an out-of-date installation regime despite its formality, Art. 206 prescribes environmental considerations, which are not further specified; moreover, the *"due regard"* requirement still lacks sufficient clarity in connection with conflicting use of the EEZs. The rise in importance of alternative regulatory measures such as the offshore renewable energy strategy developed by the European Commission, the National Marine Planning Framework of Ireland, and the Advisory Opinion by the ITLOS in 2024 demonstrates that the regulation is increasingly complemented by other measures outside the framework of UNCLOS.

Conclusion

The growing development of offshore renewable energy in the EEZ has led to the discovery of gaps in the UNCLOS legal regime. Even though the Convention provides the basic legal framework in Articles 56 and 60, the convention alone does not provide enough detail on regulation of the situation to adequately cover the intricacies of the development of offshore renewable energy today. First of all, the analysis of the provisions has revealed that the provisions of Article 60 are limited in their scope due to the focus on the separate facility rather than cumulative occupation. Second, despite being mandatory, the Environmental Impact Assessment obligation set out in Article 206 does not present a procedure that could be applied to address cumulative and wide-ranging effects. Third, the concept of due regard does not offer any conflict resolution mechanisms.

In turn, states tend to use additional governance instruments like marine spatial planning, and regional approaches. Though such developments indicate adaptability, they also illustrate a fragmented and uncoordinated approach in regulating. Overall, though UNCLOS provides the legal basis for offshore renewable energy operations in the EEZ, it does not fully deal with the environmental and spatial challenges created by modern developments. Consequently, additional development will be necessary through regulation at the international, regional, and national levels.