



The Strained Relationship of Offshore Wind Energy and Shipping: Promoting Coexistence under the Law of the Sea

Niels Krabbe

To cite this article: Niels Krabbe (14 Dec 2025): The Strained Relationship of Offshore Wind Energy and Shipping: Promoting Coexistence under the Law of the Sea, Ocean Development & International Law, DOI: [10.1080/00908320.2025.2591689](https://doi.org/10.1080/00908320.2025.2591689)

To link to this article: <https://doi.org/10.1080/00908320.2025.2591689>



© 2025 The Author(s). Published with license by Taylor & Francis Group, LLC



Published online: 14 Dec 2025.



Submit your article to this journal [↗](#)



Article views: 16



View related articles [↗](#)



View Crossmark data [↗](#)



The Strained Relationship of Offshore Wind Energy and Shipping: Promoting Coexistence under the Law of the Sea

Niels Krabbe^{a,b}

^aSchool of Business, Economics and Law, University of Gothenburg, Gothenburg, Sweden; ^bSchool of Law, Faculty of Human and Social Sciences, Åbo Akademi University, Turku, Finland

ABSTRACT

This article examines the relationship between the navigational freedoms of all states and the sovereign rights of coastal states to authorize and construct offshore wind farms within their exclusive economic zone under the law of the sea. It focuses on how coastal states have considered shipping lanes and routeing measures in the planning of offshore wind projects, and how proposals for adjusting routeing measures to facilitate such development have been received by other states at the International Maritime Organization. The analysis shows that, contrary to some interpretations, the law of the sea provides coastal states with extensive procedural autonomy in balancing offshore wind development and navigational interests, including broad discretion to adapt routeing schemes to accommodate offshore wind. At the same time, early and inclusive marine spatial planning, supported by transparent notification and consultation procedures, can operationalize the preventive logic of the United Nations Convention on the Law of the Sea—promoting coexistence between navigation and offshore wind while contributing to the efficient and sustainable use of maritime space.

ARTICLE HISTORY

Received 8 May 2025
Accepted 13 November 2025

KEYWORDS

conflicts at sea; offshore wind energy; shipping

Introduction

Offshore wind energy has become a central component of the global energy transition. Rising energy demand, falling turbine costs, and increasingly ambitious climate targets have encouraged states to allocate extensive sea areas for offshore wind development. In Europe, this trend is particularly pronounced in the Baltic Sea, where favorable wind conditions and shallow waters coincide with dense maritime traffic and sensitive

CONTACT Niels Krabbe  niels.krabbe@law.gu.se  Box 650, 40530 Göteborg, Sweden

© 2025 The Author(s). Published with license by Taylor & Francis Group, LLC

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

marine ecosystems.¹ This spatial convergence has produced a new legal and policy dilemma: How should the freedoms of navigation and the sovereign right of each coastal state to develop offshore wind farms within its exclusive economic zone (EEZ) be balanced under the law of the sea? The issue is not merely theoretical.

For example, in Germany's EEZ the area allocated for offshore wind increased from 3 to 16 percent between 2009 and 2021.² Similar expansion strategies are being pursued by Denmark, Sweden, and Finland, as reflected in their updated marine spatial plans.³ As offshore wind has gained priority, competition and the potential for conflict with other maritime uses have intensified. Shipping, fisheries, and marine protection all compete for the same limited sea space, particularly in semi-enclosed waters such as the southern Baltic Sea and the Gulf of Bothnia.⁴

For the shipping sector, offshore installations represent both direct and indirect navigational risks. Offshore wind farms can restrict traffic not only within their boundaries but also in surrounding safety zones, increasing congestion and lengthening routes.⁵ These adjustments may entail significant additional costs for shipping through higher fuel consumption and longer voyage times. The risk of collision or allision is of particular concern in constrained maritime spaces or under challenging environmental conditions, such as ice cover.⁶

The United Nations Convention on the Law of the Sea (UNCLOS)⁷ provides the overarching legal framework for balancing the sovereign rights of coastal states to exploit renewable energy resources and the navigational freedoms of other states. Coastal states may construct and authorize "installations and structures" for the production of energy from the winds and currents within their EEZs, but they must also exercise "due notice" and have "reasonable regard" for the rights of other states, including navigation.⁸ Routing systems adopted through the International Maritime Organization (IMO) supplement these provisions by defining internationally recognized traffic schemes that shipping must observe.⁹

¹ For a discussion of how climate objectives and policy incentives, particularly those emerging from the European Green Deal and the objective of climate neutrality by 2050, have accelerated the development of offshore wind projects and led many coastal states to prioritize offshore wind energy in their national marine spatial plans, see Ludwig Krämer, "Planning for Climate and the Environment: The EU Green Deal" (2020) 17(3) *Journal of European Environmental and Planning Law* 267; Kira Gee, Philipp Arndt, Marie Dahmen et al., "A New Maritime Spatial Plan for the German EEZ: Navigating Multiple Aspirations and Spatial Developments" (2024) 161 *Marine Policy* 106006; Rebecca Williams and Feng Zhao, *Global Offshore Wind Report 2023* (Global Wind Energy Council, 2023).

² Gee, Arndt and Dahmen, note 1; Markus Salomon and Jochen Schumacher, "Maritime Spatial Planning: Germany as a Forerunner in Ecosystem-Based Management?" (2022) 37(6) *Planning, Practice & Research* 739.

³ Aron Westholm, "The Role of Planning in Offshore Wind Power Deployment" in this special issue.

⁴ Ibid; Aljona Karlõševa, Sulev Nõmmann, Tea Nõmmann et al., "Marine Trade-Offs: Comparing the Benefits of Offshore Wind Farms and Marine Protected Areas" (2016) 55 *Energy Economics* 127.

⁵ Aldo Chircop and Peter L'Esperance, "Functional Interactions and Maritime Regulation: The Mutual Accommodation of Offshore Wind Farms and International Navigation and Shipping" (2016) 30 *Ocean Yearbook* 439.

⁶ Toke Koldborg Jensen, Louise Bjerrum Paillet and Christian Mathias, *Study on Maritime Safety and Wind Farms in the Gulf of Bothnia: Formal Safety Assessment* (Traficom Research Reports 13, 2025).

⁷ United Nations Convention on the Law of the Sea, adopted 10 December 1982, entered into force 16 November 1994, 1833 UNTS 397 [hereinafter, UNCLOS].

⁸ Ibid, Art 60(7).

⁹ International Convention for the Safety of Life at Sea, adopted 1 November 1974, entered into force 25 May 1980, 1184 UNTS 3, Chapter V, Regulation 10 [hereinafter, SOLAS]; Convention on the International Regulations for Preventing Collisions at Sea (1972) [hereinafter, COLREGs].

Existing scholarship suggests that this legal framework leaves coastal states substantial discretion to adjust routing measures when facilitating offshore wind projects, as long as they act consistently with IMO procedures and the principles of cooperation and reasonable regard.¹⁰ This interpretation aligns with practice in several European states, which have proposed modifications to traffic separation schemes in order to accommodate renewable-energy installations.

The Nordic region provides a particularly instructive context for analyzing these trade-offs. In the Gulf of Bothnia, extensive wind-farm developments are being planned in areas that overlap with crucial winter navigation routes between Finland and Sweden. Risk assessments highlights that while offshore wind development could proceed safely during the ice-free season, winter navigation significantly constrains spatial flexibility and demands early integration of safety corridors into planning.¹¹ These findings reinforce the need for proactive coordination between maritime authorities and energy developers at both the national and IMO levels.

This study contributes to the literature in three ways. First, it situates the legal interpretation of Article 60(7) of UNCLOS within the specific environmental and navigational conditions of the Nordic seas, including seasonal ice cover and limited sea space. Second, it connects legal reasoning with recent empirical research on maritime risk assessment and spatial planning in the Gulf of Bothnia. Third, it proposes that marine spatial planning (MSP), when implemented early and cooperatively, can operationalize the “reasonable regard” obligation and thereby reduce potential conflicts.

This article therefore examines how the law of the sea regulates the coexistence of offshore wind energy and maritime navigation, focusing on Nordic state practice. The Convention provides extensive autonomy for coastal states in balancing these interests, but this discretion is bounded by the duties of consultation, notification, and reasonable regard for navigation. Linking legal interpretation with empirical evidence contributes to a more nuanced understanding of how coastal states can promote coexistence and maximize the sustainable use of sea space.

Characterizing Offshore Wind under the Law of the Sea

Even though the first offshore wind park was not constructed until after the conclusion of the negotiations of UNCLOS, the Convention anticipated the development of offshore renewable energy. It provides rules that are directly relevant to such installations in various maritime zones.¹²

Article 56 of UNCLOS grants the coastal state sovereign rights in its EEZ for the purpose of exploring, exploiting, conserving, and managing natural resources, including

¹⁰ Chircop and L’Esperance, note 5, 456–460; Juan Carlos Farias Pardo, Magnus Aune, Christopher Harman et al., “A Synthesis Review of Nature-Positive Approaches and Coexistence in the Offshore Wind Industry” (2023) 82 *ICES Journal of Marine Science* fsad191.

¹¹ Koldborg Jensen et al., note 6.

¹² Jonathan Feddersen, Henrik Koll and Joana Geraldi, “The Temporality of Project Success: Vindeby, the World’s First Offshore Wind Farm” (2024) 55 *Project Management Journal* 2; Olivia Woolley, “Renewable Energy and the Law of the Sea” in James Kraska and Young-Kil Park (eds), *Emerging Technology and the Law of the Sea* (Cambridge University Press, 2022), 36.

the production of energy from the water, currents, and winds.¹³ These sovereign rights are complemented by jurisdictional competences over the establishment and use of artificial islands, installations, and structures.¹⁴ Article 60 elaborates these rights further, granting coastal states exclusive authority to construct, authorize, and regulate such installations and to establish safety zones of up to 500 meters around them.

The Convention does not, however, define or clearly distinguish between “artificial islands,” “installations,” and “structures.” The distinction was clarified to some extent by the *South China Sea Arbitration*, where the Permanent Court of Arbitration differentiated artificial islands from installations and structures.¹⁵ The latter two terms are used in conjunction throughout the Convention text. While there are arguments for interpreting traditional fixed offshore wind infrastructure as installations rather than structures, the Convention’s parallel use of these terms implies that it is sufficient to establish that turbines and associated foundations, cables, and substations fall under “installations or structures” rather than artificial islands.¹⁶

More importantly, as long as wind turbines are fixed to the seabed and incapable of self-propulsion, they cannot be regarded as “ships” within the meaning of Article 92 of UNCLOS.¹⁷ Ambiguity may arise in relation to moveable or floating wind turbines.¹⁸ Installations and structures are generally distinguished by being immovable; conversely, a device capable of navigation or self-propulsion is commonly classified as a ship.¹⁹ However, it has been persuasively argued that if a unit is primarily used for a stationary purpose—such as energy production—and is moved only to another location to continue that same fixed activity, it should still be considered an “installation or structure” within the coastal state’s jurisdiction under Article 60.²⁰ Some commentators have further suggested that an installation must serve an economic purpose to fall within the EEZ regime, in keeping with the economic rationale underpinning that zone.²¹

¹³ UNCLOS, Art 56(1)(a).

¹⁴ Ibid, Art 60(1).

¹⁵ The case also confirmed that installations are not subject to the regime of territorial seas and do not generate their own maritime zones. *South China Sea Arbitration (Philippines v. China) (Merits)*, Award of 12 July 2016, XXXIII RIAA 153, [803]–[806].

¹⁶ The terms “installations” and “structures” have their genesis in Article 5 of the 1958 Geneva Convention on the Continental Shelf, which referred to coastal state jurisdiction with respect to “installations and other devices necessary for its exploration and the exploitation of its natural resources.” This provision was further elaborated during the negotiation of UNCLOS, with the proposal by the United States that “installations” be defined to include “all offshore facilities, installations or devices other than those which are mobile in their normal mode of operation at sea.” See Satya Nandan and Shabtai Rosenne, *United Nations Convention on the Law of the Sea 1982: A Commentary*, Vol. II, edited by Myron H. Nordquist (Martinus Nijhoff, 1993), 575; Chircop and L’Esperance, note 5, 443–446.

¹⁷ Camille Goodman, “Harnessing the Wind Down Under: Applying the UNCLOS Framework to the Regulation of Offshore Wind by Australia and New Zealand” (2023) 54 *Ocean Development & International Law* 253.

¹⁸ Floating wind turbines are, however, attached to the seabed with cables.

¹⁹ Tobias Hofmann and Alexander Proelss, “The Operation of Gliders under the International Law of the Sea” (2015) 46(3) *Ocean Development & International Law* 263.

²⁰ Chircop and L’Esperance, note 5, 448–450; see also Woolley, note 12, 40–41.

²¹ Chircop and L’Esperance, note 5, 450; see also Alexander Proelss, *United Nations Convention on the Law of the Sea: A Commentary* (Hart Publishing, 2017), 470.

These uncertainties have prompted calls for the development of new rules for so-called moveable offshore renewable units (MORUs), which may not fit neatly within existing categories of installations or ships.²² While such ambiguity exists conceptually, its practical importance remains limited. Although some conceptual ambiguity remains, this has limited practical relevance; for traditional fixed offshore wind turbines—the focus of this article—the classification as “installations and structures” is undisputed. The coastal state thus enjoys exclusive jurisdiction over their establishment and operation.

Coastal State Rights to Offshore Wind and Navigational Freedoms

Aiming to provide the general framework for all uses of the sea, UNCLOS sets out the legal rules governing the rights and obligations of states in carrying out maritime activities. One of its defining features is the systematic delineation of coastal state sovereign rights and the corresponding freedoms of other states. The Convention seeks to reconcile these interests, offering a structure that facilitates reconciliation where potential conflicts arise between different maritime uses. As the construction of offshore wind installations represents an exercise of coastal state rights, while navigation constitutes a freedom enjoyed by all states, the interaction between these two activities illustrates a classic instance of competing interests within the law of the sea.²³

Another central characteristic of the Convention is its division of the ocean into distinct maritime zones. The balance between the countervailing forces of coastal state rights and freedoms of other states shifts across these spaces, ranging from complete coastal state sovereignty in internal waters to equal rights for all states on the high seas. Between these extremes lie the territorial sea and the EEZ, where UNCLOS establishes overlapping competences: Coastal states exercise sovereign rights for resource-related activities, while other states retain the freedoms of navigation and overflight.²⁴ The equilibrium between these interests is at the heart of the regime governing offshore wind development.

The sovereign rights conferred on coastal states by the Convention are not open-ended. Most relevant provisions include explicit caveats requiring that these rights be exercised with *due regard* for the rights and freedoms of other states.²⁵ This balancing requirement appears, *inter alia*, in Articles 56(2) and 58(3) of UNCLOS, which oblige both coastal and user states to conduct their activities with mutual consideration. The law of the sea thus provides a legal reference point for striking trade-offs between national jurisdiction and international freedoms. While certain activities fall within the sphere of exclusive coastal state competence—such as the construction of

²² Alexander Severance, “*Mare Incognitum*, Part I: Do We Now Need (to at Least Discuss) a Mobile Offshore Renewables Unit Convention?” (2021) 45(2) *Tulane Maritime Law Journal* 287.

²³ Chircop and L’Esperance, note 5, 441–443.

²⁴ UNCLOS, Arts 2–3, 56, 58, 86–87.

²⁵ *Ibid.*, Arts 56(2), 58(3).

installations and structures under Article 60—these powers are tempered by obligations designed to preserve international navigation and communication.²⁶

Accordingly, the relationship between offshore wind energy and shipping is situated within this broader pattern of balanced jurisdiction. Offshore wind development, authorized by the coastal state under Article 60, must coexist with the freedom of navigation protected by Article 87 and the rights of other states in the EEZ under Article 58.²⁷ The Convention therefore does not treat these activities as mutually exclusive, but requires their coordination through mechanisms such as prior notification, consultation, and routeing measures under the IMO.²⁸ In practice, this balance enables coastal states to pursue renewable energy objectives while ensuring that navigation, including under challenging conditions such as ice-covered waters in the Nordic region, remains safe and efficient.²⁹ This pattern of reconciling concurrent rights continues across maritime zones, though the balance shifts in favor of the coastal state within the territorial sea.

The Territorial Sea

Beyond the baseline drawn along the coast lies the territorial sea, extending up to 12 nautical miles from the baseline. Within this zone, the coastal state exercises sovereignty comparable to that over its land territory. This sovereignty includes the right to construct offshore wind farms and to regulate all their components, including foundations, substations, and underwater cables.³⁰ While the coastal state must consider its environmental obligations under UNCLOS and other applicable international instruments, other states have no general legal basis to object to the construction of these installations.

Although sovereignty in the territorial sea is comprehensive, it is not absolute. It remains qualified by the provisions of UNCLOS and general international law. Most notably, other states retain the right of innocent passage, which ensures freedom of navigation through the territorial seas of other states, subject to certain conditions.³¹ Passage must be continuous and expeditious and must not be “prejudicial to the peace, good order or security of the coastal state.”³²

At the same time, coastal states maintain a far-reaching mandate to regulate maritime traffic in their territorial seas, including for the protection of offshore facilities, installations, cables, and pipelines.³³ Ships exercising the right of innocent passage

²⁶ Richard Barnes, “Energy Sovereignty in Marine Spaces” (2014) 29(4) *International Journal of Marine and Coastal Law* 573.

²⁷ UNCLOS, Arts 60, 87, 58. There is a similar but shifted balance between the rules applicable to offshore wind and shipping in the territorial sea.

²⁸ SOLAS, Chapter V, Regulation 10; see also COLREGs; International Maritime Organization (IMO) Assembly Resolution A.572(14) of 20 November 1985, as amended, General Provisions on Ships’ Routeing.

²⁹ Koldborg Jensen et al., note 6.

³⁰ UNCLOS, Arts 2–3, 21(1)(f); see also Woolley, note 12, 38–39.

³¹ UNCLOS, Art 17.

³² *Ibid*, Art 19(1).

³³ *Ibid*, Art 21(1)(f)–(g).

must comply with the laws and regulations of the coastal state enacted in conformity with the Convention, as well as with applicable international rules and standards such as the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs).³⁴ Coastal states may therefore designate sea lanes and establish traffic separation schemes to ensure safe passage of ships, including around energy installations.³⁵ Such measures, however, must comply with the procedures and criteria set out under the International Convention for the Safety of Life at Sea (SOLAS) and the relevant recommendations of IMO.³⁶

In straits used for international navigation, where the special regime of transit passage applies, the autonomy of coastal states to regulate maritime traffic or construct installations is more limited.³⁷ Under Part III of UNCLOS, coastal states bordering such straits must cooperate with user states to ensure that passage remains unimpeded.³⁸ The issue of constructions potentially interfering with transit passage was addressed in the *Passage through the Great Belt* case.³⁹ In that dispute, Finland objected to Denmark's plan to construct the Great Belt Bridge, which would have permanently closed the strait to deep-draught vessels over 65 meters in height. Although the case was withdrawn following a negotiated settlement, the International Court of Justice's provisional order suggested a willingness to recognize that the obstruction of navigational rights by coastal state constructions may entail an obligation to modify or dismantle such structures.⁴⁰

The *Great Belt* proceedings thus underline that even within areas of extensive sovereignty, such as the territorial sea, coastal state competence to regulate maritime uses must be reconciled with international navigation rights. This principle remains pertinent for modern infrastructure such as offshore wind farms, which may similarly influence navigational access and safety if located in or near busy straits or approach routes.

The Exclusive Economic Zone

Whereas the relationship between offshore wind and shipping is relatively straightforward in the territorial sea, it becomes more complex in the EEZ, which lies beyond the territorial sea and extends up to 200 nautical miles from the baselines.⁴¹ Within this zone, the coastal state does not enjoy full sovereignty but exercises *sovereign rights*

³⁴ COLREGs, note 9.

³⁵ UNCLOS, Art 22(1).

³⁶ SOLAS, Chapter V, Regulation 10; IMO Res A.572(14), note 28.

³⁷ In Part III, UNCLOS provides for the right of transit passage in international straits, including specific rules relevant for routing measures in Articles 41–42. It should, however, be underlined that these obligations are of limited relevance in a Baltic Sea context. In its straits, the right of transit passage does not apply due to specific long-standing international conventions, which according to UNCLOS Article 35(3) have preference. Moreover, Denmark, Sweden, and Finland have refrained from extending their territorial seas in some areas to 12 nautical miles, leaving an exclusive economic zone corridor. See Alex G. Oude Elferink, "The Regime of Passage Through the Danish Straits" (2000) 15(4) *International Journal of Marine and Coastal Law* 555.

³⁸ UNCLOS, Arts 37–44.

³⁹ *Passage through the Great Belt (Finland v. Denmark)* (Provisional Measures) [1991] ICJ Rep 12.

⁴⁰ *Ibid.*, [24]–[25].

⁴¹ UNCLOS, Part V.

for the purpose of exploring and exploiting, conserving, and managing the natural resources of the waters superjacent to the seabed, the seabed, and its subsoil, as well as jurisdiction with regard to the production of energy from the water, currents, and winds.⁴² The construction and operation of offshore wind farms therefore fall within the rights conferred on the coastal state under Article 56(1)(a) of UNCLOS.⁴³

The rights of the coastal state in the EEZ are, however, functional and limited to specific purposes.⁴⁴ Other states retain the freedoms of navigation and overflight, as well as the right to lay submarine cables and pipelines, as provided in Article 58(1).⁴⁵ These overlapping rights mean that the EEZ is a shared space, where multiple lawful uses must coexist. The need to balance these uses lies at the heart of the EEZ regime.

UNCLOS provides the mechanism for this balance through the principle of due regard. Articles 56(2) and 58(3) oblige both coastal and user states to exercise their rights with due regard for each other's rights and duties.⁴⁶ In practical terms, this means that neither the coastal state's jurisdiction over offshore installations nor the navigational freedoms of other states are absolute. Both are qualified by the obligations to avoid unjustifiable interference and to engage in prior consultation and notification where appropriate.

Article 60 establishes the specific legal basis for the construction and regulation of offshore installations and structures in the EEZ. It authorizes coastal states to construct, authorize and regulate such installations, and to establish safety zones of up to 500 meters around them.⁴⁷ Yet Article 60(7) introduces a crucial limitation, providing that installations "may not be established where interference may be caused to the use of recognized sea lanes essential to international navigation."⁴⁸ This clause underscores that coastal state discretion in authorizing offshore wind development must be reconciled with the rights of navigation protected under Articles 58 and 87.

Operationally, identifying "recognized sea lanes" depends on international coordination. The IMO serves as the competent forum for establishing routeing systems such as traffic separation schemes (TSS), deep-water routes and areas to be avoided.⁴⁹ Coastal states may propose such schemes within their EEZs, but these acquire international legal effect only after adoption by the IMO under SOLAS and COLREGs.⁵⁰ This procedural arrangement ensures that national decisions concerning offshore wind siting are harmonized with global navigational safety standards, giving operational meaning to the concept of *reasonable regard*.

European state practice reflects this cooperative balance. Several states, including the Netherlands, Belgium, and the United Kingdom, have adjusted traffic separation

⁴² Ibid, Art 56(1)(a).

⁴³ Ibid.

⁴⁴ Robin Churchill, Vaughan Lowe and Amy Sander, *The Law of the Sea*, 4th ed (Manchester University Press, 2022), 263; Yoshifumi Tanaka, *The Law of the Sea*, 4th ed (Cambridge University Press, 2023), 154–200.

⁴⁵ UNCLOS, Art 58(1).

⁴⁶ Ibid, Arts 56(2), 58(3).

⁴⁷ Ibid, Art 60(1)–(5).

⁴⁸ Ibid, Art 60(7).

⁴⁹ IMO Res A.572(14), note 28.

⁵⁰ SOLAS, Chapter V, Regulation 10.

schemes and other routing measures to accommodate offshore wind areas.⁵¹ In the Nordic region, Finland and Sweden are developing similar mechanisms for the Gulf of Bothnia, where ice conditions and dense shipping traffic create specific navigational risks. A 2025 formal safety assessment by the Finnish Transport and Communications Agency (Traficom) emphasizes that offshore wind development in this area must preserve winter navigation routes and ensure year-round safety through coordinated planning.⁵²

These examples illustrate how the duties of reasonable regard and due notice under UNCLOS can be implemented through structured MSP and IMO cooperation. MSP, as required by Directive 2014/89/EU, provides a framework for early coordination between maritime and energy authorities, ensuring that navigational corridors are protected while facilitating renewable energy expansion.⁵³ This integrated approach—already applied in several Nordic and Baltic states—demonstrates how the legal obligations of UNCLOS can be operationalized to promote coexistence between offshore wind and shipping, even under challenging regional conditions such as ice navigation.

Beyond routing and siting considerations, the Convention also grants the coastal state exclusive rights to construct and operate power generation installations in its exclusive economic zone, together with jurisdiction over cables and pipelines connected to such structures.⁵⁴ At the same time, other states retain the freedom to lay submarine cables and pipelines through the EEZ of coastal states under Articles 58(1) and 79 of UNCLOS. Recent incidents involving damage to critical seabed infrastructure in the Baltic Sea—whether accidental or deliberate—have drawn renewed attention to the vulnerability of power transmission cables and other offshore energy assets.⁵⁵ These developments have increased interest in surveillance and sensor systems for cable protection and raised questions about the extent of coastal state enforcement jurisdiction in relation to such measures.⁵⁶

While enhanced monitoring and protective measures may have some implications for navigation—such as restrictions on anchoring or trawling—the physical risks associated with offshore wind installations, including turbine foundations and safety zones, are of far greater relevance for potential navigational conflicts. Accordingly, although the legal aspects of transmitting offshore wind energy to the grid are important, the principal interface between coastal state rights and navigational freedoms arises in connection with the siting and regulation of offshore installations themselves.

⁵¹ Chircop and L'Esperance, note 5, 439, 456–457.

⁵² Koldborg Jensen et al., note 6.

⁵³ Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257/135, 28 August 2014.

⁵⁴ Hannah Müller, *A Legal Framework for a Transnational Offshore Grid in the North Sea* (Intersentia, 2015) 34–38. As noted by Müller, this assumption appears to be confirmed by Article 79 on laying cables on the seabed where this is subject to the jurisdiction of a coastal state to not interfere with the coastal state's "jurisdiction over cables constructed or used in connection with the ... operations of artificial islands, installations and structures under its jurisdiction."

⁵⁵ Alexander Lott and Henrik Ringbom, "Sabotage of Critical Offshore Infrastructure: A Case Study of the Balticconnector Incident" in Alexander Lott (ed), *Maritime Security Law in Hybrid Warfare* (Brill, 2024), 155.

⁵⁶ Christian Bueger and Tobias Liebetrau, "Critical Maritime Infrastructure Protection: What's the Trouble?" (2023) 155 *Marine Policy* 105772; Lott (ed), note 55.

In conclusion, the EEZ regime exemplifies the approach of UNCLOS to balancing competing maritime interests. The coastal state enjoys extensive but qualified rights to develop offshore wind energy, while the freedoms of navigation and communication remain safeguarded through international cooperation and procedural mechanisms. Properly implemented, this balance promotes both maritime safety and sustainable offshore energy development.

Safety Zones

In connection with the establishment of offshore wind farms, the coastal state may, under Article 60(4) of UNCLOS, establish reasonable safety zones around installations and structures in which it may take appropriate measures to ensure the safety of both navigation and the installations themselves. The maximum breadth of such zones may not exceed 500 meters around each installation, measured from each point of its outer edge. Within these zones, navigation and other uses of the sea may be restricted or prohibited for safety reasons.⁵⁷

The primary purpose of these zones is to prevent collisions between ships and installations, and to safeguard installations and personnel. The authority to establish safety zones is thus an important expression of the coastal state right to regulate uses of the sea for navigational safety, while remaining consistent with the freedoms of navigation beyond their limits.⁵⁸ The IMO has recognized the practical importance of these zones and has issued guidance on their delineation, including recommendations that their extent and enforcement measures be adapted to local navigational conditions and traffic density.⁵⁹

In the practice of European coastal states, safety zones of 500 meters are the norm and are often automatically applied around each turbine or cluster within a wind farm.⁶⁰ In certain cases, smaller or irregular zones have been established where space constraints or routeing measures require a more flexible approach. For example, in the North Sea, combined safety areas and traffic separation schemes have been applied to balance navigational safety with energy development.⁶¹ In the Nordic region, national authorities have also considered the seasonal variability of ice cover and the resulting drift forces when defining safety zones, as drifting ice can extend the effective hazard radius of offshore installations.⁶²

UNCLOS does not provide detailed procedures for the establishment of safety zones. However, Article 60(4) requires that due notice be given of their existence and extent, and that permanent means for warning of their presence be maintained.⁶³ In practice, this is implemented through notifications to IMO and the publication of navigational

⁵⁷ UNCLOS, Art 60(4).

⁵⁸ Churchill et al., note 44.

⁵⁹ IMO Res A.671(16) of 19 October 1989, Safety Zones and Safety of Navigation around Offshore Installations and Structures.

⁶⁰ Chircop and L'Esperance, note 5, 439, 450–452.

⁶¹ Ibid; see also Gee et al., note 1.

⁶² Koldborg Jensen et al., note 6.

⁶³ UNCLOS, Art 60(4).

warnings and chart markings under the World-Wide Navigational Warning Service.⁶⁴ These measures ensure that the establishment of safety zones does not result in unnecessary impediments to navigation or in the creation of “hidden obstacles” contrary to the general obligations of safety at sea.

There are, however, observers who interpret the scope of coastal state jurisdiction within safety zones more broadly. Some argue that the coastal state is entitled to apply its domestic environmental and safety standards within these areas.⁶⁵ This interpretation was considered in several opinions in the *Arctic Sunrise* case before the International Tribunal for the Law of the Sea.⁶⁶ Judges Wolfrum and Kelly held:

The situation is different in respect of artificial islands and installations where the coastal State according to Article 60, paragraph 2, of the Convention enjoys exclusive jurisdiction and in the safety zones around such artificial islands or installations. This includes legislative jurisdiction as well as the corresponding enforcement jurisdiction.⁶⁷

Similarly, Judge Golitsyn, in his dissenting opinion, observed:

Reference in Article 60, paragraph 4, to the right of the coastal State to take appropriate measures means that under the Convention the coastal State has the authority to take appropriate measures to ensure compliance with its regulations governing activities within safety zones, in other words to take the necessary enforcement measures.⁶⁸

These interpretations suggest that the reference to “appropriate measures” in Article 60(4) may encompass both legislative and enforcement jurisdiction, potentially extending the functional reach of coastal state authority beyond the immediate safety rationale. However, this remains a matter of interpretation, as the Convention itself does not explicitly define the limits of such powers.

While there are thus different opinions on the extent of coastal state prescriptive and enforcement jurisdiction, Article 60(6) establishes a clear duty of all vessels to respect the safety zones established by the coastal state and to comply with generally accepted international standards regarding navigation in the vicinity of offshore wind farms.⁶⁹ Similar to other ship-related provisions in UNCLOS, this rule is directed primarily to the flag state, which, by virtue of its jurisdiction, must ensure that ships flying its flag fulfill these requirements when navigating within the EEZ of another state.⁷⁰ In light of the growing number of offshore wind farms, this obligation effectively represents an increasing limitation on the navigational freedoms otherwise enjoyed by vessels under the Convention.

The impact of these measures is further amplified by IMO recommendations, which urge ships to navigate with caution and to maintain safe speed and passing distances

⁶⁴ IMO Res A.706(17) of 6 November 1991, World-Wide Navigational Warning Service, as amended.

⁶⁵ Maria Gavouneli, *Functional Jurisdiction in the Law of the Sea* (Martinus Nijhoff, 2007).

⁶⁶ *Arctic Sunrise (Kingdom of the Netherlands v. Russian Federation)* (Provisional Measures, Separate and Dissenting Opinions) [2013] ITLOS Rep 230.

⁶⁷ *Ibid*, Separate Opinion of Judges Wolfrum and Kelly, [11].

⁶⁸ *Ibid*, Dissenting Opinion of Judge Golitsyn, [7].

⁶⁹ UNCLOS, Art 60(6).

⁷⁰ *Ibid*, Art 94(1)–(2).

in the vicinity of offshore wind installations, taking into account prevailing weather, visibility, and traffic conditions.⁷¹ These recommendations, together with the general tendency of navigators to maintain wide safety margins around hazards, can significantly affect routeing and operational planning, particularly in adverse conditions. In the Baltic Sea—and especially in the Gulf of Bothnia—the seasonal freezing of the sea and the dependence on icebreaker operations for winter navigation present particular challenges. Studies indicate that the establishment of offshore wind farms in ice-covered waters may alter local ice dynamics, leading to increased formation of ridges and rafted ice.⁷² This, combined with the loss of navigable space, can reduce the efficiency of icebreaker assistance and negatively affect winter shipping.⁷³ Moreover, the uncertainties associated with ice movement may necessitate greater safety distances between ships and offshore wind turbines than the standard 500 meter limit.

The Convention leaves room for the development of further standards or recommendations by the IMO to address such region-specific risks.⁷⁴ However, no dedicated IMO initiative has yet been undertaken to regulate safety zones or navigational practices in ice-covered waters. Given the extensive plans for offshore wind development in the Baltic Sea, including recent Swedish designations of priority areas for such projects in the Gulf of Bothnia,⁷⁵ the development of international guidance on the interaction between offshore wind installations and winter navigation appears increasingly necessary.

While safety zones form an integral part of the legal framework enabling coexistence between offshore wind and shipping, they may also give rise to challenges where sea space is limited or traffic density is high.⁷⁶ Overlapping zones from multiple installations can in practice constitute extensive restricted areas, particularly in confined waters such as the Baltic Sea.⁷⁷ This has prompted interest in developing regional standards and digital navigation tools that improve the integration of safety zones into marine spatial plans and electronic navigational charts. The IMO and the International Hydrographic Organization have encouraged states to report such data in a harmonized format, ensuring that mariners have reliable information about both existing and planned installations.⁷⁸

In sum, safety zones represent a key mechanism through which coastal states operationalize their obligation of reasonable regard under Article 60(7). When appropriately

⁷¹ IMO Res A.671(16), note 59, Annex 2.

⁷² Victor Ceder, Nils Helgesson, Basil P. Thomas et al., *The Impact of Wind Farms on Winter Navigation* (Chalmers University of Technology, 2024), 13–16; Thomas Porathe, “Ice Navigation in Arctic Offshore Wind Parks: Traffic Coordination Using Route Exchange and Moving Havens” (2023) 54 *Engineering Proceedings* 1; Koldborg Jensen et al., note 6.

⁷³ Koldborg Jensen et al., note 6.

⁷⁴ UNCLOS, Art 60(7).

⁷⁵ Havs- och Vattenmyndigheten, *Förslag till ändrade havsplaner för Bottniska viken, Östersjön och Västerhavet*, Förslag (dnr 00764– 2022) (2025) at <https://www.havochvatten.se/data-kartor-och-rapporter/rapporter-och-andra-publikationer/publikationer/2025-01-20-forslag-till-andrade-havsplaner-for-bottniska-viken-ostersjon-och-vasterhavet.html> (accessed 1 November 2025).

⁷⁶ Chircop and L’Esperance, note 5, 439, 454–455.

⁷⁷ Gee et al., note 1.

⁷⁸ International Hydrographic Organization (IHO), *Standards for Hydrographic Data and Product Specifications* (6th ed) (IHO, 2023).

designed and notified, they contribute to the safe coexistence of offshore wind and shipping. However, their proliferation in increasingly congested sea areas—particularly in regions with seasonal ice—calls for continued international coordination and technological innovation to maintain both safety and navigational efficiency.

The Obligation Not to Interfere with Recognized Sea Lanes

Under Article 60(7) of UNCLOS, installations and structures may not be established where interference may be caused to the use of recognized sea lanes essential to international navigation. The provision safeguards the freedom of navigation by preventing coastal state activities in the EEZ from obstructing key shipping routes. It is closely linked to the general obligation of due regard in Articles 56(2) and 58(3), but differs in that it formulates a clear prohibition rather than a balancing duty.

The concept of “recognized sea lanes” is not defined in the Convention. It is generally understood to include routes formally adopted by the IMO under its competence to establish ships’ routeing systems pursuant to Chapter V of the SOLAS Convention and its 1978 Protocol.⁷⁹ These encompass, for example, traffic separation schemes, deep-water lanes, and recommended routes adopted by IMO and published through nautical charts and notices to mariners.⁸⁰ Coastal states may initiate such measures, but it is for the IMO to decide on their adoption.⁸¹ Because of the limitation of coastal state prescriptive jurisdiction in the EEZ to norms in line with generally accepted international regulations, the involvement of the IMO is necessary to ensure compliance with such measures. For the purposes of the relationship between offshore wind and shipping, this IMO involvement has important consequences. Once the IMO has adopted a routeing measure, the coastal state effectively loses the autonomy to use the relevant area for other purposes, such as offshore wind, as IMO consultation is necessary for any amendment or suspension.⁸² In addition to formally adopted measures, recognition by virtue of Article 60(7) of UNCLOS may also derive from established navigational practice where a route is habitually and consistently used for international navigation.⁸³

⁷⁹ IMO Res A.572(14), note 28.

⁸⁰ *Ibid.*, Annex 1.

⁸¹ According to Article 22 of UNCLOS, states are not under an obligation to submit the establishment of such measures in the territorial sea to IMO for adoption, but they may do so. Although the involvement of the IMO is not formally required for the measures to be binding on foreign ships, the harmonizing role of the IMO may promote compliance. See Rüdiger Wolfrum, “Freedom of Navigation: New Challenges—Statement by Rüdiger Wolfrum, President of the International Tribunal for the Law of the Sea (2009),” 5–6; SOLAS, Chapter V, Regulation 10(6). As observed by Chircop, “it is conceivable that a State might still prefer not to submit a measure to the IMO for adoption, and may do so for information purposes and for distribution in the IMO, but such a course of action may trigger criticism from peer States.” Chircop and L’Esperance, note 5, 439, 454–455.

⁸² IMO Res A.572(14), note 28, [3(8)], states that “[s]uch a system, when adopted, shall not be amended or suspended before consultation with and agreement by IMO, unless local conditions and the urgency of the case require that earlier action be taken. In considering the proposal, IMO shall take account of the objectives, procedures, responsibilities, methods and criteria for routeing systems as set out in these general provisions.”

⁸³ Churchill et al., note 44, 269.

Navigational risks increase where offshore wind farms are established close to recognized shipping routes, particularly in areas with high traffic density or challenging sea and weather conditions. In such circumstances, both the IMO and UNCLOS emphasize the need for careful spatial planning to avoid interference. Article 60(7) explicitly prescribes that “artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognized sea lanes essential to international navigation.” Consistent with this rule, IMO resolutions on ships’ routeing call upon states to undertake early assessments of potential interference with established traffic patterns before authorizing offshore installations.⁸⁴ These instruments also recommend that “oil rigs, platforms and other similar structures are not established within routeing measures adopted by the IMO, as far as practicable,” and that where fixed or temporary installations cannot be avoided, the coastal state should submit amendments to the relevant routeing scheme for IMO approval.⁸⁵

This approach requires that local conditions—such as prevailing winds, currents, or the cumulative effects of several offshore projects—must be closely evaluated before approving construction near existing shipping routes. The intent is preventive: to ensure that installations do not obstruct or endanger navigation, while recognizing that some adaptation of shipping patterns may occasionally be unavoidable. In practice, IMO procedural mechanisms for routeing amendments serve as a safeguard to balance coastal state energy development with navigational safety in congested waters.

A practical consequence of Article 60(7) is that coastal states, when authorizing installations such as offshore wind farms, must ensure that they do not compromise the safety or accessibility of such routes. Where projects are proposed near recognized sea lanes, the coastal state has a duty to evaluate potential interference and to consult with other affected states or the IMO as appropriate. This requirement reflects the preventive nature of the provision and supports coordination between coastal and flag states at an early planning stage.

Interpretations of the degree of permissible impact on shipping under Article 60(7) differ among commentators. Scott argues that no development should be permitted within areas of clear navigational significance, even where no formal IMO routeing measure is in place, on the reasoning that such areas inherently fall within the scope of “recognized sea lanes.”⁸⁶ Woolley, in contrast, takes the view that non-interference with IMO-approved schemes represents a minimum standard of compliance, implying that installations in other areas may be acceptable if navigational safety is demonstrably maintained.⁸⁷ Proelss, adopting a position more favorable to coastal states, emphasizes the qualifying phrase “as far as practicable” in IMO resolutions and the enduring strength of sovereign coastal state rights.⁸⁸ He contends that neither UNCLOS nor the

⁸⁴ IMO Res A.572(14), note 28, [3(8)] and Annex 2.

⁸⁵ IMO Res A.671(16), note 59.

⁸⁶ Karen N. Scott, “Tilting at Offshore Windmills: Regulating Wind Farm Development within the Renewable Energy Zone” (2006) 18(1) *Journal of Environmental Law* 89, 100.

⁸⁷ Woolley, note 12, 52.

⁸⁸ Proelss, note 21, 479.

IMO framework renders the coastal state's discretion absolute, but that it must be exercised so as not to cause *considerable* interference with navigation, having due regard to the natural and functional constraints of the area.

These differing interpretations suggest that the boundary between lawful and unlawful interference is context dependent. The geographical scope of “recognized sea lanes essential to international navigation” may not be confined to areas where IMO has formally adopted routeing measures, but could also encompass sea areas that are customarily and substantially used for international shipping. Such areas may include approaches to major ports and harbors, or other routes frequently used by vessels.⁸⁹ In regions where environmental and spatial limitations reduce the available sea space—such as the Baltic Sea—this understanding underscores the importance of applying flexible, precautionary standards when designating offshore wind sites near established navigation corridors.

In practice, coastal states have sought to reconcile offshore wind development with recognized sea lanes through IMO routeing processes and national planning. In the Kattegat and Skagerrak, Denmark and Sweden implemented new IMO-adopted routeing measures that entered into force on 1 July 2020, aligning traffic patterns with expanding offshore energy use.⁹⁰ In the United Kingdom, projects such as Hornsea Project Three assessed proximity to IMO-adopted traffic separation schemes and incorporated navigational risk mitigation into project design.⁹¹ Similarly, in the Netherlands, the Borssele Wind Farm Zone introduced a dedicated “Borssele Wind Farm Pass” and navigational code of conduct to facilitate safe passage of ships through and around the area.⁹² Most likely as the result of the inclusive procedures, the proposed routeing measure adjustments were accepted without objection, in spite of leading to longer routes and more complicated navigation for shipping.⁹³ This practice demonstrates how coastal states have implemented the non-interference obligation through early coordination.

In the Baltic Sea, the spatial and environmental constraints are particularly pronounced. Narrow straits and archipelagic passages limit navigational flexibility, and during winter the sea regularly freezes, especially in the Gulf of Bothnia. Ice conditions further restrict navigation and necessitate the use of icebreakers, making re-routeing

⁸⁹ Adapted from IMO Res A.572(14), note 28, [2(1)] and discussion in Churchill et al., note 44, 167–169, 278.

⁹⁰ Danish Maritime Authority, “New Shipping Routes in Kattegat and Skagerrak: Implementation of New Routeing Measures Adopted by the IMO, Effective from 1 July 2020” (2020) at <https://www.dma.dk/Media/637643511955073403/NewShippingRoutes.pdf> (accessed 1 November 2025).

⁹¹ Hornsea Project Three (UK) Navigational Risk Assessment, *Environmental Statement: Volume 5, Annex 7.1—Navigational Risk Assessment*, at https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN010080-000582-HOW03_6.5.7.1_Volume%205%20-%207.1%20-%20Navigational%20Risk%20Assessment.pdf (accessed 1 November 2025).

⁹² The proposed routeing measures included adjustments to existing traffic separation schemes, new traffic schemes, adjustment to a deep water route, realignment of precautionary areas, establishment of emergency turning areas, removal of an area to be avoided and creation of new such areas, and extension of an inshore traffic zone. See Report on the Safety Assessments for the Proposed Route Structure on the North Sea off the Coast of the Netherlands (Annex), IMO Doc NAV 58/INF.2, 29 March 2012; General Introduction to the Proposals for New and Amended Routeing Measures Off the Coast of the Netherlands between Texel and North Hinder, Submitted by The Netherlands, IMO Doc. NAV 58/3/2-10, 28 March 2012.

⁹³ Chircop and L'Esperance, note 5.

difficult. These factors underline the need for detailed navigational risk assessments before consenting to new projects and for close coordination with neighboring states.

Article 60(7) also requires coastal states to give due notice of the construction of installations and the establishment of safety zones.⁹⁴ This procedural element is crucial to ensuring transparency and safety of navigation. In the Baltic region, such coordination should be integrated into national and regional MSP and environmental impact assessment (EIA) procedures, guided by the Regional Maritime Spatial Planning Roadmap 2021–2030 adopted by HELCOM and VASAB.⁹⁵ These frameworks facilitate early consultation between maritime authorities, enabling alignment of energy and shipping interests.

Although Article 60(7) has not yet been interpreted by an international court or tribunal, its preventive purpose is reinforced by IMO guidance on the establishment of safety zones and safe navigation around offshore installations.⁹⁶ The provision therefore forms part of a broader framework of obligations promoting coexistence between offshore energy development and navigation. In the Baltic Sea, where offshore wind expansion is accelerating and sea space is limited, compliance with these procedural and substantive safeguards is essential to maintaining navigational safety and effective regional cooperation.

The Mutual Obligations of Due Regard

In addition to the more specific obligation to consider the impact of offshore wind on sea lanes and routing measures, there is also a more general duty under UNCLOS to consider the effects on other states. The concept of due regard represents a key element in balancing the rights of coastal states with the freedoms of other states. It appears in several provisions, most notably Articles 56(2) and 58(3), which establish reciprocal requirements for consideration and restraint. Article 56(2) requires the coastal state to exercise its rights in the EEZ with due regard to the rights and duties of other states, while Article 58(3) imposes a corresponding duty on other states to have due regard to the rights and duties of the coastal state. Together, these provisions form a mutual obligation ensuring that no single interest—whether energy production or navigation—dominates to the detriment of others.⁹⁷

The due regard requirement serves as a bridge between the general balance of rights in the EEZ and the specific prohibitions, such as the rule in Article 60(7) against interference with recognized sea lanes. The concept has been developed through state practice and jurisprudence to entail both procedural and substantive duties. Procedurally, states must assess potential interference with the rights of others and provide prior

⁹⁴ UNCLOS, Art 60(7).

⁹⁵ HELCOM–VASAB, *Regional Maritime Spatial Planning Roadmap 2021–2030* (HELCOM and VASAB, 2021) at <https://vasab.org/wp-content/uploads/2021/11/Regional-Maritime-Spatial-Planning-Roadmap-2021-2030.pdf> (accessed 1 November 2025).

⁹⁶ IMO Res A.671(16), note 59.

⁹⁷ UNCLOS, Arts 56(2), 58(3).

information or consultation where significant risks exist.⁹⁸ Substantively, the requirement limits the extent to which a state may exercise its rights if this would cause unjustifiable harm to another's lawful use of the sea.⁹⁹

In the *Chagos Marine Protected Area Arbitration*, the tribunal held that the due regard obligation requires the acting state to consult affected states and to consider their rights before adopting measures that may restrict their activities.¹⁰⁰ Ironically, the guidance provided by *Chagos*—which emphasizes procedural balancing—may in practice strengthen the position of the coastal state. By demonstrating that it has undertaken the procedural steps identified by the tribunal, a coastal state can more readily show that it has fulfilled its duties under the Convention, even where the substantive impact on other states' rights remains significant. This outcome aligns with a broader interpretative trend under UNCLOS whereby the EEZ has evolved into a “mixed zone” that formally balances competing interests but, in practice, increasingly operates to the advantage of the coastal state.¹⁰¹

This development partly reflects case law interpreting Articles 56, 62, and 73, which has consolidated coastal states' sovereign rights over the resources of the EEZ and their exclusive jurisdiction over artificial islands, installations, and structures.¹⁰² From the perspective of treaty interpretation, this evolution may be viewed in two ways. On one hand, it risks undermining the Convention's original intention to maintain a functional equilibrium between national jurisdiction and international freedoms. On the other, it could be understood as an example of evolutionary interpretation consistent with the object and purpose of UNCLOS and Article 31 of the Vienna Convention on the Law of Treaties, whereby rights expand incrementally to accommodate new maritime uses, such as renewable energy.¹⁰³

In the context of offshore wind energy, due regard therefore functions as both a procedural and a dynamic interpretative principle. It requires coastal states to take into account the legitimate interests of navigation when designating areas for installations and establishing safety zones, while recognizing that the scope of coastal state rights in the EEZ is not static but responsive to technological and environmental change.¹⁰⁴ Conversely, flag states must respect installations and comply with safety and pollution prevention measures in their vicinity. The requirement thus functions as a two-way standard of conduct, reinforcing cooperative rather than unilateral action.

The balancing function of due regard is particularly important in the EEZ, where the Convention grants concurrent rights: the sovereign right of coastal states to explore

⁹⁸ *Chagos Marine Protected Area Arbitration (Mauritius v. United Kingdom)*, Award of 18 March 2015, XXXI RIAA 359, [519]–[534].

⁹⁹ Gavouneli, note 65.

¹⁰⁰ *Chagos Marine Protected Area Arbitration*, note 98, [519].

¹⁰¹ James Kraska, *Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics* (Oxford University Press, 2011), 267.

¹⁰² Lan Ngoc Nguyen, *The Development of the Law of the Sea by UNCLOS Dispute Settlement Bodies* (Cambridge University Press, 2023), 64.

¹⁰³ Vienna Convention on the Law of Treaties, adopted 23 May 1969, entered into force 27 January 1980, 1155 UNTS 331, Art 31(1); see also Robert Beckman and Tara Davenport, “The EEZ Regime: Reflections after 30 Years” in Harry N. Scheiber (ed), *Securing the Ocean for the Next Generation* (Law of the Sea Institute, Berkeley, 2013), 15.

¹⁰⁴ Chircop and L'Esperance, note 5, 1–42.

and exploit resources coexists with the freedom of navigation for all states.¹⁰⁵ While these rights are equal in principle, their exercise must be adapted to specific geographical and operational circumstances. Factors such as traffic density, prevailing environmental conditions, and the technical characteristics of offshore installations influence how the due regard standard is applied in practice.

To give practical effect to this principle, states have incorporated due regard obligations into MSP and EIA processes.¹⁰⁶ These mechanisms provide a framework for consultation among maritime authorities, ensuring that navigational interests are considered during site selection and design. The regional practice developed under the HELCOM–VASAB framework in the Baltic Sea exemplifies this cooperative approach, promoting coordination between energy and transport authorities to prevent conflicts at an early stage.¹⁰⁷

Although the concept is flexible, due regard does not grant unlimited discretion. In the *South China Sea Arbitration*, the tribunal reaffirmed that the standard requires states to assess the nature and extent of potential interference and to adjust their conduct accordingly.¹⁰⁸ In the context of offshore wind, this implies a continuing obligation to monitor risks to navigation and to modify measures where circumstances change—for example, by updating routing arrangements or reviewing safety zone dimensions.

Ultimately, the mutual obligations of due regard embody the overarching purpose of the Convention: to reconcile competing maritime uses through cooperation and foresight. When properly applied, the principle ensures that coastal state jurisdiction over offshore wind development proceeds in a manner compatible with navigational safety, environmental protection, and the collective interests of the international community.

Due Notice of Construction

In relation to potential conflicts between offshore wind and navigation, there is also another, less discussed element in the Convention which is likely to render the discussion of balancing between the countervailing due regard obligations less relevant for practical purposes. Under Article 60(3) of UNCLOS, coastal states are required to give due notice of the construction of installations and structures and to maintain permanent means for giving warning of their presence. This obligation forms part of the broader safety framework designed to ensure that the legitimate exercise of coastal state jurisdiction over offshore energy installations does not compromise international navigation.

While the due regard obligation provides a general standard of conduct, the due notice requirement translates this standard into concrete procedural duties. It ensures that other states and maritime users are adequately informed about the location and characteristics of offshore installations that might affect navigation or other legitimate uses of the sea.¹⁰⁹ In this sense, due notice acts as the operational complement to due

¹⁰⁵ Tanaka, note 44, 154–200.

¹⁰⁶ Ibid.

¹⁰⁷ HELCOM–VASAB, note 95.

¹⁰⁸ *South China Sea Arbitration*, note 15, [8.373]–[8.376].

¹⁰⁹ IMO Res A.572(14), note 28.

regard: Rather than balancing interests *ex post*, it seeks to prevent interference *ex ante* through transparency and information sharing.

The duty to give due notice has both procedural and functional dimensions. Procedurally, it requires timely notification through appropriate international channels—principally IMO and national hydrographic services responsible for updating nautical charts. Functionally, it entails ensuring that vessels can identify and avoid installations in practice, through visible or electronic warnings.¹¹⁰

While IMO instruments refer to the provision of “early” or “advance” notice, they do not specify *when* such notice is to be submitted. The absence of temporal criteria suggests that states are not effectively obliged to inform IMO or other states before the formal authorization of offshore wind projects has been granted. Consequently, there is no explicit duty to engage in dialogue with IMO or with potentially affected states at the planning or licensing stages. In practice, notification generally occurs only once approval has been issued and construction is imminent.

This regulatory gap indicates that, even though coastal states must pay due regard to the interests of navigation, they can in principle complete the entire process—from planning to formal authorization of offshore wind installations—without prior consultation with other states. In effect, this leaves limited opportunity for other states to influence outcomes. States are typically reluctant to intervene formally once another state’s national authorization process has advanced, especially in the absence of a clear procedural trigger for consultation. The effect is that, in relation to trade-offs between offshore wind and navigation, it is effectively for the coastal state alone to determine the balance, with limited formal mechanisms for external input.

Despite this asymmetry, cooperative state practice demonstrates the value of early dialogue. In practice, coastal states may find it in their own interest to engage in consultations well before formal authorization. As seen in the cases of the Netherlands and Belgium, dialogue was initiated already during the marine spatial planning stage to coordinate wind farm siting and routeing measures. Early engagement can help identify navigational risks and prevent later conflicts that might delay projects. Yet, even in such cases, potentially affected states often remain cautious about raising objections given the strong preference for coastal state discretion embedded in the legal framework of UNCLOS. The due notice obligation thus shapes the practical balance between offshore wind development and international navigation—not by mandating prior consent, but by encouraging transparency and voluntary coordination.

Conclusion

Offshore wind farms are expanding rapidly in scale and spatial footprint, and this growth increasingly brings them into tension with navigation. UNCLOS provides the legal framework for balancing the right of a coastal state to construct and authorize

¹¹⁰ In the regulations addressing safety of navigation around offshore installations and structures adopted by the IMO, the “due notice” criterion has been specified as publishing notices to mariners, radio warnings, and the need to indicate all permanent installations and structures on all appropriate navigational charts. IMO Res A. 671(16), note 48, [1], [4], [5].

offshore wind installations in its EEZ with the navigational freedoms of other states. While the Convention's rules appear to establish a careful equilibrium, the analysis in this study reveals that, in practice, the procedural elements of the regime produce a more asymmetric balance—one that affords coastal states extensive discretion to advance offshore wind development, often at the expense of navigational flexibility.

This asymmetry is most visible in the regulatory autonomy of coastal states concerning decisions on safety zones. Similarly, obligations for giving notice of construction do not provide for mandatory consultations with other states. In particular, the rules for considering effects on and adjustments of routeing measures provide for an extensive discretion for coastal states. As a result, national decisions on siting and safety zones may in practice be taken unilaterally, with international engagement occurring only after approval or during IMO submission stages. This reflects a wider structural bias in the EEZ regime, where coastal state jurisdiction is functionally dominant and procedural safeguards operate primarily through transparency rather than consent.

Nevertheless, the cooperative logic of the Convention remains significant. *Due regard* requires coastal states to assess and mitigate potential interference with navigation, while *due notice* ensures that other states are informed and can adapt their operations accordingly. The practical implementation of these duties through marine spatial planning, risk assessment, and routeing coordination demonstrates how procedural obligations can evolve into instruments of preventive governance. Experiences in the Netherlands, Belgium, and the Nordic region illustrate that early dialogue—though not legally required—can pre-empt objections and enhance both navigational safety and project efficiency.

From a broader perspective, the current framework reflects a pragmatic compromise between national autonomy and international coordination. While coastal states retain decisive control over the allocation of sea space for offshore energy, the role of the IMO in adopting and amending routeing measures continues to anchor these decisions in a multilateral process. This interaction between domestic discretion and international oversight remains crucial to maintaining confidence in the law of the sea as a stable framework for coexistence among competing maritime uses.

At the same time, the increasing density of offshore wind installations and the spatial limitations of semi-enclosed seas such as the Baltic Sea and North Sea suggest that reliance on voluntary coordination may become insufficient. In regions where seasonal ice complicates both navigation and visibility, the absence of clear IMO standards for ice-affected wind areas underscores the limits of current procedural safeguards. As coastal states pursue ambitious renewable energy targets, cumulative impacts on navigation, safety, and environmental conditions will intensify. Strengthening procedural clarity—particularly regarding the timing of notifications and consultations—could enhance predictability and reduce conflict potential. Recent jurisprudence, particularly *Chagos*, has reframed due regard as a primarily procedural obligation of consultation and transparency, reinforcing this preventive orientation.

Ultimately, the evolving practice surrounding offshore wind development demonstrates both the resilience and the adaptability of the UNCLOS framework. The balance between sovereign rights and international freedoms in the Convention has proven capable of accommodating new maritime uses, but this balance is dynamic rather than fixed. Its effectiveness now depends on how states translate broad obligations of due

regard and due notice into practical cooperation through IMO, regional planning, and national implementation. In this respect, the future of coexistence between offshore wind and navigation will be shaped less by formal law than by the quality of procedural coordination and the willingness of states to operationalize the preventive spirit of the Convention. Future developments in regional practice and IMO processes will show whether these procedural duties evolve into genuine cooperative norms.