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MARINE RENEWABLE ENERGY IN THE AREAS BEYOND NATIONAL JURISDICTION: INTERNATIONAL REGULATION AND LEGAL CHALLENGES

Master thesis

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TABLE OF CONTENTS

INTRODUCTION

In transition from fossil fuels – finite, disproportionally distributed resources with dramatic effect on the environment[1] – to global energy decarbonization, an important role is played by offshore renewable energy[2]. Due to stable wind and wave conditions energy generation capacity offshore is considerably higher than onshore, making open and vast marine waters highly attractive for energy production[3]. Even though ocean energy technologies, such as wave, tidal, thermal and floating solar energy devices are at the early stage of development, they are rapidly growing and drawing more attention[4]. Moreover, more mature technologies, such as offshore wind in the North Sea and the Atlantic Ocean, are already commercialized and cost-competitive with fossil fuels[5].

Since marine energy resources are more economically and technologically accessible closer to shore, the existing installations are commissioned in the territorial sea (12 nautical miles from the baseline) or within the exclusive economic zone (200 nautical miles from the baseline) of the coastal states, putting offshore structures in those areas under their jurisdiction[6]. However, the most promising areas for energy production are the areas beyond national jurisdiction (ABNJ), which comprises the high seas[7] and the deep seabed (the Area[8]), therefore in order to sustainably use those areas the existence of an effective international legal regulation is essential for such development.

One of the freedoms of the high seas under UNCLOS is the freedom to construct artificial islands and other installations permitted under international law[9]. By virtue of articles 87 and 80, high seas installations are also subject to provisions of article 60, regulating artificial islands, installations and structures on the exclusive economic zone (EEZ)[10]. Although article 60 also applies to high seas structures, UNCLOS does not introduce any changes to the regulation of installations in

[1] Leal-Arcas, Rafael, and Andrew Filis. "The fragmented governance of the global energy economy: a legal-institutional analysis." *Journal of World Energy Law and Business* 6, no. 4 (2013), p.349.
[2] IRENA (2020), Innovation outlook: Ocean energy technologies, International Renewable Energy Agency, Abu Dhabi, p.17. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Innovation_Outlook_Ocean_Energy_2020.pdf
[3] Haugan, Peter M., Lisa A. Levin, Diva Amon, Mark Hemer, Hannah Lily, and Finn Gunnar Nielsen. "What role for ocean-based renewable energy and deep seabed minerals in a sustainable future." *World Resources Institute* (2020): 14. Available at: www.oceanpanel.org/blue-papers/ocean-energy-and-mineral-sources.
[4] Ibid, 23.
[5] IRENA (2020), Fostering a blue economy: Offshore renewable energy, International Renewable Energy Agency, Abu Dhabi, p.18. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Fostering_Blue_Economy_2020.pdf
[6] United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 (hereinafter – UNCLOS), arts. 2, 3, 56, 57, 60, 76, 77, 80. Available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf
[7] Ibid, art.86
[8] Ibid, art.1(1.1): "Area" means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.
[9] Ibid, art.87(1d)
[10] Ibid, arts.60, 80, 87.

this maritime zone with a legal regime different from EEZ[11]. This ambiguity creates a lot of confusion[12], especially regarding issues on jurisdiction over the installations and the law applicable to them. While UNCLOS establishes high seas freedom and invalidity of sovereignty claims over the high seas[13], it is not clear how the marine renewable energy installations (MREIs), such as wind farms, wave, tidal, thermal, floating solar energy devices etc., and areas occupied by them would be governed, especially considering the large spaces they would be taking up. As concerning ownership, offshore installations under the flags of convenience could also become a problematic subject. Having examples in shipping, this negative practice can be used to avoid responsibilities, strict regulation and proper oversight, by which inflicting harmful consequences to the environment and to the interests of other states[14].

Further cornerstones are environmental impact and conflicts with other legitimate sea uses, more precisely with navigation, fishing and activities in the Area. Since the construction of MREIs requires significant space, the development of such installations on the high seas would interfere with other uses in the area. Shipping, fishing and activities in the Area would be completely pushed out or significantly limited in areas occupied by offshore installations with safety zones around them[15]. Moreover, offshore energy development has to be carried out taking into account the specificities of each marine ecosystem. Irreversible environmental damage can be caused if the negative impacts of MREIs, such as underwater noise, disturbances and risks to marine resources will not be properly identified and respective precautionary measures will not be undertaken[16].

In order to eliminate regulatory uncertainty that could undermine the legal order of the seas, it is important to address potential approaches to achieve more coherent international ocean governance. The possible approaches are the following: the application of the flag state principle to MREIs that could solve the issues of jurisdiction and ownership[17]; the adoption of the marine special planning and environmental impact assessment of ABNJ to reduce conflicts, strengthen cooperation,

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[11] UNCLOS, art.80: article 60 applies *mutatis mutandis.*

[12] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 500.

[13] UNCLOS, art.89.

[14] Elsner, Paul, and 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." *Energy policy* 128 (2019): 925.

[15] Fischer, Felix. "Offshore Wind in High Seas Unlimited potential beyond national control?", *Chatham Partners* (2019): 13.

[16] Elsner, Paul, and 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." *Energy policy* 128 (2019): 926.

[17] Fischer, Felix. "Offshore Wind in High Seas Unlimited potential beyond national control?", *Chatham Partners* (2019): 16.

protect the environment and promote efficient use of sea spaces[18]; and finally, the creation of specialized international authority for marine renewable energy governance or delegation of these functions to an existing international organization.

Altogether, it is essential to analyze the existing international law regulations which are applicable to MREIs beyond national jurisdiction and to highlight legal uncertainties that should be addressed, proposing specific approaches to their regulation. The research addresses such issues as matters of jurisdiction and ownership, conflicts of space uses and environmental impacts of energy development. For their regulation, certain approaches are suggested, namely, the application of the flag state principle, marine spatial planning, environmental impact assessment, and creation of specialized international authority or delegation of regulatory functions to an existing international organization.

Researched problems:

1. Which existing international legal provisions can be applied to the renewable energy installations in ABNJ? Are they sufficient for an effective regulation or is there a need for additional regulatory instruments?

2. What are the important aspects of renewable energy development in ABNJ which are not covered or insufficiently covered in international law?

3. What are the possible approaches to more comprehensive marine renewable energy regulation and what actions should be undertaken for their adoption?

Aim and objectives of the research

The research aims to address regulatory uncertainties of marine renewable energy governance in ABNJ and to determine potential approaches to their regulation.

For the aim to be achieved, the following objectives were established:

- to examine international legal provisions that could be applied to marine renewable energy development beyond national jurisdiction and to disclose matters that remain uncovered by international law;

- to analyze the legal challenges of jurisdiction and ownership, conflicts of uses and environmental impact of marine renewable energy in ABNJ and to determine how such challenges, conflicts and impact could be mitigated or resolved;

[18] Castelos, Montserrat Abad. "The black sea and blue energy: Challenges, opportunities and the role of the European union." In *The Future of the Law of the Sea*, Springer, Cham, 2017, p. 158.

- to determine legal measures that could be taken concerning marine renewable energy beyond national jurisdiction and to assess how they could be implemented.

Relevance of the research

Technological advancements of the past decades made it possible for coastal states to produce offshore renewable energy that has a lot of potential to change the current energy production. Some states are economically and technologically capable of going further offshore, placing renewable energy installations in exclusive economic zones and planning such projects in ABNJ in the future. However, there is limited international regulation that could be applied to marine renewable energy development beyond national jurisdiction. Therefore, it is essential to analyze the existing international legal instruments with regard to their application to such development, examine such crucial issues as matters concerning jurisdiction and ownership, conflicts of uses and environmental impact of marine renewable energy installations, provide possible solutions to those issues and consider the adoption of the international legal framework for the marine renewable energy development in ABNJ to establish coherent and efficient ocean governance.

Scientific novelty and overview of the research on the selected topic

This research is an interconnection of two subjects: the law of the sea and energy law. While there are various studies on marine energy law in general, very few are addressing regulatory uncertainties of marine renewable energy in ABNJ, among them are N. J. Lund[19], G. Wright et al[20], P. Elsner and S. Suarez[21], T. E. Hutchins[22]. Using the data and findings from the works of mentioned authors, as well as from other sources, this thesis aims to more thoroughly analyze major regulatory specificities and suggest potential approaches to their mitigation or solution, further providing opinions and conclusions. Due to the fragmentation of international and regional regulation, limited empirical knowledge and lack of consistent practice this topic requires more

[19] Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 95-125.

[20] Wright, Glen, Anne Marie O'Hagan, Jiska de Groot, Yannick Leroy, Niko Soininen, Rachael Salcido, Montserrat Abad Castelos, Simon Jude, Julien Rochette, and Sandy Kerr. "Establishing a legal research agenda for ocean energy." *Marine Policy* 63 (2016): 126-134.

[21] Elsner, Paul, and 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." *Energy policy* 128 (2019): 919-929.

[22] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 485-514.

research and scientific discussions. Moreover, as technological innovations progress, it becomes apparent that in the not-too-distant future the coastal states will be capable to install renewable energy projects on the high seas, which gives stronger motivation to establish a coherent international legal framework.

Significance of the research

The undertaken research could be used by the developers of marine renewable energy structures to better understand the legal implications of commissioning such installations in ABNJ. In addition, the study could be helpful for decision-makers of coastal or land-locked states that are developing or planning to develop offshore renewable energy projects on the high seas. States' representatives to international organizations could also take into account the finding of this thesis when adopting an international legal framework regulating marine renewables beyond national jurisdiction.

Research methodology

In order to achieve the aim of the research, the following methods were used in the thesis:

- Historical method was employed to provide a background of the international treaties and past decision-making processes. It assists in the deeper understanding of current international regulations, their roots and reasons for adoption. The method was mostly implemented while examining the context of the law of the sea treaties, especially the United Nations Convention on the Law of the Sea.

- Doctrinal method was used for legal analysis of the provisions in international and regional treaties applicable to renewable energy development in ABNJ. In addition, the method was applied to provide national regulations as an example of marine renewable energy governance on a domestic level, namely those concerning consenting and licencing procedures for offshore renewable energy installations.

- Descriptive method was employed to outline the current state of the research area, in particular, issues concerning jurisdiction and ownership, space use conflicts and environmental impacts of high seas renewable energy development. The mentioned method helps to provide the existing opinions on the topic expressed within international organizations or by individual authors and scholars concerning potential approaches to legal regulation, such as the flag state principle

application, marine spatial planning, environmental impact assessment, and establishment of specialized international authority.

- Linguistic method was applied for the explanation of legal terms in international treaties, especially in the United Nations Convention on the Law of the Sea, using the definitions given in the respective treaty or interpreting according to the ordinary meaning of the words in their context as they were used in the legal text.

Defence statement

The existing international treaties are not sufficient, as they are not expressly covering matters concerning jurisdiction and ownership, conflicts of uses and environmental impact of the marine renewable energy in ABNJ. Therefore, new approaches have to be implemented for the adoption of the comprehensive legal framework governing marine renewable energy beyond national jurisdiction.

Structure of the research

The thesis is divided into three chapters.

The first chapter provides a general overview of international legal provisions that could be applicable to marine renewable energy development in ABNJ. In the chapter, it is examined whether the existing international instruments expressly provide specific rules on such development and whether they would be sufficient for the effective regulation of high seas MREIs.

The second chapter is dedicated to the main legal challenges of renewable energy development, namely issues concerning jurisdiction and ownership, conflicts with legitimate uses and environmental impact in ABNJ. The chapter describes how these issues are overall addressed in the international law sources as well as in academic literature. It is examined whether the experience of other ocean sectors could be useful for the high seas renewable energy governance.

The third chapter provides potential approaches to renewable energy governance which could be adopted on the international level. Those are the application of flag state principle, marine special planning, environmental impact assessment, and the creation of specialized international authority or delegation of these functions to an existing international organization.

LIST OF ABBREVIATIONS

ABNJ – Areas beyond national jurisdiction

BBNJ – Biological diversity of areas beyond national jurisdiction

CHS – Convention on the High Seas 1958

CS – Continental shelf

EBA – Ecosystem-based approach

EEZ – Exclusive economic zone

EIA – Environmental impact assessment

EU – European Union

IALA – International Association of Marine Aids to Navigation and Lighthouse Authorities

ICJ – International Court of Justice

IHO – International Hydrographic Organization

IMO – International Maritime Organization

IRENA – International Renewable Energy Agency

ISA – International Seabed Authority

ITLOS – International Tribunal for the Law of the Sea

MPA – Marine Protected Area

MREI – Marine renewable energy installation

MSFD – Marine Strategy Framework Directive

MSP – Marine spatial planning

MSPD – Maritime Spatial Planning Directive

RFMOs – Regional Fisheries Management Organizations

UN – United Nations

UNCLOS – United Nations Convention on the Law of the Sea 1982

1. GENERAL OVERVIEW OF THE MARINE RENEWABLE ENERGY REGULATION IN INTERNATIONAL LAW

1.1 Universal treaties applicable to marine renewable energy installations beyond national jurisdiction

Present-day concept of the open seas as a commons has its roots deep in history. The freedom of the seas principle was introduced in a distant XVII century by the Dutch scholar Hugo Grotius in his work *Mare Liberum* or *Free Seas (1609)*[23]. Many years later, this principle was brought up again in the mid-XX century, when technological advancements and economic interests pushed industrialized states to exploit marine waters and go further from their shore. The growing tensions between nations over the resources and environmental threats brought by maritime activities, resource exploration and fishing were present as never before[24].

The first international attempt to bring order in ocean governance and balance competing interests was fulfilled in the First United Nations Conference on the Law of the Sea 1958, also known as UNCLOS I, when four conventions were adopted: the Convention of the Territorial Sea and the Contiguous Zone, Convention on the High Seas, Convention on Fishing and Conservation of the Living Resources of the High Seas and the Convention on the Continental Shelf[25].

In 1967, in a speech to the General Assembly Arvid Pardo, Maltese Ambassador to the United Nations, emphasized the need for "an effective international regime over the seabed and the ocean floor beyond a clearly defined national jurisdiction", as it was the only way to avoid the escalating tensions and rivalry between powerful states, conflicting legal claims, environmental pollution, and to protect the stable order and rich potential of the oceans[26]. This period marks the beginning of a joint diplomatic effort to regulate marine waters, and Arvid Pardo's call, together with many other factors, led to the Third United Nations Conference on the Law of the Sea in 1973. Nine years later, in 1982, the constitution of the seas – the United Nations Convention on the Law of

[23] Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 102.
[24] The United Nations Convention on the Law of the Sea (A Historical Perspective), U.N. OCEANS & L. SEA. Available at: https://www.un.org/depts/los/convention_agreements/convention_historical_perspective.htm#Historical%20Perspective
[25] Treves, Tullio. "The 1958 Geneva Conventions on the Law of the Sea." *United Nations Audiovisual Library of International Law* (1984).
[26] United Nations General Assembly Official Records, 22nd Session, 1515th meeting, U.N. Doc. A/6695 (Nov. 1, 1967). Available at: https://www.un.org/depts/los/convention_agreements/texts/pardo_ga1967.pdf

the Sea (UNCLOS) was adopted, provisions of which partly reflect established customary international law[27].

UNCLOS 1982 is the first convention to establish freedom to construct artificial islands and installations on the high seas. The earlier Convention on the High Seas 1958 (CHS) does not expressly mention such freedom[28], although from the formulation of both CHS and UNCLOS the list of high seas freedoms is not exhaustive, as it begins with the words *inter alia*[29].

Noticeably, UNCLOS does not provide definitions of "artificial island", "installation" or "structure". According to the Glossary of the TALOS Manual[30], "artificial island", "installation" and "structure" are defined as a humanmade structure usually built for exploration or exploitation of the marine resources, marine scientific research, tide observation, etc[31]. Consequently, as MREIs are being used for the exploitation of marine resources (wind, waves, tides, heat etc.), they should be categorized as artificial islands, installations and structures in the understanding of UNCLOS and would be further referred to as such.

Under article 87 of UNCLOS, the high seas are open to all states, both coastal and land-locked, where they can exercise freedom of the high seas under the conditions of the Convention. According to para 1(d) of the same article this freedom comprises of, *inter alia*, freedom to construct artificial islands and other installations permitted under international law[32], which are subject to the provisions applicable to the installations on the continental shelf (CS)[33]. Importantly, the freedoms are not absolute as they all shall be exercised with due regard for the interests of other states and the rights under the Convention with respect to the activities in the Area[34]. At the same time, there are no established limits of permissible interference with other activities and it is not articulated how the conflicts between different sea uses should be handled.

Freedom to construct installations on the high seas is subject to relevant provisions of Part VI, in particular, to article 80. At the same time, article 80 establishes that article 60, governing installations in the exclusive economic zone (EEZ), is applicable *mutatis mutandis* to CS[35] which,

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[27] Roach, J. Ashley. "Today's customary international law of the sea." *Ocean Development & International Law* 45, no. 3 (2014): 239-259.
[28] Convention on the High Seas 1958, art.2. Available at: https://www.legal-tools.org/doc/7b4abc-1/pdf/
[29] Rothwell, Donald R., and Tim Stephens. *The international law of the sea*. Bloomsbury Publishing (2010): 155.
[30] International Hydrographic Organization (IHO). "A Manual on Technical Aspects of the United Nations Convention on the Law of the Sea–1982 (TALOS)." *Special Publication No. 51, 4th edition* (2006), Appendix 1 – Glossary. Available at: https://www.gc.noaa.gov/documents/gcil_iho_tech_aspects_los.pdf
[31] Ibid, Appendix 1 – 17, para.47.
[32] UNCLOS, art.87(1.d).
[33] Ibid, art.87(1.d) refers to the Part VI (Continental Shelf).
[34] Ibid, art.87(2).
[35] Ibid, art.80.

consequently, makes certain EEZ provisions apply to high seas installations[36]. However, UNCLOS does not clarify to what extend article 60 is applicable to the high seas installations, considering the difference between legal regimes of these maritime zones. The lack of clear alterations and modifications that would correspond with the high seas regime leads to believe that the application of EEZ provisions to MREIs would result in inconsistent regulation of renewable energy development in ABNJ.

According to article 60, in their EEZ states enjoy exclusive right to construct, authorize and regulate the construction, operation and use of installations/structures and exercise exclusive jurisdiction over them, including jurisdiction with regard to customs, fiscal, health, safety and immigration laws and regulations[37].

With regard to safety, the article requires due notice of the construction of installations/structures and obliges to maintain warnings of their presence on a permanent basis. Where necessary, the coastal state may establish reasonable safety zones around such installations to ensure the safety of both navigation and installations themselves. In this case, the coastal state should determine their breadth taking into account international standards, and the extent of safety zones should be duly notified. They should be reasonably related to the nature and function of the installations and shall not exceed 500 metres around them, although an authorized exception could be given by generally accepted international standards or by a competent international organization. While, generally, all ships must respect these safety zones and should comply with international standards regarding navigation in the vicinity of installations, safety zones may not be established if there is a possibility of interference to the use of recognized sea lanes essential to international navigation[38]. Besides, installations do not possess the status of islands, they have no territorial sea of their own, and their presence does not affect the delimitation of the maritime zones[39].

Article 60 also provides the obligation to decommission abandoned or disused installations to ensure the safety of navigation with due regard to fishing, protection of the marine environment and rights and duties of other states. In case if the installation is not entirely removed, appropriate publicity should be given to the depth, position and dimension of parts of installations left in place[40].

[36] Rothwell, Donald R., and Tim Stephens. *The international law of the sea*. Bloomsbury Publishing (2010): 157.
[37] UNCLOS, art.60(1-2).
[38] Ibid, art.60(3-7).
[39] Ibid, art.60(8).
[40] Ibid, art.60(3).

UNCLOS provisions on environmental protection could also be applicable to MREIs since it is the general obligation of the states to protect and preserve the marine environment[41]. In accordance with article 194, by using the best practicable means at their disposal and in their capabilities, states are obliged to take all measures consistent with the Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source[42]. All necessary measures must be taken to ensure that activities under states jurisdiction or control are conducted in such a way as no damage by pollution is caused to other states and their environment. These measures should deal with all sources of pollution, including the pollution from installations and devices operating in the marine environment, and should be designed to minimize them to the fullest possible extent. Among those measures are prevention of accidents and emergency response, provision of the safety of operations at sea, and control of design, construction, equipment, operation and manning of such installations or devices[43].

In addition, articles 79, 87 and 112 enshrine the right of all states to lay submarine cables and pipelines on the bed of the high seas beyond the state's continental shelf, which is indispensable for the connection of offshore installation with the onshore grid[44]. In this respect, articles 113, 114 and 115 prescribe that it is a state obligation to adopt laws and regulations with regard to the breaking or injury of submarine cables by a ship or a person under their jurisdiction[45].

Overall, the UNCLOS sets a crucial foundation for renewable energy development in high seas by, firstly, permitting such installations in ABNJ and, secondly, prescribing rights and obligations of the states on this matter. However, as discussed in the second chapter, these provisions leave room for ambiguity and gaps in regulation as most of them were developed having in mind installations in EEZ or on CS, governance of which is significantly different from the high seas installations.

When discussing the legal regulation of offshore renewables in ABNJ it is important to mention another global treaty, which is the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention) and its 1996 Protocol[46]. The

[41] Ibid, art.192.
[42] Ibid, art.194(1).
[43] Ibid, arts.194.2, 194.3.
[44] Elsner, Paul, and 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." *Energy policy* 128 (2019): 927.
[45] UNCLOS, arts.113, 114, 115.
[46] 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (as amended in 2006). Available at: https://www.epa.gov/sites/default/files/2015-10/documents/lpamended2006.pdf

London Convention and Protocol establish the states' obligation to prevent the pollution of the sea by the dumping of waste and other matter that are likely to create hazards to human health, to harm living resources and marine life, to damage facilities or to interfere with other legitimate uses of the sea[47].

The territorial application of the Convention covers all marine waters other than the internal waters of the states[48], and the Protocol also expressly mentions the seabed and the subsoil[49]. Therefore, the Convention and its Protocol are applicable to the MREIs and cables in the ABNJ.

The London Convention defines "dumping" as any deliberate disposal of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea or deliberate disposal of such vessels, aircraft, platforms or structures themselves[50]. The 1996 Protocol expands the definition of dumping and adds any abandonment or toppling at the site of platform or other man-made structures at sea, for the sole purpose of deliberate disposal[51].

However, dumping does not include (i) the disposal of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment; and (ii) placement of matter for a purpose other than the mere disposal, if the placement is not contrary to the aims of the Convention[52]. The Protocol also contains one more exception, which is the abandonment in the sea of matter (e.g. cables, pipelines and marine research devices) placed for a purpose other than mere disposal[53]. That is, if the matter serves other purposes (energy generation, scientific research, etc.) and is not placed for disposal, such placement would not be considered as dumping under London Convention and its Protocol.

The London Convention adopted the "permitted unless prohibited" approach to dumping, listing in Annex I all matters that are prohibited to dump. On the contrary, the Protocol adopted an "approved listing" approach, listing in Annex I only matters *allowed* for dumping, which was considered as a significant milestone in the protection of the marine environment[54]. Moreover, the dumping of listed matters requires a specific permit, and the issuance of such permits is regulated in

[47] Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (hereinafter – London Convention), art.1. Available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/LC1972.pdf
[48] Ibid, art.3.3.
[49] 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (hereinafter – 1996 Protocol), art.1.7.
[50] London Convention, art.3.1(a).
[51] 1996 Protocol, art.1.4.1.4.
[52] London Convention 1972, art.3.1(b).
[53] 1996 Protocol, art.1.4.2.3.
[54] Keyuan Zou; Lei Zhang, "Implementing the London Dumping Convention in East Asia," Asia-Pacific Journal of Ocean Law and Policy 2, no. 2 (December 2017): 250.

Annex II of the Protocol[55]. Noticeably, vessels and platforms or other man-made structures at sea are regarded as matters that may be considered for dumping if observing the Objectives and General Obligations of the Protocol, provided that materials capable of contributing to pollution of the marine environment have been removed to the maximum extent and provided that the dumped materials pose no serious obstacle to fishing or navigation[56].

Therefore, analyzing the London Convention and its Protocol, it is conceivable that these legal instruments will be applicable in relation to MREIs on the high seas, ensuring states' compliance with international dumping requirements and establishing a legal framework for the consideration of such installations for dumping when they become disused. Moreover, the dumping regulations provide additional obligation to prevent the disposal of wastes from offshore renewables or arbitrary dumping of such structures at sea without necessary permits.

1.2 Regional regulation applicable to marine renewable energy installations beyond national jurisdiction

When analyzing international legal instruments governing marine waters, it is important to examine not only global treaties but also regional agreements, which take into account certain specificities of the marine area and facilitate cooperation between neighbouring states.

Particularly, UNCLOS requires states to cooperate on a global and, as appropriate, on a regional basis, directly or through competent international organisations, in formulation and elaboration of international rules, standards, recommended practices and procedures consistent with UNCLOS for the protection and preservation of the marine environment taking into account characteristic regional features[57].

There are 18 Regional Seas Conventions[58], five of which are covering ABNJ, namely: the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention), the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea Convention), the

[55] 1996 Protocol, art.4.1.2.
[56] 1996 Protocol, Annex I, paras. 1.4, 2.
[57] UNCLOS, art.197.
[58] Banet, Catherine, Alexandra Wawryk, and Eduardo Pereira. "Regional Seas Conventions and Decommissioning." (2020): 47.

Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific (Lima Convention), and the Convention on the Conservation of Antarctic Marine Living Resources (CAMLR Convention)[59]. However, it is not the aim of this thesis to examine all the mentioned Conventions, rather the focus will be on the European Regional Seas treaties within the coverage of which are the marine waters beyond national jurisdiction[60]. These are the 1992 OSPAR Convention and 1995 Barcelona Convention.

The OSPAR Convention is covering the maritime area, which includes the internal waters and the territorial seas of the contracting parties, the sea beyond and adjacent to the territorial sea to the extent recognised by international law, and *the high seas, including the bed of all those waters and its subsoil*[61]. Importantly, Convention defines an "offshore installation" as any man-made structure, floating or fixed to the seabed, placed within the maritime area for the purpose of offshore activities. However, offshore renewable energy generation does not fall under the definition of offshore activities, as OSPAR narrows them only to those connected to hydrocarbons production[62]. Therefore, both article 5 and Annex III, applicable to the pollution from offshore sources, are not relevant to marine renewable energy[63]. Instead, offshore renewables could fall under article 7, which concerns the pollution from other sources that are not explicitly mentioned in the Convention.

Article 7 provides that the parties shall cooperate to adopt Annexes prescribing measures, procedures and standards to protect the maritime area against pollution from other sources to the extent that such pollution is not already the subject of effective measures adopted by other international organisations or conventions[64]. Additionally, article 6 and Annex IV oblige parties to regularly undertake and publish joint assessments of the marine environment quality status for the maritime area, regions or sub-regions, and to include in assessment both an evaluation of the effectiveness of the taken and planned measures and the identification of priorities for action[65].

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[59] UN Environment, Regional Seas programmes covering Areas Beyond National Jurisdictions, *Regional Seas Reports and Studies No.202* (2017): p.1. Available at: https://www.un.org/Depts/los/biodiversityworkinggroup/Regional_seas_programmes_ABNJ.pdf

[60] Durussel, C., Wright, G., Wienrich, N., Boteler, B., Unger, S., Rochette, J., 'Strengthening Regional Ocean Governance for the High Seas: Opportunities and Challenges to Improve the Legal and Institutional Framework of the Southeast Atlantic and Southeast Pacific', STRONG High Seas Project (2018): 19.

[61] Convention for the Protection of the Marine Environment of the North-East Atlantic 1992 (hereinafter – OSPAR Convention), art.1(a) (emphasis added). Available at: https://www.ospar.org/site/assets/files/1290/ospar_convention-1.pdf

[62] Ibid, art.1(j), (l).

[63] Carlos Soria-Rodriguez, "Marine Renewable Energies and the European Regional Seas Conventions," Climate Law 6, no. 3-4 (2016): 321.

[64] OSPAR Convention, art.7.

[65] Ibid, art.6.

As general obligations, parties are required to take all possible steps to prevent and eliminate pollution, to take the necessary measures to protect the maritime area against the adverse effects of human activities for the safeguard of human health and conservation of marine ecosystems, and to restore marine areas which have been adversely affected, when practicable[66]. As for cooperation, parties shall adopt programmes and measures to harmonise their policies and strategies and shall apply the measures they adopt in such a way as to prevent an increase in pollution of the sea outside the maritime area or on other parts of the environment[67].

In relevance to the offshore renewable energy development, OSPAR Commission also adopted additional instruments. Among them are the Guidance on Environmental Considerations for Offshore wind farm development and Decision 98/3 on the Disposal of Disused Offshore Installations.

The Guidance was developed in order to assist interested parties or individuals in the identification and consideration of issues associated with the environmental effects of the offshore wind farm developments[68]. The document is not a definitive set of rules and it is not legally binding. It covers the main stages of life of an offshore wind farm, namely location, licensing, monitoring, construction and operation, and removal/decommissioning. The Guidance also finds it essential to perform the environmental impact assessment (EIA) to ensure that all likely effects of development are fully understood and taken into account throughout the whole life history of a wind farm[69].

The OSPAR Decision 98/3 was adopted in response to the Brent Spar incident – a strongly criticized attempt to dispose of the oil storage facility in the deep-water of the North Sea, which eventually ended with the dismantling of installation on land owing to the public scrutiny and protest campaigns[70]. The Decision introduced new rules on disposal of offshore installations, although at the time of adoption the focus was primarily on petroleum installations[71]. As a general rule, the dumping and the leaving of disused offshore installations, wholly or in part, within the maritime area are prohibited[72]. However, by way of derogation, competent authority may permit the

[66] Ibid, art.2.1(a).
[67] Ibid, art.2.1(b); art.2.4.
[68] OSPAR Commission. OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development, Reference number 2008-3 (2008): p.3, para.5.
[69] Ibid, p.4, paras.7, 8.
[70] Osmundsen, Petter, and Ragnar Tveterås. "Decommissioning of petroleum installations—major policy issues." *Energy policy* 31, no. 15 (2003): 1579.
[71] Ibid, 1580.
[72] OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations, Ministerial Meeting of the OSPAR Commission Sintra, 22-23 July 1998: para.2. Available at: https://www.ospar.org/documents?v=6875

dumping or leaving wholly or partly in place of some categories of installations listed in Annex 1[73]. Such decision is made based on the environmental and technical assessments in accordance with Annex 2 of the Decision[74]. In addition, the issuance of a permit requires the engagement in the 32-week consultation procedure of all OSPAR parties in accordance with Annex 3[75]. Noticeably, the Decision excludes from its scope parts of an offshore installation located below the surface of the seabed[76], therefore it is not applicable to cables and pipelines, unlike the London Protocol[77].

Additionally, to indicate the environmental effects of human activities, which includes marine renewable energy development, OSPAR Commission adopted several reports, such as the Assessment of the Environmental Impact of Offshore Windfarms[78], Assessment of the environmental impact of underwater noise[79] and Assessment of the environmental impacts of cables[80]. These documents are of recommendatory nature and are developed to assist public authorities and private actors in the environmental assessment process.

As for the Barcelona Convention, it does not explicitly mention man-made structures or installations anywhere in the text of the treaty itself. Rather broadly, it obliges parties to take all appropriate measures individually or jointly in accordance with the provisions of the Convention and Protocols to prevent, abate, combat, to the maximum extent eliminate pollution of the Mediterranean Sea Area, and to protect and enhance the marine environment while contributing to its sustainable development[81]. Besides, contracting parties undertake to promote the research on, access to and transfer of environmentally sound technology, including clean production technologies, and to cooperate on the implementation of the clean production process[82].

One of the protocols of the Barcelona Convention that are potentially applicable to the high seas MREIs is the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping

[73] Ibid, para.3.
[74] Ibid, Annex 2 "Framework for the Assessment of Proposals for the Disposal at Sea of Disused Offshore Installations".
[75] OSPAR Decision 98/3, Annex 3 "Consultation Procedure".
[76] Ibid, para.1.c.
[77] Hughes, William. *Fundamentals of Oil & Gas Law*. PennWell Books, LLC, 2016: 399.
[78] OSPAR Commission, Assessment of the environmental impact of offshore windfarms (2008): https://www.ospar.org/documents?v=7114
[79] OSPAR Commission, Assessment of the environmental impact of underwater noise (2009): https://qsr2010.ospar.org/media/assessments/p00436_JAMP_Assessment_Noise.pdf
[80] OSPAR Commission, Assessment of the environmental impacts of cables (2009): https://qsr2010.ospar.org/media/assessments/p00437_Cables.pdf
[81] Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (hereinafter – Barcelona Convention), 10 June 1995, art.4.1. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31970/bcp2019_web_eng.pdf
[82] Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (hereinafter – Dumping Protocol), 16 February 1976, art.13.2. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31970/bcp2019_web_eng.pdf

from Ships and Aircraft (Dumping Protocol). It was adopted to take all appropriate measures to prevent and abate pollution of the Mediterranean Sea area caused by dumping from ships and aircraft. Notably, platforms and other man-made structures, as well as their equipment, are included in the definition of "ships and aircraft"[83].

Similar to the 1996 London Protocol and OSPAR Decision 98/3, the Dumping Protocol prohibits the dumping of wastes or other matter except those listed in the Protocol[84], therefore adapting the same "reverse listing approach". Again, the platforms or other man-made structures at sea are one of the categories considered for dumping, if materials capable of creating floating debris or otherwise contributing to pollution of the marine environment have been removed to the maximum extent[85]. The dumping of listed categories requires a prior permit from the competent national authorities after carefully considering characteristics of the matter, site, methods of dumping and environmental factors[86].

Another protocol relevant to offshore renewables is the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol), under which parties undertake to protect, preserve and manage areas of natural or cultural value and threatened or endangered species of flora and fauna, particularly by establishing the specially protected areas[87]. In relation to marine renewable energy development, the Protocol requires parties to take protective measures to regulate and, if necessary, prohibit any activity or act likely to harm or disturb the species, endanger the state of conservation of the ecosystems or impair the natural or cultural characteristics of the specially protected area[88]. The SPA/BD Protocol introduces a "List of Specially Protected Areas of Mediterranean Importance" ("SPAMI List") for the purpose of cooperation in the management and conservation of natural areas, threatened species and their habitats[89]. Importantly, SPAMIs may be established in zones partly or wholly on the high seas, the proposal for inclusion of the high seas area in the List may be submitted by two or more neighbouring states[90]. The proposed protection and conservation measures in the SPAMIs may,

[83] Ibid, art.3.1.
[84] Ibid, art.4.1.
[85] Ibid, art.4.2(d).
[86] Ibid, arts.5, 6.
[87] Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (hereinafter – SPA/BD Protocol), 10 June 1995, art.3.1(a,b). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31970/bcp2019_web_eng.pdf?sequence=1&isAllowed=y
[88] Ibid, art.6(h).
[89] Ibid, art.8.1.
[90] Ibid, arts.9.1(b), 9.2(b).

therefore, apply to marine renewable energy development if it is likely to interfere with the marine ecosystems in the area.

Worth highlighting that both OSPAR Convention and Barcelona Convention require the implementation of environmental principles in their maritime areas by the contracting parties. These principles, namely, the precautionary principle and the polluter pays principle, are general and fundamental, which allows them to be implemented in relation to MREIs in maritime spaces covered by the Regional Seas Conventions. For instance, under OSPAR Convention the precautionary principle purports that preventive measures are to be taken when there are reasonable grounds for concern that substances or energy introduced into the marine environment may bring harm to human health, living resources and ecosystems or interfere with other legitimate sea uses[91]. According to the Barcelona Convention, the precautionary principle implies that when there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation[92]. Both Conventions state that by virtue of the polluter pays principle the polluter bears the costs of pollution prevention, control and reduction measures[93].

When analyzing regional regulation of maritime spaces it is important to mention the legal instruments on the European Union (EU) level that are promoting regional cooperation in the marine waters, namely the Marine Strategy Framework Directive[94] (MSFD) and Maritime Spatial Planning Directive[95] (MSPD). Although these Directives only cover marine spaces under the jurisdiction of the member states and do not regulate ABNJ[96], they can be presented as a good example of maritime governance.

The MSFD prescribes that member states shall develop and adopt marine strategies to protect and preserve the marine environment while applying an ecosystem-based approach (EBA) to the management of human activities. EBA is applied to ensure that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status (GES) and that the capacity of marine ecosystems to respond to human-induced changes is not

[91] OSPAR Convention, art.2.2(a).
[92] Barcelona Convention, art.4.3(a).
[93] OSPAR Convention, art.2.2(b); Barcelona Convention, art.4.3(b).
[94] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (hereinafter – Marine Strategy Framework Directive) (Text with EEA relevance), *OJ L 164, 25.6.2008, p. 19–40.* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0056
[95] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning (hereinafter – Maritime Spatial Planning Directive), *OJ L 257, 28.8.2014, p. 135–145.* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089
[96] Marine Strategy Framework Directive, arts.2.1, 3.1(a,b).

compromised, while enabling the sustainable use of marine goods and services by present and future generations[97]. In addition, the Directive requires member states to use, where practicable and appropriate, existing regional institutional structures, including those under Regional Seas Conventions, to coordinate their actions in the same marine regions with other member states or neighbouring third countries[98].

The other Directive, MSPD, establishes a maritime spatial planning (MSP) framework to promote the sustainable growth of maritime economies, sustainable development of marine areas and sustainable use of marine resources[99]. MSPD also requires the application of the EBA and it provides that through the MSP member states should aim to contribute to the sustainable development of maritime sectors, in particular to the sustainable development of energy sectors at sea[100]. When establishing and implementing MSP, states are free to identify relevant existing and future activities and uses in their marine waters, including installations and infrastructures for the production of energy from renewable sources and submarine cable and pipeline routes[101]. To ensure that MSPs are coherent and coordinated across the specific marine region, member states shall cooperate with other member states and third countries through forums and institutions, including through the Regional Seas Conventions[102].

Worth noting that neither OSPAR nor the UN Environment Programme/Mediterranean Action Plan (UNEP/MAP)–Barcelona Convention are the responsible bodies for the implementation of MSFD/MSPD[103]. At the same time, even though comprising of both EU and non-EU member states, their governing bodies promote coherence and cooperation in the implementation of MSFD/MSPD and especially of the EBA.

For this purpose, in 2014 OSPAR Commission adopted the OSPAR regional plan to improve adequacy and coherence of MSFD implementation, which was aimed to improve the engagement with the MSFD for the protection of the marine environment and to ensure efficient use of the

[97] Ibid, art.1.3.
[98] Ibid, art.6.
[99] Maritime Spatial Planning Directive, art.1.1.
[100] Ibid, art.5.
[101] Ibid, art.8.2.
[102] Ibid, arts.11, 12.
[103] OSPAR Commission, "ICG-MSFD Work Plan 2017–2020", 2017: p.1; United Nations Environment Programme Coordinating Unit for the Mediterranean Action Plan, "Support to the Barcelona Convention for the Implementation of the Ecosystem Approach, Including the Establishment of MPAs in Open Seas Areas, Including Deep Sea", *Contribution Agreement N°21.0401/2008/519114/SUB/D2*, Final Report (2012): p.24. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/649/SBCI_ECAP_FinalReport.pdf?sequence=1&isAllowed=y

marine resources[104]. The regional plan analyses coordinated actions with regard to the implementation of the ecosystem approach, assessment of GES, environmental targets, monitoring etc. Later in 2017, ICG-MSFD Work Plan 2017-2020 was introduced by OSPAR Commission to facilitate regionally coordinated implementation of the MSFD through OSPAR, specifically to identify key working areas such as assessment and GES, environmental targets and measures, cross-cutting issues and regular update of coherent MSFD implementation plan[105].

Similarly, the contracting parties of the Barcelona Convention also contributed to the implementation of the ecosystem approach in the Mediterranean by adopting on their 15th Meeting in 2008 the Decision IG.17/6[106]. Further, a report on the implementation of the ecosystem approach was adopted under the UNEP/MAP–Barcelona Convention, which also addressed the establishment of the marine protected areas (MPAs) on the high seas. The project was introduced in order to promote and enhance the implementation of the ecosystem approach roadmap adopted in the Decision IG.17/6, to facilitate the establishment of SPAMI in high seas and to ensure coherence with EU MSFD[107].

In brief, contracting parties established a complex system for the implementation of the ecosystem approach in the Mediterranean, including the development of various binding and non-binding instruments for efficient and coherent implementation[108].

Overall, it is important to highlight that although the aforementioned legal instruments, both universal and regional, may not expressly provide rules on the marine renewable energy development in ABNJ, it does not exclude the possibility of their application to such offshore development in the future. The general and broad formulation of the provisions makes them flexible in implementation and allows them to adapt, where appropriate, to the rapidly changing industries. However, it appears that the existing legal regulations applied exclusively would not be sufficient

[104] OSPAR Commission, "OSPAR regional plan to improve adequacy and coherence of MSFD implementation 2014-2018: Version 10 December 2014", 2014: p.1 para.3. Available at: https://www.ospar.org/site/assets/files/33141/ospar_regional_plan_action_msfd_imp-1.pdf

[105] OSPAR Commission, "ICG-MSFD Work Plan 2017–2020", 2017: p.2.

[106] Decision IG 17/6, "Implementation of the ecosystem approach to the management of human activities that may affect the Mediterranean marine and coastal environment", UNEP(DEPI)/MED IG. 17/10, Annex V: p.179. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/7287/08ig17_10_annex5_17_06_eng.pdf

[107] United Nations Environment Programme Coordinating Unit for the Mediterranean Action Plan, "Support to the Barcelona Convention for the Implementation of the Ecosystem Approach, Including the Establishment of MPAs in Open Seas Areas, Including Deep Sea", *Contribution Agreement N°21.0401/2008/519114/SUB/D2*, Final Report (2012): p.4.

[108] UNEPMAP, The Ecosystem Approach, available at: https://www.unep.org/unepmap/what-we-do/ecosystem-approach

for marine renewable energy development on the high seas, since none of the treaties provides comprehensive rules for deployment and operation of MREIs beyond national jurisdiction.

Keeping in mind the obligations to coordinate and harmonize actions of contracting parties in relation to the marine waters management, it is important to timely address the most evident legal uncertainties and regulatory gaps, such as the extent of EEZ provisions' application to the structures on the high seas, conflicts of uses resolution and admissibility of MREIs' interference with other high seas activities, which will be analysed in the following chapter.

2. LEGAL CHALLENGES FOR MARINE RENEWABLE ENERGY DEVELOPMENT IN THE AREAS BEYOND NATIONAL JURISDICTION

2.1 Challenges concerning jurisdiction and ownership

For specific legal purposes, including protection and safety, offshore installations placed on the high seas should be under the jurisdiction and ownership of a responsible state[109]. These purposes are not only in the domain of public international law, there are also private aspects such as taxation, labour, investments etc. which must be considered, although it is outside of the scope of this thesis to discuss matters of private international law.

However, as will be examined below, the issues of jurisdiction and ownership as some of the most important considerations of marine renewable energy development in ABNJ are rather vaguely, if at all, addressed in UNCLOS.

In Chapter 1 it was discovered that by virtue of articles 87 and 80, the high seas installations are regulated, *mutatis mutandis*, by the same provision as the EEZ installations[110], namely by article 60 of UNCLOS. However, the Convention does not provide any specific alterations that have to be made with regard to the installations in the high seas as these two regimes are undeniably different[111]. The EEZ has a specific legal regime, according to which the coastal state enjoys sovereign rights for the exploration and exploitation of natural resources and exercises exclusive jurisdiction over artificial islands, installations and structures in the EEZ[112]. Contrastingly, the freedom of the high seas implies that the high seas are open to all states, both coastal and land-locked, and all states equally enjoy high seas freedoms provided in the Convention[113]. Therefore the application of article 60 to the high seas installations is a subject for discussion.

More specifically, in accordance with article 60, the coastal state enjoys the exclusive right to construct, authorize and regulate the construction of installations[114]. In addition, the coastal state is entitled to exercise exclusive jurisdiction over its installations and structures, including

[109] Esmaeili, Hossein. *The legal regime of offshore oil rigs in international law*. Routledge, 2001: 54.
[110] UNCLOS, art.80.
[111] Mutatis mutandis – (lat.) with the necessary changes in points of detail, meaning that matters or things are generally the same, but to be altered when necessary. (Black's Law Dictionary, 1968, p.1172)
[112] UNCLOS, arts.56, 60.
[113] Ibid, art.87.
[114] Ibid, art.60(1).

jurisdiction with regard to customs, fiscal, health, safety and immigration law and regulations[115]. Concerning provisions on exclusive jurisdiction some scholars, in particular Lund and Dwyer, interpret them as ones also applicable to CS and the high seas. The coastal state, therefore, has a right to construct installations on the chosen part of the high seas under its authorisation and regulation[116]. Opposing opinion was expressed by Hutchins, who describes the abovementioned arguments as problematic and inconsistent with the UNCLOS regime of free and nonexclusive rights to the high sea's resources[117]. Besides, even though the high seas energy development is more likely to be commenced by experienced states with already operating renewable projects in their territorial sea and EEZ[118], yet UNCLOS provides that all states enjoy the freedom of the seas, both coastal and land-locked[119].

Worth highlighting that from the formulation of the provision, it is explicitly stated that states have exclusive right to construct, authorize and regulate only in *theirs EEZ*[120], which is understandable since in the EEZ coastal state has sovereign rights for, among other things, exploration and exploitation of natural resources and jurisdiction over installations and structures in the zone[121].

The fact that no state enjoys sovereign rights on the high seas excludes any possibility of exclusive rights in that area. Additionally, the inability of appropriation of high seas or its part by any nation is already safeguarded in article 89 of UNCLOS. The article establishes the invalidity of claims of sovereignty over the high seas, stating that no state may validly purport to subject any part of the high seas to its sovereignty [122]. Lund, when analyzing article 89, argued that this provision could become an obstacle for installing energy generators in the high seas, considering their potential great sizes and the large area they would be occupying, all under the jurisdiction of the sole state[123].

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[115] Ibid, art.60(2).
[116] Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 108; Dwyer, Kieran. "UNCLOS: Securing the United States' Future in Offshore Wind Energy." *Minn. J. Int'l L.* 18 (2009): 279.
[117] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 500.
[118] Elsner, Paul, and 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." *Energy policy* 128 (2019): 924.
[119] UNCLOS, art.87(1).
[120] Ibid, art.60(1) (emphasis added).
[121] Ibid, art.56.
[122] Ibid, art.89.
[123] Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 109.

Indeed, it seems that the long-lasting occupation of a part of the high seas would inevitably interfere with other legitimate sea uses and the rights of other states. Such interference could go far beyond the acceptable limit of due regard, prescribed by article 87[124], although it is unclear what degree of interference is considered acceptable and how to balance the conflicting interests[125]. This discussion will be further elaborated in the following subchapters.

Thus, it has been set that owing to the freedom of high seas that is enjoyed by every state, states neither can claim sovereignty over a part of the ABNJ nor do coastal states possess the exclusive right to construct installations on the high seas. But does the provision of article 60 on exclusive jurisdiction in relation to customs, fiscal, health, safety and immigration laws and regulations apply to the MREIs in high seas as it does to EEZ installations? As much as it would be reasonable for the state to exercise jurisdiction over its property when there is a lack of territorial jurisdiction[126], this issue remains unclear under UNCLOS and may lead to the misinterpretation of its provisions.

Some matters regarding the identification of ownership also need to be discussed. If in the case of MREIs in the territorial sea or EEZ there is no necessity to consider the state of ownership and registration, as installations are licenced by the state to operate in the marine waters under its sovereignty or sovereign rights, a situation with the high seas installations would be significantly different.

It could be suggested that the state owning MREI would be entitled to exercise its jurisdiction over it. In practice, however, it could be difficult to determine the national state of the installations as they can be manufactured, owned and authorised by different states. The question would be which one is responsible for the placement and operation of the structure.

The importance of authorisation of the installation cannot be overestimated, as the responsible state has to ensure compliance with environmental, safety and security regulations, technical and economic requirements etc[127]. Besides, if in the case of the offshore installations exploiting seabed and seafloor resources they are under the regulation of the International Seabed Authority (ISA)[128], MREIs are not subject to the authorisation by any particular international

[124] UNCLOS, art.87(2).
[125] Fischer, Felix. "Offshore Wind in High Seas Unlimited potential beyond national control?", *Chatham Partners* (2019): 13.
[126] Esmaeili, Hossein. *The legal regime of offshore oil rigs in international law*. Routledge, 2001: 128.
[127] Hovind, Catharina. "Licensing Offshore Wind Farms." Master's thesis, The University of Bergen, 2019: 17
[128] Competencies of the International Seabed Authority and the International Maritime Organization in the context of activities in the Area, ISA Technical Study No.25 (2019): 21. Available at: https://isa.org.jm/files/files/documents/Technical%20Study%2025.pdf

organisation. Given this fact, the responsible state is the only international actor, at least for now, that can exercise control by applying domestic legislation to the marine renewable projects on the high seas to fulfil international undertakings.

It seems rational to assume that the state of nationality is the state under the flag of which the installation is operating. The flag state is usually the state of documentation and registration[129], though under current international law regulation this principle applies only to ships, but not to the artificial islands, installations and structures at sea[130]. This can be regarded as a significant gap in marine governance, as there are no legal means to establish the connection between the state and installation prescribed by international law. Although discussions could be found on whether offshore platforms, especially floating, should be classified as ships, in this paper marine renewable energy devices are considered as installations in the understanding of UNCLOS as their purpose is not maritime navigation but the exploration and exploitation of marine resources. Considerations on the application of the flag state principle to MREIs in ABNJ will be discussed more thoroughly in Chapter 3.

Although the possibility of the flag state principle application would somehow mitigate the ownership uncertainties, some authors, namely Hutchins[131], Elsner and Suarez[132], noted that the emergence of the flags of convenience could be a potential regulatory problem in relation to marine renewable energy development. The flag of convenience, a practice found in shipping, can be defined as a flag of any country allowing the registration of foreign-owned/-controlled vessels under conditions which are more convenient for the persons registering the vessel[133]. These imply that the owner of the vessel enjoys certain benefits such as lower taxes, lax environmental and safety regulations, cheap labour etc.

At the same time, UNCLOS prescribes that ships have the nationality of the state whose flag they are entitled to fly, and requires a genuine link between the ship and the state of registration[134]. Yet, the meaning of "genuine link" has never been given in any law of the sea treaty and the concept

[129] Churchill, Robin Rolf, and Alan Vaughan Lowe. *The law of the sea*. Manchester University Press, 1999: 205.
[130] Esmaeili, Hossein. *The legal regime of offshore oil rigs in international law*. Routledge, 2001: 51.
[131] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 501.
[132] Elsner, Paul, and 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." *Energy policy* 128 (2019): 925.
[133] Boczek, Boleslaw Adam. *Flags of Convenience: An International Legal Study*, Cambridge: Harvard University Press, 1962: 4.
[134] UNCLOS, art.91.

remains a subject of debate among scholars[135]. It can be said that the purpose of the genuine link is to guarantee jurisdictional control and protection of the flag state by enforcement of consistent regulatory measures[136]. As was held by the International Tribunal for the Law of the Sea (ITLOS), under the provisions of article 94 UNCLOS the flag state has a responsibility to exercise effective jurisdiction and control in administrative matters, must adopt necessary administrative measures to ensure that vessels are not involved in activities which will undermine the flag state's responsibilities under the Convention. If violations occur nevertheless, the flag state is obliged to investigate and, if appropriate, take any actions necessary to remedy the situation[137].

Failure to exercise jurisdictional control by using the flag of convenience may result in irreversible consequences such as marine disasters and environmental pollution, due to the lack of sufficient safety and security regulations, other breaches of international obligations and may be used for the concealment of ownership to avoid responsibility[138].

Although this practice is only present in maritime shipping, it does not exclude the possibility of the flag of convenience practices in marine renewable energy development. If one state with less strict regulations would licence MREIs that are operated and factually controlled by the other, beneficial owner state, this could lead to difficulties in identification of the responsibility. In the worst cases, this practice can result in harm to human life, health, environmental pollution and violation of the rights and freedoms of other states.

In summary, the referral to the EEZ articles in UNCLOS without any adjustments to the high seas regime created ambiguity in relation to the application of these provisions. On the one hand, it is understandable, since authors of the UNCLOS perhaps did not anticipate the possibility of commissioning offshore installations beyond EEZ at the time of writing. On the other hand, this ambiguity has the potential to result in misinterpretation of the UNCLOS provisions by the state's authorities and marine renewable energy developers. While giving the right to construct the installations on the high seas, UNCLOS does not explicitly elaborate on how this right could be enforced in a manner that does not interfere with the rights and freedoms of other states.

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[135] Hamad Bakar Hamad. "Flag of Convenience Practice: A Threat to Maritime Safety and Security." *IJRDO-Journal of Social Science and Humanities Research*, no. 8, 2016: 213.

[136] Tache, Simon W. "The nationality of ships: the definitional controversy and enforcement of genuine link." *The International Lawyer* (1982): 301-312.

[137] ITLOS Reports of Judgments, Advisory Opinions and Orders. Request for an Advisory Opinion Submitted by the Sub-Regional Fisheries Commission (SRFC) (Request for Advisory Opinion Submitted To The Tribunal), List of cases: No. 21, 2 April 2015: para.119. Available at:
https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.21/advisory_opinion_published/2015_21-advop-E.pdf

[138] Hosanee, Nivedita. "A critical analysis of flag state duties as laid down under Article 94 of the 1982 United Nations Convention on the Law of the Sea." *University of Milan* (2008): 99.

Further, while the state of registration and the state of ownership could be two different states, there are no legal means to ensure the connection between the state and installation. The flag state provisions, which are relevant to maritime shipping and could bring more clarity to the MREIs regulation, do not apply to the artificial islands, installations and structures at sea. Moreover, there is a possible problematic issue of the flag of convenience, a practice that may be used to circumvent strict regulations on safety and security, environmental protection, technical standards and other requirements.

2.2. Conflicts of uses

2.2.1. Conflict with the safety and freedom of navigation

A growing and maturing marine renewable energy sector is affecting and will continue to affect other legitimate sea uses. Particularly, a pressing conflict is likely to emerge with the freedom and safety of navigation in the high seas, as MREIs could potentially influence the maritime traffic in their vicinity. Installations could affect navigation depending on their location, amount of space taken and technical characteristics of the vessels passing through the area, such as their type, size, speed capacity etc. They may create additional navigational risk by obstructing the visibility of vessels and producing radar echoes and noise that may intervene with other sound signals, as well as affect marine ecosystems and fishing industries. Lastly, MREIs could cause changes to the environmental conditions in the area by influencing tidal streams, directions and speed of currents, water depth etc., which may also raise navigational risks[139].

The freedom of navigation as one of the high seas freedoms is regarded as a principle of customary international law and safeguarded in CHS and UNCLOS[140]. Every state, coastal or land-locked, has the right to sail ships flying its flag on the high seas[141]. However, to exercise this right, certain obligations have to be fulfilled first. The flag states are required to fix conditions for the grant of nationality to ships, for their registration and to establish a genuine link between the ship and the state of registration[142]. Moreover, the flag states are entitled to exercise jurisdiction and control over their ships in administrative, technical and social matters, as well as required to take

[139] Detweiler Jr, George H. *Offshore renewable energy installations: impact on navigation and marine safety*. Coast Guard Washington DC Marine Transportation Systems Management Directorate, 2011: 20.
[140] Convention on the High Seas, art.2(1); UNCLOS, art.87(1a).
[141] UNCLOS, art.90.
[142] Ibid, art.91.

measures to ensure safety at sea, in particular with regard to the use of signals, the maintenance of communications and the prevention of collisions[143].

Keeping in mind the application of article 60 UNCLOS to the high seas installations, worth reminding that it requires due notice to the construction of installations and maintenance of permanent means for giving warning of their presence[144]. UNCLOS also obliges states to establish respective safety zones around installations to ensure the safety of both navigation and installations[145]. Ships must respect these safety zones and comply with international standards regarding navigation in the vicinity of installations[146].

Importantly, when installations and the safety zones around them may cause interference to the use of recognized sea lanes essential to international navigation they may not be established[147]. It could also be connected to the requirement of due regard for the interests of other states in their exercise of the freedom of the high seas prescribed in article 87 UNCLOS[148].

Particular attention is given to the safety of navigation when referring to the removal of installations. The provision reads as follows:

> "3. […] Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organisation. Such removal shall also have due regard to fishing, the protection of the marine environment and the rights and duties of other States."[149]

From the formulation of the article, the main reason for the removal is the threat to navigation, although due regard must be given to other legitimate sea uses as well.

More than once the article is mentioning "generally accepted international standards" and "competent international organization". Since these provisions mostly concern the safety of navigation, the competent international organization in this context would be the International Maritime Organization (IMO)[150].

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[143] Ibid, art.94(1, 3c).
[144] Ibid, art.60(3).
[145] Ibid, art.60(4).
[146] Ibid, art.60(6).
[147] Ibid, art.60(7).
[148] Ibid, art.87(2).
[149] Ibid, art.60(3).
[150] Nordquist, Myron H., John Norton Moore, Aldo Chircop, and Ronán Long, eds. *The Regulation of Continental Shelf Development: Rethinking International Standards*. Martinus Nijhoff Publishers, 2013: 263.

IMO adopted two resolutions in relation to offshore installations and safety of navigation: the Resolution on Safety Zones and Safety of Navigation Around Offshore Installations and Structures (Safety Resolution)[151], and Resolution on Guidelines and Standards for the Removal of Offshore Installations and Structures on the CS and in the EEZ (Removal Resolution)[152]. Although these are related to the offshore installations and structures on CS and in EEZ, it could be suggested that in the same manner as UNCLOS refers high seas installations to the regulation of EEZ provisions, the IMO Resolutions might be applied, with necessary changes and reservations, to the high seas installations.

The Safety Resolution sets recommendations for the member states in relation to specific measures that must be taken to ensure the safety of navigation in the vicinity of offshore installations. In particular, the states should, at an early stage, study the pattern of shipping traffic through offshore resource exploration areas to be able to assess potential interference; ensure that the exploitation of natural resources on the CS and in the EEZ does not seriously obstruct sea approaches and shipping routes; where appropriate consider the establishment of safety zones around installations or the establishment and charting of fairways through exploration areas; take all necessary steps to ensure that ships flying their flag do not enter or pass through established safety zones unless specifically authorized; and ensure that the prohibition on vessels should not apply to vessels entering or remaining in the safety zone when in distress, for the purpose of saving life or property, or in cases of force majeure[153].

The Safety Resolution also recommends that any permanent features, such as permanent installations or structures, bottom obstructions, pipelines, navigational marks and prohibited areas should be shown on all appropriate navigational charts. When the density of such features or their mobile nature makes accurate charting impossible, information on these areas, together with any associated aids to navigation and appropriate warning notes should be published and marked on the navigational charts[154].

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[151] IMO Resolution A.671(16) Safety Zones and Safety of Navigation Around Offshore Installations and Structures, adopted on 19 October 1989. Available at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.671(16).pdf

[152] IMO Resolution A.672(16) Guidelines and Standards for the Removal of Offshore Installations and Structures on the continental shelf and in the exclusive economic zone, adopted on 19 October 1989. Available at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.672(16).pdf

[153] IMO Resolution A.671(16), para.1(a-e).

[154] Ibid, Annex, para.5.1.

In relation to this recommendation, it may be suggested that international navigational charts could be used for the MREIs in ABNJ. Their purpose would be to permit safe navigation and to identify any installations or structures. Namely, the International Hydrographic Organization (IHO) adopted the Regulations for International Charts and Chart Specifications[155], which could be used when providing identification of, among other things, wind farms, tidal, wave, floating solar energy devices in the navigational charts.

In its turn, the Removal Resolution overall establishes the guidelines and standards for the removal of installations in such a manner as to not pose a threat to the safety of navigation and the marine environment. With regard to navigation, it provides that the determination of any potential effect on the safety of surface or subsurface navigation or other uses of the sea by the installation should be based on the number and type of vessels expected to transit the area in the foreseeable future; the cargoes being carried in the area; the tide, current, general hydrographic conditions and potentially extreme climatic conditions; the proximity of designated or customary sea lanes and port access routes; the aids to navigation in the vicinity; the location of commercial fishing areas; the width of the available navigable fairway; and whether the area is an approach to international navigation[156].

The installations should continue to be marked in accordance with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recommendations before the completion of any partial or complete removal. Details of the position of any installations remaining after the removal should be passed to the relevant national authority and one of the world charting hydrographic authorities[157].

In this regard it is worth mentioning that IALA adopted the Recommendation on The Marking of Man-Made Offshore Structures[158], which provides guidelines for the marking of different types of offshore structures, in particular, marking of the offshore wind farms, wave and tidal energy devices[159]. The marking of the installations serves to ensure safe navigation, protection of the environment and the structures themselves[160].

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[155] Regulations of the IHO for International (INT) Charts and Chart Specifications of the IHO, Edition 4.9.0, March 2021. Available at: https://iho.int/uploads/user/pubs/standards/s-4/S4_V4-9-0_March_2021.pdf
[156] IMO Resolution A.672(16), para.2.2.
[157] Ibid, para.3.3.
[158] IALA Recommendation O-139 on The Marking of Man-Made Offshore Structures, Edition 2, December 2013. Available at: https://vasab.org/wp-content/uploads/2018/06/2013_IALA_Marking-of-Man-Made-Offshore-Structures.pdf
[159] Ibid, p.8, section 2.
[160] Ibid, p.7, section 1.

Taking into account that the analysed legal instruments on the safety of navigation mostly concern oil and gas installations in EEZ and on CS, some of their provisions are not practically applicable to the MREIs on the high seas. Those, however, which could be applied in relation to such structures in ABNJ, should be implemented with caution and necessary modifications. Generally, those instruments could serve as a solid foundation for the crafting of marine renewable energy framework in the high seas, using the knowledge and experience gained during the exploration of seabed resources on CS. However, they most likely would not be sufficient for the successful mitigation of potential navigational risk. Considering the fragmentation and lack of clarity in current regulation, other mechanisms of conflict mitigation in the marine spaces should be developed for the sake of navigational safety and overall sea uses management.

2.2.2. Conflict with the freedom of fishing

Another freedom of the high seas prescribed in the law of the sea treaties is the freedom of fishing[161], which is subject to conditions of the provisions on conservation and management of the living resources in the high seas[162]. Worth reminding that all high sea freedoms, including fishing, must be exercised with due regard for the interest of other states as provided by UNCLOS[163].

In practice, the effectiveness of high seas fishing management is controversial[164]. One of the challenges for effective regulation of high seas fisheries is the absence of an international authority, similar to IMO or ISA, that would regulate this activity and fairly manage the exploitation of fishing ground. UNCLOS does not establish any particular obligations of fishing management, except for cooperation in conservation and management of living resources. The Convention requires states to cooperate in the establishment of subregional or regional fisheries organizations (RFMOs), which, however, mostly failed to enforce effective regulation and management[165]. Consequently, the lack of centralized fisheries regulation does not facilitate the coordination between different uses of the high seas areas, particularly in connection with marine renewable energy development.

[161] Convention on Fishing and Conservation of the Living Resources of the High Seas, art.1; Convention on the High Seas, art.2; UNCLOS, art.87(1e).
[162] UNCLOS, Part VII, Section 2.
[163] Ibid, art.87(2).
[164] Blanchard, Catherine. "Fragmentation in high seas fisheries: preliminary reflections on a global oceans governance approach." *Marine Policy* 84 (2017): 330.
[165] Green, Jessica F., and Bryce Rudyk. "Closing the high seas to fishing: A club approach." *Marine Policy* 115 (2020): 2.

Fishing in the high seas in itself is a separate topic for discussion, as there are scientific studies on the potential benefits of the prohibition of commercial fishing in marine waters beyond national jurisdiction[166]. However, these discussions will be set aside as fishery activities are outside of the scope of this research, and the analysis of MREIs impact on fisheries will be based on the general permission of high seas fishing under UNCLOS.

Although there are multiple studies of the impact of the more mature oil and gas industry on the fishing sector, the specificities of MREIs operation require separate scientific research and empirical evidence[167]. The potential effect of the high seas MREIs on fisheries can be assessed taking into account already acquired knowledge from marine renewable energy development in the territorial seas and, especially, in EEZs.

It is recognised that marine renewable energy development has a significant impact on fisheries and fishing vessels' navigation by excluding or restricting access to some of the fishing grounds in their vicinity and displacing fishing activities to other areas[168]. Worth as well mentioning the safety zones which could be established up to 500 meters around the installations, as provided in UNCLOS, and where fishing activities normally would be banned or limited[169]. Some fisheries methods, such as bottom trawling, can be completely prohibited around the MREIs due to safety and damage prevention reasons, where damage could be caused to fishing vessels, their gear, energy installations or subsea cables[170].

Noticeably, the occupation of sea spaces is not the only element of the conflict between uses, since MREIs also influence the surrounding marine area and its living resources. Due to the noise and vibration, installations can disturb fishing stocks and other organisms leading to their displacement and, in the worst case, to a reduction in population[171]. Especially damaging could be the period of construction that affect fish stocks behaviour by causing more intense disturbances than during operation[172].

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[166] Ibid, 1. *See also* White, Crow, and Christopher Costello. "Close the high seas to fishing?." *PLoS biology* 12, no. 3 (2014); Sumaila, U. Rashid, Vicky WY Lam, Dana D. Miller, Louise Teh, Reg A. Watson, Dirk Zeller, William WL Cheung et al. "Winners and losers in a world where the high seas is closed to fishing." *Scientific reports* 5, no. 1 (2015).
[167] Gill, Andrew B., Steven Degraer, Andrew Lipsky, Ninon Mavraki, Elizabeth Methratta, and Robin Brabant. "Setting the context for offshore wind development effects on fish and fisheries." *Oceanography* 33, no. 4 (2020): 119.
[168] Ibid.
[169] UNCLOS, art.60(4-6).
[170] European MSP Platform, MSP Platform Conflict Fiche 5: Offshore wind and commercial fisheries: 5. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/5_offshore_wind_fisheries.pdf
[171] Mooney, T. Aran, Mathias H. Andersson, and Jenni Stanley. "Acoustic Impacts of Offshore Wind Energy on Fishery Resources." *Oceanography* 33, no. 4 (2020): 89.
[172] Ibid, 90.

Besides, the displacement of fishing vessels to other grounds can significantly increase their concentration in those areas, leading to excessive pressures on living resources and resulting in overfishing[173]. By closing the access in one area, fishing vessels could pursue their activities in other, vulnerable and less protected ecosystems. Such displacement would not only pressure the fishing sector but could potentially increase environmental risks[174]. It is, therefore, crucial for sustainable sea spaces management to understand the impacts of fisheries displacement to other fishing locations.

The other side of the coin is that MREIs could have a positive secondary effect. Studies show that MREIs, or at least offshore wind farms (OWFs), could act as artificial reefs for marine species, enhancing their reproduction and offering shelter from fishing vessels[175]. The structures could be especially attractive for certain species, and their concentration near MREIs may as well influence the surrounding ecosystem[176]. Those influences are not well studied yet and still need further evidence to determine to what extend MREIs contribute to population growth and how they will affect fisheries[177].

There is also a possibility of a triple conflict between marine renewable energy development, fisheries and established marine protected areas (MPAs). Although there are suggestions that MREIs, especially OWFs, could serve as MPAs by providing artificial reef effect and exclusion zones to fishing activities[178], the primary purpose of MREIs is not an enhancement of living resources – they lack the design and structural features of artificial reefs[179]. Besides, MREIs could possibly attract alien or invasive species that are harmful to the specific marine ecosystems and

[173] European MSP Platform, MSP Platform Conflict Fiche 5: Offshore wind and commercial fisheries: 6.
[174] Gill, Andrew B., Steven Degraer, Andrew Lipsky, Ninon Mavraki, Elizabeth Methratta, and Robin Brabant. "Setting the context for offshore wind development effects on fish and fisheries." *Oceanography* 33, no. 4 (2020): 120.
[175] Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021: 13.
[176] Gill, Andrew B., Steven Degraer, Andrew Lipsky, Ninon Mavraki, Elizabeth Methratta, and Robin Brabant. "Setting the context for offshore wind development effects on fish and fisheries." *Oceanography* 33, no. 4 (2020): 119.
[177] Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021: 68.
[178] Ashley, M. C., S. C. Mangi, and L. D. Rodwell. "The potential of offshore windfarms to act as marine protected areas–A systematic review of current evidence." *Marine Policy* 45 (2014): 301.
[179] Gaines, Steven D., Crow White, Mark H. Carr, and Stephen R. Palumbi. "Designing marine reserve networks for both conservation and fisheries management." *Proceedings of the National Academy of Sciences* 107, no. 43 (2010): 18286-18293.

existing habitats[180]. Therefore, the influence of MREIs on the marine environment needs to be further examined and considered before the construction of installations.

Of course, the impact intensity of the abovementioned elements may differ depending on geographical and climatic characteristics of marine ecosystems, marine renewable energy technologies, types of fishing vessels and methods used etc. For that reason, it is essential to perform environmental assessments of individual marine renewable energy sites to understand their impacts on local habitats and examine possible interactions with other sea uses.

As a way of conflict reduction between fishing activities and ocean energy development, the co-location of these sectors could be considered, bearing in mind safety risks, environmental impacts and consequences of fishery displacement[181]. Accordingly, marine spatial management is regarded as a valuable tool for the mitigation of conflicts between MREIs and fisheries, as well as conflicts with other space uses[182]. States' cooperation in the high seas spatial planning could greatly contribute to the efficient distribution of marine spaces based on their characteristics and local specificities. Furthermore, the assessments of multi-use options in a particular area could allow certain types of fishing in the vicinity of offshore energy structures as well as benefit surrounding marine ecosystems[183]. However, more scientific data is needed to determine whether the multi-use of marine areas by multiple sectors will be feasible, economically viable and environmentally acceptable.

Due to various local particularities and differences in ocean ecosystems, the impacts of marine renewable energy development need to be carefully examined, especially taking into consideration other uses of marine spaces. The effects on the fishing sector by MREIs still require scientific assessment and further research to fill in the knowledge gaps. Multiple aspects need to be regarded when determining the influence of those sectors on each other, in particular, whether they could co-locate on the same marine area with the implementation of certain restrictions. The multi-use opportunities of the marine spaces could be established through the states' cooperation in the spatial planning of high seas spaces. However, such mechanisms are not currently developed, so the

[180] Ashley, M. C., S. C. Mangi, and L. D. Rodwell. "The potential of offshore windfarms to act as marine protected areas–A systematic review of current evidence." *Marine Policy* 45 (2014): 307.

[181] Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021: 19.

[182] European Parliament resolution of 7 July 2021 on the impact on the fishing sector of offshore wind farms and other renewable energy systems (2019/2158(INI)), para.41. Available at: https://www.europarl.europa.eu/doceo/document/TA-9-2021-0338_EN.html

[183] Schupp, Maximilian Felix, Andronikos Kafas, Bela H. Buck, Gesche Krause, Vincent Onyango, Vanessa Stelzenmüller, Ian Davies, and Beth E. Scott. "Fishing within offshore wind farms in the North Sea: Stakeholder perspectives for multi-use from Scotland and Germany." *Journal of Environmental Management* 279 (2021): 8.

potential conflicts between the fishing sector and marine renewable energy development, if not timely addressed, are likely to cause safety risks, liability issues and negative impacts on the environment.

2.2.3. Conflict with activities in the Area

In relation to the high seas freedoms, UNCLOS requires states to exercise them with due regard for the interests of other states and also with due regard to the rights under the Convention with respect to activities in the Area[184]. UNCLOS defines "activities in the Area" as "all activities of exploration for, and exploitation of, the resources of the Area"[185], and the Area itself is defined as "the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction"[186].

Activities in the Area are governed by the Part XI of UNCLOS[187] as amended by the 1994 Agreement on the implementation of Part XI[188], and these activities are organized, carried out and controlled by the International Seabed Authority (ISA) on behalf of mankind as a whole[189].

According to article 153 of UNCLOS, activities in the Area should be carried out in accordance with, in particular, the rules, regulations and procedures of the ISA, which has a right to take any measures provided in UNCLOS to ensure compliance with its provisions[190]. Currently, the ISA is in the process of developing the Mining Code, which is a collective term for the rules, regulations and procedures issued by ISA to regulate prospecting, exploration and exploitation of marine minerals in the Area[191]. The Mining Code consists of exploration regulations and exploitation regulations. The ISA has already adopted three sets of exploration regulations covering the prospecting and exploration for polymetallic nodules (2000, revised in 2013), polymetallic sulphides (2010) and cobalt-rich ferromanganese crusts (2012)[192]. The development of exploitation regulations began with a series of scoping studies in 2014, draft regulations have been prepared in

[184] UNCLOS, art.87(2).
[185] Ibid, art.1(1.3).
[186] Ibid, art.1(1.1).
[187] Ibid, art.134(2).
[188] Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, A/RES/48/263, 17 August 1994. Available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/closindxAgree.htm
[189] UNCLOS, art.153(1).
[190] Ibid, art.153(1,5).
[191] International Seabed Authority, The Mining Code. Available at: https://www.isa.org.jm/mining-code
[192] International Seabed Authority, The Mining Code: Exploration Regulations. Available at: https://www.isa.org.jm/mining-code/exploration-regulations

2019, and further adoption is needed before any exploitation contract could be issued[193]. The Mining Code is binding on the ISA, contractors and all contracting states, without the need for them to individually express their consent[194].

As an industry, seabed mining has emerged relatively recently, and its impact on the environment is poorly understood, taking into consideration how little is known about the deep ocean in general[195]. Despite the potentially harmful impacts of commercial-scale mining on the environment[196], this activity has received significant interest owing to the rich critical metals reserves on the seabed. These mineral resources are indispensable for the production of advanced technologies, including renewable energy technologies[197]. Consequently, the increase in the commercial interests for seabed mining would provide more competition to the marine renewable energy development, especially when the same marine area could be used by both sectors.

At the present time, ISA has entered in 31 contracts for exploration in the Area with 22 contractors, the majority of these contracts are for exploration for polymetallic nodules[198]. Since the exploitation regulations are not yet adopted, there are no contracts for commercial-scale exploitation of deep-sea resources[199].

The conflict of interests between marine renewable energy development and seabed mining may occur in connection to their allocation. Even though MREIs would not exploit resources of the Area, their occupation of water column would block access to the seabed and subsoil underneath the structures and prevent the exploration/exploitation of those resources by deep-sea mining operators.

If in relation to the seabed mining sites their location is authorized and mapped by the ISA, MREIs in the high seas do not have such regulatory mechanism that will control and authorize their deployment in accordance with UNCLOS. Thus, it could be suggested that a model similar to ISA

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[193] International Seabed Authority, The Mining Code: Draft Exploitation Regulations. Available at: https://isa.org.jm/mining-code/draft-exploitation-regulations

[194] Jaeckel, Aline. "Deep seabed mining and adaptive management: the procedural challenges for the International Seabed Authority." *Marine policy* 70 (2016): 206.

[195] Koschinsky, Andrea, Luise Heinrich, Klaus Boehnke, J. Christopher Cohrs, Till Markus, Maor Shani, Pradeep Singh, Karen Smith Stegen, and Welf Werner. "Deep-sea mining: Interdisciplinary research on potential environmental, legal, economic, and societal implications." *Integrated environmental assessment and management* 14, no. 6 (2018): 688.

[196] Haugan, Peter M., Lisa A. Levin, Diva Amon, Mark Hemer, Hannah Lily, and Finn Gunnar Nielsen. "What role for ocean-based renewable energy and deep seabed minerals in a sustainable future." *World Resources Institute* (2020): 34; Kung, Anthony, Kamila Svobodova, Eléonore Lèbre, Rick Valenta, Deanna Kemp, and John R. Owen. "Governing deep sea mining in the face of uncertainty." *Journal of Environmental Management* 279 (2021): 2; Hallgren, Axel, and Anders Hansson. "Conflicting Narratives of Deep Sea Mining." *Sustainability* 13, no. 9 (2021): 10.

[197] Toro, Norman, Pedro Robles, and Ricardo I. Jeldres. "Seabed mineral resources, an alternative for the future of renewable energy: A critical review." *Ore Geology Reviews* (2020): 2.

[198] International Seabed Authority, Exploration Contracts. Available at: https://www.isa.org.jm/index.php/exploration-contracts

[199] Kung, Anthony, Kamila Svobodova, Eléonore Lèbre, Rick Valenta, Deanna Kemp, and John R. Owen. "Governing deep sea mining in the face of uncertainty." *Journal of Environmental Management* 279 (2021): 7.

could be adopted in relation to the offshore renewables, to govern their placement and operation. Moreover, to achieve efficient space use and conflict prevention, it would be important to promote cooperation between these two sectors and develop spatial planning for the ABNJ that would take into account the interests of different sea uses, including fisheries and MPAs[200].

However, worth highlighting that marine renewable energy development cannot be authorized and regulated by the ISA. Since the generation of energy from renewable sources, such as wind, waves, tides, heat etc., does not exploit resources of the seabed, ocean floor or subsoil, it does not fall under the definition of "activities in the Area" and provisions of Part XI UNCLOS[201]. Even considering that deepwater deployment requires a floating foundation that relies on mooring and anchoring systems grounding high seas installations to the seabed[202], energy will still be generated from the renewable resources above the Area, therefore the activity does not fall under the jurisdiction of ISA [203].

Furthermore, as a way of spatial conflict mitigation, the multi-use maritime platforms could be considered as an option. Multi-use platforms (MUPs) are the combination of two or more maritime industries for their joint operation and mutual benefit[204]. Theoretically, MUPs could provide more efficient use of marine spaces and minimize conflicts with other activities at sea, provide technical savings through shared equipment and infrastructure, and reduce operational and maintenance costs[205]. The steps towards multi-use projects are already taken by the offshore sector in UK and Norway, where wind power is regarded as a significant opportunity for carbon emissions reduction from oil and gas platforms[206]. As an example, Norwegian operator Equinor is constructing the world's largest floating wind farm, Hywind Tampen, which will also be the first wind farm specifically designed to power oil and gas platforms in the Norwegian North Sea[207]. Analogously, MUPs could be potentially considered as a great opportunity across other maritime industries,

[200] Haugan, Peter M., Lisa A. Levin, Diva Amon, Mark Hemer, Hannah Lily, and Finn Gunnar Nielsen. "What role for ocean-based renewable energy and deep seabed minerals in a sustainable future." *World Resources Institute* (2020): 34.
[201] UNCLOS, art.135.
[202] Knappett, J. A., M. J. Brown, H. Aldaikh, S. Patra, C. D. O'Loughlin, S. H. Chow, Christophe Gaudin, and J. T. Lieng. "A review of anchor technology for floating renewable energy devices and key design considerations." In *Frontiers in Offshore Geotechnics III: Proceedings of the 3rd International Symposium on Frontiers in Offshore Geotechnics (ISFOG 2015)*, vol. 1, 2015: pp. 887.
[203] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 513.
[204] Legorburu, Irati, Kate R. Johnson, and Sandy A. Kerr. "Multi-use maritime platforms-North Sea oil and offshore wind: Opportunity and risk." *Ocean & Coastal Management* 160 (2018): 75.
[205] Ibid.
[206] Quinn, Tom. "Using floating offshore wind to power oil and gas platforms." ORE Catapult, January 2021: 8.
[207] Equinor, Hywind Tampen: The world's first renewable power for offshore oil and gas. Available at: https://www.equinor.com/en/what-we-do/hywind-tampen.html

integrating, in particular, deep-sea mining and marine renewable energy development in ABNJ. When both sectors are likely to develop in close proximity, MREIs could provide power supply for activities in the Area and export the remaining electricity to onshore grids[208]. However, this scenario needs to be technologically feasible and supported by relevant scientific data.

Overall, due to the increasing interest in seabed mining, this industry could become a strong competitor to MREIs development for the use of marine spaces. The cooperation between these sectors would be essential, and it is suggested that marine spatial management and different multi-use options could become useful tools for space conflicts reduction and mitigation. Importantly, to ensure compliance with UNCLOS provisions and cooperation with other space uses, marine renewable energy on the high seas will need a relevant regulatory mechanism, resembling one of ISA, that would control and authorize renewable energy generation in ABNJ. However, these functions cannot be delegated to ISA itself, since the operation of MREIs does not fall under the Part XI of UNCLOS.

2.3. Impact on the marine environment

Lastly, it should be considered how marine renewable energy development in ABNJ may influence marine environmental protection and whether it could trigger space conflict with areas designated for conservation purposes.

A general obligation to protect and preserve the marine environment can be found in Part XII of UNCLOS, provisions of which are applicable to all activities at sea, including marine renewable energy generation[209]. UNCLOS prescribes that states have to take all necessary measures consistent with the Convention to prevent, reduce and control pollution of the environment from any source, using the best practicable means at their disposal and in accordance with their capabilities[210]. They are expected to deal with all sources of pollution of the marine environment and to take measures in relation to, among others, the pollution from installations and devices operating in the marine environment, in particular, to take measures for preventing accidents and dealing with emergencies,

[208] Legorburu, Irati, Kate R. Johnson, and Sandy A. Kerr. "Multi-use maritime platforms-North Sea oil and offshore wind: Opportunity and risk." *Ocean & Coastal Management* 160 (2018): 76.
[209] Giannopoulos, Nikolaos. "Global environmental regulation of Offshore energy production: Searching for legal standards in Ocean Governance." *Review of European, Comparative & International Environmental Law* 28, no. 3 (2019): 291.
[210] UNCLOS, art.194(1).

ensuring the safety of operations at sea, regulating the design, construction, equipment, operation and manning of such installations or devices[211].

Further, UNCLOS sets forth provisions on the monitoring and environmental assessment, according to which states should endeavour, consistent with the rights of other states and as far as practicable, directly or through the international organization, to observe, measure, evaluate and analyze, using recognized scientific methods, the risk or effects of pollution of the marine environment[212]. They are required to keep under surveillance the effects of any activities they permit or engage in, in order to determine whether these activities are likely to pollute the marine environment[213]. Additionally, states should publish reports of the obtained results or provide reports at appropriate intervals to the competent international organization, making them available to all states[214]. In cases when there are reasonable grounds to believe that planned activities may cause substantial pollution of or significant and harmful changes to the marine environment, it is required to assess, as far as practicable, the potential effects of such activities on the marine environment and communicate reports of the results of such assessments[215].

Moreover, states are required to harmonize their policies in connection to the protection and preservation of the marine environment as well as to cooperate on a global and regional basis for formulation and elaboration of international rules, standards, recommended practices and procedures for marine protection, taking into account regional characteristics[216].

Putting in other words, UNCLOS obliges states to exercise due diligence in relation to the prevention, reduction and control of marine environmental pollution, including from MREIs, and to perform monitoring and environmental assessments of the activities at sea[217]. The aforementioned provisions do not oblige states to achieve certain results, they are obligations of conduct prescribing to take the best possible measures for the prevention or reduction of environmental damage[218]. At the same time, they lack detailed procedures and enforcement mechanisms that would ensure compliance with UNCLOS provisions and fulfilment of environmental requirements.

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[211] Ibid, art.194(3).
[212] Ibid, art.204(1).
[213] Ibid, art.204(2).
[214] Ibid, art.205.
[215] Ibid, art.206.
[216] UNCLOS, art.197.
[217] Giannopoulos, Nikolaos. "Global environmental regulation of Offshore energy production: Searching for legal standards in Ocean Governance." *Review of European, Comparative & International Environmental Law* 28, no. 3 (2019): 290.
[218] International Law Commission, Draft articles on Prevention of Transboundary Harm from Hazardous Activities with commentaries, UN Doc A/56/10, 2001: 154, para (7). Available at: https://legal.un.org/ilc/texts/instruments/english/commentaries/9_7_2001.pdf

Despite the obligation to cooperate, there are very few international environmental instruments addressing offshore energy generation, and even less mentioning marine renewable energy[219]. Although there is a number of biodiversity-related agreements, such as the 1992 Convention on Biological Diversity and 1979 Convention on the Conservation of Migratory Species of Wild Animals, they provide general obligation of environmental protection and could be applied to the marine renewable energy development only indirectly, not prescribing any specific rules in relation to the offshore structures[220].

Although international environmental regulations that would apply to MREIs development on the high seas is rather vague and fragmented, the gap in ABNJ governance was already recognized on the international level and first steps were taken in relation to the adoption of a comprehensive global regime that would better address conservation and sustainable use of marine biological diversity beyond national jurisdiction. Under the United Nations General Assembly (UNGA) Resolution 69/292, it was decided to develop an international legally binding instrument under the UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ)[221]. Later in 2017, UNGA adopted Resolution 72/249, deciding to convene an intergovernmental conference under the auspices of the UN to elaborate legal text of this legally binding instrument. The negotiations are to address, in particular, marine genetic resources, including questions on the sharing of benefits, measures such as area-based management tools, including marine protected areas, environmental impact assessments and capacity-building and the transfer of marine technology[222]. More attention to BBNJ negotiations is given in Chapter 3.

One of the ways of preservation and protection of the environment required by UNCLOS, as well as one of the issues raised by the Conference on the conservation and sustainable use of marine BBNJ, is the designation of marine protected areas (MPAs). The meaning of MPA was defined by the Convention on Biological Diversity (CBD) as "any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna and historical and cultural features, which has been reserved by legislation or other effective means, including custom,

[219] *See* Chapter 1.

[220] Giannopoulos, Nikolaos. "Global environmental regulation of Offshore energy production: Searching for legal standards in Ocean Governance." *Review of European, Comparative & International Environmental Law* 28, no. 3 (2019): 293.

[221] United Nations General Assembly (UNGA), Resolution 69/292. Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/RES/69/292, 19 June 2015: 2. Available at: https://undocs.org/en/a/res/69/292

[222] UNGA, Resolution 72/249. International legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/RES/72/249, 24 December 2017: 1. Available at: https://undocs.org/en/a/res/72/249

with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection and its surroundings"[223]. In connection to UNCLOS, MPAs could be justified under article 194, providing that states are required to take measures that would include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened and endangered species and other forms of marine life[224]. Moreover, as was discussed in Chapter 1, some regional conventions also establish protective measures for the conservation of marine areas, for instance, the Barcelona Convention Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean[225].

From the provisions of UNCLOS and CBD, it could be said that the key element in the establishment of MPAs is an international cooperation between states, although it is also a responsibility of the state authorising or engaging in the activities likely to affect the environment to act with due regard to ecosystems and habitats in the area[226]. Therefore, when the state is deploying MREIs on a particular area of the high seas it has to ensure the protection and preservation of the marine environment and take all appropriate measures for conservation, including, if necessary, the establishment of MPA.

As was already mentioned in the context of conflict with the freedom of fishing, certain environmental concerns are present in connection to the development of MREIs[227]. Although the understanding of marine renewable energy effects on the environment is very limited and more data is needed to evaluate the impacts, studies suggest that the deployment of such structures may result in changes in local atmospheric and oceanic dynamics; may induce physical changes in habitats or influence species behaviour, as well as attract alien or invasive species for colonization; produce noise, vibration and electromagnetic field which may cause displacement and negatively affect sensitive marine organisms[228]. At the same time, it appears that these potential effects are low to moderate, depending on the stage of life of the installation, and do not pose more danger to the environment than existing maritime industries such as commercial shipping[229].

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[223] Conference of the Parties to the Convention on Biological Diversity, Decision VII/5. Marine and coastal biological diversity, UNEP/CBD/COP/DEC/VII/5, 13 April 2004: p.2. Available at: https://www.cbd.int/doc/decisions/cop-07/cop-07-dec-05-en.pdf

[224] UNCLOS, art.194(5).

[225] *See* Chapter 1.

[226] Elferink, Alex G. Oude. "Coastal states and MPAs in ABNJ: ensuring consistency with the LOSC." *The International Journal of Marine and Coastal Law* 33, no. 3 (2018): 446.

[227] *See* subchapter 2.2.2. of the Chapter 2.

[228] Farr, Hayley, Benjamin Ruttenberg, Ryan K. Walter, Yi-Hui Wang, and Crow White. "Potential environmental effects of deepwater floating offshore wind energy facilities." *Ocean & Coastal Management* 207 (2021): 3-9.

[229] Copping, Andrea. "The state of knowledge for environmental effects: Driving consenting/permitting for the marine renewable energy industry." *Report by Pacific Northwest National Laboratory (PNNL)* (2018): 12; Farr, Hayley,

From another point of view, MREIs could benefit surrounding ecosystems by acting as an artificial reef and offering shelter areas for marine species during the operational phase. Through the restriction of fishing activities and vessel traffic, installations could contribute to the recovery of surrounding habitats from the disturbances and provide fish aggregation effects[230]. In this regard, some scholars suggest that MREIs have the potential to act as MPAs, which could be a win-win situation for both industries. On one hand, installations would provide a place of refuge for marine species and restrict access to the area for other industries, and on the other, co-location of marine renewable energy with conservation measures would minimize spatial conflicts and moderate competing interests[231]. However, it should be taken into account that MREIs lack essential features and are not designed to perform the functions of species enhancement devices[232]. Since the benefits of this synergy are based on limited empirical evidence, such factors as the type of structure, local environmental specificities etc., have to be carefully considered during the entire lifespan of the installation through the environmental impact assessment with the application of a precautionary approach[233].

Overall, the existing international environmental regulations, although generic and fragmented, prescribe obligations of environmental protection and preservation, which would also apply to marine renewable energy development beyond national jurisdiction. To fill the gap in regulation, the first steps towards comprehensive governance were made through the establishment of the Intergovernmental Conference on the conservation and sustainable use of the BBNJ for the adoption of an international legally binding instrument that is most likely to influence the regulation of MREIs deployment on the high seas.

As for the spatial distribution, the development of MREIs may potentially cause spatial conflicts with conservation measures, namely with MPAs. Although there are opinions on possible

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Benjamin Ruttenberg, Ryan K. Walter, Yi-Hui Wang, and Crow White. "Potential environmental effects of deepwater floating offshore wind energy facilities." *Ocean & Coastal Management* 207 (2021): 3; Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021: 10-11 Mooney, T. Aran, Mathias H. Andersson, and Jenni Stanley. "Acoustic Impacts of Offshore Wind Energy on Fishery Resources." *Oceanography* 33, no. 4 (2020): 93.

[230] Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021: 13.

[231] Thurstan, Ruth H., Katherine L. Yates, and Bethan C. O'Leary. "Compatibility of offshore energy installations with marine protected areas." In *Offshore Energy and Marine Spatial Planning*, Routledge, 2018: 216.

[232] Gaines, Steven D., Crow White, Mark H. Carr, and Stephen R. Palumbi. "Designing marine reserve networks for both conservation and fisheries management." *Proceedings of the National Academy of Sciences* 107, no. 43 (2010): 18286-18293.

[233] Copping, Andrea. "The state of knowledge for environmental effects: Driving consenting/permitting for the marine renewable energy industry." *Report by Pacific Northwest National Laboratory (PNNL)* (2018): 2.

co-location of these space uses for the conflict reduction due to the artificial reef effect of the offshore renewables, more substantial evidence is needed to examine the consequences of this interaction.

In general, even though the influence of offshore renewables on the marine environment were examined by numerous studies, as a relatively young industry it lacks definitive data on marine environmental impact. The potential effects on the environment may not be known until a substantial number of MREIs are developed and operating on the high seas, therefore it is essential to gather data and ensure regular monitoring for the indication of environmental risks and their timely prevention or mitigation.

3. APPROACHES TO MARINE RENEWABLE ENERGY REGULATION IN THE AREAS BEYOND NATIONAL JURISDICTION

3.1. Flag state principle application

Taking into account various challenges and legal uncertainties concerning future marine renewable energy development in ABNJ, it appears essential to introduce efficient regulatory mechanisms that would bring more clarity to the legal status of such installations and ensure compliance with international law requirements. In order to establish a connection between the beneficial owner state and installation, ensure that the state exercises effective jurisdictional control and oversees the fulfilment of international standards, the application of the flag state principle could be suggested as one of the potential regulatory mechanisms.

If in the territorial sea, EEZ or CS only one state – the coastal state – has the exclusive right to construct offshore installations, the freedom of the high seas is not limited to one state and can be exercised by all coastal and land-locked states[234]. For that reason, the flag state principle could aid to resolve the issues of jurisdiction and ownership over MREIs through the identification of the state authorizing or engaging in high seas energy generation.

However, a significant challenge of the flag state regime application to MREIs is the absence of a relevant legal basis. Under UNCLOS, the flag state regime only applies in connection to the right of navigation, stating that every state has a right to sail ships under its flag on the high seas. The flag state must fix conditions for the grant of its nationality to ships, registration of ships in its territory and for the right to fly its flag[235]. Ships normally may sail under one flag only, they have the nationality of the state whose flag they are flying and are subjected to its exclusive jurisdiction on the high seas[236]. Moreover, the Convention requires to have a genuine link between the state of the flag and a ship[237].

It is worth mentioning that some considerations could be found on whether offshore structures could be classified as “ships” in the understanding of international law. There is also no universal definition of “ship” or “vessel”, as these terms are defined differently in each convention

[234] UNCLOS, art.87.
[235] Ibid, arts.90-91.
[236] Ibid, arts.91-92.
[237] Ibid, art.91.

accordingly to the purpose of its adoption[238]. There are some treaties, namely those on the prevention of pollution from ships[239], which include fixed or floating platforms in the definition of "ship"/ "vessel". However, based on the purpose and the time of adoption of these conventions, such a definition was adopted to expand the scope of application to oil and gas installations while not considering renewable energy development. Generally, the terms "ship" and "installation/structure" have two separate legal regimes and serve completely different objectives. In the view of this study, MREIs cannot be classified as ships as their primary function is the exploitation of renewable resources but not navigation or transportation of passengers or goods. Even though some installations such as floating wind turbines could be mobile, they are meant to be eventually stationed for energy generation in one location of the high seas, which excludes them from being used as sea-going vessels[240].

In the light of these considerations the flag state regime, as it is formulated in UNCLOS, cannot be applicable to MREIs. At the same time, it appears that the flag state regime could offer some benefits for the development of offshore renewables and bring more clarity to their regulation.

Under the UNCLOS, the flag states are expected to effectively exercise their jurisdiction and control in administrative, technical and social matters over ships under their flag[241]. Besides, the flag state is entitled to exercise effective enforcement to ensure compliance by flag vessels with applicable international rules and standards. and with their laws and regulations adopted in accordance with UNCLOS for the prevention, reduction and control of pollution of the marine environment from vessels[242]. If there was a violation of such rules and standards, the flag state has to immediately commence an investigation and, where appropriate, institute proceedings in respect of the alleged violation irrespective of the place of violation or location of the caused pollution[243]. The flag state has a right to request the assistance of any state to clarify the circumstances of the case,

[238] *See*, the International Convention on Salvage, 28 April 1989; Convention on the International Regulations for Preventing Collisions at Sea, 20 October 1972; International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997; International Convention on Civil Liability for Oil Pollution Damage, 29 November 1969, etc.
[239] *See*, The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997; The Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, 15 February 1972.
[240] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 500.
[241] UNCLOS, art.94(1).
[242] Ibid, art.217(1).
[243] Ibid, art.217(4).

and any state can request the flag state in writing to investigate any alleged violation committed by the flag vessels[244].

The application of these provisions to MREIs on the high seas would serve as a legal ground for the exercise of the state's jurisdictional control over the installation and would aid the allocation of responsibility of the state authorising or engaging in energy generation activities.

As for the exercise of jurisdiction applying the flag state principle to MREIs, the following considerations could be presented. It is both a principle of international customary law[245] and a rule prescribed in UNCLOS[246] that no state can exercise its jurisdiction over a part of the high seas. However, to avoid the chaos caused by the absence of authority on the high seas, ships are subject to the exclusive jurisdiction of the state whose flag they are flying[247]. With regard to this, in the *Lotus* case the Permanent Court of International Justice stated that there are no prohibitive rules in international law that would preclude states to exercise their jurisdiction extraterritorially over their persons, property and acts outside their territory, and in these circumstances, "all that can be required of a State is that it should not overstep the limits which international law places upon its jurisdiction; within these limits, its title to exercise jurisdiction rests in its sovereignty"[248].

Consequently, it would be a matter of the state's domestic legislation to adopt laws and procedures in connection to MREIs authorised and deployed by this state on the high seas. However, in case of damages, pollution or other breaches of international obligations, such matters would be dealt with in accordance with international law[249].

As a way of ensuring compliance, every state is required to adopt its own rules on the registration and authorisation of ships flying their flag[250]. In shipping, the flag state establishes the procedure for registration to ensure the fulfilment of technical, environmental, economic requirements etc., and provides appropriate documents of authorisation. It is conceivable to apply the same approach in relation to the marine renewable energy projects planned to operate on the high seas. Nowadays, states with operational MREIs in the territorial sea or EEZ have their own

[244] Ibid, art.217(5,6).
[245] Roach, J. Ashley. "Today's customary international law of the sea." *Ocean Development & International Law* 45, no.3 (2014): 248.
[246] UNCLOS, art.89.
[247] Report of the International Law Commission to the General Assembly, Document A/3159, Report of the International Law Commission covering the work of its eighth session, 23 April—4 July 1956, *Yearbook of the International Law Commission, Volume II*, 1956: 279. Available at: https://legal.un.org/ilc/publications/yearbooks/english/ilc_1956_v2.pdf
[248] Publications of the Permanent Court of International Justice, Judgment No.9 – The Case of the S.S. "Lotus", *Series A.-No.10,* September 7th, 1927: 19. Available at: https://www.icj-cij.org/public/files/permanent-court-of-international-justice/serie_A/A_10/30_Lotus_Arret.pdf
[249] Esmaeili, Hossein. *The legal regime of offshore oil rigs in international law*. Routledge, 2001: 142.
[250] Ibid, art.91(1).

domestic regulation on consenting procedures and licencing of such installations. Consenting and licencing procedures differ from state to state and depend on the maritime zone, the scale of deployment and other conditions, but their general aim is largely the same – to ensure compliance with national legislation and international rules and standards, including environmental and safety requirements. Those procedures include, for example, marine spatial planning, navigational risk assessment, environmental impact assessment, public consultations and others[251]. It seems fair to suggest that, through international cooperation, these consenting and licencing mechanisms could be adapted for the high seas renewable energy development to ensure coherent and coordinated ABNJ governance.

However, considering that the strictness of permitting procedures for MREIs could be different in every state, it is possible that the previously discussed practice of the flags of convenience present in shipping[252] might as well emerge in the marine renewable energy industry[253]. In order to ensure that all requirements, including technological, safety, environmental and economic, are appropriately fulfilled and that less demanding domestic regulations of another state are not exploited for a purpose of convenience, it would be important to establish the link between the installation and the beneficial owner state. Therefore, as an instrument of prevention of flag of convenience practice, the genuine link approach could be applied to such installations.

The meaning of genuine link is not given in UNCLOS or any international law instrument, and the opinions regarding this concept are extremely diverse in the literature[254]. Nevertheless, it could be said that an essential element of the genuine link is the ability of the flag state to exercise its effective jurisdictional control and protection over the vessel[255]. To demonstrate the exercise of jurisdictional control, flags states must ensure that necessary mechanisms are in place and they are able to enforce adequate and consistent measures to guarantee compliance with international rules and standards[256].

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[251] Marine Scotland Consenting and Licensing Guidance for Offshore Wind, Wave and Tidal Energy Applications, 15 Oct 2018. Available at: https://www.gov.scot/publications/marine-scotland-consenting-licensing-manual-offshore-wind-wave-tidal-energy-applications/

[252] *See* subsection 2.1 of Section 2.

[253] Elsner, Paul, and 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." *Energy policy* 128 (2019): 925.

[254] Churchill, Robin Rolf, and Christopher Hedley. "The Meaning of the" Genuine Link" Requirement in relation to the Nationality of Ships." (2000): 33.

[255] Tache, Simon W. "The nationality of ships: the definitional controversy and enforcement of genuine link." *The International Lawyer* (1982): 305.

[256]Churchill, Robin Rolf, and Christopher Hedley. "The Meaning of the" Genuine Link" Requirement in relation to the Nationality of Ships." (2000): 71.

Furthermore, in its Advisory Opinion, ITLOS pointed out that a duty of the flag state, as provided in article 94 of UNCLOS, to exercise effective jurisdiction and control in administrative matters must be fulfilled through the adoption of the necessary administrative measures to ensure that the flag vessels are not involved in activities which will undermine the flag state's responsibilities under UNCLOS. If such violations nevertheless occur, the flag state is obliged to investigate and take any necessary actions to remedy the situation[257].

Important to note that in the international maritime law it was recognised that the flag states often fail to adequately enforce their jurisdictional control over the flag vessels, so the additional mechanism of the port state control was established[258]. The port state control is exercised through the inspection of foreign ships in national ports to verify their compliance with the international maritime regulations[259]. However, since MREIs are not sea-going vessels and remain stationary on the high seas for the time of operation, such a controlling mechanism as the port state control regime is obviously not available for offshore renewables[260]. Witnessing inadequate flag state control in maritime shipping, it is imaginable that similar issues could emerge in the high seas marine renewable energy sector as well. To ensure the fulfilment of international requirements by the flag states and to prevent potential violations, there is a need for additional monitoring and controlling mechanisms that would ensure the implementation of preventive and restorative measures on a case-specific basis. Such mechanisms could be enforced, for example, by a relevant international organisation regulating high seas MREIs or by individual states engaging in marine activities in ABNJ.

Nevertheless, not necessarily the experience of the shipping industry would be repeated by the marine renewable energy sector with regard to the flag state principle application. With the marine scientific development and technological advancements, there are more mechanisms for the monitoring and control of the flag state enforcement. International organisations and states engaging in marine activities in ABNJ can use various surveillance and information technologies, such as satellite radar systems, tracking devices etc., which could facilitate the oversight of the flag state

[257] ITLOS Reports of Judgments, Advisory Opinions and Orders. Request for an Advisory Opinion Submitted by the Sub-Regional Fisheries Commission (SRFC) (Request for Advisory Opinion Submitted to The Tribunal), List of cases: No. 21, 2 April 2015: para.119. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.21/advisory_opinion_published/2015_21-advop-E.pdf

[258] Hosanee, Nivedita. "A critical analysis of flag state duties as laid down under Article 94 of the 1982 United Nations Convention on the Law of the Sea." *University of Milan* (2008): 42.

[259] International Maritime Organization, Port State Control. Available at: https://www.imo.org/en/OurWork/IIIS/Pages/Port%20State%20Control.aspx

[260] Elsner, Paul, and 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." *Energy policy* 128 (2019): 925.

duties as well as increase transparency[261]. It is also reasonable to emphasise that owing to the stationary nature of energy installations their deployment and operation would be easier to observe than constantly mobile sea-going vessels. Therefore, it is believable that issues potentially deriving from the flag state regime could be overcome with the combination of diplomatic and scientific efforts, taking into account the lessons learned from shipping.

Overall, it appears that the application of the flag state principle to the marine renewable energy generation in ABNJ could clarify the legal status of such installations and could ensure the fulfilment of international undertakings by the responsible states. Therefore, it can be suggested that the adoption of the flag state approach to marine renewable energy development would be beneficial for sound marine governance and more transparent responsibility allocation. However, other issues may potentially emerge from this regime, such as the flags of convenience and inadequate jurisdictional control of the flag state. In this case, as the means of prevention and reduction of such practices, worth considering the application of a genuine link approach and the implementation of monitoring and surveillance mechanisms to MREIs.

3.2. Marine spatial planning and environmental impact assessment for areas beyond national jurisdiction

The growing pressures of expanding ocean industries, conflicts over the use of marine spaces and the need for sustainable energy development initiated heated discussions on new mechanisms and approaches to marine management both nationally and internationally. In this respect, marine spatial planning (MSP) could be regarded as a valuable instrument for the implementation of sustainable marine governance and an effective tool for the distribution of marine spaces between different uses.

In the literature, one of the definitions of MSP is formulated as the "public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that are usually specified through a political process"[262]. On the EU level, for instance, the definition of MSP in given in the MSP Directive[263]

[261] Cremers, Klaudija, Glen Wright, and Julien Rochette. "Strengthening monitoring, control and surveillance of human activities in marine areas beyond national jurisdiction: Challenges and opportunities for an international legally binding instrument." *Marine Policy* 122 (2020): 6.

[262] Ehler, Charles, and Fanny Douvere. "An international perspective on marine spatial planning initiatives." *Environments: a journal of interdisciplinary studies* 37, no. 3 (2010): 10.

and it means a "process by which the relevant Member State's authorities analyze and organize human activities in marine areas to achieve ecological, economic and social objectives"[264]. In addition, even though MSP is neither defined nor mentioned in any law of the sea treaties, this concept is not foreign to international law. In some way, the establishment of maritime zones, namely territorial sea, contiguous zone, EEZ, CS and the high seas could be also regarded as a form of spatial planning[265].

Practically, MSP could contribute to more efficient and sustainable marine renewable energy deployment in ABNJ. Since marine areas host various human activities, such as navigation, fishing, seabed mining, scientific research etc., it is important to distribute limited ocean spaces in a way that would resolve or mitigate the conflicts of uses and ensure protection and preservation of the environment. Moreover, the lack of planning increases risks and uncertainties for future developers and escalates competition between stakeholders, which may potentially discourage investors and hamper industry development[266].

As an example of a legally binding framework for maritime spatial planning, the EU's MSP Directive (MSPD) could be presented. This legal instrument establishes a regulatory tool for the sustainable development of marine regions within Member States' jurisdictional waters and requires the implementation of MSPs in all EU waters for cross-border cooperation[267]. The Directive does not impose any particular instructions or details on planning processes, it sets general objectives of MSP establishment, which are the support of sustainable development and growth in the maritime sectors, such as offshore energy, maritime transport, fisheries, aquaculture, protection and preservation of the environment, and promotion of coexistence of these activities and uses[268]. MSPD sets minimum requirements for member states, in particular: to take into account land-sea interactions, environmental, economic, and social aspects; to ensure the involvement of stakeholders; to use the best available data; to develop cooperation between member states and third countries; to apply ecosystem-based approach; to promote the coexistence of activities; and to

[263] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning (hereinafter – Maritime Spatial Planning Directive), *OJ L 257, 28.8.2014, p. 135–145.*
[264] Ibid, art.3(2).
[265] Young, Michaela. "Building the blue economy: the role of marine spatial planning in facilitating offshore renewable energy development." *The International Journal of Marine and Coastal Law* 30, no. 1 (2015): 165.
[266] Ibid 157.
[267] Friess, Bernhard, and Marie Grémaud-Colombier. "Policy outlook: Recent evolutions of maritime spatial planning in the European Union." *Marine Policy* (2019): 1.
[268] Maritime Spatial Planning Directive, art.5.

review plans at least every ten years[269]. In order to contribute to the identified objectives, the Directive requires member states to provide spatial and temporal distribution of relevant and future activities and uses in their marine waters. Such activities and uses may include, among others, installations and infrastructures for the production of energy from renewable sources[270].

Even though the EU's MSP framework only applies to the jurisdictional waters of the EU member states, their valuable experience in the MSP implementation can set a trend for the international ocean governance and significantly stimulate the adoption of MSP globally. Namely, in the Joint Communication on the international ocean governance[271], the European Commission stated that the sustainable use of the oceans and their biodiversity depends on the appropriate planning and management of human uses, both within and beyond national jurisdiction. For that purpose, the European Commission works with all relevant actors to develop proposals for internationally accepted guidelines in order to promote MSP and related processes at the international level, particularly in the UN[272]. In 2017, the Directorate-General for Maritime Affairs and Fisheries of the European Commission (DG MARE) together with the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO) adopted a Joint Roadmap to accelerate Maritime/Marine Planning processes worldwide[273]. The Roadmap establishes five priority areas, which are:

1. transboundary maritime/marine spatial planning;
2. blue economy;
3. ecosystem-based maritime/marine spatial planning;
4. capacity building; and
5. building mutual understanding and communicating MSP.[274]

[269] Friess, Bernhard, and Marie Grémaud-Colombier. "Policy outlook: Recent evolutions of maritime spatial planning in the European Union." *Marine Policy* (2019): 2.
[270] Maritime Spatial Planning Directive, art.8(2).
[271] Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "International ocean governance: an agenda for the future of our oceans", JOIN/2016/049 final, Brussels, 10.11.2016. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=JOIN:2016:49:FIN
[272] Ibid, 13.
[273] The Directorate General for Maritime Affairs and Fisheries of the European Commission, (DG MARE) and the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO), "Joint Roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide (MSP)", 2nd International Conference on Marine/Maritime Spatial Planning, Paris UNESCO HQ, 15-17 March 2017. Available at: https://www.mspglobal2030.org/wp-content/uploads/2019/04/Joint_Roadmap_MSP.pdf
[274] Ibid, 2-5.

In order to highlight the role of MSP in the achievement of the global ocean governance goals and implementation of the Agenda 2030 for Sustainable Development, the Joint Roadmap was submitted to the UN Conference to Support the Implementation of Sustainable Development Goal 14 as a part of IOC/UNESCO and DG MARE joint voluntary commitment.

It is worth highlighting that MSP should provide a strategic vision for the allocation of uses and activities, it should be future-oriented and comprehensive. Importantly, it should identify the priority uses for the particular area to moderate competing interests in accordance with political and social needs. However, such planning decisions have to be temporal and dynamic, with periodical revisions every 10 to 20 years[275]. Moreover, due to the various and unique geographical characteristics of marine ecosystems, it is impossible to establish an effective universal MSP practice. The planning processes should be area-specific and identify the best available practices for the particular marine region[276].

When developing MSP, it is important to establish the status of the marine zones, whether they will be designated for one activity only, multi-use, or any activity will be prohibited for ecosystems preservation. Particularly, the planning decisions on marine renewable energy development should identify areas with production potential and designate specific zones for the deployment of installations and laying of cable routes taking into account other uses, especially navigation and fishing, economic and technological factors, ocean conditions and environmental requirements[277]. Considering all these aspects, the seemingly endless ocean has its own space limitations which should be considered before any development starts.

It could be suggested that the development of MSP beyond national jurisdiction could start with areas that are already designated for conservation as MPAs, thereby excluding in those zones any activities harmful to the environment[278]. Moreover, it appears conceivable that other areas, such as lanes essential for international navigation and areas designated for deep-sea mining could be included in the early planning stages with the assistance of IMO and ISA respectively.

However, in order to develop and successfully implement MSP for the high seas, it is essential to establish an international authority that would navigate planning processes and ensure

[275] Wright, Glen. "Marine governance in an industrialised ocean: a case study of the emerging marine renewable energy industry." *Marine Policy* 52 (2015): 82.

[276] The 2nd International Conference on Marine/Maritime Spatial Planning, 15–17 March 2017, UNESCO, Paris, Intergovernmental Oceanographic Commission and European Commission – DGMARE 2017 (English) (IOC Workshop Reports Series, 279): 16. Available at: https://www.mspglobal2030.org/wp-content/uploads/2020/04/mspconf2017_finalreport.pdf

[277] Zaucha, Jacek, and Kira Gee. *Maritime Spatial Planning: past, present, future*. Springer Nature, 2019: 140.

[278] Young, Michaela. "Building the blue economy: the role of marine spatial planning in facilitating offshore renewable energy development." *The International Journal of Marine and Coastal Law* 30, no. 1 (2015): 164.

effective transnational cooperation in ocean governance. A single governing body would synchronize the work of various institutional authorities, both national and international, and significantly contribute to the standardization of sea spaces management through the integration of relevant marine sectors[279]. Moreover, the establishment of a global arena for coordinated and coherent planning would facilitate stakeholder participation in the international decision-making, which would ensure adaptiveness, transparency, accountability and moderation of competing interests[280].

In addition, technological innovations play a crucial role in MSP processes, as space distribution should respond to the new developments in marine space usage for maximization of efficiency and minimization of conflicts[281]. Notably, with the help of technological advancements new potential space uses could be opened, such as multi-use platforms combining two or more economic activities within the same space[282] or, where appropriate, designation of marine renewable energy zones as habitats conservation areas, integrating MREIs and MPAs[283].

Furthermore, the planning decisions are largely influenced by the considerations of the effects of sea uses on the surrounding marine environment. The aim of the environmental impact assessment (EIA) is to identify potential environmental impacts of the sea activities and uses and to propose the options to prevent or reduce the negative consequences of such impacts[284]. The EIA is inseparable from MSP, as it determines whether the area is suitable for conducting certain activities or whether the activity is incompatible with the surrounding ecosystem.

On a national level, offshore energy developers are required to conduct EIA as a part of consenting and licensing procedures. On a universal level, this obligation is prescribed in a number of international law sources.

According to UNCLOS, states are obliged to endeavour, as far as practicable, directly or through the international organization, to observe, measure, evaluate and analyze, by recognized scientific methods, the risks of pollution of the marine environment. In particular, they are required

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[279] Albotoush, Reda, and Aileen Tan Shau-Hwai. "An authority for marine spatial planning (MSP): A systemic review." *Ocean & Coastal Management* 205 (2021): 7.

[280] Ardron, Jeff, Kristina Gjerde, Sian Pullen, and Virginie Tilot. "Marine spatial planning in the high seas." *Marine Policy* 32, no. 5 (2008): 837.

[281] Kyriazi, Zacharoula, Frank Maes, and Steven Degraer. "Coexistence dilemmas in European marine spatial planning practices. The case of marine renewables and marine protected areas." *Energy Policy* 97 (2016): 397.

[282] Legorburu, Irati, Kate R. Johnson, and Sandy A. Kerr. "Multi-use maritime platforms-North Sea oil and offshore wind: Opportunity and risk." *Ocean & Coastal Management* 160 (2018): 75.

[283] Kyriazi, Zacharoula, Frank Maes, and Steven Degraer. "Coexistence dilemmas in European marine spatial planning practices. The case of marine renewables and marine protected areas." *Energy Policy* 97 (2016): 397.

[284] Yates, Katherine L., and Corey JA Bradshaw, eds. *Offshore energy and marine spatial planning*. Routledge, 2018: 134.

to keep under surveillance the effects of any activities which they permit or in which they engage in, to determine whether these activities are likely to pollute the marine environment[285]. In addition, when states have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment, they are obliged to assess, as far as practicable, the potential effects of such activities on the marine environment and communicate reports of the assessment results to the competent international organizations, making them available to all states[286].

Worth emphasizing that the obligation to perform environmental assessment is the obligation of conduct, by which states are expected to meet a standard of due diligence with respect to environmental protection[287]. That is, when it is impossible for the harm to be totally prevented, it does not imply that the state has failed to fulfil its obligation of due diligence as long as the state took all preventive measures at its disposal to minimize the risk of environmental harm[288].

As was held by the International Court of Justice (ICJ) in the *Pull Mills on the River Uruguay (Argentina v. Uruguay)* case, the obligation to act with due diligence entails not only the adoption of appropriate rules and measures but also a certain level of vigilance in their enforcement and the exercise of administrative control applicable to public and private operators, such as the monitoring of activities undertaken by the operator[289]. The obligation to protect and preserve has to be interpreted in accordance with a practice, that it may now be considered a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource. Moreover, due diligence and the duty of vigilance and prevention would not be considered to have been exercised, if a party planning works potentially affecting the environment did not undertake an environmental impact assessment[290].

[285] UNCLOS, art.204.
[286] Ibid, art.206.
[287] Giannopoulos, Nikolaos. "Global environmental regulation of Offshore energy production: Searching for legal standards in Ocean Governance." *Review of European, Comparative & International Environmental Law* 28, no. 3 (2019): 291.
[288] International Law Commission, Draft articles on Prevention of Transboundary Harm from Hazardous Activities with commentaries, UN Doc A/56/10, 2001: 154, para (7).
[289] Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010, p. 79, para.197. Available at: https://www.icj-cij.org/public/files/case-related/135/135-20100420-JUD-01-00-EN.pdf
[290] Ibid, para.204.

Later in the *Costa Rica v. Nicaragua* case[291], ICJ again held that for a state to fulfil its obligation to exercise due diligence in preventing significant transboundary environmental harm, the state must, before embarking on an activity having the potential to affect the environment of another state, ascertain if there is a risk of significant transboundary harm, which would trigger the requirement to carry out an environmental impact assessment[292].

Even though both these decisions address the transboundary harm, the ITLOS in its Advisory Opinion from 2011[293] noted that although the ICJ in the *Argentina v. Uruguay* case provided reasoning in a transboundary context, the language used was broad enough to apply it to activities with an impact on the environment in an area beyond national limits of national jurisdiction; the reference to "shared resources" may also apply to resources that are the common heritage of mankind[294].

Consequently, the abovementioned decisions, which alongside international conventions and customs are the sources of international law[295], established the states' obligation to conduct EIA before permitting or engaging in activities likely to affect the marine environment, even if such activities are conducted beyond the limits of national jurisdiction. At the same time, states enjoy wide discretion in the adoption of domestic laws and procedures for the EIA on a national level, as there are no specific international rules in this regard.

The same as MSP, the EIA must be area-based and take into account various factors, from the scale of MREIs development to the geographical characteristics of surrounding ecosystems. As was discussed in Chapter 2, the anthropogenic impacts of marine renewable energy development vary and may include acoustic and electromagnetic emission, alterations in ocean conditions (waves, tides, currents, wind), modification of habitats, changes in species' behaviour and others[296]. Therefore, the assessment of an area should be case-specific and should take into account all relevant aspects.

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[291] Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica), Judgment, I.C.J. Reports 2015. Available at: https://www.icj-cij.org/public/files/case-related/150/150-20151216-JUD-01-00-EN.pdf

[292] Ibid, para.104.

[293] Responsibilities and obligations of States with respect to activities in the Area (Request for Advisory Opinion Submitted to the Seabed Disputes Chamber), Advisory Opinion, 1 February 2011, ITLOS Reports 2011. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/17_adv_op_010211_en.pdf

[294] Ibid, p. 10.

[295] Statute of the International Court Of Justice, 26 June 1945, art.38. Available at: https://www.icj-cij.org/en/statute

[296] Yates, Katherine L., and Corey JA Bradshaw, eds. *Offshore energy and marine spatial planning*. Routledge, 2018: 136-157.

Overall, it appears that both MSP and EIA beyond national jurisdiction would be crucial for the implementation of sustainable ocean governance, conflict mitigation and environmental protection and preservation. Even though the initiatives for the creation of transnational MSP would take a lot of time and effort to achieve definitive results, yet the process has begun and the importance of efficient space distribution has been recognized by the international community. The lessons learnt by the EU member states and other countries could potentially become a driver for the international decision-making and stimulate the establishment of transnational MSP mechanisms.

Noticeably, while international law of the sea treaties do not mention MSP, UNCLOS fixes a crucial element of the planning process, the obligation to conduct EIA. Moreover, by the judicial decisions of ICJ and ITLOS, the performance of EIA was expressly found imperative even if the activities are conducted beyond the national jurisdiction of the states. However, a major challenge for the effective MSP implementation and control of EIA obligation compliance is the lack of a universal regulatory authority that would act as a mediator between competing interests of different sea uses and would coordinate the work towards the adoption of transnational MSP.

3.3. International authority governing marine renewable energy beyond national jurisdiction

The need for a centralized authority responsible for the administration and control of the MREIs deployment on the high seas was repeatedly mentioned throughout this research from different perspectives. Such an international body could be established based on the existing models of international organisations with a mandate in marine waters, as well as it could be an existing international organization that would be trusted with the functions of marine renewable energy management in ABNJ[297].

In order to maintain the freedom of the high seas, assure compliance with the suggested flag state regime and prevent the abuse of rights and freedoms by the states deploying MREIs beyond national jurisdiction, this activity would need to be overseen by the impartial party in the face of an international organization. Unlike in shipping, where additional compliance instrument is ensured by the port state control, there are no such controlling mechanisms available for the marine renewable

[297] Fischer, Felix. "Offshore Wind in High Seas Unlimited potential beyond national control?", *Chatham Partners* (2019): 19.

energy development as installations remain stationary in one area[298]. Moreover, to develop and implement MSP and ensure the performance of EIA, it is essential to have a forum for action coordination and periodic review of the planning decisions. Taking into account the rapid growth of ocean industries, it is crucial to have a mechanism for conflict moderation that would involve stakeholders from all engaged sectors. It would also facilitate the allocation of MREIs to ensure safety, security and environmental protection.

Some authors, namely Lund[299] and Hutchins[300], suggest that a model of the International Seabed Authority (ISA) could be used as a reference for the creation of a new international body with a mandate in marine renewable energy management. Indeed, it seems that gained experience and lessons learnt from the ISA establishment could be reflected in the high seas renewable energy authority. At the same time, the ISA model would need to be significantly altered, changing the focus from the seabed and subsoil resources to the energy generation from renewable sources (wind, waves, tides, heat etc.).

According to UNCLOS, the ISA is the organization that organises, carries out and controls the exploration and exploitation of resources in the Area on behalf of and for the benefit of mankind as a whole[301]. The benefit of mankind means that activities in the Area should be carried out in such a way as to benefit nations irrespective of the geographical location of states, whether coastal or land-locked, and taking into particular consideration the interests and needs of developing states and peoples who have not attained full independence or other self-governing status recognised by the UN. The ISA is required to provide for the equitable sharing of financial and other economic benefits derived from the activities in the Area through any appropriate mechanism on a non-discriminatory basis[302]. For this purpose, UNCLOS introduces a so-called "parallel system" where those states willing to conduct activities in the Area are required to submit their application to the ISA covering two mining sites of an equal estimated value[303]. One site is subject to approval and exploration by the applicant state, and the other would become a reserved area where activities

[298] Elsner, Paul, and 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." *Energy policy* 128 (2019): 925.
[299] Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 122.
[300] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 510.
[301] UNCLOS, art.153.
[302] Ibid, art.140.
[303] Churchill, Robin Rolf, and Alan Vaughan Lowe. *The law of the sea*. Manchester University Press, 1999: 229.

would be conducted by the Enterprise, the commercial arm of the ISA, or in association with developing states, thereby fulfilling its "benefit of mankind" objective[304].

The activities can only be carried out in accordance with a formal written plan of work, which could also be in the form of a contract[305]. The Authority is enabled to exercise necessary control over the activities in the Area for the purpose of securing compliance with the relevant provisions of UNCLOS, rules, regulations and procedures of ISA and the plans of approved work. States are expected to assist the ISA by taking all necessary measures to ensure compliance[306]. Furthermore, the Authority has a right to take any measures at any time to ensure compliance with its provisions, exercise the functions of control and regulation assigned to it, and has a right to inspect all installations used in connection with the activities in the Area[307].

The ISA may carry out marine scientific research concerning the Area and its resources and may enter into contracts for that purpose. It should promote and encourage the conduct of marine scientific research and should coordinate and disseminate the results of such research when available[308]. Moreover, the Authority is enabled to acquire technology and scientific knowledge relating to activities in the Area, and to promote and encourage the transfer to developing states of such technology and scientific knowledge for all state parties to benefit from them[309].

As for the environmental protection, aside from already mentioned UNCLOS provisions in this regard, the ISA is required to adopt appropriate rules, regulations and procedures for the preservation, reduction and control of pollution and other hazards to the marine environment, protection and conservation of the natural resources of the Area and the prevention of damage to the flora and fauna[310]. Furthermore, the ISA is obliged to apply the precautionary approach and control its application by the sponsoring states when conducting activities in the Area[311]. Although this approach is not expressly mentioned in UNCLOS, considering the multiple environmental protection provisions in the Convention, as was noted in the judge's separate opinion in the *Southern Bluefin Tuna* case, "it cannot be denied that UNCLOS adopts precautionary approach"[312].

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[304] UNCLOS, Annex III, art.8.
[305] Ibid, art.153(3).
[306] Ibid, art. 153(4).
[307] Ibid, art.153(5).
[308] Ibid, art.143(2).
[309] Ibid, art.144(1).
[310] Ibid, art.145.
[311] Jaeckel, Aline L. *The International Seabed Authority and the precautionary principle: balancing deep seabed mineral mining and marine environmental protection*. Brill, 2017: 134.
[312] Separate Opinion of Judge Laing in the Southern Bluefin Tuna (New Zealand v. Japan; Australia v. Iapan), Provisional Measures, Order of 27 August 1999, ITLOS Reports 1999: para.17. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_3_4/published/C34-O-27_aug_99-SO_L.pdf

Moreover, in the ITLOS Advisory Opinion it was found that according to the ISA Mining Code, namely the Nodules Regulations and Sulphides Regulation, the sponsoring states and the Authority itself are under obligation to apply a precautionary approach as reflected in Principle 15 of the Rio Declaration, therefore transforming the non-binding statement of the Declaration into a binding obligation[313]. It is also expected that the ISA will either repeat or further develop this approach when regulating exploitation activities and activities involving other types of minerals[314]. It was highlighted by the ITLOS that the precautionary approach is an integral part of the general obligation of due diligence, which goes even outside the scope of the Regulations[315]. Same as in the case of the obligation to conduct EIA, the precautionary approach could be considered a part of customary international law[316].

Notably, it is yet to be determined whether the ISA model is effective in practice since all authorised deep-sea mining activities in the Area are on the exploration stage and there are no contracts issued by the Authority for the commercial-scale exploitation[317].

Overall, the abovementioned considerations could be taken into account when establishing international authority for marine renewable energy management. Some provisions, such as ones regarding control enforcement, scientific research, transfer of technology and environmental protection, in particular the application of the precautionary principle, would be especially valuable to reflect the function of high seas renewable energy development as a common good. However, it is impossible for the ISA model to be undeniably fitting for the marine renewable energy sector. Some aspects do not seem particularly suitable, namely the "parallel system", which is the core idea established to fulfil the ISA's mission to benefit mankind as a whole. Productive areas for the renewable energy generation from wind, wave and tides are easier to locate compared to the productive seabed mining sites, therefore obliging states to conduct exploration in two areas, for one to be reserved, does not appear economically viable and practically necessary, taking into account that marine renewable energy development is a benefit of mankind in itself[318]. Moreover, since the specificities of the exploitation of seabed resources and renewable ocean resources are drastically different, their policies and permitting processes have to be accordingly adjusted. Therefore, a

[313] Responsibilities and obligations of States with respect to activities in the Area, Advisory Opinion, 1 February 2011, ITLOS Reports 2011: paras.125-127.
[314] Ibid, para.130.
[315] Ibid, para 131.
[316] Ibid, para 135.
[317] International Seabed Authority, The Mining Code. Available at: https://www.isa.org.jm/mining-code
[318] Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 124.

hybrid approach seems the most appropriate, as it would reflect the best ISA practices and incorporate methods developed specifically for marine renewable energy regulation.

Worth highlighting once again that ISA itself cannot manage marine renewable energy development as it was created with the purpose of controlling activities in the Area. Since MREIs do not operate in the Area and do not exploit seabed and subsoil resources, the ISA cannot exercise its power and functions over them. Moreover, in order to entrust ISA with the high seas renewable energy management the necessary changes must be implemented to the UNCLOS provisions on the powers and functions of the Authority. The amount of time, economic and diplomatic efforts needed for the amendments to be made does not appear reasonable, especially considering the primary purpose of the establishment of this organisation.

In the literature also could be found considerations on the adaption of high seas fisheries model to the potential marine renewable energy authority[319]. However, this approach seems inadequate for the MREIs management considering the following factors. Firstly, regulatory authorities for high sea fishing are the Regional Fisheries Management Organizations (RFMOs) as provided in UNCLOS[320], which mostly failed to prove their effectiveness in practice[321]. Due to the fragmentation, lack of enforcement and absence of a strong regulatory framework, RFMOs could rather serve as an example of unproductive management mechanisms leading to the overexploitation of common resources[322]. Secondly, a lack of a centralized authority may hinder global cooperation and may become a significant challenge for coordinated high seas energy development.

Importantly, due attention deserves an idea of conferring management of marine renewable energy development in ABNJ to an existing international organization. A good example of such an organization could be the International Renewable Energy Agency (IRENA)[323]. IRENA is an organization that promotes the widespread and increased adoption of the sustainable use of all forms of renewable energy, including wind, tidal, wave and ocean thermal energy[324]. Having much more

[319] Ibid, 121; Elsner, Paul, and 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." *Energy policy* 128 (2019): 926.
[320] UNCLOS, art.118.
[321] Green, Jessica F., and Bryce Rudyk. "Closing the high seas to fishing: A club approach." *Marine Policy* 115 (2020): 2; Cullis-Suzuki, Sarika, and Daniel Pauly. "Failing the high seas: a global evaluation of regional fisheries management organizations." *Marine Policy* 34, no. 5 (2010): 1042.
[322] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 503.
[323] Pérez, Enrique J. Martínez. "The environmental legal framework for the development of Blue Energy in Europe." In *The Future of the Law of the Sea*, pp. 127-144. Springer, Cham, 2017: 142.
[324] Statute of the International Renewable Energy Agency (IRENA), Conference on the Establishment of the International Renewable Energy Agency, Bonn, 26 January 2009, arts. II-III. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/About-

limited powers in comparison to the ISA, IRENA acts as an advisor and facilitator for member states and performs analyses of current renewable energy practices, initiates discussions and encourages research[325]. However, if given more authority, the Agency could become a primary management centre for marine renewable energy development in ABNJ after the emergence of such practice, at least until it would be found necessary to establish a separate specialized international authority.

Moreover, it is important to discuss the *Intergovernmental Conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ)*, which was convened by the UN General Assembly in its Resolution 72/249[326], and whether the Conference could affect the high seas renewable energy regulation or encourage further discussions on this topic. At present, three sessions of the Conference were held and the fourth one was postponed to 2022 due to the COVID-19 pandemic situation[327].

The purpose of the legally-binding instrument is to address the gaps in UNCLOS regulation with regard to marine biodiversity preservation in ABNJ. Such gaps include, for instance, the lack of environmental principles incorporated in the Convention, such as ecosystem-based approach and precautionary principle; no universal standards for the implementation of environmental impact assessment (EIA), marine protected areas (MPAs) and marine spatial planning (MSP); deficiency in controlling, monitoring and enforcement mechanisms; no specific rules for the regulation of present and future ocean activities with effect on the marine environment; and others[328].

The current revised draft text of the BBNJ agreement contains provisions on the marine genetic resources, including questions on sharing of benefits; measures such as area-based management tools, including MPAs; environmental impact assessments; and capacity-building and transfer of marine technology[329]. There are several points worth highlighting.

IRENA/Statute/IRENA_FC_Statute_signed_in_Bonn_26_01_2009_incl_declaration_on_further_authentic_versions.pdf ?la=en&hash=635C494208DD405EA8CD2BDB04414FECD40F55F1

[325] Ibid, art. IV.

[326] UNGA, Resolution 72/249. International legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/RES/72/249, 24 December 2017.

[327] General Assembly decision 75/570 to postpone the fourth session of the Conference (provisionally available as A/75/L.69), A/75/L.96, 9 June 2021. 1.Available at: https://www.undocs.org/en/A/75/L.96

[328] Druel, Elisabeth, and Kristina M. Gjerde. "Sustaining marine life beyond boundaries: options for an implementing agreement for marine biodiversity beyond national jurisdiction under the United Nations Convention on the Law of the Sea." *Marine Policy* 49 (2014): 92.

[329] UNGA, Revised draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/CONF.232/2020/3, 23 March–3 April 2020. Available at: https://undocs.org/en/a/conf.232/2020/3

Firstly, the inclusion of provisions on the area-based management tools, including MPAs, could be considered as a significant contribution to the high seas MSP development. Starting with MPAs in ABNJ, conflicts of uses and environmental harm could be avoided with further spatial distributions in relation to other ocean activities, designating specific areas for each sector. The Parties agreed that the areas requiring protection through the establishment of area-based management tools, including MPAs, should be identified on the basis of the best available scientific information, the precautionary principle and ecosystem-based approach[330]. However, there is still no consensus on crucial issues, such as the procedures of identification, establishment, monitoring and reviewing of area-based management tools, and the bodies, whether global, regional or sectoral, that would be performing these functions[331].

Secondly, the draft of the BBNJ agreement contains the obligation for the states to conduct the EIA of all activities that have an impact in ABNJ. The EIA provisions will constitute the global minimum standards and the agreement will include the list of activities requiring or not requiring EIA, which would be regularly updated by the Conference of the Parties[332].

Thirdly, the provisions on capacity-building and transfer of marine technology promote that all state parties should be able to exercise their rights and fulfil obligations with respect to conservation and sustainable use of the BBNJ. Capacity-building and technology transfer are essential elements for the achievement of objectives under the BBNJ agreement[333]. It will allow developing states to enjoy their rights and ensure that they have the capacity to develop, implement, monitor and manage any area-based management tools, including MPAs, as well as to conduct and evaluate environmental impact assessments[334]. However, there are still discussions on what basis capacity-building and technology transfer should be provided, mandatory or voluntary[335]. As for marine renewable energy technology, it is conceivable that the capacity-building and marine technology transfer could potentially accelerate the development of marine renewable energy in ABNJ and encourage the implementation of the best available practices and technological advancements in the deployment of offshore installations globally.

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[330] Ibid, art.16.
[331] Humphries, Fran, and Harriet Harden-Davies. "Practical policy solutions for the final stage of BBNJ treaty negotiations." *Marine policy* 122 (2020): 3.
[332] UNGA, Revised draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, arts.23, 29.
[333] Ibid, art.44.
[334] Ibid, art.42.
[335] Humphries, Fran, and Harriet Harden-Davies. "Practical policy solutions for the final stage of BBNJ treaty negotiations." *Marine policy* 122 (2020): 3.

Lastly, worth mentioning the institutional arrangements under the BBNJ agreement. There are four principal organs established under the draft treaty: the Conference of the Parties (decision-making body), Scientific and Technological Body, Secretariat and Clearing-house mechanism that would deal with compliance, capacity-building and transfer of marine technology[336]. At present, however, their functions and powers necessary to achieve the objectives under the BBNJ agreement still remain the subject of the debate between parties[337].

Overall, even though the BBNJ agreement does not raise the topic of marine renewable energy generation, mentioned provisions would nevertheless apply to MREIs as the issues of environmental conservation, including MPAs, environmental impact assessments, and capacity-building and transfer of marine technology are inevitably connected to offshore renewable energy development.

Additionally, on condition that the international community will recognize the topic as one requiring closer attention, the high seas renewable energy development could become an independent topic for discussions under the auspices of the UN, where the adoption of a legal instrument, whether binding or non-binding, on marine renewable energy management in ABNJ could be negotiated[338].

In summary, it appears that there certainly would be the need for a centralized authority responsible for the administration and control of the MREIs deployment on the high seas. For that reason, a new international body could be created, applying the knowledge and experience acquired through the work of other organizations with a mandate in ABNJ, especially the ISA. The ISA model would seem to be particularly helpful in matters concerning controlling mechanisms, enforcement capacity, scientific research, transfer of technology, environmental protection and precautionary approach. However, the ISA model cannot fit the marine renewable energy sector completely. Therefore, a hybrid approach that would reflect the best ISA practices and incorporate various methods developed specifically for marine renewable energy regulation seems the most appropriate. Alternatively, instead of the creation of a new authority, marine renewable energy management could be conferred to an existing international organization, namely IRENA. However, for an effective exercise of its functions, IRENA would need more powers and enforcement

[336] UNGA, Revised draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, Part VI.
[337] Clark, Nichola A. "Institutional arrangements for the new BBNJ agreement: Moving beyond global, regional, and hybrid." *Marine Policy* 122 (2020): 3.
[338] Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 512.

capacity. Until then, the Agency could only act as an advisory body not able to impose any binding obligations on the member states. Lastly, the high seas renewable energy regulation is likely to be affected by the *Intergovernmental Conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ)*. Additionally, provided that the international community will recognize the topic as one requiring closer attention, the discussions with respect to marine renewable energy generation in ABNJ and its potential administrative body could be raised at the separate international conference under the auspices of the UN.

CONCLUSIONS AND RECOMMENDATIONS

1. The main international legal instruments applicable to marine renewable energy development in ABNJ, while not expressly providing specific rules on the matter, are still flexible in implementation and could be adaptive, where possible, to the rapidly changing industries due to the general and broad formulation of provisions. It appears, however, that the existing regulations alone would not be sufficient for marine renewable energy management on the high seas since none of the treaties provides comprehensive rules for deployment and operation of MREIs beyond national jurisdiction and none adequately addresses matters concerning jurisdiction and ownership, conflict of uses or environmental implications of such development. Therefore, there is a need for the adoption of additional regulatory mechanisms.

2. When considering marine renewable energy development in ABNJ it is important to examine such aspects as matters concerning jurisdiction and ownership, conflicts of uses, and MREIs' environmental impacts, which are not adequately addressed in international law with regard to such development. Firstly, the issues of jurisdiction and ownership are rather vaguely, if at all, addressed in UNCLOS, referring high seas installations to EEZ provisions. Due to the differences in these regimes, it is unclear how a connection between the beneficial owner state and high seas installation could be established. Such a connection would be crucial to ensure the exercise of effective jurisdictional control, compliance with international rules and standards and responsibility allocation of the state. Secondly, marine renewable energy generation in ABNJ may trigger conflicts with other uses such as navigation, fishing, activities in the Area and environmental preservation. These potential conflicts, if not timely addressed, are likely to cause safety risks, liability issues and negative impacts on the environment. Therefore, cooperation between these sectors, marine spatial management and different multi-use options would be essential. Thirdly, marine renewable energy development in ABNJ may influence marine environmental protection and may potentially cause space conflict with areas designated for conservation purposes, namely MPAs. The UNCLOS provisions on protection and preservation of marine environment would be inevitably applicable to MREIs, although more specific and comprehensive environmental rules and standards would be needed for ABNJ in general and high seas renewable energy generation in particular. As of now, the first steps towards comprehensive ABNJ governance were made through the establishment of the Intergovernmental Conference on an international legally binding instrument under UNCLOS on the

conservation and sustainable use of marine biological diversity, which is most likely to also affect the regulation of MREIs deployment on the high seas.

3. In order to reduce legal uncertainties and promote efficient ocean governance, it seems necessary to adopt additional regulatory mechanisms for marine renewable energy development beyond national jurisdiction. Potential approaches to the high seas MREIs regulation are the application of the flag state principle, marine spatial planning, environmental impact assessment, and creation of specialized international authority or delegation of regulatory functions to an existing international organization. The application of the flag state principle to the marine renewable energy generation in ABNJ would establish a link between the beneficial owner state and installation, would serve as a legal ground for the exercise of the state's jurisdictional control and would aid the allocation of responsibility of the state authorising or engaging in energy generation activities. While other issues, such as the flags of convenience and inadequate jurisdictional control of the flag state may potentially emerge from this regime, it is worth considering the application of a genuine link approach and the implementation of monitoring and surveillance mechanisms to MREIs as the means of their prevention and reduction. Marine spatial planning (MSP) could be regarded as a valuable instrument for the implementation of sustainable marine governance and an effective tool for the distribution of marine spaces between different uses. The environmental impact assessment (EIA) is inseparable from MSP, and it is essential for the identification of potential environmental impacts and the prevention or reduction of the negative consequences of such impacts. Finally, in order to maintain the freedom of the high seas, assure compliance with the suggested flag state regime and prevent the abuse of rights and freedoms by the states deploying MREIs beyond national jurisdiction, this activity would need to be overseen by the impartial party in the face of an international organization. A new international body could be established based on the existing models of international organisations, such as ISA, or it could be an existing international organization that would be entrusted with the functions of marine renewable energy management in ABNJ.

LIST OF BIBLIOGRAPHY

INTERNATIONAL LEGAL INSTRUMENTS

1. 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (as amended in 2006). Available at: https://www.epa.gov/sites/default/files/2015-10/documents/lpamended2006.pdf

2. Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea, 10 December 1982, A/RES/48/263, 17 August 1994. Available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/closindxAgree.htm

3. Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention), 10 June 1995. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31970/bcp2019_web_eng.pdf

4. Conference of the Parties to the Convention on Biological Diversity, Decision VII/5. Marine and coastal biological diversity, UNEP/CBD/COP/DEC/VII/5, 13 April 2004. Available at: https://www.cbd.int/doc/decisions/cop-07/cop-07-dec-05-en.pdf

5. Convention for the Protection of the Marine Environment of the North-East Atlantic 1992 (OSPAR Convention). Available at: https://www.ospar.org/site/assets/files/1290/ospar_convention-1.pdf

6. Convention on Fishing and Conservation of the Living Resources of the High Seas 1958. Available at: https://www.gc.noaa.gov/documents/8_1_1958_fishing.pdf

7. Convention on the High Seas 1958. Available at: https://www.legal-tools.org/doc/7b4abc-1/pdf/

8. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention). Available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/LC1972.pdf

9. Decision IG 17/6, "Implementation of the ecosystem approach to the management of human activities that may affect the Mediterranean marine and coastal environment", UNEP(DEPI)/MED IG. 17/10. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/7287/08ig17_10_annex5_17_06_eng.pdf

10. IMO Resolution A.671(16) Safety Zones and Safety of Navigation Around Offshore Installations and Structures, adopted on 19 October 1989. Available at:

https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.671(16).pdf

11. IMO Resolution A.672(16) Guidelines and Standards for the Removal of Offshore Installations and Structures on the continental shelf and in the exclusive economic zone, adopted on 19 October 1989. Available at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.672(16).pdf

12. International Law Commission, Draft articles on Prevention of Transboundary Harm from Hazardous Activities with commentaries, UN Doc A/56/10, 2001. Available at: https://legal.un.org/ilc/texts/instruments/english/commentaries/9_7_2001.pdf

13. OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations, Ministerial Meeting of the OSPAR Commission Sintra, 22-23 July 1998. Available at: https://www.ospar.org/documents?v=6875

14. Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol), 10 June 1995. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31970/bcp2019_web_eng.pdf?sequence=1&isAllowed=y

15. Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (Dumping Protocol), 16 February 1976. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/31970/bcp2019_web_eng.pdf

16. Statute of the International Court of Justice, 26 June 1945. Available at: https://www.icj-cij.org/en/statute

17. Statute of the International Renewable Energy Agency (IRENA), Conference on the Establishment of the International Renewable Energy Agency, Bonn, 26 January 2009. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/About-IRENA/Statute/IRENA_FC_Statute_signed_in_Bonn_26_01_2009_incl_declaration_on_further_authentic_versions.pdf?la=en&hash=635C494208DD405EA8CD2BDB04414FECD40F55F1

18. UNGA, Resolution 72/249. International legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/RES/72/249, 24 December 2017. Available at: https://undocs.org/en/a/res/72/249

19. United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397. Available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

20. United Nations General Assembly (UNGA), Resolution 69/292. Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/RES/69/292, 19 June 2015. Available at: https://undocs.org/en/a/res/69/292

EUROPEAN UNION LAW

1. Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) (Text with EEA relevance), OJ L 164, 25.6.2008. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0056

2. 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, 28.8.2014. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089

3. European Parliament resolution of 7 July 2021 on the impact on the fishing sector of offshore wind farms and other renewable energy systems (2019/2158(INI)). Available at: https://www.europarl.europa.eu/doceo/document/TA-9-2021-0338_EN.html

4. Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "International ocean governance: an agenda for the future of our oceans", JOIN/2016/049 final, Brussels, 10.11.2016. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=JOIN:2016:49:FIN

OFFICIAL PUBLICATIONS

1. Competencies of the International Seabed Authority and the International Maritime Organization in the context of activities in the Area, ISA Technical Study No.25 (2019). Available at: https://isa.org.jm/files/files/documents/Technical%20Study%2025.pdf

2. European MSP Platform, MSP Platform Conflict Fiche 5: Offshore wind and commercial fisheries. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/5_offshore_wind_fisheries.pdf

3. General Assembly decision 75/570 to postpone the fourth session of the Conference (provisionally available as A/75/L.69), A/75/L.96, 9 June 2021. Available at: https://www.undocs.org/en/A/75/L.96

4. IALA Recommendation O-139 on The Marking of Man-Made Offshore Structures, Edition 2, December 2013. Available at: https://vasab.org/wp-content/uploads/2018/06/2013_IALA_Marking-of-Man-Made-Offshore-Structures.pdf

5. International Hydrographic Organization (IHO). "A Manual on Technical Aspects of the United Nations Convention on the Law of the Sea–1982 (TALOS)." Special Publication No. 51, 4th edition (2006). Available at: https://www.gc.noaa.gov/documents/gcil_iho_tech_aspects_los.pdf

6. IRENA (2020), Fostering a blue economy: Offshore renewable energy, International Renewable Energy Agency, Abu Dhabi. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Fostering_Blue_Economy_2020.pdf

7. IRENA (2020), Innovation outlook: Ocean energy technologies, International Renewable Energy Agency, Abu Dhabi. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Innovation_Outlook_Ocean_Energy_2020.pdf

8. Marine Scotland Consenting and Licensing Guidance for Offshore Wind, Wave and Tidal Energy Applications, 15 Oct 2018. Available at: https://www.gov.scot/publications/marine-scotland-consenting-licensing-manual-offshore-wind-wave-tidal-energy-applications/

9. OSPAR Commission, "ICG-MSFD Work Plan 2017–2020", 2017.

10. OSPAR Commission, "OSPAR regional plan to improve adequacy and coherence of MSFD implementation 2014-2018: Version 10 December 2014", 2014. Available at: https://www.ospar.org/site/assets/files/33141/ospar_regional_plan_action_msfd_imp-1.pdf

11. OSPAR Commission, Assessment of the environmental impact of offshore windfarms (2008): https://www.ospar.org/documents?v=7114

12. OSPAR Commission, Assessment of the environmental impact of underwater noise (2009): https://qsr2010.ospar.org/media/assessments/p00436_JAMP_Assessment_Noise.pdf

13. OSPAR Commission, Assessment of the environmental impacts of cables (2009): https://qsr2010.ospar.org/media/assessments/p00437_Cables.pdf

14. OSPAR Commission. OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development, Reference number 2008-3 (2008).

15. Regulations of the International Hydrographic Organization (IHO) for International (INT) Charts and Chart Specifications of the IHO, Edition 4.9.0, March 2021. Available at: https://iho.int/uploads/user/pubs/standards/s-4/S4_V4-9-0_March_2021.pdf

16. Report of the International Law Commission to the General Assembly, Document A/3159, Report of the International Law Commission covering the work of its eighth session, 23 April—4 July 1956, Yearbook of the International Law Commission, Volume II, 1956. Available at: https://legal.un.org/ilc/publications/yearbooks/english/ilc_1956_v2.pdf

17. The 2nd International Conference on Marine/Maritime Spatial Planning, 15–17 March 2017, UNESCO, Paris, Intergovernmental Oceanographic Commission and European Commission – DGMARE 2017 (English) (IOC Workshop Reports Series, 279). Available at: https://www.mspglobal2030.org/wp-content/uploads/2020/04/mspconf2017_finalreport.pdf

18. The Directorate General for Maritime Affairs and Fisheries of the European Commission, (DG MARE) and the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO), "Joint Roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide (MSP)", 2nd International Conference on Marine/Maritime Spatial Planning, Paris UNESCO HQ, 15-17 March 2017. Available at: https://www.mspglobal2030.org/wp-content/uploads/2019/04/Joint_Roadmap_MSP.pdf

19. UN Environment, Regional Seas programmes covering Areas Beyond National Jurisdictions, Regional Seas Reports and Studies No.202 (2017). Available at: https://www.un.org/Depts/los/biodiversityworkinggroup/Regional_seas_programmes_ABNJ.pdf

20. United Nations Environment Programme Coordinating Unit for the Mediterranean Action Plan, "Support to the Barcelona Convention for the Implementation of the Ecosystem Approach, Including the Establishment of MPAs in Open Seas Areas, Including Deep Sea", Contribution Agreement N°21.0401/2008/519114/SUB/D2, Final Report (2012). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/649/SBCI_ECAP_FinalReport.pdf?sequence=1&isAllowed=y

21. United Nations General Assembly (UNGA), Revised draft text of an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, A/CONF.232/2020/3, 23 March–3 April 2020. Available at: https://undocs.org/en/a/conf.232/2020/3

22. United Nations General Assembly Official Records, 22nd Session, 1515th meeting, U.N. Doc. A/6695 (Nov. 1, 1967). Available at: https://www.un.org/depts/los/convention_agreements/texts/pardo_ga1967.pdf

23. Van Hoey, G., Bastardie, F., Birchenough, S., De Backer, A., Gill, A., de Koning, S., Hodgson, S., Mangi Chai, S., Steenbergen, J., Termeer, E., van den Burg, S., Hintzen, N., "Overview of the effects of offshore wind farms on fisheries and aquaculture", Publications Office of the European Union, Luxembourg, 2021.

CASE LAW

1. Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica), I.C.J. Reports 2015, Judgment of 16 December 2015. Available at: https://www.icj-cij.org/public/files/case-related/150/150-20151216-JUD-01-00-EN.pdf

2. ITLOS Reports of Judgments, Advisory Opinions and Orders. Request for an Advisory Opinion Submitted by the Sub-Regional Fisheries Commission (SRFC) (Request for Advisory Opinion Submitted To The Tribunal), List of cases: No. 21, 2 April 2015. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.21/advisory_opinion_published/2015_21-advop-E.pdf

3. Publications of the Permanent Court of International Justice, Judgment No.9 – The Case of the S.S. "Lotus", Series A.-No.10, September 7th, 1927. Available at: https://www.icj-cij.org/public/files/permanent-court-of-international-justice/serie_A/A_10/30_Lotus_Arret.pdf

4. Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010. Available at: https://www.icj-cij.org/public/files/case-related/135/135-20100420-JUD-01-00-EN.pdf

5. Responsibilities and obligations of States with respect to activities in the Area (Request for Advisory Opinion Submitted to the Seabed Disputes Chamber), Advisory Opinion, 1 February 2011, ITLOS Reports 2011. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/17_adv_op_010211_en.pdf

6. Separate Opinion of Judge Laing in the Southern Bluefin Tuna (New Zealand v. Japan; Australia v. Japan), Provisional Measures, Order of 27 August 1999, ITLOS Reports 1999. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_3_4/published/C34-O-27_aug_99-SO_L.pdf

BOOKS AND JOURNAL ARTICLES

1. Albotoush, Reda, and Aileen Tan Shau-Hwai. "An authority for marine spatial planning (MSP): A systemic review." *Ocean & Coastal Management* 205 (2021): 1-9.

2. Ardron, Jeff, Kristina Gjerde, Sian Pullen, and Virginie Tilot. "Marine spatial planning in the high seas." *Marine Policy* 32, no. 5 (2008): 832-839.

3. Ashley, M. C., S. C. Mangi, and L. D. Rodwell. "The potential of offshore windfarms to act as marine protected areas–A systematic review of current evidence." *Marine Policy* 45 (2014): 301-309.

4. Banet, Catherine, Alexandra Wawryk, and Eduardo Pereira. "Regional Seas Conventions and Decommissioning." (2020): 47-74.

5. Blanchard, Catherine. "Fragmentation in high seas fisheries: preliminary reflections on a global oceans governance approach." *Marine Policy* 84 (2017): 327-332.

6. Boczek, Boleslaw Adam. *Flags of Convenience: An International Legal Study*, Cambridge: Harvard University Press, 1962.

7. Castelos, Montserrat Abad. "The black sea and blue energy: Challenges, opportunities and the role of the European union." In *The Future of the Law of the Sea*. Springer, Cham, 2017: 145-161.

8. Churchill, Robin Rolf, and Alan Vaughan Lowe. *The law of the sea*. Manchester University Press, 1999.

9. Churchill, Robin Rolf, and Christopher Hedley. "The Meaning of the" Genuine Link" Requirement in relation to the Nationality of Ships." (2000).

10. Clark, Nichola A. "Institutional arrangements for the new BBNJ agreement: Moving beyond global, regional, and hybrid." *Marine Policy* 122 (2020).

11. Copping, Andrea. "The state of knowledge for environmental effects: Driving consenting/permitting for the marine renewable energy industry." *Report by Pacific Northwest National Laboratory (PNNL)* (2018): i-25.

12. Cremers, Klaudija, Glen Wright, and Julien Rochette. "Strengthening monitoring, control and surveillance of human activities in marine areas beyond national jurisdiction: Challenges and opportunities for an international legally binding instrument." *Marine Policy* 122 (2020).

13. Cullis-Suzuki, Sarika, and Daniel Pauly. "Failing the high seas: a global evaluation of regional fisheries management organizations." *Marine Policy* 34, no. 5 (2010): 1036-1042.

14. Detweiler Jr, George H. *Offshore renewable energy installations: impact on navigation and marine safety*. Coast Guard Washington DC Marine Transportation Systems Management Directorate, 2011.

15. Druel, Elisabeth, and Kristina M. Gjerde. "Sustaining marine life beyond boundaries: options for an implementing agreement for marine biodiversity beyond national jurisdiction under the United Nations Convention on the Law of the Sea." *Marine Policy* 49 (2014): 90-97.

16. Durussel, C., G. Wright, N. Wienrich, B. Boteler, S. Unger, J. Rochette, Carole Durussel, and Glen Wright. "Strengthening Regional Ocean Governance for the High Seas: Opportunities and Challenges to Improve the Legal and In-stitutional Framework of the Southeast Atlantic and Southeast Pacific'." *STRONG High Seas Project* (2018).

17. Ehler, Charles, and Fanny Douvere. "An international perspective on marine spatial planning initiatives." *Environments: a journal of interdisciplinary studies* 37, no. 3 (2010).

18. Elferink, Alex G. Oude. "Coastal states and MPAs in ABNJ: ensuring consistency with the LOSC." *The International Journal of Marine and Coastal Law* 33, no. 3 (2018): 437-466.

19. Elsner, Paul, and 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." *Energy policy* 128 (2019): 919-929.

20. Esmaeili, Hossein. *The legal regime of offshore oil rigs in international law*. Routledge, 2017.

21. Farr, Hayley, Benjamin Ruttenberg, Ryan K. Walter, Yi-Hui Wang, and Crow White. "Potential environmental effects of deepwater floating offshore wind energy facilities." *Ocean & Coastal Management* 207 (2021).

22. Fischer, Felix. "Offshore Wind in High Seas Unlimited potential beyond national control?", *Chatham Partners* (2019).

23. Friess, Bernhard, and Marie Grémaud-Colombier. "Policy outlook: Recent evolutions of maritime spatial planning in the European Union." *Marine Policy* (2019).

24. Gaines, Steven D., Crow White, Mark H. Carr, and Stephen R. Palumbi. "Designing marine reserve networks for both conservation and fisheries management." *Proceedings of the National Academy of Sciences* 107, no. 43 (2010): 18286-18293.

25. Giannopoulos, Nikolaos. "Global environmental regulation of Offshore energy production: Searching for legal standards in Ocean Governance." *Review of European, Comparative & International Environmental Law* 28, no. 3 (2019): 289-303.

26. Gill, Andrew B., Steven Degraer, Andrew Lipsky, Ninon Mavraki, Elizabeth Methratta, and Robin Brabant. "Setting the context for offshore wind development effects on fish and fisheries." *Oceanography* 33, no. 4 (2020): 118-127.

27. Green, Jessica F., and Bryce Rudyk. "Closing the high seas to fishing: A club approach." *Marine Policy* 115 (2020).

28. Hallgren, Axel, and Anders Hansson. "Conflicting Narratives of Deep Sea Mining." *Sustainability* 13, no. 9 (2021).

29. Hamad Bakar Hamad. “Flag of Convenience Practice: A Threat to Maritime Safety and Security.” *IJRDO-Journal of Social Science and Humanities Research*, no. 8, 2016: 207-230.

30. Haugan, Peter M., Lisa A. Levin, Diva Amon, Mark Hemer, Hannah Lily, and Finn Gunnar Nielsen. "What role for ocean-based renewable energy and deep seabed minerals in a sustainable future." *World Resources Institute* (2020). Available at: www.oceanpanel.org/blue-papers/ocean-energy-and-mineral-sources.

31. Hosanee, Nivedita. "A critical analysis of flag state duties as laid down under Article 94 of the 1982 United Nations Convention on the Law of the Sea." *University of Milan* (2008).

32. Hovind, Catharina. "Licensing Offshore Wind Farms." Master's thesis, The University of Bergen, 2019.

33. Hughes, William. *Fundamentals of Oil & Gas Law*. PennWell Books, LLC, 2016.

34. Humphries, Fran, and Harriet Harden-Davies. "Practical policy solutions for the final stage of BBNJ treaty negotiations." *Marine policy* 122 (2020):.

35. Hutchins, Todd Emerson. "Crafting an International Legal Framework for Renewable Energy on the High Seas." *Environmental Law* 51, no. 2 (2021): 485-514.

36. Jaeckel, Aline L. *The International Seabed Authority and the precautionary principle: balancing deep seabed mineral mining and marine environmental protection*. Brill, 2017.

37. Jaeckel, Aline. "Deep seabed mining and adaptive management: the procedural challenges for the International Seabed Authority." *Marine policy* 70 (2016): 205-211.

38. Knappett, J. A., M. J. Brown, H. Aldaikh, S. Patra, C. D. O'Loughlin, S. H. Chow, Christophe Gaudin, and J. T. Lieng. "A review of anchor technology for floating renewable energy devices and key design considerations." In *Frontiers in Offshore Geotechnics III: Proceedings of the 3rd International Symposium on Frontiers in Offshore Geotechnics (ISFOG 2015)*, vol. 1. Taylor & Francis Books Ltd, 2015: 887-892.

39. Koschinsky, Andrea, Luise Heinrich, Klaus Boehnke, J. Christopher Cohrs, Till Markus, Maor Shani, Pradeep Singh, Karen Smith Stegen, and Welf Werner. "Deep-sea mining: Interdisciplinary research on potential environmental, legal, economic, and societal implications." *Integrated environmental assessment and management* 14, no. 6 (2018): 672-691.

40. Kung, Anthony, Kamila Svobodova, Eléonore Lèbre, Rick Valenta, Deanna Kemp, and John R. Owen. "Governing deep sea mining in the face of uncertainty." *Journal of Environmental Management* 279 (2021).

41. Kyriazi, Zacharoula, Frank Maes, and Steven Degraer. "Coexistence dilemmas in European marine spatial planning practices. The case of marine renewables and marine protected areas." *Energy Policy* 97 (2016): 391-399.

42. Leal-Arcas, Rafael, and Andrew Filis. "The fragmented governance of the global energy economy: a legal-institutional analysis." *Journal of World Energy Law and Business* 6, no. 4 (2013): 348-405.

43. Legorburu, Irati, Kate R. Johnson, and Sandy A. Kerr. "Multi-use maritime platforms-North Sea oil and offshore wind: Opportunity and risk." *Ocean & Coastal Management* 160 (2018): 75-85.

44. Lund, Nicholas J. "Renewable energy as a catalyst for changes to the high seas regime." *Ocean & Coastal LJ* 15 (2010): 95-125.

45. Mooney, T. Aran, Mathias H. Andersson, and Jenni Stanley. "Acoustic Impacts of Offshore Wind Energy on Fishery Resources." *Oceanography* 33, no. 4 (2020): 82-95.

46. Nordquist, Myron H., John Norton Moore, Aldo Chircop, and Ronán Long, eds. *The Regulation of Continental Shelf Development: Rethinking International Standards*. Martinus Nijhoff Publishers, 2013.

47. Osmundsen, Petter, and Ragnar Tveterås. "Decommissioning of petroleum installations—major policy issues." *Energy policy* 31, no. 15 (2003): 1579-1588.

48. Pérez, Enrique J. Martínez. "The environmental legal framework for the development of Blue Energy in Europe." In *The Future of the Law of the Sea*. Springer, Cham, 2017: 127-144.

49. Quinn, Tom. "Using floating offshore wind to power oil and gas platforms." *ORE Catapult*, January 2021. Available at: https://ore.catapult.org.uk/wp-content/uploads/2021/01/AI-paper-Floating-wind-for-oil-gas-v02.00.pdf

50. Roach, J. Ashley. "Today's customary international law of the sea." *Ocean Development & International Law* 45, no. 3 (2014): 239-259.

51. Rothwell, Donald R., and Tim Stephens. *The international law of the sea*. Bloomsbury Publishing, 2010.

52. Schupp, Maximilian Felix, Andronikos Kafas, Bela H. Buck, Gesche Krause, Vincent Onyango, Vanessa Stelzenmüller, Ian Davies, and Beth E. Scott. "Fishing within offshore wind farms in the North Sea: Stakeholder perspectives for multi-use from Scotland and Germany." *Journal of Environmental Management* 279 (2021).

53. Soria-Rodríguez, Carlos. "Marine renewable energies and the European regional seas conventions." *Climate Law* 6, no. 3-4 (2016): 314-335.

54. Sumaila, U. Rashid, Vicky WY Lam, Dana D. Miller, Louise Teh, Reg A. Watson, Dirk Zeller, William WL Cheung et al. "Winners and losers in a world where the high seas is closed to fishing." *Scientific reports* 5, no. 1 (2015): 1-6.

55. Tache, Simon W. "The nationality of ships: the definitional controversy and enforcement of genuine link." *The International Lawyer* (1982): 301-312.

56. Thurstan, Ruth H., Katherine L. Yates, and Bethan C. O'Leary. "Compatibility of offshore energy installations with marine protected areas." In *Offshore Energy and Marine Spatial Planning*. Routledge, 2018: 214-230.

57. Toro, Norman, Pedro Robles, and Ricardo I. Jeldres. "Seabed mineral resources, an alternative for the future of renewable energy: A critical review." *Ore Geology Reviews* (2020).

58. Treves, Tullio. "The 1958 Geneva Conventions on the Law of the Sea." *United Nations Audiovisual Library of International Law* (1984).

59. White, Crow, and Christopher Costello. "Close the high seas to fishing?." *PLoS biology* 12, no. 3 (2014).

60. Wright, Glen, Anne Marie O'Hagan, Jiska de Groot, Yannick Leroy, Niko Soininen, Rachael Salcido, Montserrat Abad Castelos, Simon Jude, Julien Rochette, and Sandy Kerr. "Establishing a legal research agenda for ocean energy." *Marine Policy* 63 (2016): 126-134.

61. Wright, Glen. "Marine governance in an industrialised ocean: a case study of the emerging marine renewable energy industry." *Marine Policy* 52 (2015): 77-84.

62. Yates, Katherine L., and Corey JA Bradshaw, eds. *Offshore energy and marine spatial planning*. Routledge, 2018.

63. Young, Michaela. "Building the blue economy: the role of marine spatial planning in facilitating offshore renewable energy development." *The International Journal of Marine and Coastal Law* 30, no. 1 (2015): 148-174.

64. Zaucha, Jacek, and Kira Gee. *Maritime Spatial Planning: past, present, future*. Springer Nature, 2019.

65. Zou, Keyuan, and Lei Zhang. "Implementing the London Dumping Convention in East Asia." *Asia-Pacific Journal of Ocean Law and Policy* 2, no. 2 (2017): 247-267.

WEBPAGES

1. Equinor, Hywind Tampen: The world's first renewable power for offshore oil and gas. Accessed 2021 November 19. Available at: https://www.equinor.com/en/what-we-do/hywind-tampen.html

2. International Maritime Organization, Port State Control. Accessed 2021 November 19. Available at: https://www.imo.org/en/OurWork/IIIS/Pages/Port%20State%20Control.aspx

3. International Seabed Authority, Exploration Contracts. Accessed 2021 November 19. Available at: https://www.isa.org.jm/index.php/exploration-contracts

4. International Seabed Authority, The Mining Code. Accessed 2021 November 19. Available at: https://www.isa.org.jm/mining-code

5. International Seabed Authority, The Mining Code: Draft Exploitation Regulations. Available at: https://isa.org.jm/mining-code/draft-exploitation-regulations

6. International Seabed Authority, The Mining Code: Exploration Regulations. Available at: https://www.isa.org.jm/mining-code/exploration-regulations

7. The United Nations Convention on the Law of the Sea (A Historical Perspective), U.N. OCEANS & L. SEA. Accessed 2021 November 19. Available at: https://www.un.org/depts/los/convention_agreements/convention_historical_perspective.htm#Historical%20Perspective

8. UNEPMAP, The Ecosystem Approach. Accessed 2021 November 19. Available at: https://www.unep.org/unepmap/what-we-do/ecosystem-approach

ABSTRACT

International regulation of marine renewable energy development in areas beyond national jurisdiction faces significant challenges due to the lack of relevant legally-binding rules governing this ocean sector. The main regulatory gaps and uncertainties of the high seas MREIs management are the issues of jurisdiction and ownership, resolution and mitigation of space use conflicts and environmental requirements and implications of energy development. The existing regulations alone would not be able to resolve these matters, therefore new approaches and governing mechanisms must be adopted and implemented. It could be suggested that the application of the flag state principle, marine special planning, environmental impact assessment, and creation of specialized international authority or delegation of regulatory functions to an existing international organization are potentially able to bring clarity in regulation and promote efficient ocean governance with respect to the high seas renewable energy development.

Keywords: marine renewable energy, areas beyond national jurisdiction, the law of the sea, ocean governance, international regulation.

SUMMARY

Thesis on the topic “Marine Renewable Energy in the Areas Beyond National Jurisdiction: International Regulation and Legal Challenges” examines which existing international legal provisions can be applied to the renewable energy installations in ABNJ and what important aspects of the high seas renewable energy development are not addressed, or insufficiently addressed, in international law. The aim of this research is to examine the regulatory uncertainties of marine renewable energy governance in ABNJ and to determine potential approaches to their regulation.

Under Chapter 1 it was discussed which international legal instruments are applicable to marine renewable energy generation on the high seas and whether they are sufficient for its effective regulation. It was concluded that the existing provisions do not expressly provide specific rules on marine renewable energy development in ABNJ. Although flexible in implementation and adaptive to the rapidly changing reality, they would not be sufficient since none provides comprehensive rules for deployment and operation of MREIs beyond national jurisdiction or addresses matters regarding jurisdiction and ownership, conflict of uses or environmental implications of such development.

Matters concerning jurisdiction and ownership, lack of effective mechanisms for space conflicts resolution, and fragmentation of provisions on environmental protection and preservation were thoroughly analyzed in Chapter 2. It was examined how these issues are overall addressed in the international law sources as well as in academic literature. The chapter includes the experience of other ocean sectors that could be useful for the high seas renewable energy regulation. It was established that these issues, if disregarded, may obstruct the achievement of effective ocean governance and lead to harmful political, environmental and economic consequences.

Chapter 3 analyses possible approaches and regulatory mechanisms that need to be implemented to establish a comprehensive regulatory framework for marine renewable energy development beyond national jurisdiction. Those are the application of flag state principle, marine special planning, environmental impact assessment, and the creation of specialized international authority or delegation of these functions to an existing international organization. These measures must be taken through coordinated actions of the international community and with the help of scientific research, technological advancements and regular monitoring, for the indication of potential risks and their timely prevention or mitigation.