- Research Article -

[H] THE LEGAL REGIME FOR MARINE RENEWABLE ENERGY ON THE HIGH SEAS[*]

AÇIK DENİZLERDE DENİZ YENİLENEBİLİR ENERJİSİ İÇİN HUKUKİ REJİM

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ABSTRACT

Renewable energy has typically been developed on land, however there is currently an increasing trend for renewable energy to be developed at sea. States often build marine renewable energy (MRE) units in their maritime zones where they have sovereignty or sovereign rights. As a consequence of technological advancements, the energy perspective has shifted, and states have begun to search for energy resources in areas beyond the national jurisdiction. While the importance of MRE increasing, the overall definition or legal status of these resources remains unclear.

UNCLOS considered freedom of high seas as one of the main principles in the law of the sea. However, it is not sufficient and clear enough when

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it is refers to activities on the high seas. In this sense, the legal status of the MRE units on the high seas will be evaluated within the scope of relevant provisions of the UNCLOS. The link between the freedom to construct artificial islands and other installations and the non-appropriation of the high seas will be explored in the context of the "due regard" principle.

Keywords: Marine Renewable Energy, High Seas, Natural Resources, Freedom of High Seas, UNCLOS

ÖZ

Yenilenebilir enerji uzun yıllar boyunca karada geliştirilirken, son yıllarda yenilenebilir enerjiden denizlerde faydalanılması için artan bir talep oluşmuştur. Günümüzde devletler egemenlik veya egemen haklara sahip oldukları deniz yetki alanlarında, deniz yenilenebilir enerji tesisleri inşa etmektedir. Ancak, teknolojik gelişmelerin bir sonucu olarak, enerjiye bakış açısı değişmiştir ve devletler kendi deniz yetki alanlarının ötesindeki alanlarda enerji kaynakları aramaya başlamışlardır. Deniz yenilenebilir enerjisinin önemi gün geçtikçe artarken, bu kaynakların ve tesislerin hukuki statüsü halen açık değildir.

Birleşmiş Milletler Deniz Hukuku Sözleşmesi (BMDHS), açık denizlerin serbestisini uluslararası deniz hukukunun temel ilkelerinden biri olarak kabul etmiştir. Ancak bu ilke, açık denizlerde gerçekleştirilen faaliyetler söz konusu olduğunda yeterli ve yeterince açık değildir. Bu anlamda açık denizlerdeki MRE birimlerinin hukuki durumu BMDHS'nin ilgili hükümleri kapsamında değerlendirilecektir. Yapay adalar ve diğer tesisler inşa etme serbestisi ile açık denizler üzerindeki

egemen iddiaların geçersizliği arasındaki bağlantı "gerekli saygı" ilkesi bağlamında incelenecektir.

Anahtar Kelimeler: Deniz Yenilenebilir Enerjisi, Açık Deniz, Doğal Kaynaklar, Açık Denizlerin Serbestisi, BMDHS

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ABBREVIATIONS

Art.	: Article
ABNJ	: Areas Beyond National Jurisdiction
HSC	: United Nations Convention on High Seas, 1958
IEA	: International Energy Agency
IMO	: International Maritime Organization
IRENA	: International Renewable Energy Agency
ISA	: International Seabed Authority
MRE	: Marine Renewable Energy
MREUs	: Marine Renewable Energy Units
SDGs	: Sustainable Development Goals
UNICPOLOS	: Meeting of United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea
UNCLOS	: United Nations Convention on the Law of the Sea

INTRODUCTION

Population growth and an increasing energy deficit have prompted countries and international energy companies to look for marine energy resources as an alternative to land-based energy reserves. As a result of these research, it was discovered that seas have a significant amount of energy deposits, and exploration and exploitation of offshore fossil fuels was started. However, especially in the past decade climate change has become a real concern for the world. Precautions had to be taken in this respect; the consumption of fossil fuels and carbon emissions had to be reduced. As a result, the importance of marine renewable energy has increased.

States focused merely on the construction of renewable energy based on land, for a long time. Yet over the past decades, many investments have been made over marine renewable energy (MRE). The renewable energy field in the marine industry is heterogeneous: some technologies are close to maturity meanwhile others are still in their infancy stage[1]. Due to the high costs required for investment and research, today marine renewable energy is mostly built up and commercialized by the developed countries. European states like Belgium, Denmark, Finland, France, Ireland, Italy, Norway, Portugal, Spain, and the United Kingdom are the leading States in MRE; however, MRE has recently started to develop

[1] Jean Dubranna, 'An Overview of Marine Renewable Energy' (22 June 2017) <http://parisinnovationreview.com/articles-en/an-overview-of-renewable-marine-energy> accessed 18 May 2020.

beyond the European Union: United States, China, Korea, Australia, New Zealand, Canada and Japan[2].

On the other hand, the importance of sustainable development, which is a fundamental strategy adopted within the United Nations, has been rising. The subject of the thirteenth Meeting of United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS) was MRE. Many delegations referred to the great importance of the relationship between sustainable development and MRE and pointed out that this subject should take place in the negotiations and outcome of the United Nations Conference on Sustainable Development (Rio+20)[3]. The outcome of this conference featured several important renewable energy issues and the increased use of renewable energy and other low-emission technologies, the quality of energy use and fossil fuel reduction[4]. Then, the United Nations also set some Sustainable Development Goals (SDGs) in 2015. There are 17 different SDGs to be achieved by 2030[5]. Although none of these goals are directly related to marine renewable energy, they refer to the future of renewable energy.

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2 United Nations General Assembly (UNGA) 'Report of the UN Secretary-General, Oceans and the Law of the Sea' (4 April 2012) UN Doc A/67/79, 8.

3 UNGA (76th Session) 'Report of the Work of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its Thirteenth Meeting' (2 July 2012) UN Doc A/67/120.

4 United Nations, 'The Future We Want Outcome of the United Nations Conference on Sustainable Development' (Brazil 20-22 June 2012), 33.

5 UN Department of Economic and Social Affairs Sustainable Development, 'The 17 Goals' <https://sustainabledevelopment.un.org/?menu=1300> accessed 18 May 2020.

Marine renewable energy is a relatively new concept in the law of the sea. As a result, there are various concerns and ongoing debates about their definitions, legal status, advantages and disadvantages, as with any new notion. Although, marine renewable energy units (MREUs) are currently located in areas subject to national jurisdiction, there is no restriction on the construction of such units beyond the national jurisdiction. Since the traditional concept of exclusive control and sovereignty of marine areas no longer works in world of today, it is theoretically and potentially possible to exploit MRE on the high seas. However, the exploitation or management of the marine renewable energy resources on the high seas has not been broadly regulated by the United Nations Convention on the Law of the Sea (UNCLOS).

The purpose of this article is to address the questions and concerns that may emerge if renewable energy is harnessed on the high seas. The article begins by looking at the many types of maritime renewable energy resources, as well as their legal examination in the international law. After this interpretation, the legal status of the units constructed for exploration and exploitation of these resources are analysed. The regime established for the exploration and exploitation of MRE on the high seas is next examined in three titles. First, the freedom to construct marine renewable energy units is discussed. The relationship between these units and other uses of the high seas are evaluated in this aspect. Special focus is given to the freedom of the high seas, which causes concerns or conflicts because of these activities. Secondly, freedom to explore and exploit of these resources on the high seas in light of the UNCLOS is set

out. In this regard, the existing regimes for the exploration and exploitation of the natural resources on the high seas are evaluated by discussing the efficiency of the Part VII of the UNCLOS. Finally, whether international governance of these resources on the high seas is required is debated. Following these discussions, it will be determined whether there are appropriate solutions for those current problems. The final section of the paper pulls together a discussion of these debates and conflicts.

I. MARINE RENEWABLE ENERGY

A) DIFFERENT FORMS OF MARINE RENEWABLE ENERGY RESOURCES

Renewable energy is the energy derived from natural resources that are inexhaustible. When compared to land, the seas have enormous potential for renewable energy. The seas receive more than 70% of the sunlight and create about 90% of the wind energy[6].

There are different types of marine renewable energy resources that have the potential to contribute energy from the seas: wind energy, geothermal energy, bioenergy, solar energy, ocean energy. Today, offshore wind has the biggest potential on the market[7]. Offshore wind turbines have recently gained popularity since winds are stronger at sea than on

[6] Nadine McCormick and Varun Vats, 'Marine-based Renewable Energy' in UNEP Green Economy in a Blue World (2012), 58.

[7] International Energy Agency states that "Deployment of offshore wind has more than quintupled from 3.2 gigawatts (GW) in 2010 to 18.7 GW in 2017 (by which time it contributed some 56 terawatt-hours (TWh) or 0.3% of global electricity generation)" IEA, World Energy Outlook 2017<https://www. iea.org/reports/world-energy-outlook-2017> accessed 18 May 2020.

land, and offshore turbines can be built larger than terrestrial turbines. The majority of the MRE is produced by the offshore wind energy facilities located near the coasts of coastal states. However, the wind turbines, distant from the rich coastal regions, can produce more wind power since geographical obstacles are not present in these areas. There are currently two possible ways to exploit this resource from the seas: grounded wind turbines and floating wind turbines[8]. The grounded wind tribunes are located on the seabed and can only be installed in shallow waters which are up to 60 meters and for deeper waters floating wind tribunes must be installed[9]. There are various prototypes for these floating wind tribunes, all having the same essential components: massive cables that tie the wind tribunes to the ocean floor. The benefit of these tribunes is that they allow for energy generation far offshore.

Ocean energy, on the other hand, is divided into different sources: wave energy, tidal currents, tidal range, ocean currents, ocean thermal energy conversion (OTEC), salinity gradient[10]. In other words, thermal energy from the sun's heat and mechanical energy from the tides and waves[11]. Ocean energy has long-term potential to reduce carbon emissions. Although these ocean energy systems are technically at the early stage of development, the theoretical potential for ocean energy technologies has

[8] Jean Dubranna, 'An Overview of Marine Renewable Energy' (22 June 2017) <http://parisinnovation review.com/articles-en/an-overview-of-renewable-marine-energy>accessed 18 May 2020.

[9] Paul Breeze, *Wind Power Generation* (Academic press 2015), 104.

[10] IPCC, Special Report on Renewable Energy Sources and Climate Change Mitigation, (CUP 2012), 503.

[11] Paul Breeze, *Wind Power Generation* (Academic press 2015), 104.

been estimated at 7,400 EJ per year which is more than enough for present and future human energy consumption[12]. All these renewable resources have different origins and the exploitation of them seeking different technologies. At present, there are various types of marine renewable energy devices that are installed, operated, maintained in the marine spaces.

Wave power can be defined as the movements of the water close to the ocean surface. Despite the fact that wave energy produces 15-20 times more permitting energy than wind or solar, the wave energy sector has not grown significantly[13].Nevertheless, especially after the oil crisis of 1973, various research and development programs (R&D) have been started by EU countries like Great Britain, Portugal, Sweden, Denmark, Ireland and Norway[14]. These R&Ds have shown that waves can provide a renewable supply of energy that can be absorbed and converted into electricity by wave energy converter (WEC) machines. There are different types of these machines, some of them are floating and others are submerged[15].

Tidal energy generates power from the difference in height between high and low tide and transforms the tide's energy into electricity[16]. Tidal

12 IPCC (n 11) 501.

13 *ibid* 524.

14 Madjid Karimirad, *Offshore Energy Structures: for Wind Power, Wave Energy and Hybrid Marine Platforms* (Springer 2014), 77.

15 'Wave Devices' <http://www.emec.org.uk/marine-energy/wave-devices/> accessed 30 November 2020. See also, 'New Trends in Renewable Energy: Will the Seas Power our Future?' <https://www. imnovation-hub.com/energy/new-trends-renewable-energy-seas-power-future/> accessed 5 January 2021.

16 Ruud Kempener and Frank Neumann, *Tidal Energy Technology Brief* (IRENA Ocean Energy Technology Brief 3 2014), 3.

energy is often generated by deploying huge barrages in places with high tidal ranges. It can also be generated by the underwater tribunes. The first tidal barrage was built on the Rance River in north-western France (Brittany) in 1967 and has been generating energy since then[17]. Many other developed countries like the UK, Russia, China, France, Korea, and Canada are producing tidal energy. According to the IPCC report, tidal range technology is the most advanced technology that can be considered 'mature' except offshore wind energy[18]. Ocean currents, which is existed in the open ocean also can be produced by underwater tidal turbines. Salinity gradient energy is generated by the difference in salt concentrations that occurs where a river flows into an ocean[19].

As a renewable energy resource, solar energy is one of the richest and reachable energy resources. Solar energy can be exploited from the seas with large floating solar panels[20]. Offshore solar energy panels are more feasible than on land ones, due to fact that they need a lot of space for installation. However, one of the most important applications of solar energy obtained from the seas is Ocean thermal energy conversion (OTEC). OTEC generates power from the temperature differences between the surface of the ocean and the much colder subsurface of the ocean water (generally 1,000 m). Thus, OTEC is basically a technology

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17 Joseph Appiott and others, 'Encouraging Renewable Energy in the Offshore Environment' (2014) 90 Ocean & Coastal Management 58, 60.

18 IPCC (n 11) 507.

19 'Ocean Energy' <https://www.irena.org/ocean>accessed 11 May 2020.

20 'Wave Devices' <http://www.emec.org.uk/marine-energy/wave-devices/> accessed 30 November 2020. See also, 'New Trends in Renewable Energy: Will the Seas Power our Future?' <https://www. imnovation-hub.com/energy/new-trends-renewable-energy-seas-power-future/> accessed 5 January 2021.

that converts sunlight, which seas absorb into electricity[21]. Since for exploiting this energy temperature difference at least 20ºC is necessary between the layers, only certain parts of the ocean can sustain this technology. For instance, tropical zones. The exploitation of the OTEC technology has begun after the Middle East oil embargo in the 1970s[22].

The development of renewable energy technologies for ocean energy exploitation is at different stages. While some of these technologies have matured, MRE technologies are still in their infancy and have a small range of applications. Nonetheless, the 2009 report of the European Ocean Energy Association[23] states that offshore wind growth has a similar deployment rate as onshore wind growth. The Association has created a Roadmap intending to evaluate ocean energy to 2020 and beyond 2050. Based on these projections, 15 percent of the EU energy demand by 2050 will be fulfilled by ocean energy. Finally, this report predicts that the output of electricity from the sea will be equal to 100 nuclear power plants in 2050[24].

B) THE LEGAL ANALYSIS OF MARINE RENEWABLE ENERGY RESOURCES

There are various areas of law that have relations with MRE such as international environmental law, maritime law, energy law, the law of the sea, etc. However, the law of the sea is the primary source in this

[21] William H Avery and Walter G Berl, 'Solar Energy from the Tropical Oceans' (1999) 24 International Journal of Hydrogen Energy 295

[22] John Warren Kindt, 'Ocean Thermal Energy Conversion' (1984) 14 Georgia Journal of International and Comparative Law 1, 2.

[23] The European Ocean Energy Association (EU-OUA) 'Oceans of Energy-European Ocean Energy Roadmap 2010-2050' (2010), 8.

[24] *ibid* 10.

regard because it generally concerns about the relationship between the obligations and the rights of the States in the different marine areas and the resources they contain. In this respect, UNCLOS was adopted in 1982 and came into force on 16 November 1994. At the time of its adoption, the President of the Third United Nations (UN) Conference on the Law of the Sea stated the core objective of the UNCLOS as: *"a comprehensive constitution for the oceans which will stand the rest of time*"[25]. Someacademics considered the UNCLOS as the modern constitution of the oceans and the famous "package deal" that addressed many problems that previous conventions could not solve[26].The UNCLOS created new concepts, organizations and more importantly, with the Part XII, it established the first international legal framework for the protection of the marine environment[27].

Although the UNCLOS created a framework for practically all activities in the seas, it is plausible to argue that it does not control all maritime issues because the conditions at the time it was adopted were different from the conditions now. MRE is one of these areas where there are no clear and comprehensive regulations in place. As previously said, a uniform strategy has not been taken for MRE because the importance of this topic has been acknowledged in recent years, hence many challenges on this subject remain unsolved.

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[25] David Anderson, *Modern Law of the Sea: Selected Essays* (Martinus Nijhoff Publishers 2007), 50.

[26] David Freestone and others, *The Law of the Sea: Progress and Prospects* (4th edn, OUP 2006), 1.

[27] Nilüfer Oral, 'Non-Ratification of the 1982 Law of the Sea Convention: an Aegean Dilemma of Environmental and Global Consequence' (2009) 1 Publicist 53, 63.

Marine renewable energy resources[28] are not defined in the UNCLOS.As a result, it would be reasonable to assess the living and non-living resources in light of the relevant UNCLOS provisions. The word 'natural resources' appears differently in each part, which regulates various marine areas[29]. UNCLOS Art. 56 regulates that in Exclusive Economic Zone (EZZ) coastal state has sovereign rights for *"exploring and exploiting, conserving and managing the natural resources, whether living or non-living"* and continues *"such as the production of energy from the water, currents and winds"*[30].This provision clearly applies to wind and current energy, but it also allows for the use of other types of marine energy that are not specifically stated, such as geothermal energy, bioenergy, tidal, OTEC, and salinity gradients.

Natural resources are defined as *"...the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species..."*in the context of continental shelf in Art. 77(4)[31]. Parallel to the continental shelf, natural resources in the Area are defined as "*all solid, liquid or gaseous mineral resources in situ in the*

[28] W Michael Reisman, 'Key International Legal Issues with Regard to Ocean Thermal Energy Conversion Systems' (1981) 11 California Western International Law Journal 425, 428 states that "it is important to understand that a resource is not a fixed and permanent thing. Rather, it is an artifact, a human creation which is shaped by the interaction of human imagination, need, technological capacity and environmental potential. Thus, things which were not "resources" in the past become resources now and may cease to be resources in the future."

[29] George Walker, *Definitions for the 1982 Law of the Sea - Terms Not Defined by the 1982 Convention* (Martinus Nijhoff Publishers 2012), 255.

[30] United Nations Convention on the Law of the Sea (Montego Bay, opened for signature 10 December 1982, entered into force 16 November 1994, 833 UNTS 397).

[31] UNCLOS (n 30) art 77(4).

Area at or beneath the seabed, including polymetallic nodules"[32]. Surprisingly, during the negotiations of Art. 133 of the UNCLOS, the discussion has been made whether to include 'water, steam, hot water' to the resources of the Area. However, in the end of the debates, this broad definition was rejected, preventing the application of this provision to ocean thermal energy[33]. Furthermore, during the thirteenth UNICPOLOS meeting, one of the delegates argued that, extending the scope of the Area beyond its current focus on the minerals to also cover the bio-derived resources was necessary (as biofuels, hydrogen production or other forms of marine renewable energies)[34]. It is an interesting proposal, since ISA (International Seabed Authority), which governs the activities relating to exploration and exploitation of the minerals in the Area, do not have authority over the genetic resources[35].

In this respect, marine renewable energy resources can be directly included in the provision of the natural resources on the EZZ[36]. Although the UNCLOS avoids making an emphasis on the exploration and exploitation of these resources on the high seas, there is no obstacle to imple-

32 UNCLOS (n 30) art 133 (a).

33 Maria Madalena das Neves, 'Offshore Renewable Energy and the Law of the Sea' in Elise Johansen and other (eds), *The Law of the Sea and Climate Change: Solutions and Constraints* (CUP 2020), 222.

34 UN Doc. A/67/120 (n 3) para 25; 25 Ocean Earth Negotiations Bulletin (4 June 2012), 3.

35 Montserrat Abad Castelos, 'Our "Planet Ocean" and Marine Renewable Energies: Shouldn't Someone be Responsible for Their Management in Areas Beyond National Jurisdiction?' in Eva M. Vázquez Gómez and Claudia Cinelli (eds), *Regional Strategies to Maritime Security a Comparative Perspective* (Tırant Lo Blanc 2014), 206.

36 Francesca Galea, 'Legal Energy Regime for the Exploration and Exploitation of Offshore Renewable Energy' (2011) 25 Ocean Yearbook 101, 106.

ment Art. 56 in this regard. Minerals and living resources are the natural resources of the continental shelf regime. Similarly, the natural resources which are governed under the regime of the Area exclusively include the minerals. These regimes do not cover marine renewable energy resources. At the same time, since the regime of the Continental Shelf and the Area do not affect the superjacent waters above them, it is not possible to directly refer to MRE herein.

To summarize, during the UNCLOS adoption process, marine renewable energy resources had no economic value and could not be exploited. Furthermore, when the UNCLOS was formed, climate change was not on the agenda of States, and MRE was deemed unnecessary[37]. Therefore, they were not regulated separately and widely, for instance, like the mineral resources in the Area. In the 70's this topic was put on the agenda after taking into consideration the economic value of the mineral resources located on or in the deep seabed in the areas beyond national jurisdiction[38].Exclusive arrangements have been made with the UNCLOS, and Part XI, which has been described as a 'extraordinarily convoluted legal structure' has been established[39]. The economic value of the resources found in the seas might vary during the time and they can

[37] Bent Sorensen, *Renewable Energy Its Physics, Engineering, Use, Environmental Impacts, Economy and Planning Aspects* (3rd edn, Elsevier Academic Press 2004), 24.

[38] Chuanliang Wang and Yen-Chiang Chang, 'A New Interpretation of the Common Heritage of Mankind in the Context of the International Law of the Sea' (2020) 1991 Ocean and Coastal Management, 6 states that the issue was first brought before the General Assembly in 1967 by the Maltese Ambassador Dr. Arvid Pardo.

[39] UNCLOS (n 30) Part XI 'The Area' and the 1994 agreement on the implementation of Part XI of UNCLOS; Robin Rolf Churchill and Alan Vaughan Lowe, *The Law of the Sea* (3rd edn, MUP 1988), 182.

become exploitable resources like the mineral resources in the Area. Likewise, especially with the effect of climate change and the foreseen potential of marine renewable energy, it will be necessary to make a comprehensive and clear classification in the near future about their recognition as a resource with exploitable potential.

C) THE LEGAL STATUS OF MRE UNITS

There is a discussion whether the MRE units are ships, artificial islands, installations or structures. In order to classify them, being able to understand the difference between these concepts has significance importance. However, not only the MRE units but also the classification of every offshore facility has created a substantial problem in the law of the sea.

The legal status of the offshore facilities has been a controversial issue for decades. There are several differences in the international conventions about their status, it is practically impossible to find an overall definition. None of the 1958 Conventions use the phrase "artificial island," but they do include the terms “installation” and “device”[40]. However, within the UNCLOS for the first time, the term “artificial island” was used; and instead of using “device”, the term “structure” was introduced. Despite the fact that the UNCLOS is the overarching legal framework for the sea, it has opted to remain silent on particular matters. As an ex-

[40] In 1958, the United Nations Conference on the Law of the Sea opened for signature four different convention and one protocol: the Convention on the Territorial Sea and the Contiguous Zone; the Convention on the High Seas; the Convention on Fishing and Conservation of the Living Resources of the High Seas; the Convention on the Continental Shelf; and the Optional Protocol of Signature concerning the Compulsory Settlement of Disputes <https://legal.un.org/avl/ha/gclos/gclos.html> accessed 15 December 2020.

ample, UNCLOS refrains from defining the following phrases or their legal status: artificial islands, installations and structures. Since there are many situations in practice where these terms are used interchangeably, not having a uniform definition poses a problem. Additionally, the UNCLOS does not give any information about their size or permanence to classify them[41]. In this regard, some academics state that unless their separate classification is necessary, the term artificial island would cover the installations and structures[42]. According to Papadakis the term artificial island refers to *"all man-made structures, installations, and other devices on the seas which are neither islands nor ships in international law"*[43].

In this context, being able to make a legal analysis of the artificial islands has crucial importance. Even though, the UNCLOS does not define artificial islands, installations and structures, two distinctions take place in the UNCLOS: first, between islands and artificial islands, and second, between artificial islands and installations and structure'[44]. As clear both in the 1958 and the 1982 Conventions, the island is the feature that is *"naturally formed area of land, surrounded by water, which is above water at high tide"*[45]. These Conventions indicate that the hand-

41 Francesca Galea, 'Legal Energy Regime for the Exploration and Exploitation of Offshore Renewable Energy' (2011) 25 Ocean Yearbook 101,109.

42 Nikos Papadakis, 'Artificial Island in International Law' (1975) 3 Maritime Studies and Management 33, 34.

43 *ibid*.

44 UNCLOS (n 30) art 60 (1).

45 *ibid* art 121(1) and art 13 'low-tide elevations "A low-tide is a naturally formed rea of land, which is surrounded by and above water at low tide but submerged at high tide"; United Nations Convention on High Seas (Geneva, 29 April 1958, Entered into Force on 30 September 1962, 450 UNTS 11) art 10 (1).

made edifices cannot be classified as an island. In this case, artificial islands precisely are not evaluated under the regime of islands[46].

Secondly, it can be possible to construct artificial islands for any purpose. Yet, installations are only established for the purpose of exploring and exploiting and managing natural resources whether living or non-living of the sea, seabed and its subsoil, and for other economic purposes[47]. This is the only distinction mentioned in the UNCLOS. In this regard, MRE units may be evaluated under the status of installations and structures[48]. Nevertheless, mainly the distinction between these offshore installations and artificial islands is not crucial since they are subject to the same regime in the UNCLOS.

Finally, these MRE units may be categorized as a ship. In this regard, the primary objective of their use and figure of their structure has an important role. MRE units are used for exploration and exploitation of energy and unlike ships, their primary objective is not navigation. MRE is a barely new industry in comparison to the oil and gas industry, it would make sense to look at how oil drilling installations (offshore facilities) are categorised; since, MRE units have similarities with the drilling platforms. Although the UNCLOS establishes some guidelines, issues such as their construction and operation under the powers of the states are

46 Imogen Saunders, 'Artificial Islands and Territory in International Law' (2019) 52 Vanderbilt Journal of Transnational Law 643, 648. See also, UNCLOS (n 30) art. 60 (8).

47 Churchill and Lowe (n 39) 139.

48 Francesca Galea, 'Legal Energy Regime for the Exploration and Exploitation of Offshore Renewable Energy' (2011) 25 Ocean Yearbook 101,109.

governed by national laws[49]. Yet in many national legislations, oil drilling installations are still considered as a ship, since the purpose of these legislations is to avoid regulating new rules in practical regard[50].

MRE units can be categorised under more than one of these traditional concepts of the law of the sea. They may change their status from time to time due to changes in their intended use[51]. For instance, offshore facilities used in the exploration and exploitation of oil and other seabed mineral resources often do not fit into the classical ship definition. Some of them are floating and some are fixed platforms. Even if they are floating, they are usually fixed to the seabed during research and operation activities. Thus, the physical and technical characteristics of these structures are different as well as the physical characters of the MRE units are different. There are different approaches to this issue in the literature. On one hand, some academics state that it would likely cause jurisdictional problems gathering all these structures under one of these traditional statuses. Therefore, it is crucial to give distinct legal recognition to MRE units[52]. In this case, until their distinct legal recognition is given, they will be classified under the appropriate status for each specific situation.

On the other hand, some academics argue that concerning floating MRE units on the high seas serious vagueness may arise. In practice, both of

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[49] İsmail Demir, 'Kıyı Ötesi (Offshore) Tesislerin Sebep Olduğu Kirlenme Zararları Dolayısıyla Hukuki Sorumluluk ve Tazminat Meselesi Üzerine Değerlendirmeler' (2015) 6 İnönü Üniversitesi Hukuk Fakültesi Dergisi 33, 44.

[50] Francesca Galea, 'Legal Energy Regime for the Exploration and Exploitation of Offshore Renewable Energy' (2011) 25 Ocean Yearbook 101,108.

[51] *ibid* 109.

[52] *ibid*.

these traditional concepts (ships and installations/structures) are needed to be registered. These both classifications are permissible under the UNCLOS; since there is no jurisdiction of the coastal state which regulated on the high seas like the EEZ and the territorial sea, it is the decision of the flag state to which classification to choose[53]. Due to fact that the UNCLOS refers to the construction of artificial islands and installations for the exploration and exploitation of the natural resources rather than the freedom of navigation of ships, until these units to be classified under their distinct category, it is appropriate to consider them as artificial islands, installations and structures[54].

II. EXPLORATION AND EXPLOITATION OF MRE ON THE HIGH SEAS

A) FREEDOM TO CONSTRUCT MRE UNITS ON THE HIGH SEAS

Today most of the marine renewable energy units take place in the nearshore of the States. However, states are closer than they imagined to launching renewable energy exploration on the high seas. In this regard, some questions may arise. For instance, in the thirteenth UNICPOLOS meeting, some delegates indicated their concerns about the possibility to locate these units in areas beyond the national jurisdiction and the lack

[53] Paul Elsner and Suzette Suarez, 'Renewable Energy from the High Seas: Geospatial Modelling of Resource Potential and Legal Implications for Developing Offshore Wind Projects Beyond the National Jurisdiction of Coastal States' (2019) 128 Energy Policy 919, 925.

[54] *ibid.*

of regulations herein; additionally, they offered that this issue must be evaluated at the international level[55].

1958 Convention on High Seas (HSC) defines high seas as: "all parts of the sea that are not included in the territorial sea or in the internal waters of a State"[56], and regulates this area as a "seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty"[57] and constitutes list of freedoms. This regime is based on the similar idea, which Hugo Grotius came up with in 1609 at the Mare Liberum[58]. Grotius stated that the seas should be free for navigation and fishing because natural law forbids the ownership of things, that created by the nature for common-human use[59]. This Convention also listed four freedoms on high seas that are not restrictive: freedom of navigation, freedom of fishing, freedom to lay submarine cables and pipelines, freedom to fly over the high seas[60].

The UNCLOS brought about some modifications by establishing Exclusive Economic Zones (EEZs) and reducing the breadth of the high seas. Instead of defining the high seas, the UNCLOS explains the application area for it[61]. However, like the HSC, the UNCLOS regulates this area as

55 UN Doc A/67/120 (n 3) para 44.

56 HSC (n 45) art 1.

57 *ibid* art 2.

58 Nicholas J Lund: 'Renewable Energy as a Catalyst for Changes to the High Seas Regime" (2010) 15 Ocean & Coastal LJ 2010 95, 102.

59 Nina Tannenwald, 'Law Versus Power on the High Frontier: The Case for a Rule-Based Regime for Outer Space' (2004) 29 YALE J. INT'L L 363, 390.

60 HSC (n 45) art 2.

61 UNCLOS (n 30) art 86 defines high seas as "all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters

a common one in which states, whether coastal or landlocked can enjoy their freedoms[62]. Also, the UNCLOS has added two freedoms to the enumerated list: freedom of scientific research and, significant to the developing renewable energy on the high seas, freedom to construct artificial islands and other installations[63].

Constructing MRE units on the high seas can be based upon some provisions in the UNCLOS. First, as it was explained earlier the article which regulates the freedom to construct artificial islands and other installations on high seas, forms the basis. This article states that[64] this freedom is subject to the Part VI, which regulates the regime of Continental Shelf. Art. 80, states that *"Article 60 applies mutatis mutandis to artificial islands, installations and structures on the continental shelf"*[65]. This provision exclusively entitles the coastal states to construct, authorize and regulate installations and structures for the purposes provided in Art. 56 and other economic purposes[66]. Coastal state has exclusive jurisdiction over such artificial islands, installations and structures in the EEZ[67]. Additionally, coastal states are granted therein the right to establish safety zones around such artificial islands, installations and structures to ensure the safety both of navigation and of the artificial islands, installa-

of a State, or in the archipelagic waters of an archipelagic State."; Myron Nordquist, *United Nations Convention on the Law of the Sea 1982 A Commentary, vol III* (Brill 2011), 60.

62 *ibid* art 87 (1).

63 *ibid*.

64 *ibid*.

65 *ibid* art 80.

66 *ibid* art 60 (1) (b).

67 *ibid* 60 (2).

tions and structures[68]. Finally, it is set forth under Art. 56 that coastal State has sovereign rights to explore and exploit natural resources whether living or non-living in the EZZ[69].All states have the right to build MRE units on the high seas within the scope of these rules.

Nonetheless, it will cause a crucial problem in the concept of freedom of the high seas. The non-appropriation of the high seas by states is the most serious concern in this subject. Due to Art. 89 of the UNCLOS *"no State may validly purport to subject any part of the high seas to its sovereignty"*[70]. Although some provisions can be applied to the establishment of marine renewable energy units on the high seas, the presence of Art. 89 raises the question of whether renewable energy is extensively regarded in the UNCLOS. Because these units are permanent, their assets will remain in that one area for the foreseeable future. Owing to their non-temporary character, it may be considered as a *de facto* appropriation of the high seas[71]. Besides, the long duration of their operations will impact the other freedoms of the high seas. Should states establish renewable energy units in this regard, it would be impossible to follow the idea of high seas as a common area. This would direct the States back to the same concerns about the mineral resources in the Area which Arvid Pardo referred back in 1967[72]. In this regard, to prevent unfair utilization of the mineral resources in the Area the UNCLOS refers these

68 *ibid* 60 (4).
69 *ibid* 56(1).
70 *ibid* 89.
71 Elsner and Suarez (n 53) 928.
72 Lund (n 58) 109.

resources as a "common heritage of mankind". In the foreseen future, this kind of measures will be needed for the MRE construction on the high seas. In this case, new regulations will be required because of the lack of clarity about renewable energy exploration and exploitation on the high seas.

B) FREEDOM TO EXPLORE AND EXPLOIT MRE ON THE HIGH SEAS

With the challenges that have been experienced, the MRE industry continues to flourish and thrive. The most challenging problem is whether the existing regimes on the high seas concerning natural resources are applicable to the MRE, which is derived from the various kind of natural resources that take place in the marine environment[73]. The UNCLOS regulates two distinct regimes for the natural resources on the high seas: fish and minerals. The approach of the UNCLOS to these two resources has obvious distinctions. Oppose to fishing, which is accepted as a common resource available for anyone, mineral resources are subject to comprehensive and restrictive regulations. Although fishing is one of the freedoms of the high seas, such freedom is not absolute[74].For instance, Art 87(1) of the UNCLOS enumerates two kinds of freedoms: on the one hand, freedoms only define the activities and declare no more; on the other hand, the second type of freedoms are subject to the other parts of

[73] Montserrat Abad Castelos, 'Our "Planet Ocean" and Marine Renewable Energies: Shouldn't Someone be Responsible for Their Management in Areas Beyond National Jurisdiction?' in Eva M. Vázquez Gómez and Claudia Cinelli (eds*), Regional Strategies to Maritime Security a Comparative Perspective* (Tırant Lo Blanc 2014), 179.

[74] UNCLOS (n 30) art 87; art 116-117.

the Convention[75]. Moreover, all States have the duty to take all measures for the conservation of these resources of the high seas. However, it is undeniable that fishing on the high seas is not as strictly regulated as minerals resources in the Area.

MRE shares characteristics with both of these resources. For example, it has an unlimited but not absolute character, similar to fisheries resources[76]. Although MRE is considered fungible, non-exclusive and intangible[77], the resources of fisheries are no longer considered limitless due to overfishing and extinction of many fish[78]. However, it would be appropriate if the MRE producers exploit these resources as a limited resource subject to some legal limitations. If managed correctly, both of these resources will be sustained. Besides, areas that are feasible to locate the MRE units are limited, and in conflicts with other uses of the high seas[79].

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75 Stefan Ásmundsson, 'Freedom of Fishing on the High Seas, and the Relevance of Regional Fisheries Management Organizations (RFMOs)' <https://www.cbd.int/doc/meetings/mar/soiom-2016-01/other/soiom-2016-01-fao-18-en.pdf> accessed 14 December 2020.

76 Stephen L Joseph, 'Legal Issues Confronting the Exploitation of Renewable Sources of Energy from the Oceans' (1981) 11 California Western International Law Journal 387, 399 states that "An analogy might be drawn with high seas energy resources. There would initially be a freedom to exploit them, not a property right in them. There would be no question of property rights in them until appropriation has occurred."

77 Richard Barnes, 'Energy Sovereignty in Marine Spaces' (2014) 29 Int'l J Marine & Coastal L 573, 576.

78 William T Burke, 'United Nations Resolutions on Driftnet Fishing: An Unsustainable Precedent for High Seas and Coastal Fisheries Management' (1994) 25 Ocean Development & International Law 127, 179.

79 Lund (n 58) 114.

Unlikely, mineral resources on the high seas subject to the principle of common heritage of mankind which is heavily regulated under the regime of the Area. Mineral resources do not have limitless character. Because of this feature, the equitable solution has been accepted for their exploitation. At the same time, similar to MRE units, installation of the structures to explore and exploit mineral resources would result in long term occupation of the space. While the exploration and exploitation of the Area are under the control of the International Seabed Authority, there is no international organization to govern exploration and exploitation of MRE on the high seas.

Despite the fact that these two regimes are similar to the MRE, direct adaptation to MRE resources is not possible due to their variances. In this context, some scholars question if a hybrid approach is feasible or whether a new framework for the exploration and exploitation of MRE on the high seas is required[80].It is more convenient to combine suitable parts of these two regimes rather than constructing a whole new system. In this regard, due to their infinite character, the freedom of the high seas approach used by the fisheries will be the easiest adaptation that is possible for MRE. Only comprehensive provisions, on the other hand, can prevent the wealthiest States from occupying high seas areas. However, these complex regulations will be difficult to fully implement. Consequently, the hybrid solution would be the best solution possible.

[80] *ibid* 24.

III. CURRENT AND FUTURE CHALLENGES ABOUT THE MRE ON THE HIGH SEAS

As previously stated, the legal structure governing MRE on the high seas may be deemed ambiguous. Should renewable energy continue to expand to these untouched areas, it will interfere with other freedoms. First of all, these problems may also occur in other marine areas where coastal States have sovereignty or sovereign rights to resolve these conflicts. Since the control of coastal States on the high seas is problematic, the main actor allocated to the activities on the high seas is the flag state. In consequence, the exploration and exploitation of MRE on the high seas would be subject to different regulations, compared to EEZ and territorial sea[81]. Therefore, the international legal framework and its restrictions have great importance as a starting point.

It is provided in the UNCLOS that while exercising their freedom of high seas all States have to exercise their rights with "due regard" to the interests of other States. Freedoms are also must be exercised within the due regard for the rights with respect to activities in the Area[82]. Like it was explained earlier, States have enumerated freedoms on the high seas. These freedoms are considered to possess equal rights. The obligation of "due regard" provides that, States must refrain from any acts that might interfere with the use of high seas by another State[83].

81 Elsner and Suarez (n 53) 927.

82 UNCLOS (n 30) art 87 (2).

83 Walker (n 29) 184.

Exploration and exploitation of renewable energy on the high seas can interfere with the traditional freedoms of the high seas, such as navigation, overflight and fishing. The ideal location for offshore wind turbines is where the wind blows continuously at high speeds. These areas are considered dangerous for navigation. While these areas of high winds are not recommended as safe sea routes, establishing wind turbines in those areas will not affect the freedom of navigation[84]. Nevertheless, all MRE units have different characteristics. So, their assets would affect navigation in a different way. For instance, the height of the offshore wind turbines has already started to cause some problems regarding the radars currently used for aerial navigation[85]. Additionally, the artificial structures and the safety zones around them limits the capacity of fishing. This limitation is not dealt with in other international conventions relating to fishing[86]. It is possible to conclude that, if these units do not possess permanent nature, the conflict with the other uses of the high seas will be reduced. However, MRE units, especially wind turbines, are considered permanent since they operated in a certain location for a period of time[87].

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84 Francesca Galea, 'Artificial Islands in the Law of the Sea' (DPhil thesis, University of Malta 2009), 67.

85 Montserrat Abad Castelos, 'Our "Planet Ocean" and Marine Renewable Energies: Shouldn't Someone be Responsible for Their Management in Areas Beyond National Jurisdiction?' in Eva M. Vázquez Gómez and Claudia Cinelli (eds), *Regional Strategies to Maritime Security a Comparative Perspective* (Tırant Lo Blanc 2014), 194.

86 Francesca Galea, 'Artificial Islands in the Law of the Sea' (DPhil thesis, University of Malta2009),109.

87 *ibid* 113.

Therefore, the term "due regard" is used to balance out these competing activities. In this aspect, the question to be asked is whether this "due regard" concept is sufficient. There is a need for certainty since constructing and managing MRE units on the high seas have a great cost. Especially, in the near future States will strongly argue in favour of establishing comprehensive rules. However, then the problem arises how to provide certainty, while not infringing upon the freedom of the seas[88]. Freedom of the high seas is one of the main principles in the law of the sea. Since only in these two areas States cannot claim any sovereignty, the high seas and the Area are the only areas left to reflect the common use of the seas. Although clear and comprehensive regulations are essential between the competing activities on the high seas, the freedom of the high seas must be considered properly. As expressed earlier, the rights of States on the high seas are of the nature of freedom. Although the "due regard" both obliges States and also provide flexibility, this principle is not an efficient management tool.

In this context, some writers point out that the Marine Spatial Planning (MSP) might be beneficial to reducing these overlapping claims[89]. Many States are already using MSP to manage conflicting uses of the marine spaces in which their national jurisdiction. This approach could also be applicable to solve conflicts on the high seas; however, in this case, regulatory authority to be needed cause its implementation by States is not

[88] Danielle Kroon, 'Due Regard in the High Seas: The Tension between Submarine Cables and Deep Seabed Mining' (2018) 24 Australian International Law Journal, 35, 53.

[89] Montserrat Abad Castelos, 'Marine Renewable Energies: Opportunities, Law, and Management' (2014) 45 Ocean Development and International Law 221, 229.

possible[90]. Since no State can claim sovereignty on the high seas, the application of MSP on the high seas will be a challenge. As in this case, the absence of a coordinating mechanism or authority for the various offshore industries is one of the governance obstacles on the high seas[91].

As a result, the foremost problem is whether an international authority to be needed for managing or having a power of control over MRE[92]. The pioneer authority is the ISA, due to its current presence in the ABNJ. However, ISA is an authority with very strict regulations and this kind of authority may overlap the freedom of the high seas adversely. Without interfering with this principle, preventing unfair use of the high seas may be possible with an advisory authority, of which the main objective is coordinating. While some academics propose that this can be achieved through organizations that already exist (ISA, IMO, IRENA), some of them argue the need for new authority. In each case, gradually relevant legislations for this integrated authority are expected[93]. In consideration of the interest of the States and the economic value, this is a hot topic which will be broadly discuses in the foreseen future.

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90 Elsner and Suarez (n 53) 926.

91 Jeff Ardron, 'Marine Spatial Planning in the High Seas' (2008) 32 Marine Policy 832.

92 Montserrat Abad Castelos, 'Our "Planet Ocean" and Marine Renewable Energies: Shouldn't Someone be Responsible for Their Management in Areas Beyond National Jurisdiction?' in Eva M. Vázquez Gómez and Claudia Cinelli (eds), *Regional Strategies to Maritime Security A Comparative Perspective* (Tırant Lo Blanc 2014, 199.

93 Yen-Chiang Chang, 'Marine Renewable Energy: What Issues a Lawyer Should Possibly Think of?' in Zou Keyuan (ed), Sustainable Development and the Law of the Sea (Brill Nijhoff 2017), 300.

CONCLUSION

The rules and principles of the law of the sea keep continue to evolve. For instance, with the UNCLOS States extended their jurisdiction and sovereign rights beyond their existing jurisdictional area with the concept of the EEZ and made changes regarding the mineral resources. Likewise, changes in the legal framework are to be obligatory, when MRE expands its application area to the untouched part of the high seas to prevent global warming and to create a sustainable energy policy. This paper suggested some solutions to achieve this successfully. First, the authoritative international definition for these resources is essential. While existing definitions of the natural resources in the UNCLOS can be applied to these resources by analogy, this causes the distinguishing features of these resources to be ignored. Secondly, the classification of MRE units is compulsory. Without the internationally accepted classification, it is impossible to resolve future conflicts on the high seas.

In consideration of the present legal framework, the utilization of MRE on the high seas has serious gaps and loopholes. For instance, the lack of coastal state jurisdiction on the high seas, the differences in the flag states regulations, and the inefficiency of the "due regard" principle prevent the sufficient application. These gaps have the potential to create conflicts between the uses of the high sea. Since the flag state regulations and the "due regard" are the only control mechanism on the high seas, the overlapping uses of these areas are inevitable. Therefore, the lack of this international perspective will interfere the freedom of the high seas. However, there are different solutions to evolve this principle

with respect to MRE without intervention. First, to explore and exploit MRE on the high seas the existing regimes for the fishing and mineral resources might be suitable examples. As explained, to accomplish an equitable solution without damaging the *Mare Liberum* the hybrid solution is the most suitable solution. Moreover, the MSP may be a precise answer to prevent the overlapping uses of the high seas while constructing MRE units. However, to come up with the MSP on the high seas, there are some important steps to take. Accordingly, the establishment of international governance on the high seas can be the key point. For instance, like the development of the Port State Control as a control mechanism of the shipping industry, an international controlling authority is an essential part in the MRE construction on the high seas. Despite considerable debate over the characteristics of this international authority, it is obvious that such an international authority is necessary to manage all of these foreseeable concerns on the high seas.

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