Legal challenges concerning offshore wind installations along the coastline of the North Sea

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Submitted in partial fulfillment of the requirements for the degree of: Master of Science in Maritime Science

Supervisor: Prof. Dr. Frank Maes
Assessor: Klaas Willaert
PERMISSION

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Shari De Gendt
Acknowledgements

First of all, I would like to emphasis how compelling the past year has been. Since the start of the MSc in Maritime Science, it has been a real roller coaster whereby I was able to explore and plunge into the marvelous maritime sector. In this context, I especially want to express my gratitude to Prof. Dr. Maes who stimulated me to choose this topic, and gave me the opportunity to get in contact with practitioners. In addition, I would like to thank my assessor, Klaas Willaert for the guidance and corrections.

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ABSTRACT

Offshore wind development faces several legal challenges during the different stages of the offshore wind turbine’s lifecycle. In the North Sea, the race for space has made it even more complex to reconcile offshore wind development with the other marine activities at sea. During the pre-installation phase it is therefore important to adopt marine spatial plans. In addition, several environmental instruments need to be taken into account before and when the offshore wind turbines are installed. However, not only the pre-installation of offshore wind turbines encounters problems. In order to bring the generated wind energy to shore after the installation of the turbines, they need to be connected to the shore. In Belgium, this proved to be a significant challenge as well. Moreover, vessels face more and more risks of collisions due to the increase in offshore wind turbines in the North Sea. It is therefore important to assess the regime concerning safety zones and the risks for the turbines. Lastly, during the decommissioning phase, the offshore wind developers are confronted with the question whether or not they could and should leave the offshore wind turbine at sea. If they decide to remove the installation, the question remains how to remove the turbine in the most sustainable way. The decommissioning phase is, however, not examined in this analysis.
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<thead>
<tr>
<th>Acronym</th>
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<tr>
<td>BOG</td>
<td>Belgian Offshore Grid</td>
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<td>BOP</td>
<td>Belgian Offshore Platform</td>
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<td>BPNS</td>
<td>Belgian Part of the North Sea</td>
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<td>CAES</td>
<td>Compressed air energy storage</td>
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<td>CJEU</td>
<td>Court of Justice of the European Union</td>
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<td>CMS</td>
<td>Convention on Migratory Species of Wild Animals</td>
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<td>CO₂</td>
<td>Carbon dioxide</td>
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<td>CoP</td>
<td>Conference of the Parties</td>
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<td>CREG</td>
<td>Commission for Regulation of Electricity and Gas</td>
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<td>dB</td>
<td>Decibel</td>
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<td>DG</td>
<td>Directorate-General</td>
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<td>DG MARE</td>
<td>Directorate-General for Maritime Affairs and Fisheries</td>
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<td>EC</td>
<td>European Commission</td>
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<td>EcoQOs</td>
<td>Ecological Quality Objectives</td>
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<td>ECT</td>
<td>Energy Charter Treaty</td>
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<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EMODnet</td>
<td>European Marine Observation and Data Network</td>
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<td>EPC</td>
<td>European Parliament and the Council</td>
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<td>ETS</td>
<td>Emissions Trading System</td>
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<td>EU</td>
<td>European Union</td>
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<td>FESS</td>
<td>Flywheel energy storage system</td>
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<td>FiT</td>
<td>Feed in Tariff</td>
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<td>GAIRS</td>
<td>Generally Accepted International Rules and Standards</td>
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<td>GES</td>
<td>Good Environmental Status</td>
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<td>GGEs</td>
<td>Greenhouse Gas Emissions</td>
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<td>GHG</td>
<td>Greenhouse Gasses</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<td>HV</td>
<td>High voltage</td>
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<td>IMO</td>
<td>International Maritime Organisation</td>
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<td>IMP</td>
<td>Integrated Maritime Policy</td>
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<tr>
<td>IOC-UNESCO</td>
<td>Intergovernmental Oceanographic Commission of UNESCO</td>
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<td>IRENA</td>
<td>International Renewable Energy Agency</td>
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<tr>
<td>kWh</td>
<td>Kilowatt-hour</td>
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<td>MASPNOSE</td>
<td>MAritime Spatial Planning in the NOrthSea</td>
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<td>MOG</td>
<td>Modular Offshore Grid</td>
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<td>MoU</td>
<td>Memorandum of Understanding</td>
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<td>MSPD</td>
<td>Maritime Spatial Planning Directive</td>
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<td>MSP</td>
<td>Marine Spatial Planning</td>
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<td>MUMM</td>
<td>Management Unit of the North Sea Mathematical Models</td>
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<td>MV</td>
<td>Mean Voltage</td>
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<td>Abbreviation</td>
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<tr>
<td>MW</td>
<td>Megawatt</td>
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<td>MWh</td>
<td>Megawatt-hour</td>
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<td>NECAPs</td>
<td>National Energy and Climate Action Plans</td>
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<td>NIMBY</td>
<td>Not In My Back Yard</td>
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<td>NM</td>
<td>Nautical Miles</td>
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<td>Non-ETS</td>
<td>Non – Emissions Trading System</td>
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<td>NSCOGI</td>
<td>North Sea Countries’ Offshore Grid Initiative</td>
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<td>O&amp;M</td>
<td>Operations and Maintenance</td>
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<td>OSPAR</td>
<td>Oslo/Paris Convention for the Protection of the Marine Environment of the North-East Atlantic</td>
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<td>OWFs</td>
<td>Offshore Wind Farms</td>
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<td>PHS</td>
<td>Pumped Hydro Storage</td>
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<td>RES</td>
<td>Renewable Energy Sources</td>
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<td>RED</td>
<td>Renewable Energy Directive</td>
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<td>SEA</td>
<td>Strategic Environmental Assessment</td>
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<td>SEL</td>
<td>Sound Exposure Level</td>
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<td>TEU</td>
<td>Treaty on the European Union</td>
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<td>TFEU</td>
<td>Treaty on the Functioning of the European Union</td>
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<td>TGC</td>
<td>Tradable Green Certificate</td>
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<td>TSO</td>
<td>Transmission System Operator</td>
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<td>TWh</td>
<td>Terrawatt-hour</td>
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<tr>
<td>WFD</td>
<td>Water Framework Directive</td>
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<td>WTO</td>
<td>World Trade Organization</td>
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1. Introduction

1.1. Recent Developments

1.1.1. In Belgium

1. Offshore wind energy generation could make a significant contribution to meeting the demand of electricity in the coming decades. An ideal setting for the development of offshore wind activities is the North Sea, which is characterized by relatively shallow waters and excellent wind conditions. Of the North Sea States, Belgium is considered to be one of the leading countries in this regard. It has become a leading country mainly because of its introduction of marine spatial planning. In order to maintain this position, however, a clear and comprehensive legal framework must be in place that is complementary to the marine spatial planning instrument. The focus of this framework should encompass the whole lifecycle of the offshore wind turbines, assessing the risks that come along with their operation, maintenance and decommissioning.

2. On the 20th of December 2017, the Secretary of State for the North Sea, Philippe De Backer, introduced his long-term vision with regard to the Belgian part of the North Sea (BPNS) in 2050. In his vision, the Secretary of State stressed the importance of three core-principles: naturalness, blue economy and innovation, and multiple use of space. The latter will gain importance, especially since the Belgian government recently announced its plans to develop additional offshore wind farms (OWFs) in its part of the North Sea.

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3. At the moment, only four of the nine licensed wind farms are already operational, namely C-Power, Belwind, Northwind and Nobelwind. The other OWFs including Mermaid, Northwester 2, Seastar, Rentel and Norther are to be installed by 2020. We can ask ourselves what the impact will be on the other actors in the North Sea, while keeping in mind the presence of those nine licensed OWFs and the foreseen expansion of OWFs on the opposite side of the ones that already have a license. The expansion will lead to an obvious change of appearance of the BPNS. In order to avoid possible conflicts, the legal framework needs to be able to provide solutions for the future increase in activities. In order to assess probable conflicts, an analysis of the current legal framework is therefore necessary.

![Draft of the future designated area for offshore wind farms.](image)

Figure 1. Draft of the future designated area for offshore wind farms.¹⁰

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<td>⁹ Ibid.</td>
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1.1.2. Regional Cooperation

4. The BPNS stretches out over an area of 3454 km². In order to arrange the most optimal spatial uses, Belgium needs to co-operate with its neighbouring countries that surround the rest of the North Sea. The EU therefore adopted the Marine Spatial Planning Directive (MSPD) in 2014, which requires all coastal Member States to prepare cross-sectorial marine spatial plans by 2021. Apart from obligations such as the application of the ecosystem-based approach, these plans need to entail cross-border cooperation. Such an integrated and cross-border approach is vital for large-scale offshore wind projects and their interconnectors.

5. The EU therefore set up a project in 2010 called MASPNOSE. This project focused on the facilitation of cross-border cooperation between European countries on an ecosystem-based MSP. The project encompassed the Thornton Bank case whereby the Netherlands and Belgium eventually set up common objectives and identified potential interferences between OWFs and shipping.

6. This analysis looks further into the contribution of the Renewable Energy Directive (RED). This Directive established the 20-20-20 targets, which aim at a 20% reduction in EU greenhouse gas emissions (GGE) from 1990 levels and a 20% increase of RES in the share of EU energy consumption by 2020. On top of that, the Directive aims at a 20% increase in the EU’s energy efficiency.

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17 Ibid., 787.
7. While the 20-20-20 targets are binding at EU level only, the Directive set mandatory national targets for each Member State as well. For Belgium, this target was set at 13% of its gross energy usage. It is important to note that Belgium, like the other Member States, is free to decide how to reach their targets. Most North Sea States including Belgium, however, consider offshore wind energy as a substantial contributor for reaching their renewable energy targets. In this context, the nine governments of the countries surrounding the North Sea also signed a memorandum of understanding (MoU) for regional cooperation on offshore wind energy. Besides the targets for 2020, the EU already established targets for 2030. These targets will be discussed in another section.

1.2. Research Question

8. The overarching research question is the following: “What are the legal challenges faced during the pre-installation, installation, O&M, and decommissioning phase of OWFs?” This overarching question encompasses thus legal challenges in every step of the lifecycle of an offshore wind turbine.

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Therefore, the analysis will assess the existing international, European and Belgian regulations that impact each one of these phases. During every phase, we will also look into the environmental and economic challenges that accompany the strict legal obstructions.

9. The questions regarding the pre-installation phase will be merely about the influence of several international instruments such as OSPAR, the influence of EU instruments related to the environment and blue growth such as the MSPD, the problems faced during the tender procedure, and the procedure to acquire permits in Belgium.

10. The questions related to this phase are then:

   “In what way does MSP aid the functioning of OWFs, and are there still improvements possible?”

   “Which principles stipulated in MSP does an offshore wind developer need to take into account when he is designing his OWF?”

   “What is the impact of an OWF on the environment?”

   “How does an offshore wind developer acquire his permits and what are the possible pitfalls during this procedure?”

11. In the installation stage the analysis focuses on the fact that the OWF needs to be connected to an onshore electricity grid in order to make its energy available for households. The installation stage and O&M phase are analysed together out of practical considerations. Several issues between these stages overlap especially with regard to the navigation separation schemes and the possible risks that are associated with vessels in the vicinity of the OWF. The necessity of safety zones and the possibility of an exemption regime are also analysed in that setting. The impact on the shipping industry in general is addressed as well. Consequently, these questions arose:

   “What are the current problems to connect the OWFs with the onshore electricity grid?”

   “What is the regulation surrounding the laying of cables and pipelines?”

   “What are the legal consequences if a vessel damages an offshore feeder cable connecting the OWF and the onshore electricity grid?”

   “What is the offshore wind developer’s competence in the safety zone surrounding the OWFs?”

   “Should certain activities be allowed within the safety zone and if so, which ones?”

   “What is the impact of the presence of an OWF on the shipping industry?”
1.3. Methodology

12. The foundation of this dissertation is made up of a literature review and consists mainly of an analysis and evaluation of the current Belgian legal framework. To provide a more holistic view of the issues, however, this analysis also includes a description of the relevant international and European legislation. The main focus is thus a descriptive research.

13. This contribution analyses and evaluates the legal framework with regard to the pre-installation, installation, O&M, and decommissioning phase. Before examining the separate phases, the current status of the offshore wind industry is assessed. The examination of more technical considerations is necessary in order to get a more complete overview of the issues addressed in later sections of the analysis. In addition, the framework provided by the international law of the sea is explored. Due to the fact that the UNCLOS provisions have an impact on basically every phase of the lifecycle of the OWFs, this legal instrument is examined in a separate section.

14. Then, the legal instruments that leave a mark on the regulation concerning the pre-installation phase are dealt with. These instruments are the Bonn Convention, the OSPAR Convention, the Espoo Convention and the Energy Charter Treaty. The first three instruments can be classified as instruments wishing to protect the environment in one way or another. The latter, is important to make the reader aware of the only international instrument related to energy regulation.

15. After the international section, the analysis moves on to the European regulation. In the pre-installation phase, the instruments influencing the planning methods are assessed. The instruments concerned are the Blue Growth Strategy, the Integrated Marine Policy, the Renewable Energy Directive, the Marine Strategy Framework Directive and the Marine Spatial Planning Directive. The latter is the most important in the context of this dissertation and receives therefore the most attention. Furthermore, the Habitats- and Birds Directives are analysed because these instruments can pose challenges for the development of offshore wind activities. The EU regulation concerning environmental impact assessment and state aid is also relevant for the development of OWFs, but is not examined in this dissertation. The third section is about the Belgian regulation, and more specifically about the tender, concession and permit procedure. In addition, the Belgian implementation of the aforementioned European instruments is addressed.

16. The section concerning the installation and O&M phases makes an analysis of the necessity and the legal issues concerning the installation of a transboundary offshore electricity grid. In addition, the section looks into the additional risks of collisions for vessels caused by the presence of the OWFs. In this light, the legal framework concerning the safety zones is examined. Moreover, the importance of navigation separation schemes and the impact of the installation of an OWF on these schemes are addressed. It should be noted that the multiple use of OWFs is not going to be addressed in this analysis.
17. The last stage concerning the decommissioning of the offshore wind turbines is not examined in this analysis and further research should be done in order to provide a full overview of the instruments regulating the lifecycle of the offshore wind turbines. Such an examination should look into the sustainable ways to remove the turbines. In addition, such an analysis should look into the possibilities to abandon the structure in order to serve as an environmental hot spot for example for mussels and so on.

18. While the energy policies and regulations play a role as well, due to their influence with regard to tariffs and so on, these will not be discussed in detail.

2. Status of the Industry: Technical Considerations

19. In order to get a comprehensive overview of the offshore wind industry, this section is dedicated to the technical considerations with regard to the OWFs.

20. The popularity of offshore wind energy can be explained by the fact that it is cost effective, environmentally friendly (in comparison to non-renewables), and socially popular amongst a majority of the population because they are not located in the population’s vicinity.\(^2\) Apart from these aspects, there are other unique advantages of OWFs. The first advantage relates to the fact that there is no requirement of land, which results in a closer proximity to coastal load centres.\(^2\) Furthermore, there is the lack of height and noise restrictions which implies that the developer can invest in offshore wind turbines with a larger capacity.\(^2\)

By enlarging the dimensions, the developers have exploited the positive relationship between the rotor diameter and the generating capacity in order to develop increasingly powerful wind turbines that can generate up to 10, 15 and 20 MW.\(^3\)


\(^{28}\) M. AHMAD, Operation and Control of Renewable Energy Systems, Wiley Online Library, 2017, 175.


21. Apart from these aspects, wind as such can be described as an intangible, fungible and non-exclusive resource and is caused by the heating of the earth’s surface by the sun. The offshore wind turbines are aeromechanical devices that can capture the wind’s kinetic energy and convert the rotational movement of a rotor into electrical or mechanical energy. The global potential for wind energy is estimated to be around 72 terawatts, which is quite significant if you know that the total electricity generation in 2016 amounted to 24,353 TWh. In the renewable energy mix, wind energy represented almost 34% of the total newly installed renewable energy capacity in 2016.

22. While the technical and geographical parameters governing the deployment of individual offshore wind turbines vary considerably, turbines are usually installed in arrays that consist of rows of individual turbines. The installation of a single wind turbine is namely not the end goal, it needs to be integrated into a wind farm. A wind farm consists of a number of turbines, switchgear, transformers and a substation onshore to feed the electrical power into the grid.

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23. While a wind farm leads to economies of scale, there is a risk of a decrease of the total energy converted to electricity, compared to the same number of isolated turbines operating under the same wind inflow conditions. In order to reduce this risk, developers need to analyse the aerodynamic effects of wake turbulence from each individual turbine over the entire proposed wind farm area.

24. On the one hand, the developers try to minimize the possible wake interactions between the wind turbines and on the other hand they try to maximize the power output. They therefore determine the spacing within and between the rows of turbines. The space between the turbines regularly equals a distance that is seven times greater than the turbine rotor diameter. Moreover, the arrays are often spaced in a linear series or a grid pattern, or are irregularly spaced in order to take into account the site-specific factors such as the location of shipping navigation lanes. In the end, this analysis should help to determine the efficiency of the various turbines in different layouts, and result in an optimization of the layout of the OWF.

25. The layout of a wind farm, however, is not only driven by aerodynamic factors.
26. The developers need to take into account other factors as well, including: seabed conditions, grid connection locations, hydrography, bathymetry and the wind resource in an area. Consequently, OWFs need to be located where the wind resource and the transmission-to-shore options are optimum.

27. The cost of the electrical infrastructure providing the transmission-to-shore is typically between 15% and 30% of the total cost of an OWF and consists of an internal distribution network, transmission network to shore, and substations or converter stations. The generated power produced by the OWF thus needs to overcome this cost. Furthermore, locations where this optimum is reached may often be in conflict with national, regional or international marine spatial plans, and other sectors such as fisheries and shipping may take precedence in these areas.

28. The offshore wind turbines are more or less structurally similar to their land-based counterparts. The offshore turbines, however, need to withstand harsher environmental conditions, which include for example: a large water depth, currents, waves and complex seabed conditions etc. The harsh environment can be a problem with regard to the reliability, maintainability and availability of offshore wind turbines. In order to withstand the hostile saline environment, all components need to be marinized to minimize corrosion. In addition, developers add high-grade marine coatings to all the exterior components.

29. The turbines’ predominant design consists of a horizontal-axis machine with three blades positioned upwind of the tower.

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46 Ibid.
47 Ibid., 3.
54 Ibid.
30. The turbine can be divided into three main components: the tower, the nacelle and the rotor assembly.\textsuperscript{56} Besides the turbine installation, the installation of a foundation, substation and cables will be required.\textsuperscript{57}

31. The first component of the turbine usually takes the form of a hollow steel cylinder, which is mounted on an offshore substructure.\textsuperscript{58} Such a tower needs to be able to withstand the unique combination of loading forces caused by the exposure to on the one hand, the wind which is not only the energy source but also the main disturbance of the system, and on the other hand the waves and currents.\textsuperscript{59} A ladder or lift is integrated in the tower to allow the service personnel to access the nacelle from their crew transfer vessels (CTV).\textsuperscript{60} Apart from the ladder, the tower might house electrical equipment and limited accommodations in case the personnel is forced to remain in the tower as a consequence of extreme weather conditions.\textsuperscript{61}

32. Another important characteristic of the tower is its height, reported as the hub height, where developers usually want to install wind speed measurement systems.\textsuperscript{62} The tower height depends on three main factors: the rotor diameter, the minimum height above sea level required for the lowermost extremity of the rotor dictated by national regulations, and site-specific considerations.\textsuperscript{63} These conditions relate to the water depth, bottom conditions and broader environmental considerations such as wind, wave, current and ice conditions.\textsuperscript{64}

\textsuperscript{64} \textit{Ibid.}, 444.
33. The second component, the nacelle to which the rotor with the blades is attached, is connected to the top of the tower by means of a yaw gearing. The latter enables the nacelle to rotate 360 degrees, which allows the wind turbine to change direction in order to face the direction of the wind. The nacelle houses the mechanical equipment, including the gearbox, required to manipulate the pitch and the speed of the turbine blades, in addition to the electrical generators employed to produce electricity.

34. Thirdly, there is the rotor which is connected to a shaft, which goes through a gearbox into the generator. The rotor itself is the instrument to which the blades are attached. The blades are forced to rotate due to the pressure exerted by the wind and then they turn the driveshaft that engages the electrical generators housed in the nacelle which results in the production of power.

35. The design of the blades is of vital importance because it is considered to be the key component for the further technical development of the entire wind turbine system. In addition, an optimal design can result in more reliable and efficient wind turbines.

36. The efficiency refers to the aerodynamical efficiency and the fact that the blades need to be structurally sound enough to bear all the mechanical and aerodynamic loads. An aerodynamically efficient blade is thus the prime necessity to extract maximum power from a wind turbine. The developers therefore use fibre-reinforced plastics, which should be able to cope with the extreme high-cycle fatigue loads.
37. Balancing the aerodynamic and structural parameters is becoming increasingly challenging, as wind turbines get larger and more sophisticated. The design of the blades is typically seen as a tool to get a competitive advantage.

38. Nowadays, offshore wind turbines are often equipped with helicopter landing platforms to permit personnel aerial access, even though accessing the turbines by vessel is the most economical access method. Such platforms have proven to be a handy asset to service the turbines during certain types of inclement weather conditions as they provide fast access in comparison to the workboat solution.

39. In addition to the components of the turbine, the offshore wind turbines are composed of a support structure which consists of a substructure and a foundation. The main design drivers for these substructures are a combination of high loads, materials fatigue and the cost closely interlinked with the sheer size of support structure components. There exist two primary methods for mounting the offshore wind turbines: fixed or floating substructures or foundations. Most of the currently installed or operating turbines are mounted on fixed foundations.


40. In principle there are six types of fixed foundations: a monopile, a gravity based foundation, a jacket, a tripod, a tri-pile, and a suction bucket.\textsuperscript{83} An illustration of the types of foundations is added to this analysis in the annexes.

41. The preference for fixed foundations can be explained by the fact that most offshore wind turbines are installed in an area with a water depth of less than 50m.\textsuperscript{84} Fixed foundations can only be used in shallow water and transitional water sites due to the fact that it is not feasible to install them on a loose or soft seabed.\textsuperscript{85} Developers have therefore been paying a lot of attention to the floating foundations, because these can be used in water depths exceeding 50-60m and can be installed on a loose seabed.\textsuperscript{86}

42. As of 50m water depth, the application of floating structures becomes more attractive than fixed ones.\textsuperscript{87} On the one hand, because the floating foundations can be used on a loose seabed, on the other hand because there is an economic breakpoint at which a fixed foundation becomes more costly in comparison to the floating foundation.\textsuperscript{88} On top of that, the floating supported structures have greater flexibility of construction and installation procedures, the ability to transfer onerous bending loads onto water rather than the rigid seabed, and easier removal upon site decommissioning.\textsuperscript{89}

43. The downside of floating structures is that they are considered to be more complex in design and installation.\textsuperscript{90}


\textsuperscript{86} Ibid.


\textsuperscript{88} Ibid.


44. There are at the moment only two principle types of floating substructures: the spar buoy and the semi-submersible. The most important floater-specific issues are: the floating stability, station keeping, and the floater motion control system.

45. The floating stability refers to a stable equilibrium and reflects a total integrity against down flooding and capsizing. The problems concerning the floating stability often relate to the wind turbine thrust and loads due to the occurrence of sea waves and the up wind yaw stability. Secondly, there can be issues concerning the station keeping system, which is vital for keeping the wind turbine in position in such a way that it can generate electricity and transfer the electricity to its destined receiver. The last category of specific issues relates the to floater motion control system, which is used to minimize the excitation in the pitch mode of motion of the floater unit.

46. Apart from the requirements for the individual turbines, the OWF needs to be accompanied by grid interconnection infrastructure. The latter includes the submarine cables or array cables that collect the power produced by the wind farm, the offshore substation, and the export cable to the shore. Thanks to the grid interconnection infrastructure, the power generated by the individual turbines can be delivered to the land-based consumers. In the past, the connection to the grid was not problematic due to the small size and influence of the wind turbines.

93 Ibid.
96 Ibid.
98 Ibid.
47. Even now, for the smaller OWFs or those closer to shore, the power may be brought directly to shore via submarine electrical cables which results in an injection into the grid at distribution voltage.\textsuperscript{101}

48. The situation has become more complex since the introduction of larger OWFs. For the larger OWFs or those at greater distances from the shore, which produce the growing share of the installed capacity, one or multiple offshore substations need to be installed.\textsuperscript{102} The offshore substations are typically located within the boundaries of the wind farm and mounted on steel jacket structures or monopiles.\textsuperscript{103} They are used to increase the power to a transmission voltage of approximately 133kV, before the power is transmitted to the onshore grid.\textsuperscript{104} The transmission is required in order to transform the power collected at the inner distribution cables at medium voltage to an HV level suitable for long-distance transmission.\textsuperscript{105} The transmission is thus necessary in order to avoid electrical losses during the power transfer via cables.\textsuperscript{106}

49. Due to the increase in generating capacity of an OWF, a rise in scale or number of offshore substations becomes unavoidable.\textsuperscript{107} Besides, it is also economically viable in the sense that the lifetime cost of power losses due to transmission of high power at the MV level becomes comparable to the capital cost of having an offshore substation.\textsuperscript{108} By optimizing the operating voltage for a given cable, the viable power transmission distance at a given power can be significantly extended, and the higher voltage level also increases the transmission capacity.\textsuperscript{109}


\textsuperscript{106} Ibid.


50. The number of substations is determined by the size of the wind farm, the voltage level which affects the maximum length of a feeder, and the capacity of the wind farm, the capacity of the transformer and the HV cable.\textsuperscript{110} The need for an offshore substation basically depends upon the power generated and the distance to the shore, which determines the trade-offs between capital expenditures and transmission losses.\textsuperscript{111}

51. The location of such a substation is vital when the developer is designing a collector system.\textsuperscript{112} Mainly because this location will have an immense influence on the layout of the cabling and as a consequence thereof on the expenditure of the project.\textsuperscript{113} Usually, fibre optic cables accompany the electrical export cable in order to facilitate the remote systems that are monitoring the OWF.\textsuperscript{114} Furthermore, the offshore substations can function as central service and accommodation platforms for the personnel of the OWF.\textsuperscript{115} They can contain data monitoring and control systems and maintenance and equipment support facilities as well.\textsuperscript{116}

52. Another obstacle in the context of wind energy development is the current limitation in storage technology.\textsuperscript{117} The availability of wind energy is highly dependent on weather conditions and this can be challenging in case of mismatches between wind supply and energy demand.\textsuperscript{118} Some energy storage systems have been investigated and applied over the last few years, including: the pumped hydro storage (PHS), the flywheel energy storage system (FESS), the compressed air energy storage (CAES) and so on.\textsuperscript{119} If a storage system is not installed, the energy generated by the OWFs can be directed into the electricity grids, but it cannot be stored for use on demand.\textsuperscript{120} As a consequence, the energy either has to be rejected or diverted.\textsuperscript{121}

\textsuperscript{113} Ibid.
\textsuperscript{120} B. DROSTE-FRANKE, B. P. PAAL, C. REHTANZ, D. U. SAUER, J.-P. SCHNEIDER, M. SCHREURS and T.
53. In principle, this issue can be avoided and even solved if States cooperate to allocate and exchange their surplus energy in order to manage the fluctuations in supply and demand. Currently, grid connections are, however, still designed to serve exclusively the national energy markets in individual States, with little regard for regional cooperation or the direct transmission between States.

3. Legal Framework in Relation to the Lifecycle of an Offshore Wind Turbine

3.1. General background

54. The first offshore wind farms in Europe were all built as demonstration projects in the 1990s and were located in the territorial sea. Their existence was the result of the idea of a ‘Green Europe’ that was created in the 1970s, and gradually turned into one of the normative foundations of the EU. Ever since that idea, the EU has been trying to stimulate and oblige its Member States to shift towards the use of renewable energy sources. Many Member States invested in the development of offshore wind energy in order to reach the 20-20-20 targets, accounting even for 43.1% of the renewable electricity technologies installed by 2020.

55. In order to enable this development, the coastal states need to ensure that they have the required legal powers offshore, a legal regime for developing offshore wind energy and bringing the electricity onshore.

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122 Ibid.
126 Art. 194 TFEU.
56. In principle, every State can establish their own planning regimes and regulatory processes to manage and coordinate their marine activities, including the development of OWFs. However, due to the fact that marine activities are transboundary by nature, the EU acknowledged that the legislation concerning these activities should be governed by a transboundary regime. In this context, cross-border cooperation is key for building a common and streamlined planning approach and making optimal use of the maritime space. The potential synergies resulting from such a transboundary approach thus need to be taken into account by the MSP regimes of the EU Member States.

57. Not only the installation of OWFs can benefit from a transnational approach, also the grid investments, which are necessary to connect the OWFs with the onshore electricity network, run less risk of being sub-optimal. A sub-optimal electricity network can significantly slow down the development of offshore wind energy projects and the development of a well-functioning Europe-wide market for electricity. Belgium already encountered difficulties regarding such a network with its Stevin-project. The latter and its importance will be discussed further in-depth in the analysis.

58. Over the past few years, it has become clear that the development of OWFs can face various legal challenges. The root of the problems is typically related to the range of spatial and functional impacts of OWFs on existing marine uses.


132 Ibid.


59. First of all, the OWFs tend to occupy large ocean spaces on an exclusive basis for a long period of 20 to 30 years, depending on the stipulation in the concession.\textsuperscript{137} Their functional impact consists of local wind and visibility conditions, possible displacement of shipping navigation routes and low overflight, the possible displacement of commercial and recreational fishing activities, increased danger of allusions and collisions, and the interference with radar functionality.\textsuperscript{138} Furthermore, OWFs tend to have an environmental impact on the livelihood of several animal populations such as birds, bats, and marine mammals.\textsuperscript{139} In this light, it is not surprising that other marine users want to limit the impact of OWFs on their activities.\textsuperscript{140} The methods to avoid conflicts between the marine users and types of impacts will be addressed in other sections of this analysis.

60. Locating wind turbines in the marine environment, however, is still attractive for the Belgian government because of the availability of geographical usable areas.\textsuperscript{141} In addition, the sea area can accommodate extensive arrays capable of producing power on a large scale.\textsuperscript{142} Clustering the wind turbines in arrays reduce the use of space and the costs relating to O&M.\textsuperscript{143} Furthermore, installing wind turbines offshore is more beneficial than installing wind turbines onshore due to a higher reliability as a result of consistently higher wind speeds.\textsuperscript{144} The wind conditions on the sea with an average of 10 m/s are more favourable in comparison to the wind conditions on land with an average between 6-8 m/s.\textsuperscript{145} As a result, there is a higher production per unit installed.\textsuperscript{146}


\textsuperscript{146} Communication (Comm.) to the European Parliament, the Council, the European Economic and
61. Besides the higher reliability, there is less likelihood of impacts that trigger public opposition, such as noise, lowering of property values and interference with landscape aesthetics.\textsuperscript{147} This way, the government avoids problems concerning the NIMBY–effect, which assumes that everyone agrees with the usefulness of the project, but prefers to have it in someone else’s backyard rather than their own.\textsuperscript{148}

3.2. Overarching Framework: International Law of the Sea

62. Even though the regulation of energy is considered to be a matter of national rather than international law, it is important to stress that international law plays a key role in energy regulation in six aspects.\textsuperscript{149} First of all, it provides a framework for how transboundary or common resources are to be utilized.\textsuperscript{150} In se, it is essential to know who controls a non-exclusive resource in order to avoid conflicts and to stimulate countries to resource co-operation.\textsuperscript{151} In the context of offshore wind energy this can be tricky, since wind energy is a product of common-pool resources, which result from complex natural processes that reach beyond the exclusive control of any State.\textsuperscript{152} As a result, this requires a coordinated regulation between States in accordance with the natural patterns of the energy system.\textsuperscript{153}

63. Second, international law may constrain the ability of States to control or interfere in energy production activities, especially via international investment and trade law.\textsuperscript{154} Such interference can take the shape of tariffs or restrictions with regard to state aid for example. Furthermore, international law facilitates access to and supply of energy resources.\textsuperscript{155}

\textsuperscript{153} Ibid.
\textsuperscript{154} Ibid.
\textsuperscript{155} Ibid.}
Since many resources are usually not located in the near vicinity of the energy users, there is a need for international networks of supply to support the transfer of energy and raw materials.\textsuperscript{156}

64. In addition, international law set out a basic framework for controlling the transboundary consequences of energy use, such as transboundary pollution.\textsuperscript{157} Aside from that, international law addresses global problems that cannot be satisfactorily solved on a unilateral basis, and tries to coordinate global initiatives.\textsuperscript{158} Last but not least, international law facilitates the coordination of domestic energy law regimes and policies, including finance, technological support and training for developing countries.\textsuperscript{159}

65. The regulation for offshore energy projects is also embedded in the context of international law, and is especially stipulated in the framework of the international law of the sea.\textsuperscript{160} The international rules have been drafted at a high level of generality, providing for their extension to new ocean uses.\textsuperscript{161} In this context, the most relevant instrument is the United Nations Convention on the Law of the Sea, which was adopted in 1982 and ratified by Belgium on the 13\textsuperscript{th} of November in 1998 (hereafter UNCLOS).\textsuperscript{162} The aforementioned convention introduced a new offshore zone, namely the Exclusive Economic Zone (EEZ) and established other concepts to indicate different zones in the sea bordering a State’s coast.\textsuperscript{163} The jurisdiction of a coastal state depends on the spatial ambit of those marine spaces, which are defined on the basis of their distance from the coast.\textsuperscript{164} The convention, however, does not set many conditions on the development of blue energy, including OWFs, in areas under the sovereignty or jurisdiction of States.\textsuperscript{165}

\textsuperscript{156} Ibid.
\textsuperscript{157} Ibid., 588-589.
\textsuperscript{163} C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at Sea?”, \textit{TRNI} 2015, 56.
3.2.1 Territorial Sea: Territorial Sovereignty

66. The zone closest to the shore is the territorial sea, which extends to maximum 12 NM starting from the State’s normal baseline.\textsuperscript{166} The convention does not set a minimum breadth of the territorial sea.\textsuperscript{167} The normal baseline can be defined as the low – water line drawn along the coast.\textsuperscript{168} The breadth of the territorial sea in Belgium extends to the maximum of 12 NM.\textsuperscript{169}

67. In the territorial sea, the coastal state has full sovereign rights and is free to set laws, regulate use, and use any resource.\textsuperscript{170} The only condition is that with regard to traffic, the coastal state takes into account the recommendations of the competent international organisation (IMO), customary practices, and the nature and density of the traffic.\textsuperscript{171} Besides these stipulations, the convention does not specifically mention anything concerning the control of energy in the territorial sea.\textsuperscript{172} Since a State’s sovereignty extends to its territorial sea, the sovereignty over energy resources should be treated in the same way as on land territory.\textsuperscript{173}

68. Foreign vessels have a right of innocent passage through the territorial sea of a third state.\textsuperscript{174} During the innocent passage, the foreign vessels may not be hampered by the coastal state except in accordance with UNCLOS.\textsuperscript{175} An example of such an exception is the creation of safety zones around installations such as OWFs within which navigation is prohibited or restricted.\textsuperscript{176}


\textsuperscript{168} Art. 5 UNCLOS; Y. TANAKA, \textit{The International Law of the Sea}, Cambridge, Cambridge University Press, 2015, 45.

\textsuperscript{169} Wet 6 oktober 1987 tot bepaling van de breedte van de territoriale zee van België, BS 22 oktober 1987.


\textsuperscript{171} Art. 22 UNCLOS.

\textsuperscript{172} R. BARNES, “Energy Sovereignty in Marine Spaces”, \textit{IJMCL} 2014, 591.

\textsuperscript{173} Art. 2 UNCLOS; R. BARNES, “Energy Sovereignty in Marine Spaces”, \textit{IJMCL} 2014, 591.

\textsuperscript{174} Articles 17 to 19 UNCLOS.


\textsuperscript{176} Art. 21, 60(4) and 60(5) UNCLOS; K. N. SCOTT, “Tilting at Offshore Windmills: Regulating Wind Farm Development within the Renewable Energy Zone”, \textit{Journal of Environmental Law} 2006, 103.
69. In this light, it is important that the location of generation facilities does not hamper or deny the right of passage.\textsuperscript{177}

70. With regard to innocent passage it is relevant to stress that a coastal state can encounter limitations regarding the exercise of criminal and civil jurisdiction vis-à-vis foreign ships and their crews.\textsuperscript{178} Coastal states do possess legislative jurisdiction regarding the innocent passage through the territorial sea with respect to the protection of navigational aids and facilities and other facilities or installations, and the protection of cables and pipelines.\textsuperscript{179}

71. While more than 90\% of the Belgian OWFs are located in a range from the Thornton bank to the Bligh Bank and thus outside the territorial sea, the zone remains important in the light of the laying of cables and the grid connection to shore.\textsuperscript{180} The coastal state has for example the right to establish certain conditions for the cables or pipelines entering its territory or territorial sea.\textsuperscript{181}

\textbf{3.2.2. Exclusive Economic Zone and Continental Shelf: Sovereign Rights}

72. Beyond the territorial sea, coastal States can have an EEZ and a continental shelf.\textsuperscript{182} These zones are the most important ones when it comes to the European offshore wind activities, because the majority of European OWFs is located in them.\textsuperscript{183} Contrary to the territorial sea, the coastal States only have limited sovereign rights in these zones, which they can exercise for the purpose of exploring and exploiting natural resources.\textsuperscript{184} Both concepts are closely related, but they have separate features.\textsuperscript{185}

\textsuperscript{177} Art. 24 UNCLOS; R. BARNES, “Energy Sovereignty in Marine Spaces”, \textit{IJMCL} 2014, 591.


\textsuperscript{179} Art. 21(1)(b) and 21(1)(c) UNCLOS; Y. TANAKA, \textit{The International Law of the Sea}, Cambridge, Cambridge University Press, 2015, 95.


\textsuperscript{181} Art. 79(4) UNCLOS; C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at Sea?”, \textit{TRNI} 2015, 58.


\textsuperscript{184} Art. 56 and 77 UNCLOS; C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at Sea?”, \textit{TRNI} 2015, 57.

\textsuperscript{185} C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at Sea?”,
73. First of all, the EEZ can be established by a declaration from the coastal state, and extends to a maximum of 200 NM from the baseline.\(^{186}\) Thus, contrary to the territorial sea or the continental shelf, the existence of the EEZ does not come into being as an automatic consequence of sovereignty.\(^{187}\) Belgium defined her EEZ in article 2 of the Law of 22 April 1999 concerning the exclusive economic zone of Belgium in the North Sea.\(^{188}\)

74. Every other North Sea state also established an EEZ, which gave them the sovereign right to generate offshore wind energy outside their territorial sea.\(^{189}\) When these states established their EEZ, they had to decide whether to extend their existing laws or adopt a new legal regime for offshore wind, due to the fact that laws need to be explicitly declared applicable to the EEZ.\(^{190}\) As seen in the section about the technical considerations, OWFs also require a construction of installations and connections to the shore. The coastal states thus also had to decide how to design the permitting regime and how to classify the cables connecting the OWFs to the shore.\(^{191}\)

75. If you examine the legal frameworks of the North Sea States applied to offshore wind development, two different approaches can be identified.\(^{192}\) They have classified OWFs either as installations requiring some sort of construction permit, or as an activity aimed at producing electricity and falling under the relevant national electricity legislation.\(^{193}\) In Belgium, a developer needs an offshore domain concession in order to construct the OWF, but he does not need a production license.\(^{194}\)

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\(^{189}\) H. K. MÜLLER and M. M. ROGGENKAMP, “Regulating Offshore Energy Sources in the North Sea – Reinventing the Wheel or a Need for More Coordination?”, *IJMCL* 2014, 728.

\(^{190}\) *Ibid*.

\(^{191}\) H. K. MÜLLER and M. M. ROGGENKAMP, “Regulating Offshore Energy Sources in the North Sea – Reinventing the Wheel or a Need for More Coordination?”, *IJMCL* 2014, 728.


\(^{194}\) Art. 6 Wet 29 April 1999 betreffende de organisatie van de elektriciteitsmarkt, *BS* 11 mei 1999 (hereafter Electricity Act); C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at Sea?”, *TRNI* 2015, 61-64.
76. In the EEZ, the coastal state has sovereign rights for the purpose of exploring and exploiting, conserving and managing the living and non-living natural resources of the waters superjacent to the seabed and of the seabed and its subsoil. These rights can also be exercised with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds. On top of that, the coastal state has jurisdiction with regard to the establishment and use of artificial islands, installations and structures. As a consequence of these rights, the EEZ is the most adequate zone to develop offshore wind energy activities in.

77. The Belgian legislation incorporated the sovereign rights provided in article 56 UNCLOS in article 7 of the Belgian Act of 13 June 1969 on the exploration and exploitation of non-living resources of the territorial sea and the continental shelf (hereafter Act of the Continental Shelf). The Belgian regulation thereby confirmed that artificial islands, installations and other structures that are permanently erected in the territorial sea or on the continental shelf, and the persons and goods on these artificial islands, installations or structures are subject to Belgian law. Article 38 of the Act concerning the Exclusive Economic Zone of Belgium in the North Sea extended the scope of application of article 7 of the Act of the Continental Shelf to all other artificial islands, installations and structures.

78. Besides the provisions in article 56 UNCLOS, article 60 UNCLOS is also relevant for the regulation of OWFs. This article states that a coastal state has the exclusive right in its EEZ to construct, operate and use, and regulate artificial islands, installations and structures for the purposes provided for in article 56 and other economic purposes, and installations and structures which may interfere with the exercise of the rights of the coastal State in the zone. A coastal state also has prescriptive and enforcement jurisdiction with regard to these structures. Further specifications concerning the precise nature of the right are not given, although the right presumably flows from the State’s general sovereign rights over resources in the EEZ.

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195 Art. 56 (1) UNCLOS.
196 Art. 56 (1) UNCLOS.
197 Art. 56 (1) UNCLOS.
200 Art. 38 of the Belgian Act of 22 April 1999 concerning the Exclusive Economic Zone of Belgium in the North Sea, BS 10 July 1999.
201 Art. 60(1) and 60(2) UNCLOS.
79. Decisions concerning the placement and operation of such structures must take into account navigational concerns, whilst their removal must have due regard to fishing and protection of the marine environment. Vessels still have the freedom of navigation in the EEZ, and States need to keep this in mind. Apart from that, it is important to note that the concepts of ‘installations’ and ‘structures’ are not defined as such by UNCLOS. Legal doctrine has helped out by stating that wind turbines and connection stations are considered to be covered by these concepts.

80. Another regime, namely the continental shelf, comprises the seabed and subsoil of the submarine areas beyond the territorial sea and applies in principle to a distance of 200 NM from the baseline. In this zone, the coastal state can also exercise the sovereign rights for the purpose of exploration and exploitation of its natural resources. If the natural prolongation of the land territory below the sea, however, is longer than 200 NM, States may claim a continental shelf up to a maximum of 350 NM measured from the baseline. When a State extends its continental shelf, the state needs to inform the Commission on the Outer Limits of the Continental Shelf about this. After the Commission is informed, it will provide recommendations on the basis of which the coastal state shall establish the final boundary.

81. While UNCLOS does not directly mention provisions concerning the control of the energy supply, article 79 UNCLOS does state that all states are entitled to lay submarine cables and pipelines on the continental shelf. In addition, UNCLOS confirms that coastal states have jurisdiction over cables and pipelines constructed or used in connection with the economic activities in the EEZ or connected to installations under the jurisdiction of the coastal state.

\[207\] *Ibid*.
\[208\] Art. 76 UNCLOS.
\[209\] Art. 77(1) UNCLOS.
\[211\] Art. 4 Annex II UNCLOS; C. REICHERT, “Determination of the Outer Continental Shelf Limits and the Role of the Commission on the Limits of the Continental Shelf”, *IJMCL* 2009, 393.
\[214\] See arts. 48(2), 76, 79(4) and 87(1)(c) UNCLOS; H. K. MÜLLER and M. M. ROGGENKAMP, “Regulating Offshore Energy Sources in the North Sea-Reinventing the Wheel or a Need for More Coordination?”, in N. BANKES and S. TREVISANUT (eds.), *Energy from the Sea: An International Law Perspective on Ocean Energy*, Leiden, Brill, 2015, 158.
82. Cables or pipelines that are not linked to any of these activities still fall under the general freedom to lay cables and pipelines.  

83. Other states, however, also have the right to lay submarine cables and pipelines in the EEZ and across the continental shelf. Their right is in a certain way restricted in the sense that the delineation of the pipeline’s course is subject to the coastal state’s consent. Moreover, this action will not affect the coastal state’s jurisdiction over cables and pipelines constructed in connection with the exploration of its continental shelf or exploitation of its resources or the operations of artificial islands, installations and structures under its jurisdiction.  

84. Furthermore, all states need to pay due attention to the position of existing submarine cables and pipes and the access for their repair. In Belgium, the other States need to obtain a federal authorization from the Belgian government in order to construct cables and pipelines used for the functioning of artificial islands, structures or installations.  

85. The aforementioned provisions are vital for the creation and maintenance of energy networks and permits the coastal State to take reasonable measures to ensure the enjoyment of its resource-related rights.  

**3.3. Pre - installation Phase**  

3.3.1. International Regulation  

86. The zonal fragmentation of UNCLOS and the functional jurisdiction associated with it has come under increasing criticism in the light of the obstacles it poses to concerted action to address global problems, such as climate change, sustainable energy for all and conservation of marine biodiversity. There are, however, several other legal instruments that complement UNCLOS in order to provide an adequate framework to develop OWFs. These global, regional and national instruments will be discussed according to their importance during each phase of the lifecycle of an OWF.  

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215 Art. 87(1)(c) UNCLOS.  
216 Art. 58 UNCLOS.  
218 Art. 79(4) UNCLOS.  
220 Art. 4 of the Belgian Act of 13 Juni 1969 on the exploration and exploitation of non-living resources of the territorial sea and the continental shelf, *BS* 8 October 1969.  
3.3.1.1. Environmental Instruments

87. Even though wind energy technologies deliver environmental benefits in terms of reduced GGEs, they can impact the environment significantly, for example with regard to biodiversity. More precisely, OWFs’ impacts on the environment include: impacts on fauna as a result of collisions, nuisance and displacement from noise, vibrations and electromagnetism, barrier effect, seascape impact, and habitat destruction. Such impacts are expected to turn up especially during the periods of construction and decommissioning due to the increased activity during these phases. It is for example currently not technically possible to reduce noise emissions during these phases to the prescribed thresholds of 160 dB SEL (sound exposure level).

88. The impacts, however, need to be addressed before the start of the activities and that is why the following sections address the relevant environmental instruments in relation to the protection of the environment in the vicinity of OWFs. This analysis is relevant in the planning phase of the OWF, because wind energy projects can be unable to obtain planning consent if they contravene regulation on protected species and habitats. In this context the following instruments can play a role: the Convention on Biological Diversity, the Bonn Convention, the Bern Convention, the Ramsar Convention, the Espoo Convention and the OSPAR Convention. Due to the fact that the EU regulation is more relevant for our analysis, the majority of these instruments will not be examined in this thesis.

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223 P. RODDIS, “Eco-innovation to reduce biodiversity impacts of wind energy: Key examples and drivers in the UK”, Environmental Innovation and Societal Transitions X, X.
226 Ibid.
227 P. RODDIS, “Eco-innovation to reduce biodiversity impacts of wind energy: Key examples and drivers in the UK”, Environmental Innovation and Societal Transitions X, X.
A. The Convention on the Conservation of Migratory Species of Wild Animals (hereafter the Bonn Convention)

89. The Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their area of natural distribution.\(^{234}\) In addition, the treaty has the objective of promoting the favourable conservation status of those species.\(^{235}\) When States ratify the convention, they acknowledge the importance of migratory species being conserved, and the need to take action to avoid any migratory species becoming endangered.\(^{236}\)

90. Article V obliges States to make complementary agreements covering the whole of the area throughout which migratory species are distributed. The scope of protection of the migratory species varies, depending on the Appendix in which the species appear.\(^{237}\) The Bonn Convention stimulates the Parties to conclude additional agreements in order to protect the species listed in Appendix I or II.\(^{238}\)

91. In addition to the provisions in the Convention, the Conference of the Parties (CoP) to the Bonn Convention has adopted a number of resolutions to address the adverse impacts of wind farm development on migratory species.\(^{239}\) Firstly, there is the Resolution about wind turbines and migratory species.\(^{240}\) The main goal of the resolution was to stimulate the Parties to conduct research to evaluate the environmental impact of wind turbines on migratory species, and to urge the Parties to identify the areas where those species are vulnerable.\(^{241}\) Other relevant resolutions include the resolution concerning the Further Steps to Abate Underwater Noise Pollution for the Protection of Cetaceans and Other Biota\(^{242}\), the resolution on the Adverse Anthropogenic Marine/Ocean Noise Impacts on Cetaceans and Other Biota\(^{243}\) and the resolution on renewable energy and migratory species\(^{244}\).

\(^{237}\) B. VANHEUSDEN en G. VAN HOORICK, Milieurecht in kort bestek, Mortsel, Intersentia, 2011, 72.
\(^{238}\) See arts. II(3)(c), IV(3) and V of the Bonn Convention.
\(^{240}\) CoP, Wind Turbines and Migratory Species, UNEP/CMS/Resolution 7.5 (Rev. COP12), Manila, October 2017.
\(^{241}\) Ibid.
\(^{243}\) CoP, Adverse Anthropogenic Marine/Ocean Noise Impacts on Cetaceans and Other Biota,
92. In Europe, the Habitat – and Bird Directives provide additional protection and impose (more) strict obligations on the EU Member States.

B. Convention for the Protection of the Marine Environment of the North-East Atlantic (hereafter OSPAR Convention)

93. The OSPAR Convention imposes a general obligation on its Parties to take all possible measures in order to prevent and eliminate pollution and to take the necessary measures to protect the maritime area against adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems, and restore where possible the marine areas which have been adversely affected. In addition, the Convention requires from the Parties to apply the precautionary principle and the polluter pays principle.

94. The former is often used as a key argument against the construction of OWFs. Even though a lot of research has been conducted to map the environmental impact of OWFs, a lot of uncertainty still remains about the impact of OWFs. The principle as such entails that a State needs to take measures before there is full scientific certainty about an activity, if there is a chance that by taking such measures the State can prevent far-reaching and irreversible damaging consequences from that activity.
95. An example of the application of the precautionary principle is the obligation to use noise mitigation techniques such as bubble curtains, which depend on an air barrier or sound-dampening obstacles placed between the pile and the water.  

96. Secondly, the OSPAR Convention requires the application of the polluter pays principle, which the OECD introduced in a recommendation in 1972. It originates from economic concepts such as the Coase theorem concerning the external (social) costs and the idea of A. C. Pigou concerning the internalisation of the external costs into the costs of economic activity. In the OSPAR Convention, the principle requires that the costs of pollution prevention, control and reduction measures shall be borne by the polluter. The Convention thus establishes a responsibility for the Contract Parties to apply the polluter pays principle.

97. In addition, the OSPAR Commission stressed the importance of the ecosystem approach in its Strategy for the Protection of the Marine Environment of the North-East Atlantic 2010–2020. The OSPAR Commission was established in accordance with article 123 and 197 UNCLOS, and is the competent regional organization guiding international cooperation on the protection of the marine environment of the North-East Atlantic. The Commission is made up of representatives of the Governments of 15 Contracting Parties and the European Commission, which represents the European Union.

98. The ecosystem approach adopted by the OSPAR Commission embodies a strategy to halt the degradation of biodiversity and our ecosystems as a whole. However, it does not have a formal, universally agreed definition, but is usually based on three core elements.

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255 Art. 2(2)(b) OSPAR Convention.
99. In the strategy, the OSPAR Commission reflects those core elements in its interpretation of the ecosystem approach. The elements consist of the holistic management of human activities, which should be based on the best available knowledge on the components, structure and dynamics of ecosystems, thereby achieving the sustainable use of ecosystem goods and satisfying the human needs in a way that does not compromise the integrity, or health, of ecosystems.

100. The Contracting Parties to the OSPAR Convention had to implement the ecosystem approach within the framework of their obligations and commitments, such as under the EU Marine Strategy Framework Directive (MSFD). As a result, the North Sea States established the Bergen Statement in 2010, which reaffirmed the conceptual framework for the implementation of the ecosystem approach within the North Sea, and mainly focused on the contribution by OSPAR to the implementation of the MSFD.

101. In 2002, the North Sea States had already recognized the need to manage all human activities that affect the North Sea, in a way that conserves biodiversity and ensures sustainable development by establishing the Bergen Declaration. The framework of this declaration also included the trialling of Ecological Quality Objectives (EcoQOs) and indicators to monitor the health of the North Sea ecosystem.

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102. Furthermore, the Bergen Declaration stated that Marine Spatial Planning (MSP) could be used as a tool to support the ecosystem approach.\textsuperscript{267} It should be noted, however, that there is no legal framework for MSP at the OSPAR level.

103. In addition, the third Annex to the OSPAR Convention specifically tackles the pollution from offshore sources.\textsuperscript{268} The Annex states that disused offshore installations and pipelines may not be dumped, nor left in the maritime area without a permit issued by the competent authority.\textsuperscript{269} The provisions in the Annex are especially relevant in the decommissioning phase or after accidents. Besides those provisions, the OSPAR Commission conducted an assessment of the environmental impact of OWFs and provided guidelines to minimize their impact.\textsuperscript{270}

\textit{C. Convention on Transboundary Environmental Impact Assessment (hereafter Espoo Convention)\textsuperscript{271}}

104. The Espoo Convention addresses the transboundary effects of certain activities and obligates the Contract Parties to conduct an environmental impact assessment (EIA) at the project level of the proposed activity.\textsuperscript{272} In addition to the fact that the EIA must be undertaken prior to any decision to authorize or undertake an activity, States need to include at least the information provided for in Appendix II of the Espoo Convention.\textsuperscript{273} The information needs to contain for example a description of the planned activity, alternative solutions, corrective measures, an identification of the gaps in knowledge and uncertainties and so on.

105. In principle, a Contract Party is only obligated to conduct an EIA for the activities listed in Appendix I of the Espoo Convention.\textsuperscript{274}

\textsuperscript{267} F. M. PLATJOUW, “Marine Spatial Planning in the North Sea – Are National Policies and Legal Structures Compatible Enough? The case of Norway and the Netherlands”, \textit{IJMCL} 2018, 43.
\textsuperscript{268} Annex III On the Prevention and Elimination of Pollution from Offshore Sources of the OSPAR Convention.
\textsuperscript{269} Arts. 5, 7 and 8 Annex III On the Prevention and Elimination of Pollution from Offshore Sources of the OSPAR Convention.
\textsuperscript{274} Art. 2(3) Espoo Convention.
106. The activity of constructing major installations for the harnessing of wind power for energy production, such as OWFs, also appears on this list in Appendix I. Thus, Contracting Parties need to conduct an EIA before installing OWFs. Parties can deviate from the principle, in the sense that they can apply the terms of the Espoo Convention to other activities that were not enlisted on Appendix I.275

107. This is possible in any case where the States involved agree to do so, if the proposed activities have a harmful transboundary impact due to their breadth, location, and long-distance effect.276 An example of such a case is the activity of cable laying in the North Sea. While this activity is not listed in Appendix I, the North Seas Countries’ Offshore Grid (NSCOGI) initiative stated that the principles established in the Espoo Convention had to be used to guide the coordination of national processes to authorize the planned transboundary infrastructure.277

108. The obligation to conduct an EIA is connected to the duty of States to prevent transboundary harm, and the duties to notify and consult the potentially affected States in relation to plans or activities that might give rise to such harm.278 In addition, the requirement to conduct a transboundary EIA is linked to the implementation of the general concept of sustainable development and the application of the precautionary principle.279

109. The sustainable development concept was introduced by the Brundtland Commission in 1987.280 The concept can be defined as a development that meets the needs of the present without comprising the ability of the future generations to meet their own needs.281


281 Ibid.
110. The definition introduces the need for balancing four equally important facets. Those facets include the protection of long-term ecological sustainability, the satisfaction of basic needs, and the promotion of intragenerational and intergenerational equity.

111. The convention also established notification and consultation procedures, which can be used by the authorities and the general public of the states that are likely to be affected by an activity. In this context, Belgium contacted its neighbouring states, the Netherlands, France and the United Kingdom in order to consult them in the framework of the Espoo Convention about their development plans concerning OWFs. In that way, these states addressed their concerns about: the lack of knowledge about the impact of the OWF development on the transport of sediment, the impact of the energy-island, the impact of the electricity socket at sea, the expansions of ports, and the limited knowledge about cumulative environmental impacts of the OWFs.

112. The major disadvantage of the existence of uncertainties about the cumulative effects of OWFs, is that it can cause substantial delays during the consenting procedure. This is typically aggravated by the lack of clarity about how to assess those cumulative effects.

3.3.1.2. Energy Charter Treaty (ECT)

113. The regional multilateral ECT entered into force in April 1998 and applies to all forms of energy, including the renewable energy generated by OWFs. The ECT provides together with the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects a unique multilateral framework for energy cooperation.

283 Ibid.
286 Ibid.
291 BALIM, “The Linkage between Double Tax Treaties and Government-to-Business Agreements in
114. The fundamental aim of the ECT is to promote and facilitate the investment and trade in energy markets and the cooperation in the energy field in line with WTO provisions and nuclear non-proliferation regimes. By doing so, the ECT wants to strengthen the rule of law on energy issues and create a level playing field by removing trade barriers in order to improve the efficient operation of the energy markets in Europe and Eurasia. In addition, the ECT desires to minimize the risks associated with energy-related investment and trade. The ECT also tries to facilitate knowledge exchange.

115. The ECT introduces both commercial and environmental obligations, though the latter are aspirational rather than prescriptive in nature. The ECT did for example incorporate the polluter pays principle in article 19 (1). In addition, article 19 comprises ten other objectives related to environmental matters such as public participation, the use of environmentally sound technologies, EIA etc. Aside from the environmental obligations, the ECT contains binding regulation on investment, trade and transit related issues, and it includes a dispute settlement mechanism.

116. Basically, the provisions of ECT can be divided into five broad categories. First of all, there is a category of provisions about the protection and promotion of foreign energy investments, which is based on the extension of national treatment, or the most-favoured nation treatment.
117. The second category deals with the free trade in energy materials, product and energy-related equipment and is based on WTO rules. Furthermore, the ECT deals with the freedom of energy transit through pipelines and grids, which is especially important for the connection of OWFs to shore. On top of that, the ECT focuses on reducing the negative environmental impact of the energy cycle through improving energy efficiency. Lastly, the Treaty provides mechanisms for the resolution of state-to-state or investor-to-state disputes.

118. The scope of application of the ECT extends to the contracting States’ territories, including the territorial waters and other maritime zones where the States exercise sovereign rights and jurisdiction. There are 52 States party to the Energy Charter Treaty, including the EU. The new charter, called the International Energy Charter, has 64 signatory states as of August 2015 thereby exceeding the number of the original signatories to the Energy Charter Treaty.

119. In addition, article 18 of the ECT proclaims that the Contracting States have sovereignty and sovereign rights over energy resources. In comparison to UNCLOS, these rights need to be exercised in accordance with and subject to the rules of international law. Furthermore, the ECT does not limit a State’s authority and discretion as to how to structure the ownership of energy resources. Thus, the ECT leaves the ownership of resources unaffected.

120. From time to time, the ECT tries to modernize in order to ensure its importance for energy security cooperation, investment protection and its normative influence globally.

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303 Ibid.


305 Arts. 1(10)(a) and 1(10)(b) Energy Charter Treaty.


310 Arts. 1(10)(a), 1(10)(b) and 18(1) Energy Charter Treaty.

311 Art. 18(3) Energy Charter Treaty.


121. Even though several States signed the new International Energy Charter, there remain several issues unsolved related to energy security, access to energy, the negative environmental and climatic externalities created by the extraction, production, transport and consumption of energy.  

122. The Charter remains, however, important because it articulates a political will to reduce transaction costs, create the necessary order and mitigate the negative externalities of the energy sector. On top of that, it provides an international forum, which is relevant because the existing institutions dealing with energy only have a partial scope with a limited amount of members. These multilateral institutions typically co-exist and need to compete with strong bilateral and bloc relations, which can diminish their contributions to the international energy regulation scene.

123. One of those institutions is the International Renewable Energy Agency (IRENA), which has the objective of promoting the adoption and sustainable use of all forms of renewable energy. IRENA’s mandate includes the facilitation of dialogue, promotion of research and education, and the development of policy recommendations. At the moment, there are 156 States who are a party of IRENA, with a further 25 States in accession.

124. Another shortage of the ECT is that it refers little to other groups of actors such as energy companies, international financial institutions or NGOs, which have assumed more weight in international energy governance. However, there is no mention of the various segments of renewables or prioritisation of any sources of energy or ranking them in any way. While this wide coverage seeks to attract as many actors as possible by offering something for everyone, it represents incremental progress in relation to the existing structure of institutions of international energy governance. Overall, the IRENA plays a more critical role for the development of renewables, and more in particular for the international framework concerning OWFs.

125. An analysis of other instruments, such as customary international law in relation to energy law, would be too extensive in this context.

315 Ibid., 92-93.
316 Ibid., 92.
318 Art. IV(A) of the the Statute of the International Renewable Energy Agency (IRENA), Bonn, 26 January 2009, RENA/FC/Statute.
321 Ibid.
3.3.2. European Regulation

126. In addition to the UNCLOS and the OSPAR, a number of EU Directives are also of particular relevance to the governance of the North Sea ecosystem in relation to the development of OWFs. These are in particular the Habitats Directive\(^{322}\), the Birds Directive\(^{323}\), the Marine Strategy Framework Directive\(^{324}\), the Directive on Maritime Spatial Planning\(^{325}\), and the Renewable Energy Directive.\(^{326}\) Other important EU instruments that will be analysed in this context are the Blue Growth strategy\(^{327}\) and the Integrated Maritime Policy.\(^{328}\)

127. The EU Emissions trading scheme\(^{329}\), the Environmental Impact Assessment Directive\(^{330}\) and the Strategic Environmental Assessment Directive\(^{331}\) also plays a role in the development of the offshore wind industry but will not be discussed in this context.

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3.3.2.1. Blue Growth Strategy

128. The European Commission adopted the Blue Growth Strategy in 2012, believing that the blue economy could be a driver for Europe’s welfare and prosperity.\textsuperscript{332} The strategy was launched in order to anticipate changes resulting from climate change and the expected increase of scarcity of natural resources, increased vulnerability of the planet, growth in urbanization and the density of the human population in coastal areas.\textsuperscript{333} It is part of the framework of the Integrated Maritime Policy\textsuperscript{334}, which aims to stimulate marine activities in order to create smart, long-term and sustainable socio-economic growth, while safeguarding the natural resources provided by the sea.\textsuperscript{335}

129. Three pillars consisting of different components form the heart of the strategy. The first pillar adopts a sectorial approach and encompasses ocean strategy, aquaculture, marine biotechnology, seabed mining and coastal tourism.\textsuperscript{336} The second category pays attention to knowledge, legal certainty and security in the blue economy.\textsuperscript{337} In this framework, the EU wants to improve access to information about the sea. On top of that the Strategy focuses on the implementation of maritime spatial plans to ensure an efficient and sustainable management of activities at sea.\textsuperscript{338} The third aspect relates to integrated maritime surveillance, which needs to give the authorities from the MS more information over the activities at sea.\textsuperscript{339}

\begin{thebibliography}{9}
\bibitem{334} Communication (Comm.) to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - An Integrated Maritime Policy for the European Union, Brussels, 10 October 2007, COM/2007/0575 final.
\bibitem{337} \textit{Ibid}.
\bibitem{339} \textit{Ibid}.
\end{thebibliography}
130. The third pillar contains sea basin strategies, which focus on the seas in which the EU MS can exercise their sovereign rights. These sea basin strategies need to ensure tailor-made measures and foster cooperation between the MS.340

131. SOMA et al express their concern about the fact that the strategy is merely based on a technology-oriented approach and misses a social innovation aspect.341 A report from ECORYS also acknowledged that the Blue Growth Strategy is unlikely to reach its full potential without public acceptance and support.342

132. In the context of this dissertation, however, it seems clear that the Blue Growth Strategy has contributed to the boom it knows today. Thanks to the existence of the Blue Growth Strategy and the fact that the EU wanted to stimulate blue energy, the Maritime Spatial Planning Directive was adopted.343 Nevertheless, in order to better implement the strategy it is recommended to adopt a complementary funding instrument.344

3.3.2.2 Integrated Maritime Policy (IMP)

133. As of the 1990s, several governments adopted programmes to establish integrated ocean policies.345 In 2007, the EU followed this international trend with the adoption of the Integrated Maritime Policy.346 The main goal of the IMP is to foster coordinated and coherent decision-making to maximise the sustainable development, economic growth and social cohesion of Member States, and notably the coastal, insular and outermost regions in the Union, as well as maritime sectors, through coherent maritime-related policies and relevant international cooperation.347 As it is an integrated policy, the IMP incorporates the objectives established in other marine policies and legislation such as the designation of Marine Protected Areas (MPAs) complementing the Natura 2000 sites, the development of offshore renewable energy and sustainable fisheries.348

347 Art. 3(1) Maritime Spatial Planning Directive.
348 W. QIU and P. J. S. JONES, “The emerging policy landscape for marine spatial planning in
134. The vision of the IMP is described by the EU in the Green Paper “Towards a Future Maritime Policy for the Union: a European Vision for the Oceans and Seas”, which was presented by the European Commission on 7 June 2006. In this paper, the cross-sectorial management was identified as one of the main ways to promote growth of the maritime economies in the Member States.

135. In addition, it called for an effective coordination and integration of marine policy areas at all levels. After a consultation period of one year the EU adopted the Bluebook, which proposed certain goals, such as the sustainable development of economic growth, employment and marine environmental conservation. The Bluebook also emphasized the importance of MSP as an implementation mechanism for sustainable development.

136. The IMP incorporated the MSFD as its environmental pillar. However, both instruments have different policy objectives due to several reasons. First of all, there is the time aspect: the MSFD is older than the IMP. Furthermore, different Directorate-Generals took care of the development of the instruments. The MSFD was the responsibility of the DG Environment and concentrated on environmental protection. The IMP on the other hand, was assigned to DG MARE and focused on promoting the marine economy. It is no wonder then that the IMP emphasizes the promotion of cross-sectorial integration and maritime economic growth more than the MSFD.

137. Seeing the different approaches of the IMP and the MSFD, it is fair to say that there is still room for improvement of the consistency of the EU’s actions especially with regard to blue energy. Even though blue energy is recognized as a key component of the Blue Growth Strategy and the IMP, it is not given the same importance across all the EU’s policies and strategies.

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351 Ibid.

352 Ibid.


356 Ibid.


358 M. ABAD CASTELOS, “The Black Sea and Blue Energy: Challenges, Opportunities and the Role of
138. There is for example no specific section devoted to blue energy in the Energy Union Framework Strategy.\textsuperscript{359}

### 3.3.2.3. Renewable Energy Directive (RED)\textsuperscript{360}

139. The Renewable Energy Directive provides a common regulatory framework for the promotion of energy from renewable sources such as offshore wind energy.\textsuperscript{361} It established the 20-20-20 targets and set mandatory national targets for the overall share of energy from renewable sources. The MS can meet the 20-20-20 targets by using domestic resources, transfer of guarantees of origin for renewables by means of international agreements or through a system of private trade.\textsuperscript{362}

140. The targets aim at a 20% reduction in EU’s GGEs from 1990 levels, a 20% increase of RES in the share of EU energy consumption by 2020 and a 20% increase in the EU’s energy efficiency.\textsuperscript{363} Furthermore, the RED is a key component of the EU Climate and Energy Package adopted in 2008 to contribute to the EU’s fulfilment of Kyoto Protocol objectives.\textsuperscript{364}

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\textsuperscript{362} Arts. 4, 7 and 9 RED; R. LONG, “Harnessing Offshore Wind Energy: Legal and Challenges and Policy Conundrums in the European Union”, IJMCL 2014, 703.


141. In addition, it provides rules concerning joint energy projects between Member States, guarantees of origin, administrative procedures, information and training, along with access to the electricity grid. As such, the Directive contributes to the regulatory stability required to promote the installation of OWFs.

142. The RED has been the object of revision since 2016 in order to adopt targets for 2030, but the process of revising is not finished yet. Therefore it is not sure yet what the targets in the RED II will comprise. However, the EU did adopt a 2030 strategy whereby the EU stated the following targets. These targets include a 40 % cut in GGEs compared to 1990 levels to be shared between ETS (Emission Trading System) and non-ETS sectors, at least a 27% share of renewable energy consumption and at least 27% energy savings compared with the business-as-usual scenario.

143. In addition to the RED, it is important to remind the reader that there are other EU instruments that contribute to the development of the offshore wind industry. It concerns several EU primary and secondary law instruments. A key feature of EU law is that the EU can only act within the limits of competences conferred upon it by the MS under the TEU and TFEU and other EU treaties. Secondly, there is a range of diverse provisions in the EU treaties relating to energy, the internal market, trans-European networks and infrastructure that impact the development of the offshore wind industry. While the EU and the MS share the competence for the formulation and implementation of energy policies, the EU legislative proposals need to respect the principles of subsidiarity and proportionality.

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365 Art. 1 RED.
368 Communication (Comm.) to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A policy framework for climate and energy in the period from 2020 to 2030, COM/2014/015 final, Brussels, 22 January 2014.
369 Ibid.
372 art 5 (2) TEU.
373 Art. 5(1) TEU and art 4(2)(i) TFEU.
The principle of subsidiarity entails that with regard to areas which do not fall within the EU’s exclusive competence, the EU shall act only if and in so far as the objectives of the proposed action cannot be sufficiently reached by the MS, but can rather be better achieved at EU level due to the scale or the effects of the proposed action.\(^374\)

The technical complexity of the electric energy market and the inherent peculiarity of electricity as a commodity required a certain level of centralize control and regulation.\(^375\) With regard to the electricity market, several directives were adopted, which in accordance with the principle of subsidiarity allowed the MS to establish their own implementation strategies and methods as a means of achieving the EU-mandated goal of electric energy restructuring.\(^376\)

The principle of proportionality states that the action of the EU must be limited to what is necessary to achieve the objectives of the Treaties.\(^377\) In this light, the RED introduced the obligation to use only necessary and proportionate procedures for renewable energy with the intention to make the procedures more efficient.\(^378\) The principle was also explicitly recognized in the context of offshore wind energy development in a case that reached the Court of Justice of the European Union (CJEU).\(^379\) The case concerned the prohibition of OWFs in nature conservation areas in the Italian Puglia region. The CJEU stated that: “the principle of proportionality (...) requires that measures adopted by Member States in this field do not exceed the limits of what is appropriate and necessary in order to attain the objectives legitimately pursued by the legislation in question”. Moreover, the CJEU added: “when there is a choice between several appropriate measures recourse must be had to the least onerous, and the disadvantages caused must not be disproportionate to the aims pursued”.\(^380\)

\(^{374}\) Art. 5(3) TEU.
\(^{377}\) Art. 5(4) TEU.
147. From an offshore wind power perspective, the EU treaty objectives for energy are quite inventive. The objectives focus on the functioning of the energy market, the security of supply and the promotion of energy efficiency and savings.\footnote{Art. 194(1) TFEU.} \footnote{Art. 194(1)(c) TFEU.} \footnote{Art 170(1) TFEU.} In addition, the objectives want to ensure the development of new and renewable forms of energy and the interconnection of energy networks.\footnote{R. LONG, “Harnessing Offshore Wind Energy: Legal Challenges and Policy Conundrums in the European Union”, \textit{IJMCL} 2014, 712.} Moreover, the TFEU states that the EU is obliged to contribute to the establishment and development of trans-European energy networks and infrastructures.\footnote{Ibid.} The latter is essential for the completion of the subsea power grid at regional seas levels.

148. In this analysis the stress lies on the environmental considerations that need to be taken into account in order to reach these objectives, but the EU is also obliged to take internal market considerations into account.

149. The more regional approach towards offshore renewable energy provided by the EU can only be applauded. Several advantages result from such an approach. Firstly, there is the cost-effective advantage due to the rationalization and convergence of the disparate approaches to the support schemes pursued by the MS.\footnote{Arts. 34-37 TFEU; R. LONG, “Harnessing Offshore Wind Energy: Legal Challenges and Policy Conundrums in the European Union”, \textit{IJMCL} 2014, 712-713.} Associated with this aspect, there is a possibility of reducing the restrictions on cross-border access to energy resources.\footnote{Ibid.} Consecutively, the offshore wind industry will be able to attract capital investment.\footnote{Ibid.} In addition, the EU creates an equal opportunity for all coastal EU MS to develop the resource.\footnote{Ibid.}

150. The most important contribution of a regional approach, however, is that it will bring the functioning of the internal energy market in relation to the production and transmission of electricity from offshore wind into line with EU treaty provisions on the free movement of goods.\footnote{R. LONG, “Harnessing Offshore Wind Energy: Legal Challenges and Policy Conundrums in the European Union”, \textit{IJMCL} 2014, 712-713.} At the moment, the energy regulation is still at odds with some principles of European trade law of the internal market and the free movement of goods across the internal borders of EU MS.\footnote{R. LONG, “Harnessing Offshore Wind Energy: Legal Challenges and Policy Conundrums in the European Union”, \textit{IJMCL} 2014, 712-713.}
3.3.2.4. EU Marine Strategy Framework Directive (MSFD)

151. The Marine Strategy Framework Directive is considered to be the most developed branch of the Integrated Maritime Policy.\(^\text{390}\) The MSFD was adopted to establish a framework for the development of marine strategies designed to achieve ‘Good Environmental Status’ (GES) of the marine areas by 2020.\(^\text{391}\) Thus, the MSFD called for the development of a marine strategy by each Member State. The provisions in the MSFD are also influenced by the EU’s water policy, and should be read together with the provisions of the Water Framework Directive (WFD),\(^\text{392}\) as they share a close connection in terms of content, objectives and regulatory design.\(^\text{393}\)

152. The concept of GES refers to: the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations.\(^\text{394}\) The assessment of the GES is based on eleven qualitative descriptors.\(^\text{395}\) The last of these descriptors is particularly relevant in the context of this dissertation because it requires the introduction of energy to be at levels that do not adversely affect the marine environment.\(^\text{396}\)

153. The marine strategies developed by the MS need to protect and preserve the marine environment, prevent its deterioration or even restore the marine ecosystems in areas where these have been adversely affected.\(^\text{397}\) In addition, the strategies need to prevent and reduce inputs in the marine environment in order to ensure that there are no significant impacts on or risks to the marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.\(^\text{398}\) The main goal of the MSFD is to achieve a use of the marine environment at a level that is sustainable, thereby safeguarding the potential for uses and activities by current and future generations.\(^\text{399}\)

\(^{394}\) Art. 3(5) MSFD.
\(^{395}\) See Annex I of the MSFD.
\(^{396}\) Nr. (11) Annex I of the MSFD.
\(^{397}\) Art. 1(2)(a) MSFD.
\(^{398}\) Art. 1(2)(b) MSFD.
Furthermore, those strategies had to include an initial assessment of the current environmental status of national marine waters and the environmental impact and socio-economic analysis of human activities. Moreover, the MS needed to determine what GES means for their national marine waters. Then, the MS need to establish environmental targets and associated indicators to achieve a GES by 2020.

On top of that, they needed to establish a monitoring program, because the strategy needs to be reviewed and updated every six years. The MS also need to conduct an impact assessment with a detailed cost-benefit analysis before any new measure is considered. The previous obligations concerning monitoring, assessment and adaptive management are all essential for implementing the ecosystem approach imposed by the MSFD on the MS. Even now, the major challenges for implementing this approach are the lack of data and knowledge, and the difficulty to integrate existing information due to different standards and formats. At the time of the adoption of the MSFD the MS identified a sever lack of data with regard to the impact of underwater noise and marine litter on the ecosystems. The lack of data imposed enormous financial and temporal challenges for some Member States.

Furthermore, the MSFD requires the application of the precautionary principle with regard to adaptive management so that measures are taken when cause-effect relationships are not yet fully established scientifically, and modified when more knowledge becomes available. Last but not least, the MS need to develop a program of measures designed to achieve or maintain GES by 2020. Another obligation imposed by the MSFD on the MS relates to regional cooperation.

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401 Art. 5(2)(a)(ii) MSFD.
402 Art. 5(2)(a)(iii) MSFD.
Moreover, the MSFD requires that MS cooperate and coordinate their activities on a regional scale, even with third countries located in the same marine region of sub region.\textsuperscript{412}

157. For the development of OWFs, there is one article that deserves some more explanation. It concerns article 14(1) MSFD which contains the circumstances under which a MS can deviate from the target to achieve good environmental status by 2020. The planning and installation of OWFs can fall within the scope of the exceptions due to the fact that MS may deviate when there are modifications or alterations to the physical characteristics of marine waters brought about by actions taken for reasons of overriding public interest which outweigh the negative impact on the environment exist.\textsuperscript{413} The exception can apply to the planning and establishment of OWFs because they can contribute to a reduction of GHGs, which falls under a reason of overriding public interest.\textsuperscript{414}

158. Due to the generic terminology, such as the concept of GES, the success of the MSFD mainly depends on how well the MS implement the MSFD provisions into national law.\textsuperscript{415} In addition, the success likely also depends on improved regional cooperation and data sharing.\textsuperscript{416}

3.3.2.5. Marine Spatial Planning (MSP)

\textit{A. Definition}

159. MSP is key to enhancing offshore wind development, but its importance goes far beyond its role in supporting and facilitating the development of the offshore renewable energy industry.\textsuperscript{417} The concept was first used in Australia for the management of the Great Barrier Reef, and was adapted to a more multi-disciplinary approach by the GAUFRE project.\textsuperscript{418} The latter is nowadays used as a global standard.\textsuperscript{419}
160. The reasons for the MSP’s key role are the following. First of all, MSP provides stability, legal certainty, predictability, transparency and clarity for investors. In addition, it can bring down the costs of wind energy and reduce the capital costs through an optimum integration of OWFs into the marine environment. In other words, good site location will help developers to avoid costly investments in inappropriate sites. Thirdly, MSP brings about the increased coordination and improved cooperation between states in the EU or between countries in a specific geographical area, specifically with regard to cabling, pipelines, shipping lanes, and OWFs.

161. As such, MSP needs to be approached as a holistic and transboundary process. Transboundary cooperation is considered a necessary component of effective MSP especially for the sake of implementing an ecosystem-based approach. Such an approach is critical with regard to the elimination or minimization of negative effects on sensitive habitats. Associated with this, MSP can be used to map the diverse usage of the sea and the sea bottom and how this usage affects the marine environment.


Ibid.


162. Thus, the MS can provide a high level of environmental protection through the adoption of MSP. Marine spatial planning is therefore crucial in the context of wind energy from a nature conservation point of view. Through MSP, Member States can also explore various alternatives and get the public and other stakeholders involved very early on in the decision-making process. Furthermore, other sea users already occupy many attractive zones for OWFs, and working together with these users can avoid conflicts and create synergies in order to use the space that is left as optimal as possible.

163. Marine spatial planning is often described as an integrated, policy-based approach to the regulation, management and protection of the marine environment, including the allocation of space, which addresses the multiple, cumulative and potentially conflicting uses of the sea and thereby facilitates sustainable development.

164. The first official definition was created by the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) and defined MSP as a public process of analysing 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. Nowadays, the international community generally accepts this definition. The definition in the Maritime Spatial Planning Directive is more rudimentary and explains MSP as a process by which the relevant authorities of the MS analyse and organize human activities in marine areas to achieve ecological, economic and social objectives.

165. In order to be successful a maritime spatial plan needs to fulfil several conditions and go through three stages that need to be conducted in a continuous, iterative and adaptive way.

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434 Ibid.
435 Art. 3(2) Maritime Spatial Planning Directive.
436 F. MAES and J. SPEYS, “Ruimtelijke planning op zee: waar België goed in is”, De Grote Rede 2014,
166. Firstly, there is the planning and analysis phase whereby the protection, enhancement and sustainable use and the development of the area needs to be examined. During this stage, the MS need to pay attention to the fact that their marine spatial plans need to be based as much as possible on scientific research about the marine environment and the probable impacts of several marine activities.

167. The second phase concerns the implementation of the plan, which is performed by executing planned work and investments, encouragement, and through regulations, incentives and enforcements of the proposed changes and on-going activities, both on and below the sea surface. In this context, an organization or legal entity with the authority to unite the involved governments needs to be appointed in order to facilitate a systematic and result-oriented debate. Without a clear political mandate a lot of good intentions related to MSP strand before they get executed due to a continuous debate about the division of competences between the different departments of the involved ministries.

168. Thirdly, there is the monitoring and evaluation stage during which the MS need to assess the effectiveness of the plan in order to determine the possible improvements, and to establish review and adaption procedures. Thus, maritime spatial plans need to be part of a continuous will for improvement, which takes into account new societal challenges.

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443 Ibid.
The monitoring process needs to comprise the impacts of the existing and new activities at sea and the maritime spatial plan itself. The evaluation stage reflects the adaptive aspect of the MSP since the results of the evaluation are fed back to the first stage of planning and analysis, after which the process restarts. To sustain the adaptive aspect of the MSP it is necessary to establish a continuous financing mechanism.

In the end, the MSP must be the result of a transparent and participatory process, which takes into account the future challenges. Thus, the final decision on what usage will be assigned to different areas will be a matter of societal choice.


In 2008, the EU adopted MSP as a policy objective, which resulted in 2014 in a Directive that established a framework for maritime spatial planning. The MSPD was designed to implement the Integrated Maritime Policy in the EU. The MSPD recognized the increasing demand for maritime space for different purposes, as well as the multiple pressures on coastal resources and acknowledged the need for an integrated planning and management approach.

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172. To achieve this, the MSPD recommended a transboundary and integrated approach with regard to
MSP which should contribute to the effective management of marine activities and the sustainable
use of the existing marine and coastal resources, by creating a framework for consistent, transparent, sustainable and evidence-based decision-making. 453

173. The European Commission emphasized that even though a great deal of MSP could be achieved at
the national level, it considered it important to pursue action at EU level to achieve a coherent
framework for MSP within the EU. 454 Past experience has demonstrated that the sectorial approach
to managing different marine activities is not achieving the balanced and responsible development
that is needed from a sustainability perspective. 455

174. A common approach would therefore enable a more comprehensive application of MSP in a
transboundary context. As such, the EC tries to balance the two overarching goals of MSP, namely
the allocation of space to different marine users and the protection of the marine environment. 456

175. The MSPD only applies to marine waters, and not to coastal waters, which limits the scope of the
EU-wide application of MSP mostly to the EEZ of the MS. 457 The scope of the subjects that need to
be addressed by the MS in their marine spatial plans extends to the infrastructure associated with
energy installations, aquaculture areas, fishing areas, maritime transport routes and traffic flows,
military training areas, nature and species conservation sites and protected areas, raw material
eXtraction areas, scientific research, tourism, and underwater cultural heritage. Thus, the content
of the marine spatial plans is usually quite extensive. 458

453 Preamble (9) MSPD; R. LONG, “Harnessing Offshore Wind Energy: Legal Challenges and Policy
454 Communication (Comm.) to the European Parliament, the Council, the European Economic and
Social Committee and the Committee of the Regions – Maritime Spatial Planning in the EU –
455 M. YOUNG, “Building the Blue Economy: The Role of Marine Spatial Planning in Facilitating
456 Communication (Comm.) to the European Parliament, the Council, the European Economic and
Social Committee and the Committee of the Regions – Maritime Spatial Planning in the EU –
YOUNG, “Building the Blue Economy: The Role of Marine Spatial Planning in Facilitating Offshore
457 Art. 2(1) MSPD; N. SOININEN, “Marine spatial planning in the European Union”, in D. HASSAN, T.
KUOKKANEN and N. SOININEN (eds.), Transboundary Marine Spatial Planning and International
establishing a Community vessel traffic monitoring and information system and repealing Council
and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257,
Regulation: The Mutual Accommodation Of Offshore Wind Farms and International Navigation and
Shipping”, Ocean Yearbook 2016, 455.
176. The MSPD requires from the MS to establish and implement their marine spatial plan(s), as soon as possible, and at the latest by 31 March 2021.\textsuperscript{459} It should be noted that the timelines for the marine spatial plans were drafted to be as compatible as possible with the timetables set out in other relevant legislation, such as the MSFD.\textsuperscript{460}

177. The MSPD contains a number of minimum requirements related to the maritime spatial plans.\textsuperscript{461} First of all, the MS need to ensure the involvement of stakeholders and organize the use of the best available data.\textsuperscript{462} In addition, cooperation among Member States and with third countries should be part of the planning and management process in order to tackle issues of a transboundary nature.\textsuperscript{463}

178. This can be quite challenging and requires careful negotiations with regard to policy priorities and regulatory practices within each jurisdiction.\textsuperscript{464} In this context, drafting a transboundary MSP has more chance to succeed if the policy and legislative structures and discourses in the neighbouring jurisdictions are compatible.\textsuperscript{465} Thus, successful transboundary MSP mainly depends on the willingness of the coastal states to consider each other’s national policy priorities in exercising their sovereignty and sovereign rights and to adjust them towards common goals for the benefit of the whole region.\textsuperscript{466} However, the planning details and determination of management objectives are left to the Member States.

179. A critical note regarding the regional cooperation obligation in the MSPD relates to the fact that the MSPD does not create new coordinating bodies or structures to harmonize the regional cooperation.\textsuperscript{467} Instead the MSPD delegates the coordination of the cooperation to the existing regional sea conventions, without specifying the tangible role of these regional institutions.\textsuperscript{468}

\textsuperscript{459} Art. 15(3) MSPD.
\textsuperscript{461} Arts. 6 and 8 MSPD.
\textsuperscript{462} Arts. 6(2)(d) and 6(2)(e) MSPD.
\textsuperscript{463} Art. 6(2)(g) MSPD; F. M. PLATJOUW, “Marine Spatial Planning in the North Sea – Are National Policies and Legal Structures Compatible Enough? The Case of Norway and the Netherlands”, IJMCL 2018, 57.
\textsuperscript{466} Ibid.
\textsuperscript{468} Art. 11(2)(a) MSPD.
180. Moreover, the MSPD does not prescribe in detail how cooperation mechanisms on spatial planning should look or work in practice.\textsuperscript{469} This undermines the competitiveness in the wind energy sector and the benefits that could derive from the offshore wind power as a European resource.\textsuperscript{470}

181. In relation to the North Sea, however, it is likely that this will not cause any problems because regional cooperation in MSP is more advanced in this region.\textsuperscript{471} It is relevant to note that a forum was set up under the name ‘North Seas Energy Forum’.\textsuperscript{472} It brings together representatives of the public, private and non-governmental sectors from the North Sea Countries to discuss challenges and opportunities for regional cooperation in energy topics, and specifically for the deployment and use of offshore wind energy.\textsuperscript{473}

182. Even though the MSPD requires the cooperation with third countries as well, there is no joint work in the framework of the MSPD.\textsuperscript{474}

183. Another negative aspect of the MSPD is that is does not harmonise the scale or level of planning which can have a negative effect on the overall level of integration of sectorial policies and cooperation between member states.\textsuperscript{475} This can undermine the advantages identified with MSP even more.\textsuperscript{476}

184. Several UNCLOS provisions will also influence the regional cooperation with regard to MSP in the North Sea.\textsuperscript{477} It concerns the provisions about the designation of sea lanes, the prescription of traffic separation schemes, consent on the delineation of the course for the laying of the pipelines on the continental shelf and the measures to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life.\textsuperscript{478}

\textsuperscript{470} \textit{Ibid}.
\textsuperscript{472} Political Declaration on energy cooperation between the North Seas Countries, Luxemburg, 6 June 2016.
\textsuperscript{474} F. M. PLATJOUW, “Marine Spatial Planning in the North Sea – Are National Policies and Legal Structures Compatible Enough? The Case of Norway and the Netherlands”, \textit{IJMCL} 2018, 78.
\textsuperscript{476} \textit{Ibid}.
\textsuperscript{478} Arts. 2, 17, 56 and 77 UNCLOS.
185. There are also measures that can strengthen the implementation and success of the MSPD. It concerns for example the adoption of a geographic information system (GIS) data management system. Thanks to this system it would be possible to take other sea users and development plans into account, which would allow the designation of the most efficient areas and therefore reduce the offshore wind development costs. Good marine data management at EU level will be key to support effective MSP.

186. Another measure that could strengthen MSP is the strategic environmental and project assessment, which will not be discussed in this analysis.

3.3.2.6. Habitats- and Birds Directives: Natura 2000

187. UNCLOS is additionally concerned with the protection of the marine environment, on which the offshore energy sector has a major impact. While UNCLOS does not limit the extent of the exploitation of non-living energy resources, the Convention does stipulate that there is an obligation to prevent, reduce and control pollution of the marine environment. Contrary to the duties with regard to living resources, there is thus no duty of conservation, nor an obligation to utilize these resources sustainably.

188. European instruments such as the Habitats- and Birds Directives, however, provide a stricter framework for nature conservation and needs to be taken into account during the lifecycle of an OWF. The geographical scope of the Habitats and Birds Directives extends to the waters under jurisdiction of the MS and the waters where the MS exercise their sovereign rights. Thus, the Directives do not only apply to internal waters and the territorial sea, but also to the exclusive economic zone and the continental shelf. The provisions of these Directives therefore also have an impact on the installation of an OWF.


480 Ibid.


484 Ibid.
189. The Habitats- and Birds Directives are a means by which the European Union meets its obligations under the Bern Convention and Bonn Convention. They are considered to be the cornerstones of the EU’s biodiversity policy and form the legal bases for the implementation of the Natura 2000 Network. The latter is a coherent European ecological network of protected areas called “special protection areas” under the Birds Directive, and “special areas of conservation” under the Habitats Directive. The most important legal consequence of the designation of sites under these Directives is that the condition or quality of these protected areas should not deteriorate.

190. As a consequence thereof MS need to assess the implications of their plans and projects that are likely to have a significant effect on these protected areas. To help the MS, the EC published an instruction manual giving interpretative and methodological guidance on how to conduct such an assessment. The assessment process consists of four phases including the description of the elements of the project, the conservation objectives, the effects on the main species and habitats, and the possible corrective measures. If scientific doubts arise during the process, the precautionary principle has to be applied. However, even when the MS conclude that the activity causes environmental damage, they may authorize the project if there are no alternative solutions or if there are overriding reasons of public interest, although in that event MS are obligated to create or improve another habitat elsewhere as a compensating measure.

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490 Arts. 6(3) and 6(4) of the Habitats Directive; DG ENVIRONMENT, Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, November 2001.
493 Ibid.
191. The main aim of the Habitats Directive is to promote the maintenance of biodiversity. In order to achieve this, the MS need to take measures to maintain or restore natural habitats and wild species listed in the Annexes to the Habitats Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance. In addition, the Habitats Directive established a selective protection restricted to the natural habitats listed in Annex I, the habitats of species listed in Annex II, and the species listed in Annexes IV and V. It is striking that protection of the biodiversity related to the open and deep seas is under-represented in these Annexes. A revision of the Interpretation Manual of the European Union Habitats, however, made it possible to extend scope of application of Annex I of the Habitats Directive to important deep sea ecosystems.

192. Furthermore, the Habitats Directive states that it is prohibited for any MS to deliberately kill or disturb species in Annex IV. This is especially important for the offshore wind industry since offshore wind turbines typically tend to interfere with the habitats of birds, bats and marine mammals. It is thus a legal obligation in Europe to avoid or at least reduce the bat and bird mortality by wind farms to a minimum. For the protection of the marine habitats mentioned in the Habitats Directive, it is necessary to avoid the Natura 2000 sites when planning the OWF activities and locations.

193. The Birds Directive provides a framework for the conservation and management of wild birds in Europe and possible human interactions with those birds. It is relevant to note that even though the Birds Directive contains several objectives for a wide range of activities, the MS maintain the discretion to precise the legal mechanisms to achieve these objectives.

194. Overall, there are mainly three categories of birds that occur in the North Sea region and get protection under the Birds Directive.

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496 Ibid.
497 Arts. 12 and 13 of the Habitats Directive.
499 Ibid.
500 Ibid.
502 M. PLATTEEUW, J. BAKKER, I. VAN DEN BOSCH, A. ERKMAN, M. GRAAFLAND, S. LUBBE and M.
195. First of all, there are the seabirds, which spend all their time at sea outside the breeding season. The second category consists of coastal birds, which live year-round on the coast for breeding and resting purposes, but fly daily over the North Sea. Then, there are also the migratory and water birds, which migrate seasonally along the North Sea shores or cross the North Sea between the European continent and the British Isles. These three categories should be taken into account when assessing the impact of OWFs.

196. The main pressures on wildlife caused by OWFs are underwater sound pulses from piling during construction, and habitat loss and collisions during operation. The two last pressures are part of the three ways through which the OWFs negatively affect the birds and bats. The first impact thus relates to the loss of habitat in the sense that some species tend to avoid the OWF areas as they no longer ‘recognize’ an OWF as part of their habitat and are displaced from these areas. Secondly, there is the additional energy expenditure. Due to the fact that OWFs intersect with foraging and migration routes, several bird species are forced to fly around them. In the context of the southern North Sea, however, this effect is believed to be minimal. Then there is also the additional mortality by collision because species flying through OWF areas run a higher risk of collision and mortality.

197. The activities of bats around OWFs have been monitored the last few years and the results stated that their presence around OWFs is more frequent and regular than previously assumed. Bats are usually present at over 85 km from the shore, which suggests seasonal migration across the North Sea.


Ibid.
Ibid.
Ibid.
Ibid.
Ibid.


Ibid.


Ibid.
Ibid.
Ibid.

M. PLATTEEUW, J. BAKKER, I. VAN DEN BOSCH, A. ERKMAN, M. GRAAFLAND, S. LUBBE and M.
198. In order to protect the species and habitats in line with the aforementioned directives in the North Sea, the MS need to take effective prevention and mitigation measures. These measures should effectively ensure that cumulative effects on species are not putting the species’ conservation status or Natura 2000- site objectives at risk. The MS can implement the mitigation measures through conditions on permits for OWFs, which can include restrictions on the maximum underwater noise levels during construction. The latter can be tackled by using sound screens and/or bubble curtains. Another possibility is to increase the minimum capacity of the individual wind turbines, thereby installing a lesser amount of turbines in the OWF. Moreover, the permits can impose the obligation to turn the turbines off or slow them down during intensive bird or bat migration seasons. Lastly, a careful selection of OWF locations can enhance the habitat quality within the geographical range of the impacted species.

199. The relation between the Habitats and Birds Directive and the MSFD needs to be addressed as well, specifically with regard to the relation between article 14(1)(d) of the MSFD and article 6(3)(4) and article 7 of the Habitats Directive. The former stipulates the possible exemptions to deviate from the GES and is particularly important for the establishment of OWFs. The aforementioned articles of the Habitats Directive describe the required assessment with regard to plans or projects that are likely to have a significant effect on the protected sites and the possible exceptions. If the integrity of a site is adversely affected and there are no feasible alternative solutions, then the plans or projects can only be carried out for imperative reasons of overriding public interest. In addition, this is only possible as long as the overall coherence of the Natura 2000 network is protected through adequate compensatory measures.


Ibid.
Ibid.
Ibid.
Ibid.
Ibid.
Ibid.
Ibid.
520 Ibid., 228.

Art. 6(4) Habitats Directive.

The overriding public interest exception under article 14(1)(d) of the MSFD has fewer safeguards than the exception stipulated in the Habitats Directive. In this context, the EC has stated that the MSFD exceptions cannot take precedence over article 6 of the Habitats Directive, as the Treaty requires that stricter provisions take precedence when more than one provision applies to the same issue.

3.3.3. Belgian Regulation

3.3.3.1. Belgian MSP

The Belgian marine spatial plan comprises the territorial sea, the continental shelf and the EEZ, as established in the Royal Decree concerning the establishment of a marine spatial plan. The legal base for the Belgian marine spatial plan and its procedure is stated in the Act on the Protection of the Marine Environment of 20 January 1999, which title was changed by the Act of 20 July 2012. The environmental principles on which the Act is based are the precautionary principle, the preventive principle, the principle of sustainable development, the polluter pays principle and the restoration principle.

The principle of preventive action and the restoration principle have not been previously explained in this analysis and are therefore examined in this section.


526 Wet 20 juli 2012 tot wijziging van de wet van 20 januari 1999 ter bescherming van het marine milieu in de zeegebieden onder de rechtsbevoegdheid van België, wat de organisatie van de mariene ruimtelijke planning betreft, BS 11 september 2012.

527 Arts. 3 and 4 Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 13 maart 1999.
203. The preventive principle is closely linked to the precautionary principle and the identification of the difference between the principles depends on the ‘uncertainty’ criterion. If the environmental effects of an activity are known, and the MS takes action to avoid the environmental impact, the action will be defined as a preventative measure. On the other hand, if the effects are uncertain, those same measures can be labelled as precautionary measures. In this context, it is important to note that the scope of the preventive principle is broader than the no-harm rule. The application of the preventive principle implies that the MS are aware of the fact that restoration is not always possible, or that restoration could be costlier than the establishment of measures, which impede or reduce the risk of damage.

204. The restoration principle involves the obligation of the public authorities to act once the damage has been caused. This principle is closely linked to the polluter pays principle, since the principle also requires that the party who caused the damage, bears the costs of restoration.

205. The offshore wind farm developers need to take these principles into account during their activities at sea. Moreover, the government needs to consider these principles when it drafts the marine spatial plan. This consideration aspect implies that the principles only serve as guidelines, which need to be assessed on a case-to-case basis. As such, the MS have a best-efforts obligation and not an obligation of result.

206. However, the precautionary principle for example cannot be waived by the licensing authority and needs to be assessed by the Scientific Service Management Unit of the North Sea Mathematical Models (MUMM). This assessment also fits into the framework of the advice procedure following the environmental impact assessment concerning the request for a permit of the installation and exploitation of OWFs at sea.

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^529^ Ibid.

^530^ Ibid.


^533^ Ibid.

^534^ Art. 4 Wet 20 januari 1999 ter bescherming van het mariene milieu en ter organisatie van de mariene ruimtelijke planning in de zeegebieden onder de rechtsbevoegdheid van België, BS 12 maart 1999.

207. One measure that can be taken to fulfil the requirement of the precautionary principle is to obligate the offshore wind developer to establish continuous monitoring programmes, in addition to strict conditions in the permit.\textsuperscript{539}

208. Furthermore, the Belgian government incorporated certain obligations for the establishment of the marine spatial plan. First and foremost, the plan needs to be the result of a planning procedure and a public inquiry.\textsuperscript{540} Secondly, the plan needs to be the subject of a strategic environmental assessment (SEA) and needs to provide an amendment procedure.\textsuperscript{541} Moreover, the plan will be evaluated every six years and if necessary it will be revised after the evaluation. The government, however, does not have to wait six years to intervene and response to new developments. The possibility namely exists to develop an intermediate amendment procedure.\textsuperscript{542}

209. In addition, the Law foresees several aspects with respect to content that are necessary to develop the marine spatial plan.\textsuperscript{543} To start off, the plan needs to be based on a spatial analysis of the BPNS and develop a long-term vision, which indicates the measures, instruments and actions to execute the marine spatial plan.\textsuperscript{544} The plan also needs to pursue several economic, social and environmental goals, in addition to safety targets with a minimum of effective objectives and reliable indicators to achieve the desired goal or desired behavioural change.\textsuperscript{545}

210. The marine spatial plan is binding and needs to be strictly observed. A decision to allow an activity without a permit that breaches the plan can be nullified by the competent court.\textsuperscript{546} Thanks to the Royal Decree concerning the establishment of the marine spatial plan and its four Annexes, there is a very detailed delineation of the areas that are designated to specific activities and where certain activities are forbidden. The allowed activities can entail activities that are subject to permits and that make use of the designated areas. Moreover, they can entail an activity that is not the subject of a permit and for which there has been no designation of an area besides routeing measures.\textsuperscript{547} An example of such a non-licensed activity is shipping.

\textsuperscript{539} Ibid.
\textsuperscript{540} Art. 5bis, §1 Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 13 maart 1999.
\textsuperscript{541} Art. 5bis, §1 Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 13 maart 1999.
\textsuperscript{542} Art. 5bis, §2 Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 13 maart 1999.
\textsuperscript{543} F. MAES, “Ruimtelijke planning op zee in België: van plan naar proces en een nieuw plan”, Tijdschrift voor Milieurecht 2016, 422.
\textsuperscript{544} Ibid.
\textsuperscript{545} Ibid.
\textsuperscript{546} Art. 5bis, §4 Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 13 maart 1999.
\textsuperscript{547} F. MAES, “Ruimtelijke planning op zee in België: van plan naar proces en een nieuw plan”,
3.3.3.2. Tenders, Concessions and Permits

211. Under the Belgian federal system, the competence concerning energy is a shared competence whereby each of the three regions has jurisdiction over its own energy policy, with the exception of nuclear plants and the transmission network regulation. While the jurisdiction of the regions is territorial, the Federal State remains in charge of the territorial sea and the EEZ and can on that basis regulate the offshore activities. This explains why the legal framework for the development of offshore wind parks in Belgium is settled under Articles 6 and 7 of the Electricity Act.

212. In addition, it is important to note that the zone reserved in the BPNS for offshore wind energy exploitation is set by the Royal Decree of 17 May 2004. The designated area for offshore wind energy covers 270 km² for a total capacity of 2 000 MW, of which approximately 170 km² are currently already occupied by existing projects. At the moment, the tender procedures are closed and nine OWFs have obtained a license. The Secretary of State, however, recently announced he is considering recalling the concessions granted to Northwester II, Mermaid and Seastar. This consideration is the consequence of the low prices awarded to OWFs in the Netherlands and in Germany.

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Tijdschrift voor Milieurecht 2016, 420.
554 Ibid.
If the tender procedures are opened again, it is important that the offshore wind developer knows what kind of permits and licenses are needed to develop OWFs in the BPNS. There are three key permits and licenses required to develop the offshore wind activity, namely a domain concession, a marine protection permit, and cable permits. In addition, the offshore wind developer should keep in mind that his OWF needs to be authorized by the Federal Minister of Energy within three years after the notification that the latest concession, permit or license has been granted. This obligation also applies to an OWF in a demonstration phase. Moreover, the developer is not allowed to shut down a significant part of the OWF for more than one year, except in the event of lawful, thorough technical reasons or force majeure.

**A. Domain Concession**

Pursuant to article 6 of the Electricity Act, the offshore wind developer needs to acquire a domain concession from the Federal Minister of Energy after an advise of the CREG for constructing and operating a power plant using water, currents or wind energy within the designated marine areas. As such, a domain concession for wind development grants a right to occupy a parcel in the zone reserved for wind development and has as a consequence that this part of the public domain is no longer accessible to the public. Moreover, by obtaining the concession the developer gets an occupation permission for the development and operation of the OWF, with the exception of the offshore cables.

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556 Art. 14, 4° KB 20 december 2000 betreffende de voorwaarden en de procedure voor de toekenning van domeinconcessies voor de bouw en de exploitatie van installaties voor de productie van elektriciteit uit water, stromen of winden, in de zeegebieden waarin België rechtsmacht kan uitoefenen overeenkomstig het internationaal zeerecht, *BS* 30 december 2000.
560 *Ibid*.
215. The procedure and the conditions for the application of the concession and for the award of the concession are elaborated in the Royal Decree of 20 December 2000. The latter specifies that the applicant of the permit needs to fulfil certain conditions before his permit is granted, including for example the requirement of an adapted functional and financial structure, sufficient financial means, the required technical capacities and so on. In this context, it is relevant to note that every party concerned can hand in an application of competition to obtain a domain concession for the same location.

216. With regard to the procedure for the application, Article 4 of the Royal Decree of 20 December 2000 states that the applicant needs to hand his application to the competent Minister. In his application, the applicant needs to include several personal details, a summary with the global description of the project, a separate note answering all the selection criteria, a detailed plan about the integration of the OWF in the designated area and so on. The involved ministries and the CREG will evaluate the application and give advice and the manager of the transmission grid is consulted as well. After this procedure, they will present the Minister of Energy either a proposal of awarding the domain concession or a refusal to award the domain concession.

217. Moreover, the Royal Decree stipulates another set of criteria that the developer needs to take into account. These criteria include for one the conformity of the installation with the technical regulations regarding the operation of, and access to, the transmission grid. The second criterion concerns the impact of the installation on previously authorised activities at sea pursuant other legislation or regulation. Thirdly, there is the criterion concerning the quality of the project, both technically and economically in the light of the best available techniques. In addition, the quality of the submitted O&M plan will be assessed. If the installation is permanent, the assessment will include the proposal of technical and financial provisions for the treatment and removal of the installation.

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562 KB 20 december 2000 (hereafter Decree on Concessions) betreffende de voorwaarden en de procedure voor de toekenning van domeinconcessies voor de bouw en de exploitatie van installaties voor de productie van elektriciteit uit water, stromen of winden, in de zeegebieden waarin België rechtsmacht kan uitoefenen overeenkomstig het internationaal zeerecht, BS 30 december 2000.
563 See art. 2 Decree on Concessions.
564 Art. 7 Decree on Concessions.
565 See art. 4 Decree on Concessions.
567 Ibid.
568 Art. 3, 1° Decree on Concessions.
569 Art. 3, 2° Decree on Concessions.
570 Art. 3, 3° Decree on Concessions.
571 Art. 3, 4° Decree on Concessions.
572 Art. 3, 5° Decree on Concessions.
218. The last criterion entails the location of the project within the zone designated for offshore wind domain concessions.573

219. The Royal Decree also imposes several obligations upon the developer once he has obtained the domain concession. It concerns for example obligations regarding information, the start of the exploitation phase, the necessary measures to protect public safety, measures to protect the environment and so on.574

220. With regard to the concession, it should be noted that the concession is rewarded to the applicant and not to the involved wind turbine installation.575 This can hinder the options to transfer the offshore wind installations. With reference to the transfer, the developer-applicant should know that he needs to inform the representative of the Federal Minister of Energy about the enquiry to sell, the full or partial transfer, the division and rent of the domain concession.576 The concession holder is not allowed to conclude such a transfer, at least not before a period of 50 working days has expired during which the Minister can decide whether the transfer is compatible with the retention of the domain concession.577

221. Domain concessions to build and operate power plants are granted for a fixed-term of 20 years with an extension possibility to maximum 30 years.578 A domain concession may be granted prior to the environmental permit, but will not come into effect until the environmental permit is in place.579

222. After an alteration of the Electricity Act in 2014, it also became possible to acquire a domain concession for the installation and exploitation of hydro-electrical energy storage facilities at sea, also known as the energy islands.580 Further requirements regarding the procedure to obtain a domain concession for these energy islands are stipulated in the Royal Decree of 8 May 2014.581 Furthermore, it will also be possible to obtain a domain concession for the construction and exploitation of installations necessary for the transmission of electricity, also known as the electricity sockets at sea.582

573 Art. 3, 6° Decree on Concessions.
574 See art. 14 Decree on Concessions.
576 Ibid.
577 Art. 20 Decree on Concessions.
578 Art. 13 Decree on Concessions.
579 Art. 12 Decree on Concessions.
580 Art. 6/1 Electricity Act.
581 KB 8 mei 2014 betreffende de voorwaarden en de procedure voor de toekenning van domeinconcessies voor de bouw en de exploitatie van installaties voor hydro-elektrische energieopslag in de zeegebieden waarin België rechtsmacht kan uitoefenen overenkomstig het internationaal zeerecht, BS 6 juni 2014.
582 Art. 13/1 Electricity Act.
223. The aforementioned installations, however, cannot enjoy financial aid and the system of the tradable green certificates thus does not apply to them in contrast to the installations of the offshore wind farms.\(^{583}\) Article 7 of the Electricity Act further stipulates the different financial support measures for offshore wind development.\(^{584}\)

**B. Marine Protection Permit**

224. Besides the domain concession, the development of OWFs requires an environmental permit, also called the marine protection permit.\(^{585}\) This permit grants the permit holder a right to construct the installation and a license to operate the installation.\(^{586}\)

225. The legal framework governing this permit is set out in three instruments, namely the Law on the Protection of the Marine Environment of 20 January 1999 (hereafter the Marine Environment Law)\(^{587}\), the Royal Decree of 7 September 2003 concerning the procedure for licensing and authorising the activity (hereafter the Licensing and Authorisation Decree)\(^{588}\) and the Royal Decree of 9 September 2003 concerning rules on the assessment of the environmental impact (hereafter the EIA-Decree)\(^{589}\). The former prescribes that all maritime areas under Belgian jurisdiction fall under the regime that is established by this law and the subsequent Royal Decrees.\(^{590}\) Thus, the law does not make a distinction between OWFs that are established in the territorial sea and OWFs that are established in the EEZ or the continental shelf.\(^{591}\)

226. The procedure to obtain the marine protection permit can start following two routes. On the one hand, the procedure can start via a public hearing or on the other hand by means of a simplified procedure.\(^{592}\)

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583 Art. 6/1, §1 Electricity Act.
588 KB 7 september 2003 houdende de procedure tot vergunning en machtiging van bepaalde activiteiten in de zeegebieden onder de rechtsbevoegdheid van België, BS 17 september 2003.
589 KB 9 september 2003 houdende de regels betreffende de milieu-effectenbeoordeling in toepassing van de wet van 20 januari 1999 ter bescherming van het mariene-milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 17 september 2003.
590 Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder rechtsbevoegdheid van België, BS 12 Maart 1999.
592 Art. 9 Licensing and Authorisation Decree.
227. If the applicant chooses the former, the procedure will include a public hearing during which the affected and involved persons can express their objections.\textsuperscript{593} Depending on the impact of the activity, the public inquiry can be cross-border and will be held within 45 days.\textsuperscript{594}

228. Once again, the application procedure requires the personal details from the applicant concerning the identity, financial resources and so on.\textsuperscript{595} However, in this procedure the applicant also needs to submit an environmental impact study to the MUMM of the Operational Directorate Natural Environment.\textsuperscript{596} After the submission, the MUMM carries out an EIA.\textsuperscript{597} As a part of its assessment MUMM can also execute other studies in order to give an opinion on the acceptability of the project regarding the protection of the marine environment.\textsuperscript{598}

229. The MUMM then gives its report with recommendations, which is based on the EIA and the consultation procedure, to the Federal Minister for the Marine Environment.\textsuperscript{599} Based on these instruments, the Federal Minister for the Marine Environment decides whether or not to issue an environmental permit.\textsuperscript{600} In this light, the Minister can decide that he will only grant the permit if the future holder will take environmental compensation measures.\textsuperscript{601}

230. While the operating license is granted for a period of 20 years, the period of the construction authorisation is limited to a period of five years.\textsuperscript{602} The latter is specifically issued by the Ministry of the Environment to carry out an activity under specified conditions and during a given period.\textsuperscript{603} In this context, it will be granted for the period needed to construct all the installations falling under the scope of the installation.\textsuperscript{604} The five-year period starts from the day of the notification of the granting of the authorisation and can be extended once by another five-year term.\textsuperscript{605}

231. Once the environmental permit is granted, a monitoring programme needs to be set up to assess the effects of the project on the marine environment.\textsuperscript{606}

\textsuperscript{593} Art. 18 Licensing and Authorisation Decree.
\textsuperscript{594} Art. 18, § 2 Licensing and Authorisation Decree.
\textsuperscript{595} Art. 13 Licensing and Authorisation Decree.
\textsuperscript{596} Art. 28 §1 of the Marine Environment Law; art. 7 of the EIA-Decree.
\textsuperscript{598} See \url{http://odnature.naturalsciences.be/mumm/en/windfarms/}.
\textsuperscript{599} Art. 38, §1 Licensing and Authorisation Decree.
\textsuperscript{600} Art. 38, §1 Licensing and Authorisation Decree; C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at sea?”, \textit{TRNI} 2015, 62.
\textsuperscript{601} Art. 42 Licensing and Authorisation Decree.
\textsuperscript{602} Art. 41, §1 Licensing and Authorisation Decree.
\textsuperscript{603} C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at sea?”, \textit{TRNI} 2015, 62.
\textsuperscript{604} \textit{Ibid}.
\textsuperscript{605} Art. 41, §1 Licensing and Authorisation Decree.
\textsuperscript{606} Arts. 16 and 24 EIA-Decree.
The federal government is responsible to implement this legal obligation. As such, the monitoring has two goals. For one, it enables the authorities to mitigate or even halt the activities in case of extreme damage to the marine ecosystem. On the other hand it aims to understand and evaluate the impact of OWFs on the different aspects of the marine environment and support the future policies regarding OWFs. The permit holders must pay the costs of the programme.

The holder of the marine protection permit needs to keep in mind that this permit will only enter into force after all other required permits and licences have been obtained, with a maximum of four years after the date of issuance. In addition, the marine protection permit will expire if the other required permits and licences are refused. The permit can also only be partially or fully transferred with the formal and express consent of the Minister of the North Sea. However, this mechanism does not apply in the case of a change of control of the licensee.

C. License to lay submarine cables

The third key element that is required to install and exploit an offshore wind farm is a license to lay submarine cables in the BPNS. The application procedure is set out in the Royal Decree of 12 March 2002. As a general provision, this decree stipulates that the cable must be laid as close as possible to existing installations and in such a way as to minimise the impact on the sea floor and the protected areas in the vicinity.

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608 Ibid.
609 Ibid.
610 Art. 24 EIA-Decree.
611 Art. 42 Licensing and Authorisation Decree.
612 Art. 41, §2 Licensing and Authorisation Decree.
615 Art. 4 wet 13 juni 1969 inzake de exploratie en de exploitatie van niet-levende rijkdommen van de territoriale zee en het continentaal plat, BS 8 oktober 1969.
616 KB 12 maart 2002 betreffende de nadere regels voor het leggen van kabels die in de territoriale zee of het nationaal grondgebied binnenkomen of die geplaatst of gebruikt worden in het kader van de exploratie van het continentaal plat, de exploitative van de minerale rijkdommen en andere niet-levende rijkdommen daarvan of van de werkzaamheden van kunstmatige eilanden, installaties of inrichtingen die onder Belgische rechtsmacht vallen, BS 9 mei 2002.
617 Art. 2 KB 12 maart 2002.
235. The granting of the license is once again the subject of several criterions, which are similar to the provisions in the aforementioned sections, and are stipulated in article 5 of the Royal Decree of 20 March 2002. This Royal Decree also demands for example evidence of the financial and technical capacity of the applicant.618 To obtain the license, the applicant also needs to conduct an environmental impact assessment.619

236. Unlike the previous permits, the submarine cable license is not granted for a fixed term.620 The license can expire, however, if the licensee has not started the activities within 3 years after the date of the notification of the granting of the license.621 At the licensee’s request, this term can be extended by a period of 2 years.622

237. To conclude, it should be noted that the requirements for a transaction of either one of the three permits could hamper an M&A transaction and cause unwanted delays.623 Moreover, the differences between the three required instruments can be the subject of uncertainty of potential investors in the offshore energy projects.624 These are uncertainties should be avoided in order to attract additional investors.

3.4. Installation and Operations & Maintenance Phase

3.4.1. Transnational Offshore Grid in the North Sea

238. The increase in amount of OWFs resulted in a question concerning the most efficient method to connect the generated wind energy to the shore.625 Typically, the OWFs in the BPNS are connected to a transmission station via several dedicated cables that are not bundled together.626 The operator of the OWF concludes an individual connection contract with the transmission system operator (TSO) in order to establish such a radial connection.627 This contract includes a capacity reservation on the Belgian transmission grid.

618 Art. 6, §2, 5° KB 12 maart 2002.
619 Art. 6, §2, 12° KB 12 maart 2002.
621 Art. 14 KB 12 maart 2012.
624 Ibid.
626 Ibid.
The OWF operators can opt for a shared connection cable or grid together with other concession holders in order to reduce costs or facilitate the administrative hassles. In this context, it is important to note that the OWF operators have a right on subsidies for the expenses made to connect to the transmission network.

The reader should note that the offshore grid connection procedure is the competence of the Belgian federal authority. There is only one TSO in Belgium, which is called Elia and takes care of the distribution network. Thus, Elia has a legal monopoly. The procedure to establish a connection is the following. The first step is an optional one whereby the plant developer requests an orientation study about the estimated cost of connection. Then, the plant developer applies for a connection to the TSO, which will perform a detailed study by proposing the technical solution for the grid connection. In this stage, the TSO will offer a cost proposal as well. If the applicant accepts the proposal, the parties can conclude their connection agreement. As mentioned before, the plant developer then bears the costs of the grid connection to a Belgian onshore substation.

Since 2014 it is, however, possible for OWFs with an offshore domain concession granted after 1 July 2007 to deviate from article 13/1 of the Electricity Act and the aforementioned procedure. As such, those OWFs can opt not to connect to a substation.

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630 Art. 6, §1, VII, 2e lid, c) van de Bijzondere wet van 8 augustus 1980 tot hervorming der instellingen, BS 15 augustus 1980.


632 Ibid.


634 Ibid.

635 Ibid.


637 Art. 4, 4° Wet van 8 mei 2014 houdende diverse bepalingen inzake energie, BS 6 juni 2016.
242. In 2017, Elia announced an investment of approximately 400 million euro in a modular offshore grid (MOG) in the North Sea.\textsuperscript{638} It will connect four OWFs, namely Rentel, Northwester 2, Mermaid and Seastar, to the Belgian onshore grid and will also provide opportunities for future development and interconnections with neighbouring countries.\textsuperscript{639} In addition, Elia has started the “Nemo” project, which is supposed to establish a submarine connection between the substations in Belgium and the United Kingdom via a high voltage direct current (HVDC) cable with a capacity of approximately 1000 MW.\textsuperscript{640} This development is particularly interesting in the light of the Third Electricity Directive\textsuperscript{641} of the EU, which aims at the development of a true internal electricity market through a network connected across the EU.\textsuperscript{642}

243. The MOG will consist of an offshore platform to which the four OWFs can connect and which will be linked to the shore through three submarine cables.\textsuperscript{643} The project is expected to start its operations in 2019.\textsuperscript{644} During the preparations, Elia encountered several problems related to public resistance regarding the Stevin project, which main goal was to upgrade the electricity grid between Zomergem and Zeebrugge.\textsuperscript{645} After a settlement agreement with the parties concerned, Elia could continue the project.\textsuperscript{646} In addition to the Stevin project, Elia introduced the Horta project with the purpose to construct a new high-voltage substation in Zomergem.\textsuperscript{647}

244. In addition to Elia’s grid development, it should be noted that several North Sea States are planning to develop a super-network high voltage cable in the North Sea by 2030.

\textsuperscript{638} ELIA, \textit{Press release: Elia completes all main construction contracts for Modular Offshore Grid}, 13 March 2018.
\textsuperscript{643} ELIA, \textit{Press release: Elia awards submarine cable installation contract for the Modular Offshore Grid (MOG) to DEME Group}, 16 August 2017.
\textsuperscript{644} Ibid.
\textsuperscript{645} RvS 24 juni 2014, nr. 227.836; RvS 8 juli 2014, nr. 228.020; RvS 8 juli 2014 nr. 228.021; RvS 7 oktober 2014, nr. 228.666; RvS 7 oktober 2014, nr. 228.667.
245. The North Sea States have been conducting a research in order to explore their options with regard to the development of an offshore grid for the North Sea.\textsuperscript{648} In this context, a regional agreement was signed by Germany, Belgium, Denmark, France, Ireland, Luxembourg, Norway, the Netherlands, the United Kingdom and Sweden.\textsuperscript{649} Apart from these initiatives, there are other submarine substations located in the North Sea, but these are merely organized on a point-to-point basis between two North Sea States.\textsuperscript{650}

246. What are now the advantages of such a transboundary offshore grid? First of all, such a coordinated network of cables could reduce the amount of cables and the required investment costs.\textsuperscript{651} Thus, this would be both beneficial from an economic and an environmental point of view due to the minimized impact on the environment and the use of scarce space at sea.\textsuperscript{652} Thanks to its scale the transboundary grid would also be able to resolve the problems of regularity of supply and difficulties of storage by moving away from a reliance on local generation.\textsuperscript{653} Moreover, it would stimulate the transboundary trade in green electricity.\textsuperscript{654}

247. The development of a transboundary grid, however, also faces several legal uncertainties. Since legal certainty is extremely important for the offshore wind industry due to the large investments and long-term planning aspect, it is important to identify these uncertainties.\textsuperscript{655} The main consternation in this context relates to the classification of the cables. They either need to be classified as part of the installation or as a transmission line.\textsuperscript{656} The legal classification of a submarine cable depends on its location and destination point as stipulated in article 79(4) UNCLOS.\textsuperscript{657}

\textsuperscript{648} H. K. MÜLLER and M. M. ROGGENKAMP, “Regulating Offshore Energy Sources in the North Sea – Reinventing the Wheel or a Need for More Coordination?,” IJMCL 2014, 735.
\textsuperscript{649} Memorandum of Understanding of the North Seas Countries’ Offshore Grid Initiative, Brussels, 3 December 2010.
\textsuperscript{652} Ibid.
\textsuperscript{653} C. DEGREEF and W. GELDHOF, “Offshore energy and the Belgian legal framework: All at sea?”, TRNI 2015, 70.
\textsuperscript{656} H. K. MÜLLER and M. M. ROGGENKAMP, “Regulating Offshore Energy Sources in the North Sea – Reinventing the Wheel or a Need for More Coordination?,” IJMCL 2014, 735.
\textsuperscript{657} T. CHELLINGSWORTH and D. VANHERCK, “De Noordzee en de ontwikkeling van een offshore grid”, in K. DEKETELAERE and B. DELVAUX (eds.), Jaarboek Energierrecht, Antwerpen, Intersentia,
In the context of the transboundary grid, there would be cables connecting the transmission substations of two coastal states. If those cables do not enter the territorial sea and merely cross the EEZ of a coastal state, that coastal state will not be able to impose obligations on the use and laying of these cables because they do not fall within the scope of article 79(4) UNCLOS. However, the cables do fall within the scope of article 79(2) UNCLOS.

Another issue arises with regard to these transmission cables when an OWF, located in the EEZ, wants to connect to such a cable. The cable would be used in the framework of the economic exploitation of the EEZ and the coastal state would therefore possess sovereign rights with regard to that cable. However, it is uncertain whether or not the coastal state has a right to prescribe that the OWF in its EEZ must or can connect in a ‘third party access-manner’ to that transmission cable. As most wind parks are still situated relatively close to the shore, the need for third-party access has yet to be addressed.

### 3.4.2. Safety Zones and the Risk of Collisions and Allisions

The impact of an OWF is characterized by many facets such as an impact on radar systems, navigational safety, ability of aviation, data used for the purpose of navigation, air-traffic control, weather forecasting and so on. The next section addresses the impact on shipping because the North Sea is one of the busiest navigational routes in the world with several international shipping hubs such as Rotterdam and Antwerp and OWFs are usually deployed in proximity to those ports. As such, the OWFs have the potential to present significant challenges with respect to navigation in this area.

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2015, 107.  
658 Ibid., 108.  
659 Ibid., 108.  
251. In this context, the reader should be reminded of the fact that vessels do not need a permit to use the navigation routes and that the freedom of navigation will apply as long as the vessel and the cargo do not have an impact on the interests of Belgium.  

252. First of all, there is an increased risk of ship-to-ship collisions due to the greater congestion in the marine areas outside the boundaries of the OWFs. Forcing maritime traffic to navigate in a smaller and more confined area is destined to result in an increased risk of collisions. A second hazard relates to the risk of an allision between a vessel and an offshore wind turbine or their associated infrastructure. If vessels would have an accident in the vicinity of the OWF, this could even result in a shut down of the wind farm and in the end even to a reduced reliability of the electricity generation.

253. In order to avoid problems, it is recommended to design the wind turbine towers to be collision-friendly to ships. A future legal issue in this context could be about qualification of a physical impact between a traditional vessel and a floating wind turbine. A third hazard relates to the reduced ability for ships to manoeuvre in the vicinity of OWFs. A definition of the restricted ability to manoeuvre is provided for by Rule 3(g) of COLREGS and generally relates to a vessel that is unable to keep out of the way of another vessel.

254. Besides the offshore wind turbines, the cables can also have an impact on the navigation ability of vessels. For one, they can impinge on the ability of vessels to anchor in the vicinity of an OWF or the corridor through which its export cable runs.

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669 Ibid.

670 Ibid.


255. Moreover, the cables can create an additional navigational hazard by compromising the ability of vessels to anchor in certain areas in case of need.\footnote{Ibid.} If a vessel needs to sacrifice its anchor in order to avoid damaging a submarine cable, it will be entitled to compensation.\footnote{Ibid.} In addition, the submarine cables may pose risks to or displace other marine uses such as fishing, dredging, trawling and so on.\footnote{Ibid.} While the risk can be mitigated through cable burial or protection, the erosion or scouring of sediment on the sea floor as a result of currents or weather can expose the buried cable and increase the risk for conflicts with other marine users.\footnote{Ibid.}

256. Besides the property damage of vessels and offshore wind turbines, there is also a maritime safety concern that comes into play.\footnote{Ibid.} The OWF construction and operations personnel, as well as the seafarers, are namely exposed to the previously mentioned risks.\footnote{Ibid.} The severity of these hazards will increase according to the proximity of OWFs to shipping lanes, the density and scale of marine traffic, as well as factors relating to the winds, currents and wave patterns.\footnote{Ibid.}

257. In order to reduce the risk of accidents and conflicts, the concession zones in the BPNS were diminished and adapted in favour of shipping in 2011.\footnote{Ibid.} In addition, it is recommended to establish a maritime navigational risk assessment.\footnote{Ibid.} The latter can recommend re-routing as a risk-control option to mitigate the navigational risks in the vicinity of an OWF.\footnote{Ibid.} Re-routing, however, can result in additional financial costs, environmental impact and even an decrease in energy efficiency.\footnote{Ibid.}

258. It is important to note that in the concession zones granted for offshore energy production, the exploitation of installations for the production of electricity out of water, currents and wind have priority over other activities, such as fishing and shipping.\footnote{Ibid.}

259. In order to reduce the risk of allisions and collisions, the coastal state has the discretionary right to establish safety zones in which it may take appropriate measure to ensure the safety of navigation and of the artificial islands, installations and structures. These safety zones should be designed to ensure that they are reasonably related to the nature and function of the artificial islands, installations or structures. Moreover, the zones may not exceed a distance of 500 metres around them, measured from each point of their outer edge. It is possible to deviate from the distance of 500 metres if this is authorized by generally accepted international standards or if the International Maritime Organization (IMO) recommends this. As the IMO has not recommended such standards, the exception is currently irrelevant. The safety zones established in the EEZ regime apply mutatis mutandis to installations on the continental shelf.

260. The establishment of a safety zone presupposes the existence of a domestic law in, or an executive order by the coastal state, which can set up or declare the existence of a safety zone. In Belgium, the government determines the outer boundary of the safety zone of an OWF in the awarded domain concession via a Ministerial Decree. The boundaries of the OWFs are also stipulated in the coordinates in article 8, §1 of the Royal Decree of 20 March 2014. The latter also provides the possibility to establish a safety zone of 500 meters for the electricity socket at sea. The zone designated to the electricity socket can also be used as a mooring, or to establish active nature conservation measures as long as these activities do not hamper the functioning of the electricity socket.

687 KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012; F. MAES and J. SPEYS, “Ruimtelijke planning op zee: waar België goed in is”, De Grote Rede 2014, 20.
693 KB 20 maart 2014 tot vaststelling van het marien ruimtelijk plan, BS 28 maart 2014.
694 Art. 8, §3 KB 20 maart 2014 tot vaststelling van het marien ruimtelijk plan, BS 28 maart 2014.
695 Art. 8, §4 KB 20 maart 2014 tot vaststelling van het marien ruimtelijk plan, BS 28 maart 2014; F. MAES, “Ruimtelijke planning op zee in België: van plan naar proces en een nieuw plan”, Tijdschrift
261. In addition, the coastal state can also establish safety zones in the territorial sea, as a consequence of the full sovereignty in this zone. However, UNCLOS does not provide specific rules for the safety zones established around installations in the territorial sea. While the coastal state has the right to establish safety zones of any size in the territorial sea, it needs to respect the other provisions in UNCLOS, including the right of innocent passage.

262. All vessels need to respect the safety zones and the fact that the installations themselves are under the jurisdiction of the coastal state. In this light, the coastal state needs to give due notice of the extent of the safety zone. However, if the plans of the coastal state regarding OWFs have the potential to impede international navigation, this will necessitate requests for appropriate routeing measures to the International Maritime Organization (IMO).

263. In this context, it is relevant to stress that the coastal state does have the right to restrict the freedom of navigation under the safety zone regime according to article 60 (6) UNCLOS. Belgium has done so in the Royal Decree of 11 April 2012, which prohibits shipping and fishing in safety zones. There is an exemption to this prohibition for war vessels, vessels that provide assistance in case of emergencies and vessels that are the property of or are commissioned by the government. The scope of the exemptions also extends towards vessels in distress, a case of force majeure, search and rescue vessels and vessels that take care of the maintenance of the submarine cables and pipelines.

voor Milieurecht 2016, 425.


700 Art. 60 UNCLOS.


702 KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.

703 Art. 5, 1° KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.

704 Art. 5, 4° KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden
After a consultation, the offshore wind operator can agree to grant access to the safety zone for scientific research as well. The concession holder himself, and the holder of the permits regarding the laying of the submarine cables are also granted access in the safety zones. In this context, it is possible to create synergies between aquaculture and the offshore wind activities since the Royal Decree explicitly states that the permit holder of an aquaculture project can get access to the safety zone as well if the concession holder agree to this.

The Belgian marine spatial plan designated two areas between the OWFs for sustainable aquaculture on the condition that the eutrophication decreases in these areas and that the activity is established with the consent of the permit holder of the OWF. The consent for joint use of the concession area is in principle only of a temporary nature and can only last as long as the term of the concession, which is 20 years with an extension possibility of 10 years.

It is important to stress that the OWFs do not possess the status of islands and that the safety zone consequently does not constitute a territorial sea. Thus, with regard to the safety zones and the OWFs in the EEZ, the coastal state can only exercise jurisdiction based a permissive norm due to the fact that article 58 UNCLOS explicitly states that the coastal states only has sovereign rights in this zone. While UNCLOS contains a permissive norm for the exercise of exclusive jurisdiction over the offshore wind installations, a parallel provision for safety zones is missing. Therefore, the coastal State cannot claim comprehensive and exclusive jurisdiction over the safety zone surrounding installations on its continental shelf or in its EEZ.

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705 Art. 5, 3° KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.
706 Art. 5, 4° KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.
707 Art. 5, 2° KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.
708 Arts. 10, § 2 and 10, §3 KB 11 april 2012 tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.
711 Art. 60 (1)(b) UNCLOS.
267. Consequently, the coastal state only has a restricted jurisdiction in the safety zones. The jurisdiction is functionally limited to safety measures. The coastal state ban all shipping activities in the safety zones unless the competent authorities specifically authorize these activities. In this context, the coastal state cannot interfere with the freedom of overflight. Article 60 UNCLOS namely only speaks of the breadth of the safety zones and the obligation for ships to respect them. This choice of words indicates that only the freedom of navigation can be restricted by the coastal State under the safety zone regime, and that the freedom of overflight remains unrestrained.

268. In this context, the coastal state is also not allowed to take measures for the protection of the marine environment that go beyond the general rights of the coastal State in the EEZ and on the continental shelf. This is a pity because the elements for effective marine protection in these areas are present. On the one hand, the coastal state does have the enforcement jurisdiction in the safety zones and on the other hand there is a control and monitoring system set up by the offshore wind developer. The enforcement powers of the coastal State are namely extended geographically by the inclusion of safety zones in the regime of hot pursuit.

269. While article 60 UNCLOS does not explicitly mention the enforcement jurisdiction, the IMO has adopted a resolution related to safety zones and the safety of navigation around the offshore installations and structures which recognizes the enforcement powers of the coastal state in this context. This instrument stipulates the rights of the coastal state with regard to the violation of a safety zone. On the one hand, the coastal state is entitled to take action in accordance with international law, and on the other hand the coastal state can notify the flag state if it deems this necessary. Even though the Resolution does not enter into detail about the possibility of the coastal state to “take action in accordance with international law”, the mere reference to such enforcement jurisdiction acknowledges its existence.

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713 Art. 60 (4) UNCLOS.
715 Art. 5 Koninklijk besluit tot instelling van een veiligheidszone rond de kunstmatige eilanden, installaties en inrichtingen voor de opwekking van energie uit het water, de stromen en de winden in de zeegebieden onder Belgische rechtsbevoegdheid, BS 1 juni 2012.
716 Art. 87(1)(b) UNCLOS.
717 Ibid.
719 Art. 111 (2) UNCLOS.
721 Resolution 671 of the IMO Assembly (19 October 1989), UN. Doc. RES A.671(16).
723 Resolution 671 of the IMO Assembly (19 October 1989), UN. Doc. RES A.671(16).
270. The measures taken by the coastal state need to be aimed at ensuring the safety of navigation and the installation. More specifically, the measures should focus on ending the vessel’s presence in the safety zone. In first instance, the coastal State would be restricted to non-intrusive measures such as the request to leave the safety zone through visual and auditory means. Those signals also need to be given before the hot pursuit begins and while the delinquent vessel is still in the safety zone. The second step can only be taken if the vessel fails to comply with such a request. This step entails the physical removal of the ship from the safety zone. As such, only government vessels have the right of hot pursuit, private vessels belonging to the operator or the installation cannot undertake these first steps of engaging in hot pursuit. Once hot pursuit is initiated, it may not be interrupted.

4. Conclusion

271. If there is one aspect that has become clear after this analysis, it is that the regulation concerning the offshore wind development is complex and spread out over energy law, trade law and environmental law on an international, European and national level. The most remarkable aspect in that sense is the stimulation of the European Union to develop offshore wind energy. Even though the EU adopted several policies, such as the Integrated Marine Policy and the Blue Growth Strategy, it is the same organization that confronts the offshore wind developers with several challenges and difficulties.

272. It has become clear that a lot of transboundary aspects are involved in the installation of the OWFs as well. The necessity of such a transboundary approach arises not only when the offshore operator is dealing with environmental aspects, but also when he is dealing with the structure of the cable network. There are, however, still several uncertainties regarding the regulation that serves as a framework for the offshore wind energy development. One hot topic at the moment relates to the uncertainty regarding the third party access of the submarine cables. If this issue is not handled with, it can hamper the current developments in the matter of transboundary transmission grids.

273. Apart from the uncertainty regarding third party access, there is the issue concerning the relation between several EU instruments. The focus on blue energy is not always in conformity within every EU instrument.

IJMCL 2015, 527.
725 Ibid.
726 Ibid.
727 Ibid.
728 Art. 111(4) UNCLOS.
730 Ibid.
731 Ibid.
274. While the blue growth strategy explicitly stimulates the development of offshore wind energy, the OWFs often encounter obstacles either in the form of environmental obligations or trade law obligations. In order to avoid conflicts, the EU should therefore take measures to minimize and avoid these conflicts without truly excavating the existing regulations.

275. Regarding the scientific uncertainty, it remains important to establish monitoring programmes in order to anticipate the long-term impact on the environment. Related to this, it is relevant for the OWF operators to look into synergies during the operation stage of the wind farm in order to offset the damages done during the installation and decommissioning phase. In this context, it is even relevant to look into the positive effects on fisheries and other marine mammals. A safety zone surrounding an OWF can in that sense also serve as a protection zone, thereby complementing even the function of a marine protected area (MPA).

5. Annexes


6. References

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Wet 22 april 1999 betreffende de exclusieve economische zone van Belgie in de Noordzee, BS 10 juli 1999.
Wet 29 april 1999 betreffende de organisatie van de elektriciteitsmarkt, BS 11 mei 1999.

Wet 20 januari 1999 ter bescherming van het mariene milieu in de zeegebieden onder de rechtsbevoegdheid van België, BS 13 maart 1999.

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6.2. Case Law


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