Renewable wind energy

**Table of contents**

1. Introduction
2. Policy and Regulations regional level (MSFD/OSPAR/TWSC)
3. Policy in the three states/Länder (federal level, federal state level)
4. Spatial Planning (EEZ/Coastal waters)
5. Legislation (Laws, permission procedures)

[Note:

In the future also:

Status quo on- and offshore

Impacts

Effects of Wind energy on the property

Offshore: Construction phase OWF (pile driving/Marine mammals); operational phase, maintenance (ship traffic); construction phase cables, maintenance

Onshore: operational phase

Conclusion: common ground and possible further steps]

1. Introduction

Playing a crucial role in combating climate change, renewable energies do already and will even more contribute to the reduction of CO2-emissions in the upcoming years. While it is undeniably the case, that less emissions caused by the combustion of fossil fuels will have a positive effect for the environment, it shall not be neglected that there are also impacts detrimental to habitats and species.

This inventory gives an overview of the current situation in Denmark, Germany (focusing on the Länder Schleswig-Holstein and Lower Saxony) and the Netherlands in so far as it concerns the Wadden Sea World Heritage.

Renewable energy in the Wadden Sea refers to wind energy both in the offshore area and the coastal area. Concerning the offshore areas, this report will focus on the areas where wind farms exist or will be erected in the next ten years’ time and the high voltage power cables which connect these areas to the mainland. In addition to that, the development of wind farms in the coastal area adjacent to the Wadden Sea WH site will be described.

This inventory starts with outlining the current policies and status quo concerning wind energy and its development on- and offshore. This will, firstly, be done by describing the policies and regulations on an international level, which comprises beneath the TWSC’s own policies also aspects of conventions and directives such as OSPAR and the EU – MSFD.

In a second step, the existing tools and contents of spatial planning in the three countries will be presented. These are the levels at which the basic decisions for the further development and implementation are made. In a third step, concrete actions and the impacts on the environment will be highlighted. Therefore, the contents of a permission procedure, comprising preventive and mitigation measures are mentioned in this chapter.

The conclusion will wrap up if there is a further need for coordination, exchange and harmonisation of procedures within the existing frameworks of the TWSC.

1. Policy and Regulations TWSC / regional level (MSFD/OSPAR)

2.1 OSPAR

The three countries are also contracting parties to OSPAR, the international convention for the protection of the marine environment of the North-East Atlantic. The OSPAR Convention entered into force on 25 March 1998, replacing the Oslo and Paris Conventions (hence the name of the convention. Since 1998, the cooperation of the Contracting Parties covers all human activities that might adversely affect the marine environment of the North-East Atlantic. Programmes and measures cannot be adopted under the Convention on questions relating to fisheries management and there is a preference for issues related to shipping to be dealt with by the IMO.

Concerning offshore energy, the *OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development[[1]](#footnote-1)* (with last update in 2008) has been elaborated. The purpose of this guidance note is to assist OSPAR contracting parties, developers, consultants, regulators or any other interested parties or individuals in the identification and consideration of some of the issues associated with determining the environmental effects of offshore wind farm developments. It covers the topics location, licensing, monitoring, construction and operation, removal/decommissioning. The Contracting parties have to report regularly about their application of the issues mentioned in the guidance paper.

OSPAR is working on a revision of the North-East-Atlantic Environmental Strategy (NEAES) until 2021. One of its operational objectives will be related to ambient and impulsive noise and measures to be taken.

Common indicators for both ambient and impulsive noise are under development. In a first step, sources shall be identified and mapped. With a risk assessment approach, the potential impact on species shall be analysed by comparing the sound data with existing data on MPAs and the distribution of marine species in a second step. In order to use synergies, this process is aligned with the respective development taking place under the EU Marine Strategic Framework Directive (MSFD), as both the EU and many of its member states are contracting parties to OSPAR.

2.2 MSFD

The Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC), is the key component of the EU's policy for healthy, clean and productive seas. The implementation of the Directive aims to minimise the overall anthropogenic pressures to a level that does not impair the marine ecosystems’ ability to respond to man-made changes, while at the same time allowing the ocean's commodities (such as fish, seafood) and services to be used sustainably, by both current and future generations (ecosystem approach; Article 1(3)). The objective of the MSFD is to achieve or maintain a good environmental status (GES) by 2020.

This entails the development and implementation of marine strategies in order to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected while also reducing inputs in the marine environment (Article 1(2)).

Being member states of the European Union, the implementation of the Marine Strategic Framework Directive lies with the three countries. Member States are required to report on the current state of nature and the environment (assessment in accordance with Article 8) of their marine waters and define the desired state of their marine waters (GES, Article 9). In the event of a deviation between the current and desired state of marine waters, or in order to maintain a good environmental status, the Member States must establish environmental targets (Article 10). [[2]](#footnote-2)

Besides the obligatory reporting about the environmental status regarding these targets, each member state has to develop and implement a so-called programme of measures. In Germany, existing tools such as marine spatial planning and marine protected areas in both EEZ and coastal waters shall be used to find the balance between nature protection and the development of renewable energies. Furthermore, the topic of underwater noise, both of an ambient and impulsive quality, has been incorporated. As a first step, a sound register shall be developed. Currently, these programmes are under revision. [Note: to add short information of the situation in NL and DK]

2.3 TWSC (Common ground)

There are no wind farms or wind turbines within the Wadden Sea World Heritage property. The transfer cables cross underneath the property. This has been stated in the nomination dossier for the inscription on the UNESCO World Heritage List and been incorporated into the Wadden Sea Plan 2010 (WSP 2010).

As laid down in the WSP 2010 (§§ 3.18, 4.17, 7.4, 8.4 and 9.11), it is the common policy that no wind turbines shall be erected in the Nature Conservation Area and to allow it outside the Conservation Area only if important ecological and landscape values are not negatively affected (§§ 3.19, 4.18, 7.5, 8.5 and 9.12 WSP).

Nonetheless, the associated cable laying and connections to the mainland of the offshore Wind farms occur through the WSWH property.

The three countries agreed to “concentrate cable crossings through the Wadden Sea within a minimum of cable corridors and a minimum of cables using the best available techniques, e.g. cables with highest capacity available, and to communicate regularly on this item in order to use synergies” (§§ 3.17, 4.19, 5.10 and 7.3, WSP).

Keeping this in mind, the Leeuwarden Declaration as of May 2018 contains the stipulation to:

*29. Instruct the Wadden Sea Board to review and monitor the impacts of renewable energy production and energy transportation on the Wadden Sea ecosystem and to consider measures to avoid or mitigate possible negative impacts by looking for best environmental practices also with the aim of developing, for example, related common principles to evaluate the impact of high-voltage power cables in the Wadden Sea Area in close consultation with the responsible bodies and stakeholders;*

The procedures regarding legislation and planning which ensure that this common policy will be adhered to in the three countries will be described later in this document. The following figure gives a first overview of the framework that is in place in the three countries.

**Table 1.** A. Legal framework that prohibits the development of windfarms in the Netherlands, Denmark and the three German Federal States. B. National policies that support the energy transition to renewable sources. C. International and national legal framework to regulate construction. Source QSR: Energy, 2017; Nomination Dossier, 2012 and update by partner organisations.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Legal framework to prohibit development of windfarms within the WS | Policy to promote renewable energy | International and national legal framework to regulate construction |
| Wadden Sea World Heritage property in… |  |  |  |
| …the Netherlands | Dutch Conservation Area (PKB Area) | Energy Agreement for Sustainable Growth  National Government Vision Wind At Sea  Roadmap Wind Energy at Sea 2023  National Environmental Vision | Habitats Directive ++  EIA Directive  Wind Energy at Sea Law  Electricity law |
| Germany |  | Renewable Energy Sources Act (RES-Act) | Habitats Directive ++  EIA directive (federal and Länder) |
| Lower Saxony | National Park Act |  |  |
| Hamburg | National Park Act |  |  |
| Schleswig-Holstein | National Park Act |  |  |
| Denmark | Danish Statutory Order | Energy Act  National Energy and Climate Plan (NECP)\* | Habitats Directive ++ |

\* To meet the EU’s energy and climate targets for 2030, EU Member States need to establish a 10-year integrated national energy and climate plan (NECP) for the period from 2021 to 2030. Introduced under the [Regulation on the governance of the energy union and climate action (EU/2018/1999),](https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/energy-union#content-heading-2) the rules requires the final NECP to be submitted to the Commission by the end of 2019 ([ec.europa.eu/energy](file:///\\cwss-dc01\cwss\02%20Trilateral%20Cooperation\2.5%20Task%20Groups\TG-MM\TG-M%202019%20-\TG-M%2020-1\docs\ec.europa.eu\energy)).

++ Habitat Directive for assessment and permission for construction of corridors for laying power cables across the area.

Ein Bild, das Text, Karte enthält.

Automatisch generierte Beschreibung

**Figure 1.** Map of offshore wind farms and connecting power cables. Source: [Wikimedia Commons](https://upload.wikimedia.org/wikipedia/commons/a/a1/Map_of_the_offshore_wind_power_farms_in_the_German_Bight.png), Maximilian Dörrbecker (Chumwa) / CC BY-SA (<https://creativecommons.org/licenses/by-sa/2.0>). Update from 21.01.2020

[Note: this map will be updated by CWSS. Who takes and holds this georeferenced info per country? Can we establish formal contact with them to update GIS info? Ideally, we need the \*.shp files]

1. Policies in Germany (Federal and Länder), The Netherlands, Denmark

Wind energy generation has a very important role in Europe. From a total of 3,018.5 MW provided in European waters, 86.1 % were in the North Sea, 9.2 % in the Baltic Sea, and 4.7 % in the Irish Sea (data from 2015 in QSR, 2017). The governments from the Netherlands, Germany and Denmark have plans to increase the generation of renewable energies to progressively lower fossil fuel use. Figure 1 shows the planned increase in Megawatts production between 2020 and 2030 and the percentage that that production represents from the overall energy production.

**Figure 2.** Plans to increase the renewable energy production in the three countries measured in Megawatts. In Germany by 2025 it is expected that 40-45% of all generated energy comes from renewable sources, and in 2035, 55-60%. In the Netherlands it is planned to increase from 14% in 2020 to 40% in 2030 (without wind production at land) and in Denmark in 2014, 40% of all energy was generated from wind power, in 2020, 50%.   
[Note: this figure will be updated after receiving the relevant information – if comparable information is available]

3.1 Germany

3.1.1 Federal

With the phasing out of the use of coal, the expansion of renewables and enhanced energy efficiency, Germany intends to become more climate neutral in the next years. Germany aims, as laid down in the Climate Action Programme 2030 (Klimaschutzprogramm 2030), at phasing out coal-fired power plants by 2038. Renewables play an important role for energy supply as nuclear power plants will also be phased out by 202x. According to the Act on renewable Energies (Erneuerbare Energien-Gesetz, EEG), 40-45% of the electric power consumption shall be supplied by renewable energy until 2025. As of 2018, ca. a third of the whole electric power consumption in Germany came from renewable energy, with wind energy contributing 16% of the total. In 201, 110 TWh were produced by wind turbines, ~19.5 TWh being supplied by offshore wind farms (both North and Baltic Sea). In the first quarter of 2020, wind turbines with a capacity of 137 MW have been erected offshore.

The expansion targets for renewables as a whole are to be increased. For offshore wind power, the expansion target for 2030 has been raised to 20 GW. The ministers for Energy of the Bund and the relevant federal states (Hamburg, Bremen, Lower Saxony, Schleswig-Holstein and Mecklenburg –Vorpommern) concluded an agreement in May 2020 about the way forward, including criteria about the grid connection of the offshore windfarms that take into account the natural values of the Wadden Sea area. This aim shall be incorporated into the corresponding law for Offshore Wind Energy, The Windenergie auf See- Gesetz (WindSeeG). This law amendment has to pass the Federal parliament (Bundestag) and the Federal council (Bundesrat) in the months to come. There is a discussion ongoing if this aim is going to be raised to 40 GW by 2040.

3.1.2 Schleswig-Holstein

The Law on Energy transition and climate protection (Energiewende- und Klimaschutzgesetz) of Schleswig-Holstein contains ambitious goals: it is intended to reduce emissions of greenhouse gases by 40% until 2020 and 80-95% % by 2050. 37 TWh of electricity shall be generated by renewables until 2025. Schleswig-Holstein aims at being able not only to generate enough energy from renewables for its own supply of electricity, but also to be able to supply other federal states with it. In 2017, 11.3 TWh were generated by onshore wind turbines and 6.9 TWh by offshore wind turbines. Nearly 3.000 wind turbines with a nominal capacity of 6.5 GW were installed in SH onshore. The coastal areas of the districts of Dithmarschen, Steinburg and Nordfriesland play an important role in this [Note: SH to check wie viele Anlagen im näheren Umfeld. Add figure on situation in SH]. Already, the ratio between renewables and of the electric power consumption in SH is at 150% in 2018[[3]](#footnote-3) with a major contribution from wind energy. It is intended to raise this to 250% till 2025. In 2018, 48.5% of electric power was generated by wind on- and offshore.

3.1.3 Lower Saxony

3.1.4 Hamburg

[Note: Task in progress to add the relevant information for LS and HH]

3.2 The Netherlands

To reduce the CO2-emissions in the Netherlands, the Routekaart Windenergie op Zee 2030 lays down that by the end of 2023, 3.5 GW shall be generated by offshore wind farms, with a raise to 6.1 GW in 2030. As of 2020, 1.0 GW are supplied by offshore wind farms in the Dutch coastal waters.

The Energy Act (Energiewet 1.0) stipulates that the development offshore is connected to several types of measures that have to take place in the mainland: the further development of the grid onshore, identification of new connection facilities (NVP) and areas of demand for energy supply. Aspects that shall also be considered to reduce the costs arising from the offshore grid connection are alternative solutions such as Hydrogen power offshore, interconnectors between offshore wind farms and the UK, supply of offshore facilities of mining and connection to the CCS-net.

Concerning the Wadden Sea, it is foreseen to connect the wind farms belonging to the area called “Ten noorden van de Waddeneilanden” via a 220kV AC power cable system to the mainland, which causes a crossing of the WH site. This offshore wind farm area shall generate about 0.7 GW, it is intended to run the application process at the end of 2022 with the aim to have the project implemented until 2027.

A public hearing process concerning all the potential areas that will be open to wind farms has taken place while identifying the potential network connection points. An EIA has been carried out, also regarding the grid connection.

[Note: please confirm if the information added fulfills the request “Please check if this information is still valid and add information that is needed concerning spatial planning as such in NL regrading wind farms”]

3.3 Denmark

[Note: Task in progress to add information regarding the Danish energy policy]

1. Spatial planning

Spatial planning is one of the key instruments to balance competing interests. Bearing in mind that the impacts of wind turbines on the environment, especially on nature and human health, it has widely been recognized that the construction of wind turbines shall be restricted to defined areas.

[Note: to include GIS-charts? Overview by BSH?]

4.1 Germany

The legal basis for the establishment of maritime spatial plans in the German EEZ is the Federal Regional Planning Act, which was extended to the EEZ in 2004, and last amended in 2017 to implement the EU Directive on Maritime Spatial Planning. In contrast to the territorial sea, the EEZ does not belong to the territory of the Federal Republic of Germany. Maritime spatial planning must therefore respect the freedoms of the UN Convention on the Law of the Sea, such as the freedoms of navigation, overflight and to lay cables and pipelines.

The legal regulations for spatial planning in the German EEZ apply to:

* economic and scientific usage,
* ensuring the safety and ease of maritime navigation, and
* the protection of the marine environment.[[4]](#footnote-4)

The maritime spatial plans for both North and Baltic Sea were established in a broad-based consultation process, in which submissions of authorities, associations and private individuals were obtained and evaluated at various stages of the planning process. In 2009, the plans entered into force as ordinances. As of now, they are revised and updated until 2021. On 11 June 2019, the Federal Ministry of the Interior, Building and Home Affairs (BMI), with the support of the Federal Maritime and Hydrographic Agency (BSH), started the revision and updating process which includes a consultation phase of the public authorities in a first stage.

The spatial development plan (Flächenentwicklungsplan) 2030 which has been adopted in June 2019 contains stipulations concerning the areas for offshore wind energy and offshore grid connections in the North Sea and Baltic Sea in the period from 2026 to at least 2030. Within the areas, areas will be defined for which it will be determined how much capacity (megawatts) from offshore wind turbines is expected to be installed and commissioned in each calendar year. In order to ensure synchronisation with the required grid connections for the offshore wind turbines, the location of the offshore platforms and the route for the grid connections within the German Exclusive Economic Zone will be determined. In addition, it is determined in which calendar year the planned offshore wind turbines and their grid connections will go into operation.

The scope of application of the FEP relates to the German Exclusive Economic Zone of the North Sea and the Baltic Sea. In addition, the plan mainly deals with spatial determinations for cross-border (international) grid connections and connections between grid infrastructures. The technical planning specifications are made on the basis of planning and standardised technical principles.

The FEP determines the chronological order in which the areas for offshore wind turbines will be put out to tender and the wind turbines will go into operation. In determining the order, criteria such as the efficient use of existing and planned grid connections, the spatial proximity to the coast, conflicts of use on an area, the expected capacity to be installed on the area, and the resulting suitability of the area for cost-efficient power generation play a role. The demand for offshore grid connections is determined by the Federal Network Agency (Bundesnetzagentur) on the basis of the Grid Development Plan Electricity (Netzentwicklungsplan Strom, NEP) which is submitted by the transmission system operators (TSO). The four TSO have to enhance and expand the high voltage transmission grid in line with the demand both offshore and onshore. The NEP contains different scenarios covering ten –fifteen years and is revised every two years. A public consultation is part of the development process of the NEP.

When these plans are consulted, it is mandatory to involve the competent authorities of the Länder to coordinate the planning procedures. The next revision of the FEP is due end of 2020.

Federal states (Länder)

[Note: Add charts depicting the zones and the grid connections]

4.1.1 Schleswig-Holstein

Regulations are made within the Landesentwicklungsplan (Spatial Development Programme of the state of Schleswig-Holstein which is developed according to the Spacial Planning Act of Schleswig-Holstein). Special areas for Wind farms (Windenergieeignungsgebiete) are designated that comprise 2% of the land area of Schleswig-Holstein. The construction wind farms and their repowering is hence limited to these areas. On the other hand, so-called priority areas such as nature reserves and the National Park of Schleswig-Holstein Wadden Sea are defined as areas where any kind of land use has to comply with the relevant environmental protection regulations. The Act of the National Park of Schleswig-Holstein Wadden Sea explicitly prohibits the construction of projects such as Wind farms within the National Park. Buffer zones around this area are defined as criteria which have been applied to identify these special areas for Wind farms. For example, an area along the coast of the North Sea has been defined as being of utmost importance for Bird migration. An area of 300m adjacent to the National Park is to be kept free from Wind farms to ensure the exchange between the National Park and the hinterland concerning resting, breeding, or foraging sites.

They will be defined and depicted in the regional spatial plans which are, like the Landesentwicklungsplan, developed by the competent authority, the Ministry for the Interior. They will enter into force as ordinances under the Schleswig-Holstein Spatial Planning Law (Raumordnungsgesetz Schleswig-Holstein).

Regarding the grid connection of the high voltage power cables which connect the offshore wind farms in the EEZ with the grid nodes in the mainland in Schleswig-Holstein, the corridor has been defined and incorporated into the LEP. With the revision of the plan, the so-called Büsumtrasse will still be defined as the sole cable corridor crossing the Wadden Sea World Heritage site in Schleswig-Holstein. The revised LEP is intended to enter into force in 2020/2021 and thus incorporates the development in the years until 2035.

4.1.2 Lower Saxony

4.1.3 Hamburg

[Note: Task in progress to add information regarding the planning system. Are there areas defined for wind turbines? Are there any criteria this delimitation is based upon?]

4.2 The Netherlands

There are various procedures to be followed before windfarms can be build and decisions are final. Below is an overview of needed decisions and to be followed procedures. The participation process is continuous and runs throughout the procedures.

*National coordination regulation*

It follows from article 20a, 20c and 20ca from the electricity law 1998 that for an extension of the Net at Sea the national coordination regulation (RCR) applies. The Minister of Economic Affairs and Climate (EZK) is the project-minister and the coordinating competent authority. The needed decisions (integration plan and implementation decision; see further on) will be brought in procedure simultaneously. Handed in opinions and appeals will be dealt with simultaneously. The Minister of EZK is together with the Minister of Interior and Kingdom Relations (BZK) are the competent authorities for determining the location.

*Integration plan*

The Ministers of EZK and BZK determine an integration plan for the windfarm in which it is ruled where new cable connections and the transformation station will be build. This instrument is applied at the national level, because the minister of EZK is responsible for energy policy. This is confirmed in the electricity law 1998.

The integration plan applies for both the part of the project that runs over land and the part at sea. The part at sea only concerns the area part of the municipalities. The municipality area runs up to a maximum of 1 kilometer from the coast.

The integration plan concerns for the upcoming wind farms the trajectory, the conditions for the spacious relevant aspects of the project (for example the transformation station), the exploitation and the building process. The integration plan contains amongst others;

* A map with the exact trajectory and location of the transformation station,
* Plan rules which contains the conditions for the spacious relevant aspects of design, building and exploitation of the wind farm;
* Explanation on the possible effects of the project for the surrounding, such as the effects on the environment, nature, archeology, safety and (other) users.
* Attachments such as the environmental impact assessment and research reports.

The integration plan will be determined by the ministers of EZK and BZK and has a comparable level of detail and a (spacious) effect at performance decisions as a land use plan. It will be written like a land use plan based on good spacious development. Amongst others, it translates in weighing all relevant spacious interests and effects.

*Implementation decision*

For building and exploitation of the windfarm there is, next to the integration plan, also a range of implementation decisions needed. Amongst others it applies for permits based on the waterlaw, the nature protection law and the law on general provisions environmental law (Wabo). These permits also apply for the part of the trajectory that falls outside of the integration plan.

Needed permits and waivers are requested at the competent authorities. The Minister of EZK supervises the various permit procedures because the national coordination regulation applies. The minister supervises both the content related and procedural alignment of the implementation decisions and the integration plan. He also sets deadlines in which the involved governmental actors need to finish their implementation decisions and makes sure the integration plan and implementation decisions are published simultaneously.

After taking into consideration the various opinions the minister finalizes the decisions. Changes might be possible. Against the final decision it is possible to appeal at the highest court (Department of Administrative Justice at Raad van State). When a competent authority does not decide in time, the minister of EZK or other competent ministers can rule themselves. This is also possible when the competent authority decides not in line with the integration plan.

*Environmental and planning act*

Through the Environment and Planning Act (Omgevingswet) the government wants to combine and simplify the regulations for spatial projects. The aim is to make it easier to start up projects. For example, the construction of housing on former business parks, or the building of wind farms. The environmental and planning act is expected to be effective from the 1st of January 2021. The law will replace, amongst others, the national coordination regulation and the integration plan. The content of the procedures will remain the same.

4.3 Denmark

1. Nature protection law

[Note: Tbd: introduction about legislation in place which was part of the nomination dossier]

5.1 Germany

The federal Nature protection Act (Bundesnaturschutzgesetz, BNatSchG) sets the legal frame for nature protection in Germany. The competent authorities are at state level which ensure the application of the law in combination with the nature protection acts of the Länder which complement it.

Certain species such as birds and marine mammals (harbour porpoise) are also specially protected according to §44 BNatSchG, as well as certain biotopes (such as intertidal mudflats, and salt marshes)acc. to §30 BNatSchG. The impact on these has also to be assessed within in the application process. In general, the impact of the project is subject to the so-called “Eingriffsregelung” acc. to §§15 ff. BNatSchG which considers the impacts of construction and operation of the project on nature such as species and biotopes in general and ecosystem functions of soil, water and air.

The EU-directive on Environmental impact assessment (EIA) has been transposed into both federal and state law. Certain projects such as the construction of wind farms (both onshore and offshore) has to be assessed according to its potential impacts on the environment, including biodiversity and other ecosystem functions and components. This assessment is part of the licensing procedure, which includes a public consultation phase.

5.1.1Schleswig-Holstein

As far as the WH site is concerned, the Act on the Protection of the Schleswig-Holstein Wadden Sea (NPG), is the main legal instrument that defines actions and measures which are prohibited or allowed. According to § 5 (1) NPG, any project that might severely impact on the conservation goal (Natural dynamics shall proceed in a mostly undisturbed way (which mirrors the OUV)) of the National Park and its parts is prohibited. § 5 (1) Nr.8 prohibits explicitly the construction and operation of Wind Farms. Generally, the NGOs are being consulted in the process and can comment on the planning documents.

The National Park and its adjacent area is part of the Natura2000 Network and designated both as Special Area of Conservation (NTP SH Wattenmeer und angrenzende Küstengebiete) and Special Protected Area (Ramsargebiet SH Wattenmeer und angrenzende Küstengebiete). The main conservation objective of the SAC and SPA is to maintain that natural processes may occur in a mostly undisturbed way. Furthermore, conservation targets concerning different species of waterbirds, marine mammals, fish and habitat types are defined, being published by the Ministry for the environment. Whenever a project is applying for a permission which might have an impact on the SAC or the SPA, it is mandatory that an appropriate assessment acc. to §34 BNatSchG is carried out which describes and assesses the potential impact of the project regarding the conservation targets.

Moreover, it has to be assessed if the project is possible regarding the provisions of the National Park Act (when it is envisaged to be realized within the boundaries of the National Park proper). The construction of Wind turbines is explicitly prohibited (see above).

When licenses regarding the laying of high-voltage power cables are issued, avoidance and mitigation measures are part of the permits. First of all, the cable corridor with the least impact on the environment is identified after a thorough assessment of alternatives. In the case of the Wadden Sea area of Schleswig-Holstein, this corridor has been identified and incorporated in the spatial planning documents (see above).

Concerning the cable laying as such, best available techniques to minimize effects on soil, habitats, benthic organisms, birds, mammals are identified and have to be applied.

The so-called 2K-criterion defines that the seafloor in 30cm depth shall not be heated more than 2K C due to the heat loss of the cable systems in order to prevent changes in geophysical traits or the benthic ecosystem. Permit holders are obliged to prove this via a monitoring at representative sites.

A time frame for the cable laying is also determined, which ensures that the disturbance of animals such as breeding, moulting or roosting birds and marine mammals such as seals and harbour porpoises are restricted to a minimum. Licenses so far have been issued for three high-voltage grid connection systems (HelWin1, HelWin2, SylWin1) which connect offshore wind farms with the mainland via the so-called Büsumtrasse. Furthermore, Nord.Link, a 525kV HVDC grid connection between Norway and Germany is traversing the National Park in parallel with these three 380kV grid connections systems. The high-voltage DC link will enable the exchange of 1,400 megawatts of renewable energy-wind power from Germany and hydropower from Norway.

5.1.2 Lower Saxony

5.1.3 Hamburg

[Note: Task in progress to add regulations from National park acts regarding wind farms and information on licensing procedures (LS)]

5.2 The Netherlands

The complete effect analyses for the windfarm at sea north of the Wadden Sea islands was published at the 8th of June. The minister of EZK is expected to choose preferred alternative by the end of October 2020.

5.3 Denmark

[Note: Task in progress to add comparable information about the legislation in place DK which is applied in the licensing procedueres (EIA, HD,..) Concrete regulations concerning the WS WH site in your country (what is mentioned in the statutory order and/or provide a link, if possible)]

Impact on the environment

[Note: To be discussed if we need a para on visibility (impairment of Landscape)]

Impacts arise throughout the life cycle of marine renewable developments, including: site selection, construction, operation, decommissioning and removal. Impacts include the effects of noise on marine mammals and fish, disturbance and loss of habitats, bird collisions and visual intrusion. Marine renewables can also interfere with other uses of the sea – causing hazards to shipping and the servicing of the offshore industry, and displacing fishing activities and recreational boating. There may also be conflict with marine conservation objectives (OSPAR 2020).

Impulsive sound sources have been observed to cause temporary displacement of small cetaceans (e.g. harbour porpoise), increased physiological stress in some fish species (e.g. European seabass), and developmental abnormalities in invertebrate larvae. Concerning harbour porpoises, the impact ranges from temporal avoidance of certain areas to temporary or even permanent damages to the sense of hearing. As these animals rely on their sense of hearing both for orientation as well as for foraging, impacts caused by impulsive sound can result in severe effects.

While effects on individual animals have been shown for a number of species, there is uncertainty over whether and how the effects of sound on individuals are translated to the population or ecosystem scale.

Another matter concerning sound is ship traffic.

[Note: To be added: Habitat loss, Collisions of birds with wind turbines /impairment of migratory routes/exchange between breeding/roosting sites and feeding grounds]

Energy from Oil and Gas

Energy from Oil and Gasrefers to the exploitation platforms and pipes used to transport oil and natural gas.

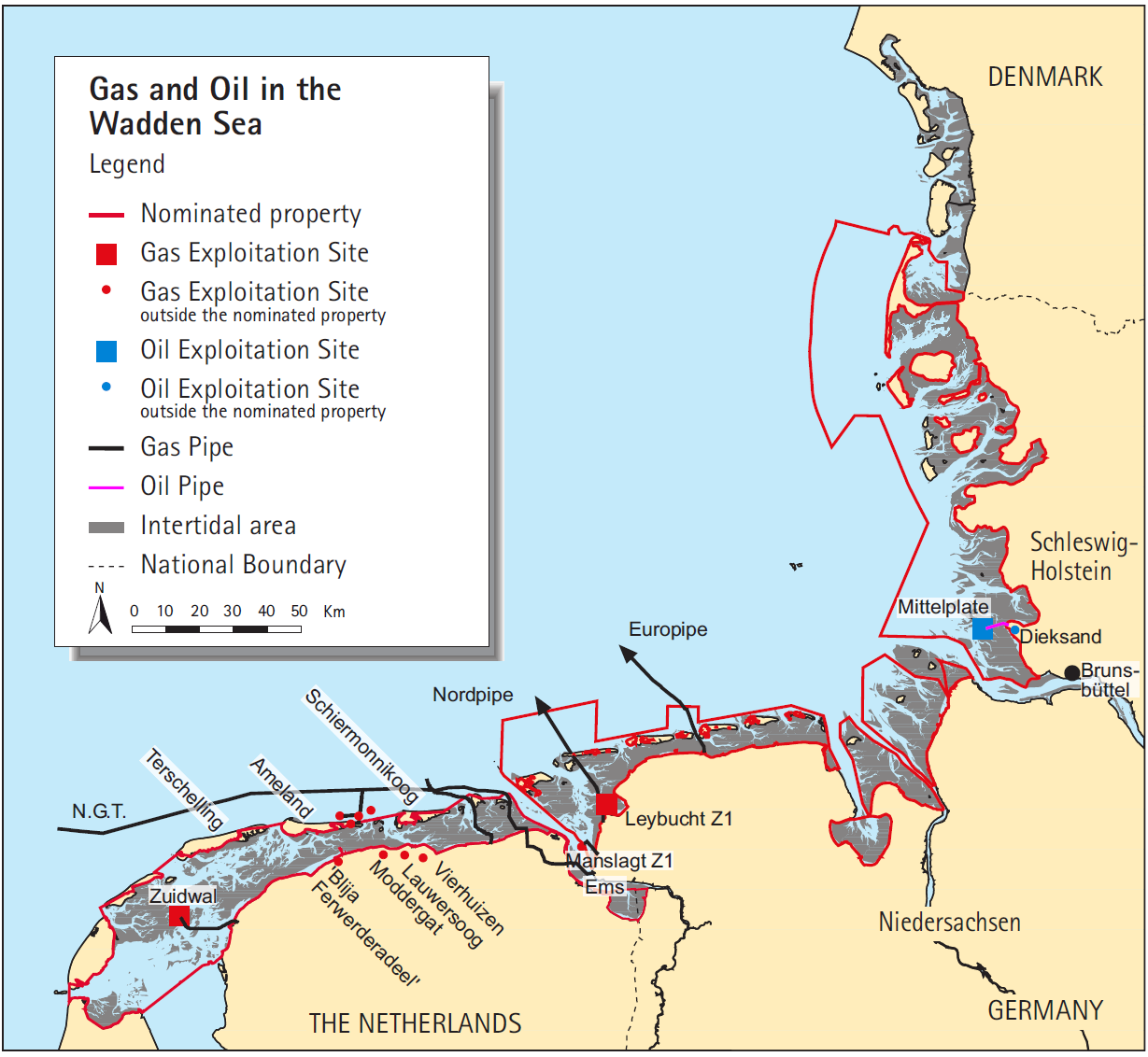
1. Inventory

There are no gas & oil exploitation platforms within the Wadden Sea World Heritage property. Among the three countries, only the Netherlands exploits gas. The exploitation is done from the shore outside the Wadden Sea World Heritage site using directional drilling in the soil underneath the WSWH.

[Note: to add what is the situation in LS?]

Oil is only extracted in one place in Germany: the oil platform Mittelplate and Dieksand, a land-based exploitation site adjacent to the Wadden Sea near Friedrichskoog (see figure 3). The area of the Mittelplate is excluded from the WH property and its exploitation permit was issued before the World Heritage nomination (even before the founding of the National Park in 1985). Since 2005, the crude oil which is produced at Mittelplate is transported to the mainland via a subsoil pipeline. The platform can be characterized as a zero-emission unit.

|  |  |  |
| --- | --- | --- |
|  | Gas exploitation | Oil exploitation |
| Wadden Sea World Heritage property in… |  |  |
| the Netherlands | Yes, from the shore outside the WSWH with directional drilling underneath the WSWH. | No |
| Lower Saxony | No |  |
| Hamburg | No | No |
| Schleswig-Holstein | No | Yes, permit issued before World Heritage nomination (until 2041). |
| Denmark | No | No |



**Figure 3.** Gas and oil exploitation sites and pipes.   
[Note: are the data in the map still current or need update? Who takes and holds this georeferenced info per country? Can we establish formal contact with them to update GIS info? Ideally, we need the \*.shp files]

1. Common ground

Trilateral agreements:

1. In the Nature Conservation Area, new exploitation installations for oil and gas will not be permitted (WSP, 2010).

“For the area of the World Heritage property, Germany and The Netherlands have confirmed their commitment not to explore and extract oil and gas at locations within the revised boundaries of the nominated property in line with law in force” (WSP, 2010). In Denmark, “exploration and exploitation of gas and oil in­cluding seismic investigations is prohibited in the nominated property according to the Statutory Order on the Nature and Wildlife Reserve Wad­den Sea” (Nomination Dossier, 2012).

1. “New licenses for the construction of pipelines in the salt marshes for the transport of gas and oil shall not be issued unless in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest including those of a social or economic nature.
2. The exploration and exploitation of the energy resources in the North Sea, as well as in the Wadden Sea Area, has to comply, at least, with the international agreements in the appropriate fora. This results *inter alia* in a prohibition on discharging oil-based muds and cuttings. *Dumping or discharge of water based muds and/or cuttings is only allowed in line with relevant OSPAR agreements*.
3. Infrastructural works which are necessary for the supply of the islands and the Halligen with, amongst others, gas, water and electricity, or other utilities, shall be carried out in a way that the environmental impact on the Wadden Sea is kept to a minimum and permanent, or long lasting, impacts are avoided.
4. The construction of pipelines shall be such that the environmental impact on the Wadden Sea ecosystem is kept to a minimum and permanent, or long lasting, negative impacts are avoided, and if this is not possible, compensated. In the Nature Conservation Area, new licenses for the construction of pipelines in the tidal area for the transport of gas and oil shall not be issued unless in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature” (WSP, 2010).

In the Netherlands, all activities related to exploration and exploitation are subject to the strictest regulations probably worldwide. They will be carried out in accordance with binding international and national mining and nature protection legislation, and in compliance with the Wadden Sea Plan (Stade Declaration 1997) and international regulations, for example PSSA, OSPAR, AEWA, MARPOL, and the Ramsar and Bonn Conventions.

Legislation (Laws, permission procedures)

These agreements are backed up with the legal framework presented in Table 3.

The Netherlands

The legal framework in regard to energy from oil and gas in the Dutch part of the Wadden Sea is based on the following:

1. The Mining Law;
2. The Nature Protection Law;
3. The Law in regards to environmental licenses.

The Netherlands applies the ‘Hand on the tab’ principle in regards to production of gas under the Wadden Sea. Production of gas is allowed if the subsidence caused by the gas extraction does not negatively impact the nature of the Wadden Sea. Three factors are taken into consideration; sea level rise, sedimentation in the Wadden Sea (natural recovery capacity) and subsidence caused by gas exploration.

In the Dutch Wadden Sea there is one site for the exploitation of natural gas: Zuidwal. All other production sites are located outside the nominated property, but the wells or reservoir may extend under it. The Mining Law limits mining activities in the Wadden area. New mining constructions are not allowed in the Wadden Sea, on the Wadden islands and in the North Sea (7 km up north from the Wadden Islands). Next to that, shared usage of mining constructions needs to be considered within 12 miles of the coast and view disturbance needs to be limited before new constructions are allowed.   
Oil extraction does not take place around the Wadden Sea.

**Table 3.** Legal framework that regulates the oil and gas exploitation activities

|  |  |  |  |
| --- | --- | --- | --- |
|  | Legal framework | Governance/Responsible Authority to grant permits | Enterprise (?) |
| Wadden Sea World Heritage property in… |  |  |  |
| …the Netherlands | The Mining Law;  The Nature Protection Law;  The Law in regards to environmental licenses |  | Gas: …? |
| Lower Saxony | Regulated by the National Park Act | State Authority for Mining, Energy and Geology (LBEG) | NA |
| Hamburg | Prohibited by the National Park Act | Hamburg Wadden Sea National Park (?) | NA |
| Schleswig-Holstein | Regulated by the National Park Act and the Federal Mining Law | State Authority for Mining, Energy and Geology (LBEG) | Oil: Wintershall Dea |
| Denmark | Prohibited by the Statutory Order on the Nature Reserve Wadden Sea |  |  |

Sources: QSR, 2017; Nomination Dossier, 2012.

1. Trends

According to the National Park Act, the exploitation of oil is limited to the existing Mittelplate. New exploitation installations for oil and gas will not be permitted. Gas and oil exploitation will continue through directional drilling. Some of these drillings from the Mittelplate currently reach a length of 9,000m.

1. Threats Oil and Gas

*Threats Oil*

The related traffic for maintenance and supplies to the platform is reduced to the minimum required. There is a longtime monitoring in place concerning shelducks which use this part of the Wadden Sea as the primary moulting site. Up to now, no adverse effects have been found. With the pipeline, the former transport of the crude oil via double hulled tankers is no more necessary and thus the threat of an oil spill reduced drastically. Comprehensive safety regulations which are controlled regularly by the competent authority (LBEG) contribute to preventing environmental damage to the birds or the mudflats and tidal waters. Every incident whatsoever occurs has to be reported to the LBEG. There is a *Meldeplan acc. to offshore-directive* in place which includes also the LKN with the units of Schadstoffunfallbekämpfung [Note: to check English expression] and the National Park Authority amongst the relevant authorities.

[Note: to further describe impacts]

oil spills

lowering soil

Nature protection in the Wadden Sea is the priority and gas exploration can only take place if the OUV’s are not negatively impacted.

Gas exploration can be a threat to the Wadden Sea when it negatively impacts the nature.

Climate change causes sea level rise which strengthen the impact of subsidence caused by gas extraction. This is closely monitored.

1. References

Nomination dossier (2008, 2014)

QSR (2017)

WSP 2010

1. https://www.ospar.org/work-areas/eiha/offshore-renewables [↑](#footnote-ref-1)
2. Source: http://www.blmp-online.de/PDF/MSRL/MSFD\_Guide.pdf [↑](#footnote-ref-2)
3. MELUND (2020) : Erneuerbare Energien in Zahlen für Schleswig-Holstein [↑](#footnote-ref-3)
4. https://www.bsh.de/EN/TOPICS/Offshore/Maritime\_spatial\_planning/maritime\_spatial\_planning\_node.html [↑](#footnote-ref-4)