NorthSEE project
WP 5 – Energy Infrastructure in MSP

Status quo report on offshore energy planning provisions in the North Sea Region

Report annexes

Annex 2: National marine planning and licensing frameworks in North Sea countries and links to offshore renewable developments

April 2018

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Annex 2: National marine planning and licensing frameworks in North Sea countries and links to offshore renewable developments

1.5. Belgium

MSP in Belgium

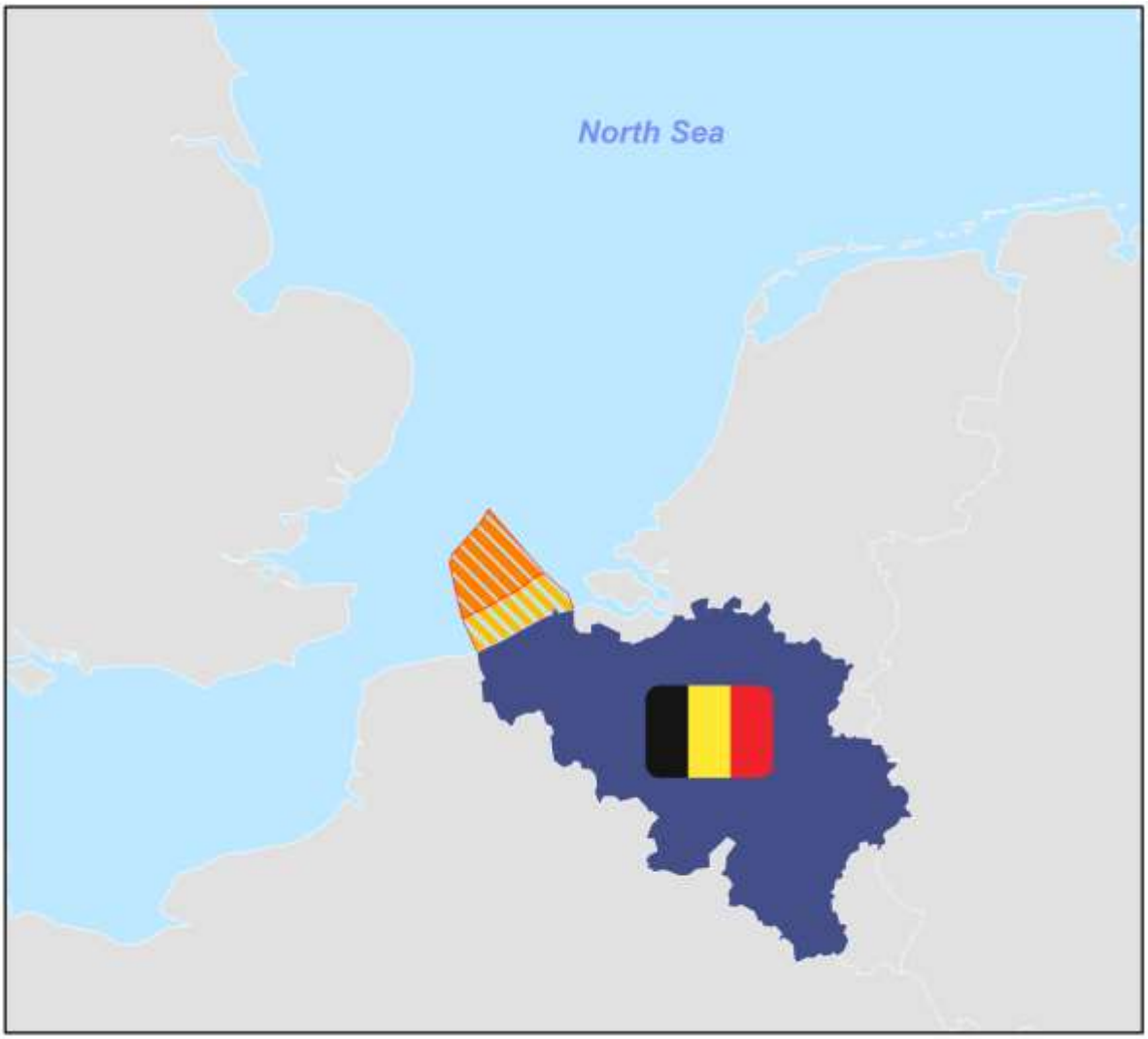

Figure 6: Belgian marine waters. Created by: Christian Aden, University of Oldenburg.

Belgium has an Exclusive Economic Zone (EEZ) of 2,017 km^2 and a Territorial Water (TW) area of 1,437 km^2. Belgium was among the first countries to implement an operational, multiple-use marine spatial planning system that covers its territorial sea and EEZ.

It all started with a scientific study "A sea of Space" published in 2005, which identified and listed the activities in the Belgian part of the North Sea, made a preliminary analysis of the interactions between these activities and initiated a spatial structure plan for the sustainable management of the Belgian part of the North Sea.

Promoted by the then Minister of the North Sea, a "North Sea master plan" was approved by a number of cabinets in 2003 and 2004. A number of sand and gravel extraction zones and a concession zone for the wind farms were demarcated (by the Royal Decree of 17th May 2004) in the initial phase (2004). In the second

phase (from 2005), the Birds and Habitats Directive areas were established on sea (via the Royal Decree of 14th October 2005. In 2010, the policy document of the then Secretary of State for the North Sea policy included that "initiatives should be taken to keep this process high on the agenda". The Marine Environment service took the lead to give shape to this engagement.

Since 2012, the marine spatial planning stands high on the political agenda. The planning process has received a legal basis so that this plan can be drawn up as binding. The Marine Environment Act of July 20, 2012 was amended and now determines the modalities for a marine spatial plan for the Belgian waters. The title of the Act was amended such that it was appropriate to the last amendment to the "Act for the protection of marine environment and for the organisation of marine spatial planning in the maritime regions under the Belgian jurisdiction". On 20 March 2014 Belgium approved a new maritime spatial plan for the Belgian part of the North Sea by Royal Decree.

The Belgian minister of the North Sea is overall responsible for the Maritime Spatial Plan (MSP) in Belgium. The preparation and implementation of MSP is coordinated by the Marine Environment Division of the Federal Public Service (FPS) Health, Food Chain Safety and Environment with the involvement of the Federal Government Service for Mobility Director General Shipping and the Management Unit of the North Sea Mathematical Models and the Scheldt estuary (MUMM), a department of the Royal Belgian Institute of Natural Sciences (RBINS).

Offshore energy planning

Energy is one of the eight main activities in the Belgian MSP. While developing the MSP, the goals set for renewable energy are always taken into account and spatial areas are designated. The Minister for the North Sea has taken the initiative to devote an area of 238 km² in the Belgian part of the North Sea to the production of renewable energy under the Marine Spatial Plan of March 2014. This area is known as the wind turbine area and occupies about 7% of the Belgian North Sea.

The sectoral planning is carried out by the federal public service for Economy. The energy targets are set by the minister of Economy. The electricity transmission system operator is Elia. The responsible authorities provide the building permits and designate the area for each wind farm company. They are part of the advice commission who decide on the draft version of the MSP.

There are plans to build between 409 and 433 turbines in the wind turbine area by 2020, yielding a total capacity of 2,230 to 2,280 MW. This means that, in principle, wind farms will account for around 10% of total Belgian electricity generation and will power close to half of the homes in Belgium. Given a 50% capacity factor for wind farms and an installed annual electricity capacity of 20,000 MW in Belgium, we can assume that by 2020 offshore wind farms will account for 5% of the total, or a quarter of the energy which Belgium is required to generate from

sustainable sources under the core European objectives. Offshore wind energy is therefore an important share of the national 13% sustainable energy target.

National Data Portal

To support the planning process in Belgium, the Management Unit of the North Sea Mathematical Models (MUMM) developed an online spatial analysis portal called Marine Management atlas. The portal provides access to the marine data and information on Belgian seas. The online repository centralised data within the different sectors of uses of the Belgian marine space. This portal is capable of integrating information identified by geographical references (data entry by digitalisation, scanning, manual input or data transfer), of saving, handling and consulting these data and representing them spatially by creating charts. Spatial data are centralised on the MUMM website by sectors. It stores the IDOD database which contains oceanographic data, available on request for free.

As of 2010[27] has included 33 datasets of general categories (such as geography and spatial structure, the physical environment, integrated coastal zone management, use of sea areas, nature and environment, tourism and recreation, industry and companies, fisheries and agriculture, architectural patrimony and culture, living at the coast, coastal defence). Planned improvements to the Atlas include updates to the atlas, providing more interactive maps, besides the static (and easy to use) maps, Integrating sustainability indicators into the atlas, and including more marine information.

The portal can be accessed here: http://odnature.naturalsciences.be/marine-atlas/data .

Stakeholder engagement

In accordance with the Royal Decree on November 2012 on the procedure for adoption of a marine spatial plan, the public was consulted between July and September 2013 on the draft marine spatial plan and on the environmental impact assessment. The public consultation of the two documents was announced in June and July 2013 through:

- Publication in the Official Journal of Belgium
- The Federal Portal Website
- The website of the FPS Public Health, Food Chain Safety and Environment
- DG Environment – Marine Environment Unit
- Letters to the various stakeholders

Public consultation aimed at collecting information on potential socio-economic and environmental impacts of the marine plans. Various authorities were

[27] Balla et al. (2017) Marine Cadastre in Europe: a preliminary study. Report commissioned by common vision partners (PCC, EULIS, ELRA, CLGE, Eurogeographics)

consulted: the Advisory Committee created through the Royal Decree of November 2012, the Federal Council for Sustainable Development, the three regional governments and the coast guard.

Consultation also took place with France, the Netherlands and the UK in 2013, which made comments and proposed amendments on the Draft Marine Spatial Plan. These comments are available on the FPS Public Health, Food Chain Safety and Environment's website publically.

A draft plan and visions for future spatial uses were approved by the Council of Ministers in 2013, after a process of consultations and advice from a newly established advisory commission on MSP, in addition to expert consultation and stakeholder participation.

From 2 July till 29 September 2013, the Federal Public Service Public Health, Food Chain Safety and Environment organized a public consultation about the draft MSP and the environmental impact assessment. A small group of stakeholders were contacted before the draft plan was released (Province of West Flanders and Flanders Marine Institute).

The public consultation produced a total amount of 140 contributions. These related to the content and the procedure of the plan, and also to the content of the environmental impact assessment. All comments have been carefully considered and the plan has been adapted at several places. All comments and how they have been treated can be found on www.consult-environment.be.

The consultation was organized on three levels: consultation of authorities, public consultation and international consultations. Consulted authorities included the SEA Advisory Committee, the Federal Council for Sustainable Development, the regional governments, the Coast guard, other authorities considered relevant. Comments were received from the SEA Advisory Committee, the Federal Council for Sustainable Development, the Coast Guard, the Walloon Region and the Flemish Region.

Public consultation included private individuals, authorities, as well as federations/associations and companies, including Foundation for Durable Fishery Research (Stichting Duurzame Visserijonderzoek, SDVO), Flanders Marine Institute (Vlaams Instituut voor de Zee, VLIZ), Shipowner Committee (Rederscentrale), Royal Belgian Shipowners Association (KBRV), Belgian Offshore Platform, Ghent University, Department of Marine Biology, World Wildlife Fund (WWF), Port of Zeebrugge, ELIA, electricity transmission system operator

International consultations: other European Member States (parties to the Espoo Convention) by letter of 28 June 2013 – UK, the Netherlands and France. All three of them submitted remarks.

After the public consultation and before adopting the MSP, the Minister of the North Sea examined and took into account the remarks and recommendations received, and issued a declaration summarizing how the results of the public consultation were taken into account. Some important changes included the insertion

of some exceptions (shrimp fishery by horse, by foot and, under conditions, by boat) to the ban on seabed disturbing fishery techniques in the 'Vlaamse Banken'; the shift and the reduction of the zone to stock energy on the Wenduinebank and the reduction of the zone for the 'plug at sea'; the renaming of some shipping routes and traffic routes; the authorization to establish aquaculture projects, as far as the eutrophication level (level of fertilization) decreases; and clear actions and changes of the procedure to ensure the involvement of authorities and stakeholders in the follow-up and evaluation of the MSP.

Marine licensing

The licensing system was established within the 3 regions (Flemish, Walloon and Brussels-Capital regions) by different Decrees. The Flemish Council adopted a Flemish Regulation on environmental permits (VLAREM I) in 1991, The Brussels-Capital region adopted an Ordinance on environmental permits in 1997, and the Wallon region adopted a Decree in 1999. A codex on Spatial Planning for each region also provides a legal framework for Spatial Planning.

In the Energy sector, the licensing procedure for every wind farm project is subject to the law on the Protection of the Marine Environment (20 January 1999, Belgian Official Journal 12 March 1999) and two royal decrees, KB VEMA of 7 September 2003 (amended on 26 December 2013) concerning the procedure for licensing and authorising the activity and KB MEB of 9 September 2003 (amended on 26 December 2013) concerning rules on the assessment of the environmental impact.

The following procedure for permission to build and operate a wind farm is based on the two royal decrees mentioned above. The procedure also calls for several permits, including a domain concession and an environmental permit for the construction and exploitation of the wind park. Environmental permits are delivered by the Management Unit of the North Sea Mathematical Models and the Scheldt estuary (MUMM), which is a department of the Royal Belgian Centre for Natural Sciences. The building permit is given by the public service for Economy.

Firstly, an external consultant undertakes an EIA on behalf of the applicant. The applicant must then submit the EIA as part of their application to the scientific department of MUMM who assesses the EIA to see if it meets the requirements. The public is also consulted: during 45 days a public consultation is organised in Belgium and if impacts could cross international borders, consultation with the concerned country is arranged. Based on the EIA and on the results of the public consultation, the MUMM advises the federal Minister for the Marine Environment, which supports the decision of the Minister to issue (or not) a permit of exploitation.

The period between the submission of the request and the final decision of the Belgian Minister competent for the North Sea, takes about 6 to 8 months depending on the complexity of the document.

In addition to the environmental permit procedure, there is a procedure for granting a domain concession (Royal Decree 20 December 2000, published in the Belgian Official Journal 30 December 2000, changed by the royal decree of 28 September 2008, Belgian Official Journal of October 30th, 2008) for the proposed project area. Requests are submitted to the CREG (Commission for the Regulation of the Electricity and the Gas), which advises the Minister of Energy. A domain concession can be granted before an environmental permit is granted. However, the concession is not valid until the environmental permit is granted. The expected operational duration for a wind farm in Belgium is 25 years. The environment permits and domain concession includes a three year decommission time. So the permits and concession are valid for 28 years. But the can be extended for another ten years.

Finally, there is another procedure for the installation of the cables (Royal Decree 12 March 2002, published in the Belgian Official Journal 9 May 2002). Applications are made to the General Energy Directorate of the Federal Public Service Economy, SMEs, Self-Employed and Energy, which advises the Minister for Energy.

MUMM is also responsible for law enforcement in the marine environment, and carries out environmental monitoring programs during the construction of offshore installations and exploitation of marine resources in accordance with the Water and Marine Strategy Framework Directives.

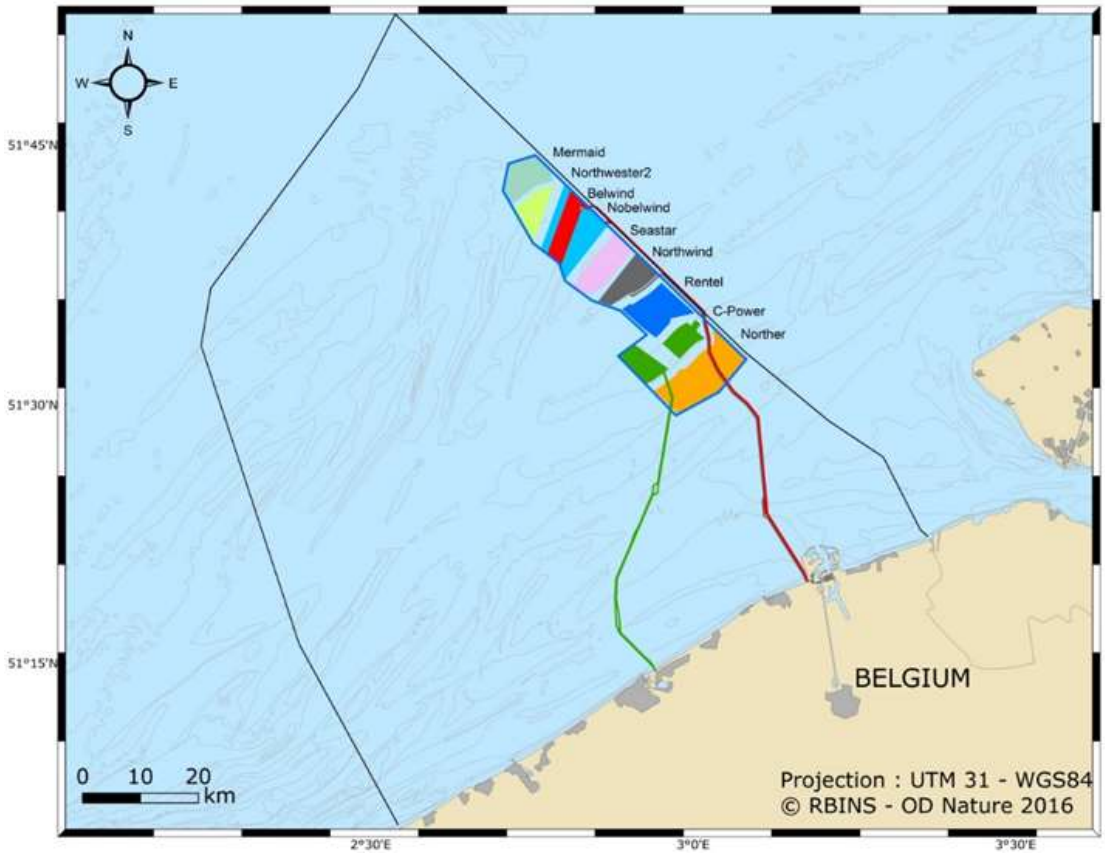

Figure 7. Offshore Wind Farms in Belgian waters.

1.6. Denmark

MSP in Denmark

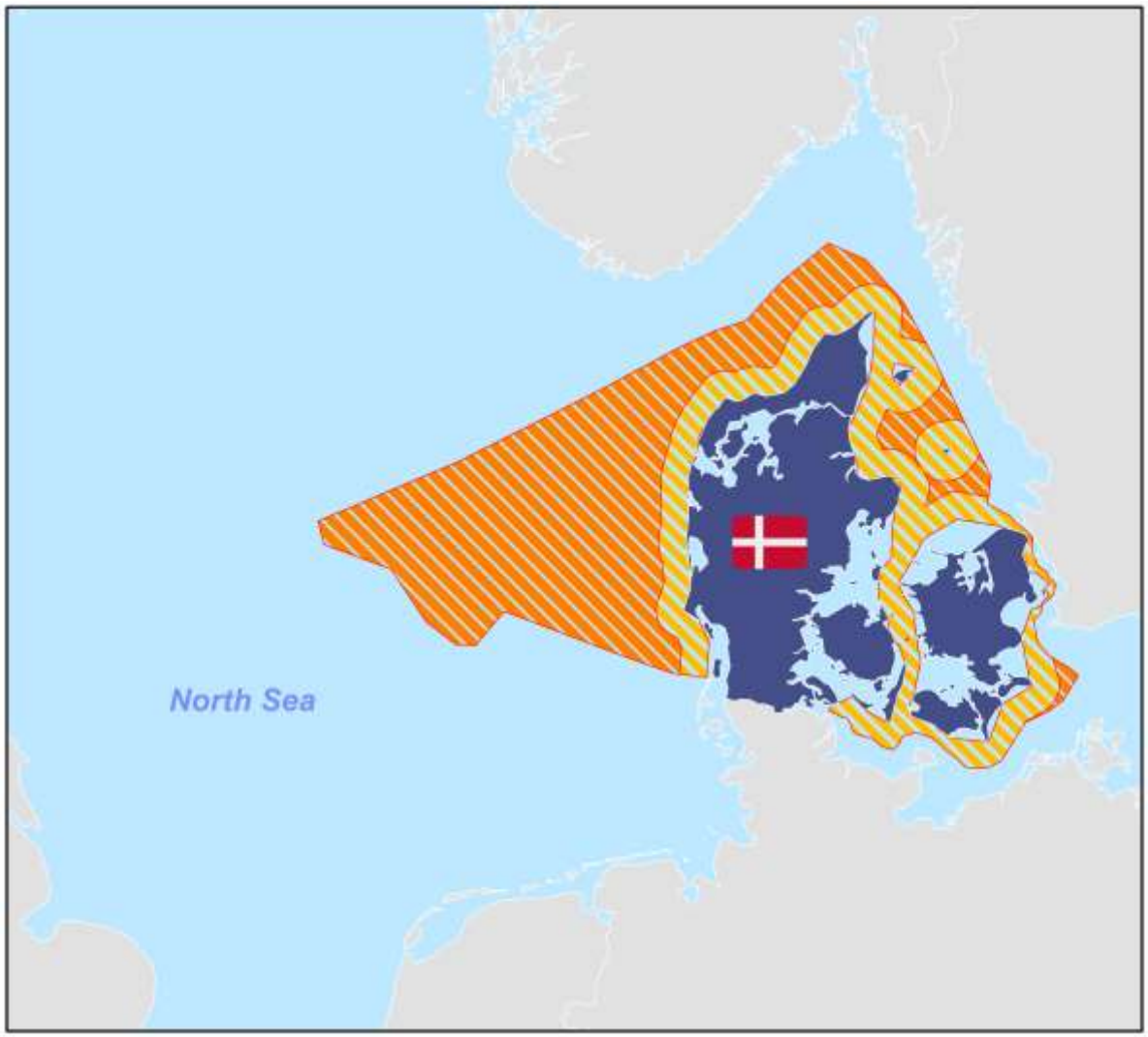

Figure 8: Danish marine waters. Created by: Christian Aden, University of Oldenburg.

Denmark has an Exclusive Economic Zone (EEZ) of 58,897.2 km^2 (excluding Internal Waters) and a Territorial Water (TW) area of 32,019.5 km^2. The EEZ and TW that is limited to the Greater North Sea Region is 71,533.2 km^2 (excluding Internal Waters). Denmark does not have a comprehensive marine spatial plan for its sea areas, but the Danish MSP process was launched in 2016. A range of sectoral plans (e.g. energy infrastructure, fisheries and nature protection) developed during the past decades will provide the basis for the new maritime spatial plan.

Referring to communications from the European Commission on maritime policy[28] and maritime spatial planning[29], the Danish government already in 2010

[28] COM (2007) 575, "Conclusions from the Consultation on a European Maritime Policy"

published an integrated maritime strategy[30]. In this policy paper the need for a holistic and sustainable approach to blue growth in close collaboration among sectors, authorities, and stakeholders were introduced, and the need for cross-border collaboration at the EU-level was emphasized. And as a result of the EU Directive 2014/89/EU establishing a framework for maritime spatial planning, the Danish act on maritime spatial planning[31] was adopted in June 2016 and is expected to be fully implemented in 2021. The main purpose of the act is formulated in order to promote economic growth, the development of marine areas, and the use of marine resources on a sustainable basis. The Danish Ministry for Industry, Business and Financial Affairs have the general responsibility for the implementation, and the Danish Maritime Authority, which is part of this Ministry, is appointed to be in charge of the MSP process as such. This process is now being developed in close collaboration with the national authorities serving the sectorial interests to be taken into account due to the aim of contributing to a sustainable development of the energy sector at sea, maritime transport, fishing and aqua culture, the extraction of raw materials from the sea, as well as the preservation, protection and improvement of the environment, including resilience to the consequences of climate change.

The Danish MSP process will include a close dialogue among the relevant ministers and national authorities[32], and municipalities and regional authorities in the coastal areas will be involved as well as relevant private and commercial stakeholders, and as a general rule, the proposal will be made publicly available for a six month hearing period before approval. Furthermore, the role of cross border collaboration is emphasized as means of achieving the sustainability goals.

In the coastal zone the maritime spatial planning meets the terrestrial planning. The Danish Minister for Industry, Business and Financial Affairs is responsible for safeguarding national interests through physical planning due to the Danish act of physical Planning. The Business Authority[33] functions at the national level by setting the overall guidelines for the physical planning on land, while the

[29] COM (2008) 791, “Roadmap for Maritime Spatial Planning: Achieving Common Principles in the EU”

[30] Danish Government (2010), En samlet maritim strategi (in Danish), http://www.stm.dk/multimedia/En_samlet_maritim_strategi.pdf

[31] Danish act on maritime spatial planning, https://www.dma.dk/Vaekst/Rammevilkaar/Legislation/Acts/Act%20on%20maritime%20spatial%20planning.pdf#search=maritime%20spatial%20planning (English translation of ”Lov om maritim fysisk planlægning, https://www.retsinformation.dk/forms/r0710.aspx?id=180281)

[32] Danish Ministry of Energy, Utilities and Climate (The Danish Energy Agency, The Danish Geodata Agency); Danish Ministry for Industry, Business and Financial Affairs (The Danish Business Authority, The Danish Maritime Authority); Ministry of Environment and Food of Denmark (The Environmental Protection Agency, The Danish Agricultural Agency, The Danish Veterinary and Food Administration, The Danish Nature Agency including the Danish Coastal Authority, The Danish Environmental Protection Agency); Danish Ministry of Culture (The Danish Agency of Culture and Palaces); Danish Ministry of Transport, Building and Housing (The Danish Transport, Construction and Housing Authority); Danish Ministry of Defense (Defence Command Denmark, Danish Defence Acquisition and Logistics Organisation)

[33] https://danishbusinessauthority.dk/physical-planning

municipalities are responsible for translating the overall guidelines and visions into actual spatial planning through municipal plans and local development plans. The MSP will function as a regulatory plan at the national level, which include national interests regarding the coastal zone in order to ensure land-sea interaction, which will influence the planning premises for the municipal level, for instance concerning promotion of sustainable tourism, recreational activities, out-door life, etc.

This also relates to the Danish Coastal Authority[34], which is part of the Danish Nature Agency belonging to the Danish Ministry of the Environment, and being the relevant national authority, when the government or private actors wish to construct or change coastal protection, perform power cable installation, dam construction, or other types of interventions in Danish territorial waters. The Coastal Authority advises The Danish Ministry of the Environment and helps design deeds, announcements and additional legislation concerning the coasts and territorial waters.

Offshore energy planning

Denmark has started to plan for offshore energy developments since 1985 to ensure the provision of electrical power and avoid the use of nuclear and fossil energy[35].

In 1995, a spatial planning committee for offshore wind was established and it still exists. The committee is led by the Danish Energy Agency[36] and consists of government authorities responsible for the natural environment, safety at sea and navigation, offshore resources extraction, visual interests and grid transmission conditions. In 2007 the commission presented a sectorial plan on "Future Offshore Wind Turbine Locations – 2025" based on the examination of 23 specific possible locations, each of 44 square kilometres. Facing a transition towards green energy and due to the Energy Strategy 2050 by the Danish Government in 2011, the ambition to be completely independent from fossil fuel energy by 2050[37] was launched. The strategy refers to Danish Act for the Promotion of Renewables[38], that came into force in January 2009 setting the legal requirements for the exploitation of offshore renewable energy in territorial and offshore waters. The energy targets provided by the Danish Energy Agreement 2012[39] illustrated a broad political commitment to an ambitious green transition for Denmark towards energy savings and promotion of renewable energy in all sectors. The energy agreement is running

[34] http://eng.kyst.dk/the-tasks-of-the-danish-coastal-authority.html
[35] Danish Energy Agency (2017) Danish Experiences from Offshore Wind, Ministry of Energy, Utilities and Climate (https://ens.dk/sites/ens.dk/files/Globalcooperation/offshore_wind_development_0.pdf)
[36] Danish Energy Agency (2017) Danish Experiences from Offshore Wind, Ministry of Energy, Utilities and Climate (https://ens.dk/sites/ens.dk/files/Globalcooperation/offshore_wind_development_0.pdf)
[37] The Danish Government (2011), Energy Strategy 2050 – from coal, oil and gas to green energy, http://dfcgreenfellows.net/Documents/EnergyStrategy2050_Summary.pdf
[38] https://ens.dk/sites/ens.dk/files/Vindenergi/promotion_of_renewable_energy_act_-_extract.pdf
[39] Danish Ministry of Climate, Energy and Building (2012), DK Energy Agreement, March 22 2012, https://stateofgreen.com/files/energyagreement

until 2020, and during autumn 2017[40] the Danish Government will present an ambitious proposal for a new agreement 2020-2030 aiming at getting approval by a broad majority of the members of the Danish Parliament. Especially, offshore wind developed on market conditions is considered a key issue referring to the recommendations on future energy policy from the Danish Energy Commission[41].The Energy Commission consists of members from the Ministry of Energy, Utilities and Climate, the Ministry for Industry, Business and Financial Affairs, the Ministry of Finance and the Ministry of Taxes, while the ministry of Ministry of Environment and Food of Denmark and the Danish Ministry of Transport, Building and Housing have been involved ad hoc. The commission points out the need for a transition towards a paradigm shift in energy policy, where focus is on an international perspective, increased electrification and on developing efficient market-based solutions in order to achieve the long-term goal of becoming a low-emissions society based on renewable energy by 2050.

National Data Portal

Due to the Danish act on maritime spatial planning, the minister for Industry, Business and Financial Affairs shall ensure the organisation and use of the best available data and the sharing of information necessary for MSP. As part of the MSP process, the Geodata Agency[42] belonging to Ministry of Energy, Utilities and Climate, is responsible for the Danish maritime infrastructure (MSDI), which is being developed due to the purpose of enabling authorities to coordinate activities and optimise the use of the sea and its resources. The MSDI[43] displays data from 11 national authorities involved in the development. Selected data can be downloaded as maps, and when further developed, the MSDI will provide metadata in INSPIRE format as well as information on how the data can be accessed. Though, at this stage there is no comprehensive set of MSP data easily accessible in a GIS format.

Stakeholder engagement

Denmark's first marine spatial plan will be created in the context of national dialogue between Danish ministries, agencies, local authorities, businesses and organisations as well as communities playing a role in the marine space. Neighbouring countries will also be consulted on the MSP.

Marine licensing

[40] Danish Government (2017), https://www.regeringen.dk/regeringens-politik-a-%C3%A5/energi-forsyning-og-klima/
[41] "Energikommissionens anbefalinger til fremtidens energipolitik" (in Danish, summary in English), http://efkm.dk/media/8275/energikommisionens-anbefalinger_opslag.pdf.
[42] http://eng.gst.dk/danish-hydrographic-office/msdi/
[43] Det marine Danmarkskort – MSDI, http://msdi.dk/kort/

The conditions for offshore wind farms are defined in the Promotion of Renewable Energy Act[44] .

Licenses are granted by the Danish Energy Agency[45], which serves as a "one-stop-shop" for the project developer.

The establishment of offshore wind turbines can follow a tender procedure or an open-door procedure[46]:

Government Call for Tenders: Most new offshore wind farms in Denmark are established after a tendering procedure to realise new offshore wind farms at the lowest possible cost. All tenders are decided in political energy agreements. In tenders for large scale offshore wind farms, Energinet.dk constructs, owns and maintains both the transformer station and the underwater cable, that carries the electricity to land from the offshore wind farm. Energinet.dk is responsible for the electricity infrastructure in Denmark and act as an independent system operator (TSO).

Open Door Procedure: In this situation, the project developer takes the initiative to establish an offshore wind farm and must submit an unsolicited application for a licence to carry out preliminary investigations in the given area. The application must include a description of the project, and areas that are designated for offshore wind farms in the update of the report Future Offshore Wind Power Sites from 2011 must be avoided. The developer pays for the grid connection to land.

Stakeholder and public consultation in the energy plan development is compulsory under the Danish law which requires a period of consultation of at least 8 weeks after the energy plan application and EIA are received by the Danish Energy Agency. The consultation is announced publically on the agency website and in local and national newspapers. The stakeholders are from the shipping industry (Danish Maritime Authority and the Danish Maritime Safety organisations), air traffic (Danish Civil Aviation Administration (CAA-DK), fisheries (the Danish Fishermen's Association and local fisheries organisations, Bønnerup Fiskeriforening and Grenaa Fiskeriforening), nature and cultural heritage conservation organisations (the Agency for Spatial and Environmental Planning, the National Environmental Research Institute and the Heritage Agency of Denmark), telecommunications and other energy industries, military organisations or local communities.

Three licenses are required to establish an offshore wind farm in Denmark (For both procedures listed above, the project developer must obtain all three licenses):

- License to carry out preliminary investigations

[44] Promotion of Renewable Energy (English translation), Acthttps://ens.dk/sites/ens.dk/files/Vindenergi/promotion_of_renewable_energy_act_-_extract.pdf
[45] Danish Energy Agency, https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits
[46] https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits

- License to establish the offshore wind turbines (only given if preliminary investigations show that the project is compatible with the relevant interests at sea)
- License to exploit wind power for a certain number of years, and an approval for electricity production (given if conditions in license to establish project are kept).

The three licenses are given successively for a specific project. Furthermore, it is necessary to perform an Environmental Impact Assessment (EIA) if the project is expected to have an environmental impact, which has been the case for all of the existing Danish offshore wind farms so far. The specific procedure for the EIA regarding offshore wind farms is described in Executive Order no. 68 of January 26th 2012. Furthermore, the Danish Energy Agency has guidelines developed for the elaboration of EIA for offshore wind proposals.

The EIA statement must include the entire offshore wind turbine project, i.e. also plants and installations offshore and onshore. Realisation of the offshore wind turbine project requires an expansion of the electricity grid onshore, as well as coordination between planning authorities onshore and offshore (the Danish Nature Agency and the Danish Energy Agency) as early as possible in the process.

The EIA process includes a public hearing process[47], where authorities, neighboring countries and other stakeholders can be heard.

[47] Bekendtgørelse af lov om miljøvurdering af planer og programmer og af konkrete projekter (VVM), https://www.retsinformation.dk/forms/r0710.aspx?id=190145

1.7. Germany

MSP in Germany

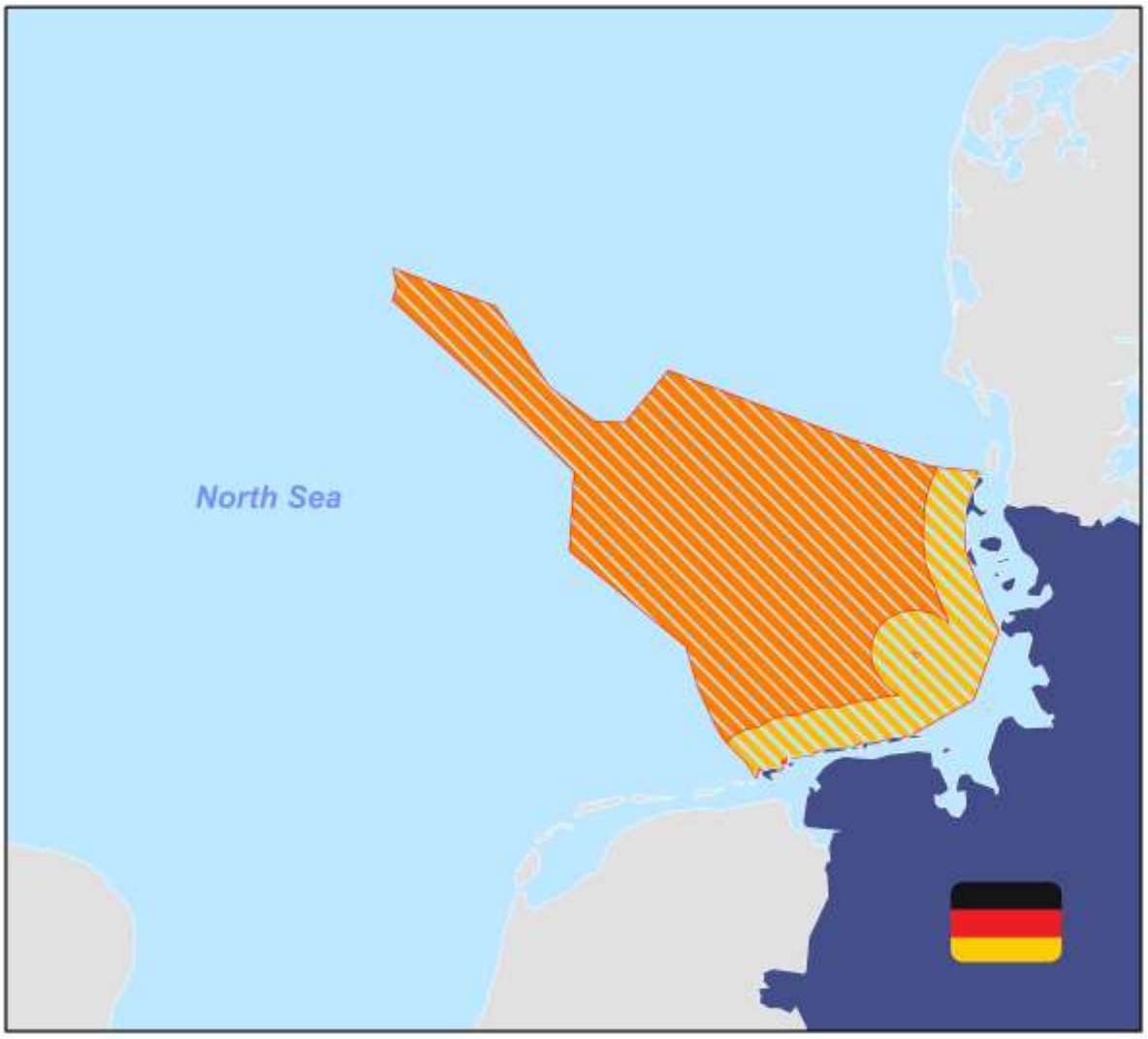

Figure 9: German marine waters. Created by: Christian Aden, University of Oldenburg.

Germany has an Exclusive Economic Zone (EEZ) of 28,600 km^2 and territorial waters of approximately 12,500 km^2 in the North Sea. The Federal Government is primarily responsible for introducing legislation in energy policies and the federal coastal states for the administrative implementation of national law. The Federal Government is responsible for spatial planning and licensing activities in the EEZ (12 – 200 nm). The federal coastal states administer territorial waters (0 – 12 nm) regarding planning.

The ordinance of the Federal Spatial Planning Act in 2004 sets up the legal framework for economic and scientific uses of the sea and introduced the principles to protect the marine environment. The legal framework for MSP is also provided by the Federal Maritime Responsibilities Act of 2002, the Federal Mining Act of 1980, and the Federal Energy Management Act of 2005.

The MSP process was initiated by the 'Strategy of the Federal Government for the Use of Wind Energy at Sea' in 2002[48], which set the ambition to create a framework to develop offshore wind farms. The Federal Ministry for Transport and Digital Infrastructure (BMVI[49]) has ultimate responsibility for spatial planning at national level including maritime spatial planning of the German EEZ. The Federal Maritime and Hydrographic Agency (BSH[50]), a subordinate agency of the BMVI, is mandated to prepare the spatial plans and to license offshore installations and infrastructure. BSH prepared the maritime spatial plan for the German EEZ the North Sea (Raumordnungsplan), which also included a strategic environmental assessment. The MSP was adopted by Government in 2009.

Offshore energy planning

The Federal Government's Integrated Energy Programme[51] (IEKP) launched in December 2007 stated the interest in environmental protection and the intention to reach a 25.000MW capacity of offshore wind energy by 2030. The 2010 Energy Concept[52] set the path for the development and implementation of a long-term energy strategy until 2050 with the promotion and further development of renewable energy. The Renewable Energy Law (EEG[53]) reduced the 2030 target for offshore wind energy to 15.000MW.

At national level, the German Government sets energy targets and then the Federal Ministry for Economy and Energy (BMWi[54]) is responsible for implementing these targets and create the legislative and regulatory framework. BMWi has the general lead in the development of offshore wind energy and is responsible for the grid connection of wind parks. The subordinate Federal Network Agency (BNetzA[55]) is the regulator for the grid connections to the offshore wind parks and allocates grid capacities to wind parks.

Starting in 2012, the BSH was tasked to develop spatial sectoral plans (Bundesfachplan-Offshore) and the timeline for the development of grid connections (Offshore-Netzentwicklungsplan) of offshore wind farms. The Bundesfachplan Offshore plans the connection of wind parks to the grid. The Offshore Wind Energy Law (WindSeeG, 2017) will, in the future, eventually combine the two plans into one integrated plan (Flächenentwicklungsplan).

[48] Strategie zur Windenergienutzung auf See im Rahmen der Nachhaltigkeitsstrategie der Bundesregierung, 2002.
[49] Bundesministerium für Transport und Digitale Infrastruktur
[50] Bundesamt für Seeschifffahrt und Hydrographie
[51] Integriertes Energie- und Klimaprogramm der Bundesregierung, BMWi, 2008.
[52] Energiekonzept für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung, Bundesregierung, 28. September 2010
[53] Erneuerbare-Energien-Gesetz, 2014, 2016
[54] Bundesministerium für Wirtschaft und Energie
[55] Bundesnetzagentur

The Federal Ministry for Environment (BMUB[56]) and its subordinate federal agencies[57] support the environmentally sustainable implementation of offshore wind energy.

The MSP for the German EEZ has designated areas of offshore renewables, however, these areas are solely for offshore wind. The policy target of 15.000MV energy production in German waters by 2030 requires around 3.000 wind turbines (5MV turbines). That number would claim an area of roughly 10% of the total German EEZ. Maritime spatial planning is the planning tool to secure this space and avoid conflict with other uses at sea.

National Data Portal

The GeoSea Portal (www.geoseaportal.de), run by BSH, provides sector-specific data for the German waters and interactive maps. Data sets are provided in the form of interactive maps (WebGIS based). There is also a multi-sectoral spatial data infrastructure called Marine Data Infrastructure Germany (MDI-DE) (www.mdi-de.org/mdi-portal) which aims to provide data and information coming from coastal engineering, coastal protection, marine environmental protection and marine nature protection via a joint internet portal. Data are generally free to access but some of them are accessible by request to the relevant authorities. MDI-De is a joint project of various public authorities and research institutions.

Another database is Continental Shelf Information System (CONTIS), run by BSH, which provides information on the different sectors of use of the German sea waters such as planned offshore wind farms, shipping and environmentally sensitive areas. CONTIS feeds into the GeoSea Portal mentioned above. These data repositories are developed in accordance with the INSPIRE Directive.

Stakeholder engagement

During the initial preparation of the maritime spatial plans for the German EEZ various stakeholders participated in the consultation of the draft MSP. The stakeholders provided feedback which was analysed and taken into account during the preparation of the final plan version.

The planning process started with the notification by the mandated Ministry[58] (BMVS) in 2005, followed by the collection of information on maritime activities from concerned public authorities and NGOs. Based on this information and sectoral plans a first MSP draft was prepared.

After publication of the first draft, a public hearing in 2008 invited stakeholders from other planning authorities, the industry and NGOs to discuss the plan.

A second round of participation, including public discussions, was held and further comments collected. The BMVS coordinated the development of the plan with

[56] Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit
[57] Umweltbundesamt, Bundesamt für Naturschutz
[58] Federal Ministry for Transport, Construction and Urban Development

the neighbouring countries. The transboundary consultations were conducted in meetings with representatives of ministries and maritime offices, which were in charge of MSP. The coordination also included the German coastal states, which have the spatial planning mandate for the respective coastal waters. Through ESPOO consultation in the course of the strategic environmental assessment, the potential impact of the MSP on the marine environment of neighbouring countries was collected.

After revising the draft MSP a second round of participation concluded with a hearing in mid-2009.

The revision of the German MSP, starting in 2018, will, in general, follow the same process. A first draft of the revised MSP will be subject to a first round of a national public participation (around 4 months) and a hearing. The international participation is mainly addressed at state authorities.

A second draft plan is then subject to another round of national consultations and a hearing, as well as a second round of international consultations, including a hearing. All stakeholder comments are collected and archived at the Federal Maritime and Hydrographic Agency (BSH).

Marine licensing

The legal basis for erecting offshore installation in the German EEZ is the UN Convention on the Law of the Sea and the Federal Maritime Responsibilities Act[59] . The Offshore Installations Regulations[60] regulate the approval procedure for offshore installations. BSH is the federal agency to licence offshore installations in the German EEZ. The mandate for licensing offshore installations in the territorial waters lies with the respective federal state.

According to the SeeAnlV the installation and operation of any offshore installations, including wind parks and transmission infrastructure (converter platform, cables) does require a planning permission. See Figure 10 for a map of offshore windfarm clusters and see Figure 11 for a map of offshore windfarms, platforms and cables in the German North Sea EEZ.

The approval process (Planfeststellungsverfahren) for wind farms in the EEZ which can take between 3 to 5 years has defined steps:

- **Preparation of the plan** for a wind farm by the developer and submission of required planning documents to the BSH.
- **First round of consultation** involves the documents being sent to the concerned public authorities (Directorates for Shipping and Waterways, Mining Authority, Federal Environmental Agency, Federal Agency for Nature Conservation) which then have one month to respond. Statements are then

[59] Seeaufgabengesetz (SeeAufgG, 2016)
[60] Seeanlagenverordnung (SeeAnlV, 1997)

collected from the concerned public authorities and reviewed. The whole duration of the first round of consultation is 2-3 months.

- **Second round of consultation** includes mainly neighbouring countries such as interest groups for wind energy, fishing, shipping, nature etc., coastal states (grid connection), and transmission systems operators. The second round on consultation also takes 2-3 months.
- **Public display** of plan to the general public**.**
- Conducting an **application conference** and **environmental scoping** with presentation of the project by the developer; discussion of the project; scoping of environmental impacts; collection of concerns and possible conflicts.
- Definition of the **scope of the assessment**, including safety measures; time and action plan; technical state of the art; study on possibility of collisions; environmental assessment.
- **Third round of consultations**: On the basis of the assessment documents collection of statements from the concerned public authorities and public display. The duration of this consultation is 2-3 months.
- **Public hearing**: Submission to the plan by authorities and the public are discussed.
- **Decision on planning permission** by BSH with additional provisions, e.g. an operation period of 25 years; safety concept; geological survey; construction of OWF according to state-of-art; noise reduction measures; decommissioning concept.
  The decision is based on criteria (see the Marine Facilities Ordinance, SeeAnlV) on safety and ease of shipping (and air traffic), no obstacle to national defence, no harm for environment (i.e. pollution, bird migration) and other regulation (maritime spatial planning designations).
  The consent of the Directorate General for Shipping and Waterways is required.
- **Public display and publication** of the planning permission resolution.

The installation and operation of cables at sea is regulated in the Federal Mining Act[61]. The request has to be addressed with BSH as the regulating agency. The planning documents have to specify the type and scale of the installation and the possible implication for public and private interests. The approval process follows a similar process as the wind parks.

[61] Bundesberggesetz (BbergG, 1980)

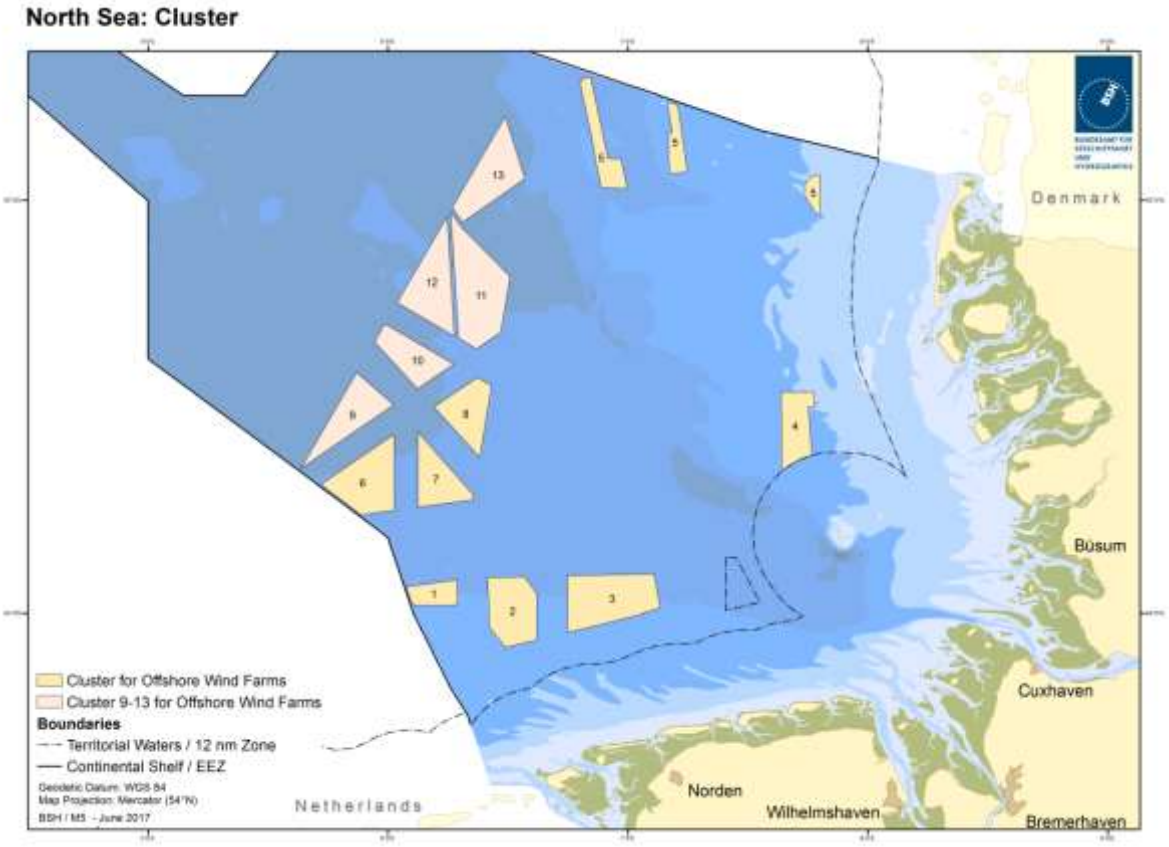

Figure 10. Map of offshore wind farm clusters in the German North Sea EEZ

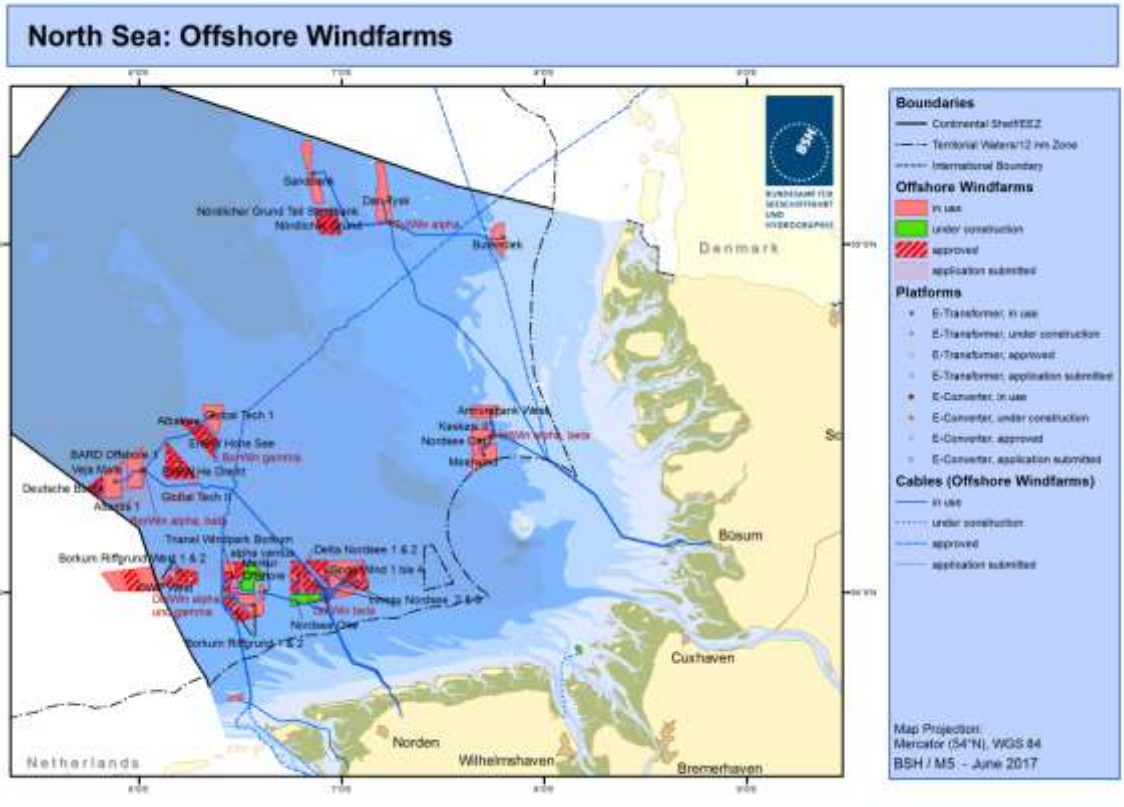

Figure 11. Map of offshore wind farms, platforms and cables in the German North Sea EEZ

1.8. The Netherlands

MSP in The Netherlands

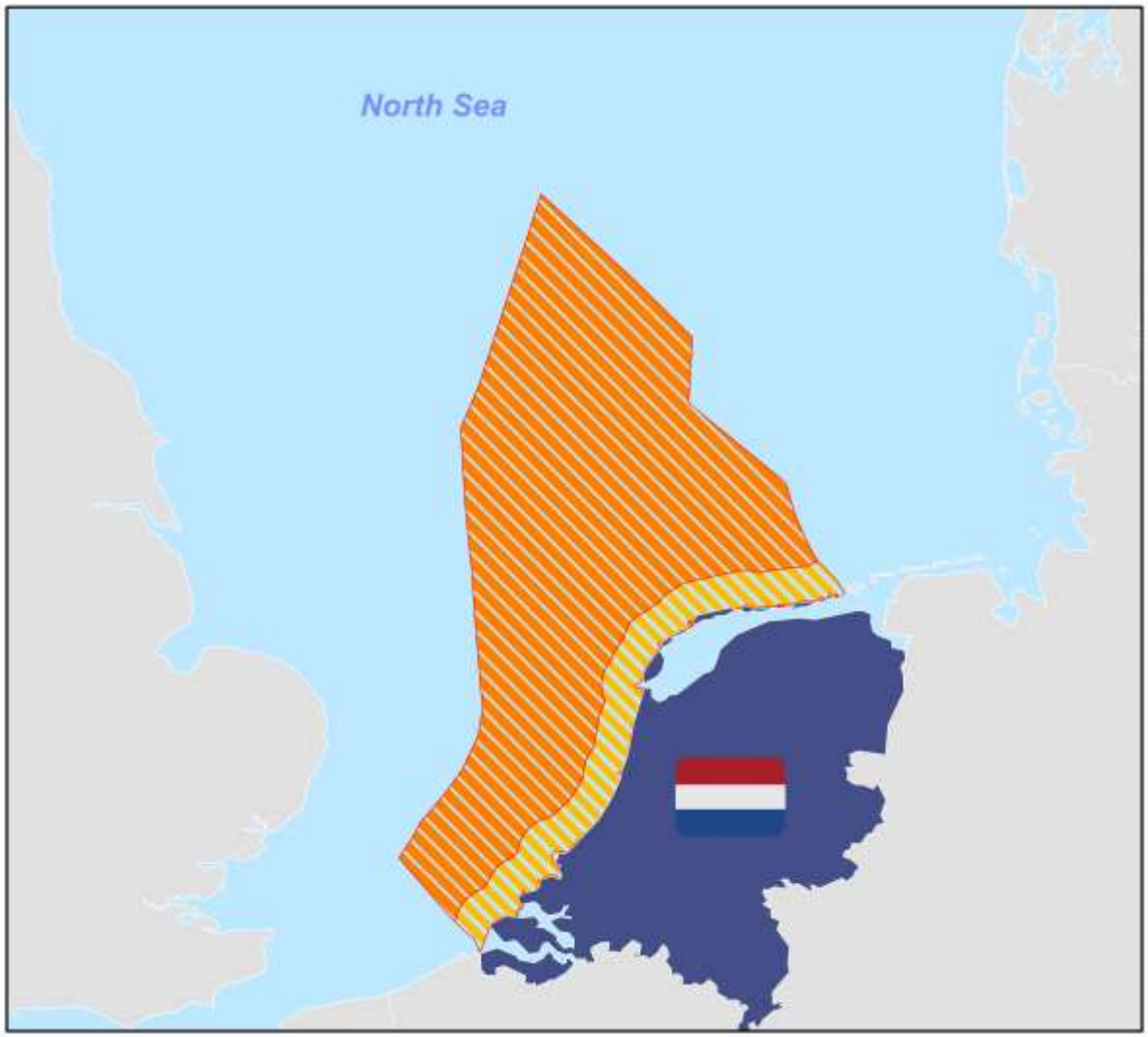

Figure 12: Dutch part of the North Sea. Created by: Christian Aden, University of Oldenburg.

The Netherlands has an Exclusive Economic Zone (EEZ) and Territorial Water (TW) area of 58,000 km^2. In the Netherlands, the waters from 1 km off the coast of Netherlands and within the EEZ are under the single authority of the central government, but different ministries are responsible for different sectors.

In 2005, the Dutch Ministry of Housing, Spatial Planning and the Environment published for the first time a North Sea chapter in their national 'Spatial Planning Policy Document'. The Dutch government initially (2005) chose a MSP approach that defined 'use zones' only where necessary (e.g., shipping routes, military exercise, ecologically valuable areas). This approach allowed a considerable amount of freedom to the private sector by giving them the latitude to develop initiatives within certain constraints. Spatial planning was considered as a means of fostering

sustainable use while simultaneously allowing as much scope as possible for private sector initiatives (IMPNS 2015, 2005).

In 2009 a more strategic and forward-looking plan was made with a greater focus on spatial development (Policy Document on the North Sea 2009-2015). This policy document is part of the National Water Plan (NWP) 2009-2015. The National Water Plan describes the measures that must be taken to keep the Netherlands safe and habitable for current and future generations and to make the most of the opportunities that water has to offer. The Policy Document of the North Sea details and substantiates the policy choices about human uses of the North Sea and their implementation in the NWP.

The Dutch marine spatial planning policy aims at preventing fragmentation and promoting the efficient use of space, while giving private parties the scope to develop their own initiatives in the North Sea. This overall goal is elaborated in more detail in the 'Integrated Management Plan for the North Sea 2015' (IMPNS 2015) where it is translated into: (1) to foster a "healthy sea"; (2) to foster a "safe sea"; and (3) to foster a "profitable sea" (IMPNS 2015, 2005).

The National Water Plan 2009-2015, including the North Sea Policy Document, was updated and approved on 12th December 2015 by the Cabinet. The 2016-2021 North Sea Policy Document evaluates the policy choices in the previous policy document, describes the current situation on the North Sea, maps out the developments for the years to come and records the policy choices for the upcoming planning period. Furthermore, the vision on the North Sea, as described in the North Sea 2050 Spatial Agenda, and the Netherlands' Maritime Spatial Plan are incorporated into the North Sea Policy Document 2016-2021.

A variety of divisions from various ministries[62] have policy responsibilities for the North Sea. The Minister for Infrastructure and the Environment is the Cabinet member responsible for coordinating the integrated North Sea policy and management. The Interdepartmental Directors' Consultation Body North Sea (IDON) is supporting the Minister when it comes to the creation, elaboration and evaluation of the integrated North Sea Policy. Represented within IDON, based on a variety of policy dossiers, are directors from the Ministry of Infrastructure and the Environment, Rijkswaterstaat (implementation agency of the Ministry of I&M), the Ministry of Economic Affairs, the Ministry of Education, Culture and Science, the Ministry of Defence, and the Coastguard.

The Ministry of Economic Affairs is responsible for the Dutch energy policy, setting energy targets, energy production, and utilisation of energy. The Netherlands Enterprise Agency (RVO.nl) is executing the SDE+ offshore wind energy subsidy and permit tenders on behalf of the Ministry of Economic Affairs. Rijkswaterstaat is the coordinating management authority and is collaborating with the other authorities

[62] https://www.noordzeeloket.nl/en/spatial-management/managing-governmental-organizations/

on harmonisation of the various management tasks, particularly permit issuance and information management.

Offshore energy planning

In the National Energy Agreement[63], more than 40 parties have agreed that 16% of energy must be generated sustainably by 2023. All of the available sustainable energy sources are needed in order to achieve that target. Offshore wind energy is an indispensable part of this. It has been agreed that offshore wind energy should be generating a total of 4,450 MW of electricity by 2023. That means an extra 3,450 MW on top of the 1,000 MW that has already been built or is under construction[64].

The Ministries of Economic Affairs and of Infrastructure and the Environment, the Netherlands Enterprise Agency and Rijkswaterstaat are working together to realise the objectives of the Offshore Wind Energy programme. The wind energy sector, the offshore stakeholders, the coastal government organisations and local residents are all involved in realising the plans.

In consultation with the wind energy sector a new wind energy system has been designed. The system contributes to efficient space use, cost reduction and acceleration of wind power roll-out at sea. The North Sea is important for many functions such as fishing, mining, shipping, ecology and recreation. It is therefore desirable to balance the coherence with other activities in the North Sea. In the past, it was up to initiators to search for a location for their wind farm. In the new system, the State will arrange all the conditions required to build wind farms, such as their precise location, the permit and the connection to the electricity network. This is stipulated in new legislation and a new bill on offshore wind energy, the Offshore Wind Energy Act (Wet windenergie op Zee), which came into force in July 2015.

The system looks like this:

1. In the National Water Plan areas are designated at sea where the construction of wind farms is permitted. It also states that outside the designated wind energy areas the government does not give permission for the construction of wind farms at sea. The Government has chosen three areas[65] in which offshore wind farms will be developed in the years up to 2023. .

2. Within the designated areas the State takes ‘wind farm site decisions’. The Minister for Economic Affairs is, in conjunction with the Minister for Infrastructure and the Environment (jointly competent authority) responsible for the ‘wind farm site decisions.’ Within each designated area, multiple wind

[63] http://www.energieakkoordser.nl/doen/engels.aspx
[64] https://www.noordzeeloket.nl/en/functions-and-use/Maritime_wind_energy/Existing_wind_farms/index.aspx
[65] http://www.noordzeeloket.nl/en/functions-and-use/offshore-wind-energy/

farm site decisions are possible. Each site will have a capacity of approximately 350 MW and each time two sites will be connected to one T platform. A 'power socket' like this can process a maximum of 700 MW capacity.

Each wind farm site decision specifies where a wind farm may be built in the area and under which conditions. These conditions leave space for the builders to decide – within specific frameworks – which technique to use. The State will draw up an environmental impact assessment (EIA) for each site. This means that no additional EIA will be required by companies bidding to develop projects.

In addition, the State will study the structure of the site, the soil, the wind speeds and the water data for the sites. The project developers can use this information in their bid during the tender procedure. The Dutch Government provides all relevant site data, via the Netherlands Enterprise Agency (RVO.nl), an agency of the Ministry of Economic Affairs.

In the Water decree, part of the Water act, some general rules are listed for all wind farms in the North Sea. Before starting the building process the developer has to provide for instance detailed plans for the outline of the wind farm, the vessels they are going to use and the marking and lighting of the wind farm to the competent authorities.

3. The State will provide subsidies to companies for the construction of the farms. The company that can build the best and least expensive wind farm will be simultaneously granted the subsidy and the permit to build the wind farm. Rijkswaterstaat will coordinate the monitoring of the expected impacts, in order to learn for future EIAs (adaptive management).

Note that under this new legal framework, the Dutch transmission system operator TenneT is responsible for the electricity transmission infrastructure needed for the offshore wind farm. The Electricity Act 1998 was amended to formally designate TenneT as operator of the offshore grid, including the legal framework for the planning of the roll-out and the establishment of its statutory liabilities for delays and faults. TenneT will construct five platforms of 700 MW with two 220 kV cables to the high-voltage network on land. Two wind farms can be connected to each platform.

National Data Portal

Spatial data used to implement MSP in the Netherlands can be viewed on the North Sea Atlas[66] available on the government website (www.noordzeeloket.nl). Some data can be downloaded from a multi-sectoral spatial data infrastructure called

[66] https://www.noordzeeloket.nl/en/spatial-management/north-sea-atlas/

Nationaal Georegister[67] (NGR). Different web portals also provide various environmental data on the North Sea. An interactive map displaying all activities taking place in the Dutch EEZ is available on a platform called The Marine Information and Data Centre (IHM) or Informatiehuis Marien[68].

Stakeholder engagement

Public participation has taken place at various stages during the establishment of the National Water Plan. This public participation also includes international cooperation with neighbouring countries. Documents, such as the draft National Water Plan and Environmental Assessment report, of public participation are available on the Dutch government website along with the public responses which are submitted either verbally or in writing[69] . Particularly, a report of answers of the Dutch Cabinet to public consultation, which highlights the points of the National Water Plan that have been revised in accordance to the public consultation analysis, is made publically available, together with the final Plan. The timeline and timeframe for informal public participation in the marine spatial planning process is decided on a case-by case basis, and experience in MSP is used as reference for developing offshore energy plans. Formal stakeholders' consultation is part of the reviewing process of the National Water Plan and its MSP part which will be undertaken every 6 years.

Documents available for consultation can be found on the government website[7071].

Marine licensing

The Dutch Government sets frameworks to enable use of space in the North Sea to evolve efficiently, safely and sustainably. Multiple use of space is an important principle in this regard. It offers balanced opportunities for all forms of use of the North Sea. The assessment framework, which is described in the North Sea Policy Document 2016-2021, is the mechanism utilised by the Central Government to assess the permissibility of activities at sea. The assessment framework comprises five steps, working from broad to fine and completed sequentially, though they are not necessarily all applicable.

The assessment framework is a policy regulation and obliges the competent authority to act in accordance with this framework when issuing permits. As such, the assessment framework is chiefly of importance to permit authorities and users of the

[67] http://www.nationaalgeoregister.nl/geonetwork/srv/dut/catalog.search#/search?topicCat=oceans
[68] http://www.informatiehuismarien.nl/
[69] http://www.ruimtelijkeplannen.nl/web-roo/roo/
[70] http://www.noordzeeloket.nl/en/functions-and-use/offshore-wind-energy/inspraak-consultatie/
[71] www.bureau-energieprojecten.nl

North Sea wishing to apply for a permit based on the Water Act, the Earth Removal Act, the Nature Conservation Act, the Flora and Fauna Act, the Environmental Permitting (General Provisions) Act, a number of shipping laws, and the Mining Act. The policy regulation is applied by the competent authorities, viz. Rijkswaterstaat (on behalf of the Minister for Infrastructure and the Environment) and the Minister for Economic Affairs.

The Dutch Government introduced new legislation and a new bill on offshore wind energy, the Offshore Wind Energy Act (Wet windenergie op zee), which came into force in July 2015. The Act prohibits the construction, exploitation and removal of a wind farm in the Dutch territorial sea or Dutch Exclusive Economic Zone (EEZ) without a licence, sets out the requirements for a licence application, and provides the legal framework for the designation of sites for the construction and exploitation of wind farms in the so-called Wind Farm Site Decision (WFSD, 'kavelbesluit'). The licensing authority is the Netherlands Enterprise Agency (RVO.nl) and they execute the "Stimulering Duurzame Energieproductie" or "Stimulation of Sustainable Energy Production" (SDE+) offshore wind energy subsidy and permit tenders on behalf of the Ministry of Economic Affairs.

The 'general rules' for offshore wind farms (Water Decree) also apply for all locations within the Dutch EEZ. Paragraph 6A of the Water Decree provides general requirements for the construction of offshore wind farms. Together with these 'general rules' in the Water Decree, the WFSD contains the specific conditions for building and operating a wind farm on a designated site.

Within the designating offshore wind areas, the Government first designates a wind farm zone. It then carries out the site investigations, determines the conditions for building and operating a wind farm, and issues request for tenders from industry for the associated subsidies and project permits. The Ministry of Economic Affairs (via the Netherlands Enterprise Agency website RVO.nl) provides site data, which can be used for the preparation of bids for these tenders. Winners of the site development tenders will be granted a permit to construct a wind farm according to the Offshore Wind Energy Act, a SDE+ grant and offered a grid connection to the mainland. The permit is valid for a 30-year period and will be issued by the Minister of Economic Affairs. With SDE+ the ministry of Economic Affairs aims to encourage the production of renewable energy in the Netherlands.

According to the application the wind farm must be operational within four years after the permit is irrevocable, and can operate until the 29th year. Decommissioning can start latest end of year 25 and should be completed within two years maximum after the power generation operations have stopped, but at the latest in the 30th year.

In summary, the process is as follows:

- The Ministries of Economic Affairs and Infrastructure and the Environment will issue a draft Scope and Detailed Level Memorandum for the wind farm zone.

This memorandum describes what is being investigated in the Environmental Impact Assessments and the Appropriate Assessment.

- Consultation period on draft Memorandum Scope and Level of Detail (6 weeks). Also the Committee for Environmental Impact Assessment will be asked to issue its recommendations on the Scope and Detailed Level Memorandum. International consultation also takes place at this stage.
- After Environmental Impact Assessments have been completed, draft wind farm site decisions will be prepared by the Ministries of Economic Affairs and Infrastructure and the Environment.
- Consultation period on the draft wind farm site decisions and Environmental Impact Assessments and Appropriate Assessment. (6 weeks)
- The Ministries of Economic Affairs and Infrastructure and the Environment issue a Wind Farm Site Decision (WFSD), including the boundary and coordinates on the site.
- Appeal at the Raad van State (State Council) is granted for those who have issued a contention on the draft wind farm site decision within 6 weeks after publication of the final version of the wind farm site decision.
- The Raad van State will issue its verdict within 6 months after the date of the hearing.
- The Government will issue the call for tenders.
- The winner of a tender is allowed to build a wind farm on the specific site and therefore receives: A SDE+ grant and a permit, based on the Offshore Wind Energy Act, allowing it to build, operate and decommission a wind farm;
- The winner and TenneT (i.e. Dutch TSO responsible for the development and operation of the grid connections) agree upon (respectively) a Realisation Agreement and a Connection and Transmission Agreement, required prior to realisation or operation of the connection.

Rijkswaterstaat (Ministry of Infrastructure and the Environment) is appointed as the overseeing authority charged with enforcing the general rules that stem from the Water Act and specific rules that stem from the Wind Farm Site Decisions.

The period from drafting Scope and Detailed Level Memorandum for the wind farm zone until irrevocable decision is max 22 months.

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en Klimaat

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Date
Subject Offshore Wind Energy Roadmap 2030

Our reference
DGETM-E2020 / 17177527

Dear Madam President,

The Dutch North Sea has the potential to play a significant role in achieving the national contribution to the goals of the Paris climate agreement and the necessary sustainable development of our energy supply towards 2050. A number of crucial steps toward achieving this were set out in the Energy Agreement of 2013.[1] The basis for the Netherlands' long-term energy policy was laid down in the Energy Report,[2] the subsequent Energy Dialogue[3] and the Energy Agenda.[4] In the Coalition Agreement, the Dutch Government will continue to develop that policy and will be actively pursuing the implementation thereof.

The current realisation of offshore wind energy under the Energy Agreement has seen and, until 2023, will continue to see crucial steps being taken for the sustainable development of the Dutch energy supply. The prospect of five calls for tender has given market participants the confidence to invest and has altered risk perception. This has resulted in a major reduction in costs. The Government wishes to retain the market's confidence and the current momentum and intends to issue the remaining calls for tender for the Energy Agreement within the next two years to complete the Offshore Wind Energy Roadmap 2023.[5]

At the same time, the national government wishes to take the next step to further develop offshore wind energy for the period 2024 to 2030, and wishes to kick off preparations for this endeavour. To that end, this letter contains the key elements for an Offshore Wind Energy Roadmap for the period 2024 to 2030. In this way, I am honouring the commitment I made to the House during the General Consultation on Energy of 18 January.[6]

[1] Energy Agreement for Sustainable Growth, Parliamentary Paper 30196, no. 202.
[2] Energy Report "Transition to sustainable energy", Parliamentary paper 31510, no. 50.
[3] Parliamentary Paper 30196, no. 484.
[4] Energy Agenda "Towards a low carbon energy supply", Parliamentary Paper 31510, no. 64.
[5] Parliamentary Paper 33561, no. A/11.
[6] Parliamentary Paper 29023, no. 229.

The development of offshore wind energy takes place within the context of a broader transition towards a sustainable energy supply by 2050 and the role of the North Sea within that project, but also in relation to other existing functions and values on which offshore wind energy will have an impact, such as nature and biodiversity, fisheries and aquaculture. The North Sea is subject to highly intensive use and is one of the busiest seas in the world. For that reason, a broader vision on the North Sea is required to ensure effective management of this body of water. Such a vision is currently being developed in the form of a North Sea Strategy 2030. The Strategy centres on ecological recovery, a future-proof food supply and a sustainable energy supply. The Offshore Wind Energy Roadmap 2030 will be a key starting point for that strategy.

In anticipation of that broader vision, this letter provides initial insight into the preconditions necessary from the perspective of the North Sea as a(n) (sustainable) energy source and the corresponding further growth of offshore wind energy beyond 2030 moving towards 2050. The key preconditions relate to ecology, the interfaces with other interests in the North Sea, the integration on land of the connections with the high-voltage grid and the coordination with energy demand. The challenge we face is to find sustainable solutions for these issues in conjunction with food production (fisheries and aquaculture) and the conservation and restoration of ecology and biodiversity. The Ministers of Infrastructure and Water Management, the Interior and Kingdom Relations and Agriculture, Nature and Food Quality and I will be collaborating on this endeavour. As such, this letter to the House is also sent on behalf of my colleagues.

It is expected that offshore wind energy will be addressed in the national Climate Agreement. Insofar as the agreements go beyond what is stated in this letter, it goes without saying that an appropriate solution must be found within the preconditions mentioned in this letter.

I. The changing role of the North Sea as an energy source

The Dutch North Sea is over one and a half times the size of the surface of our country and, at present, plays a key role both as a source of energy and food and as a nature area. Current exploitation of the North Sea as an energy source, however, is set to change. In the decades to come, the production of gas and oil will gradually decrease, with a large number of fields to be closed and the corresponding infrastructure to be dismantled. This makes room for other development plans, though this will require planning and coordination.
Due to its relatively shallow waters, favourable wind climate and proximity of good ports and (industrial) energy consumers, the Dutch North Sea provides opportunities to facilitate energy transition. As yet, sustainable energy produced from water (waves and tides) and aquatic biomass (algae and seaweed) is not as developed as wind energy, and these production methods still require further research for their development. How much offshore wind energy will be needed in the long term depends in part on the climate reduction goal set and the

interpretation thereof. The scenarios of the PBL Netherlands Environmental Assessment Agency range from 12 to 60 or even 75 Gigawatts in 2050.[7, 8] It is through the ambition set out in the Coalition Agreement – which would result in approx. 11.5 Gigawatts of installed capacity by 2030; see part II of this letter – that the Government will be charting a course corresponding closely to the more ambitious PBL scenarios. This scale would only make sense if the wind farms were not only used to meet the energy demand for electricity and light, but also for the replacement of oil and gas as fossil fuels and raw materials in transportation, heating and industry. I shall be returning to this topic in part III of this letter.

National government is working with the Energy Union (EU) to realise the further integration of the energy market and the further sustainability of energy production. In addition, our nation is working alongside nine neighbouring countries that border on the North Sea in the North Seas Energy Cooperation, in order to learn from one another, achieve better coordination of plans and facilitate joint projects. In short, the fact that the North Sea is shared by multiple neighbouring states provides additional opportunities to achieve synergy with each other's wind energy activities during the implementation of the Roadmap. The implementation of the Roadmap, however, need not wait until a final decision is taken on these issues.

II. Roadmap for the construction of additional offshore wind farms up to 2030

Task regarding offshore wind energy by 2030

The Coalition Agreement contains the task of using offshore wind energy to realise an additional reduction of carbon dioxide emissions by four megatonnes by 2030, relative to the baseline set out in the 2016 National Energy Outlook. This task translates into a total scale of offshore wind farms of approximately 11.5 Gigawatts (GW) by 2030.[9] Taking into account the existing wind farms (approx. 1 GW) and the wind farms to be realised under the current offshore wind energy roadmap to 2023 (approx. 3.5 GW), this means that between 2024 and 2030, wind farms will have to be added that collectively total approx. 7 GW. This is in line with the 2016 Energy Agenda, which assumed the roll-out of approximately 1 GW each year for this period. In addition, the following key principles from the Agenda should be noted:

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[7] *Verkenning van klimaatdoelen; Van lange termijn beelden naar korte termijn actie* (Exploration of Climate Goals: From Long-term Vision to Short-term Action). Policy Brief. PBL/Energy Research Centre of the Netherlands (ECN), 9 October 2017.
[8] *De toekomst van de Noordzee; De Noordzee in 2030 en 2050* (The Future of the North Sea: The North Sea in 2030 and 2050). PBL, 2018.
[9] The PBL Netherlands Environmental Assessment Agency assumed production of 9.4 GW through offshore wind energy by 2030 (National Energy Outlook 2016 – adopted and proposed policy scenario). An emissions reduction of 4.0 megatonnes of carbon dioxide is equivalent to 2.1 GW in additional offshore wind energy. Please see the "*Nationale kosten Energietransitie in 2030*" (National Costs of the Energy Transition in 2030), PBL Netherlands Environmental Assessment Agency, 3 April 2017.

- continuation of the construction of wind farms in areas further out to sea in pre-designated wind farm zones;
- leading role carried out by national government regarding spatial decisions and preparatory studies: TenneT to connect to wind farms;
- further cost price reduction and stimulation of innovation and competition;
- capitalisation of earning opportunities and expansion of employment;
- multiple and multifunctional use of space where possible, insofar as this results in a further reduction of the costs of offshore wind energy or limits the social costs of the energy transition;
- preparation for large-scale multinational wind farms and international connections at sea.

The reason for the Offshore Wind Energy Roadmap 2030 to be drawn up at this point is twofold:

1. First of all, it is vital to maintain continuity in the realisation of offshore wind energy for the timely achievement of the abovementioned task. In order for the first wind farm to become operational in 2024 or 2025, it is crucial that a call for tenders be issued for the relevant site(s) in 2020 or 2021. Experience has shown that there is period of approximately four years between the point at which a permit is issued for the wind farm and the point at which the wind farm becomes operational. Before the call for tenders can be issued, a site decision must be taken that defines the exact location and preconditions for the wind farm. The running time of this process is approximately two years. In conjunction with the necessary preparation and construction time of the wind farm (approximately four years), this means that the overall process must be initiated in 2018. The same applies for the integration plans for the necessary connections of the offshore grid to connect the wind farms with the high-voltage grid on land.
   Due to the fact that the National Water Plan has already designated wind farm sites in the North Sea that are not yet being used (please see the map below), it is possible to achieve the necessary quick start. The designation of entirely new wind farm zones in the National Water Plan through a government structural vision process would likely add an additional two or three years. The same applies to having them included in the National Environmental Vision.
2. In addition, clarity early on regarding the realisation of offshore wind farms is vital to providing market perspective and retaining the confidence of wind farm developers. This would result in cost reductions and willingness to invest.

The wind farm zones designated in the National Water Plan provide sufficient space for the wind farms to be realised between 2024 and 2030, pursuant to the task set by the Coalition Agreement. However, the conservation goals for seabirds and the available capacity to feed and transport electricity from the offshore wind farms to the high-voltage grid on land do impose significant limitations. I shall be outlining these issues in greater detail when I set out the structure of the actual Roadmap later in this letter. First of all, I should like to focus on the consideration of the interests of other users of the Dutch North Sea.

Consideration of interests in relation to the Roadmap 2030

As stated previously, the Dutch part of the North Sea is subject to a multitude of values and interests and corresponding designated uses. At the time of the designation of the wind farm zones in the National Water Plan in 2009 (the Borssele and IJmuiden-Ver Wind Farm Zones) and 2014 (the Hollandse Kust and North of the Frysian Islands Wind Farm Zones), an assessment took place of offshore wind energy interests and the interests of other offshore uses. The Government decided that offshore wind energy should take priority in those areas over other activities.

This would be without prejudice to the fact that the national government intends to take into account other activities as much as possible in the development of the Roadmap, and enable multifunctional use of the offshore space where appropriate. To this end, consultations were held with stakeholders in multiple tracks during the preparation of the Roadmap 2030. A number of large meetings where held for this purpose in April and June 2017, during which offshore stakeholders (including stakeholders in the fishing industry, nature conservation and environmental organisations, the shipping industry, oil and gas companies, the recreational sector, coastal municipalities and the wind energy sector) were able to voice their concerns and recommendations. During the North Sea Days, held in October 2017, the foregoing parties and knowledge institutes developed these issues further, and an update was issued on the possibilities that were studied for this Roadmap. In the interim, the various separate interests were primarily discussed in bilateral sessions and consultations. The various stakeholders will be consulted yet again in relation to the further development (including allotment) of the wind farm zones.

The construction of offshore wind farms under the Roadmap 2030 will restrict the possibilities for trawl fishery, if the wind farms remain closed to this type of fishing. The key bottlenecks arise in the Southern North Sea, where the designated wind farm zones are located. The Government recognises this and will be holding consultations with the fishing industry and wind energy sector over the coming period in order to reach an agreement. In addition, the Government will already be meeting the needs of the fishing industry in the Offshore Wind Energy Roadmap 2030 by not (entirely) using all designated wind farm zones, leaving more free space for fishing.
The Government will also be consulting with the fishing industry in the further development of the 2030 Roadmap, such as in relation to determining the options for joint use of the wind farms. The arrival of the wind farms also results in opportunities to engage in other types of fishing, such as through the use of passive fishing gear (traps, pots, gill netting) and aquaculture (for example, mussel farming) within wind farms.

The arrival of the wind farms also provides opportunities for the conservation and recovery of the nature and biodiversity of the North Sea. If seabed disturbance is excluded, future wind farm sites may, in principle, be combined with sites containing protected seabed nature or seabed nature qualifying for protection. The

latter would require careful alignment of trawl fishery and nature conservation interests. In addition, the nature-inclusive construction of wind farms may also contribute to nature restoration and hydraulic engineering innovations.

Shipping conducted in the Dutch North Sea will also be affected by the arrival of new wind farms. The wind farm zones that have already been designated have already been thoroughly considered in terms of spatial integration and location using the assessment framework for "Safe distances between shipping lanes and offshore wind farms".[10] Before the wind farms are tendered, clear agreements must be made regarding the possibility of the wind farms' use as a shipping corridor. The Government will be considering the monitoring and evaluation results for a period of two years from the opening up of the existing wind farms from 2018. Depending on the shipping corridor decision, additional facilities, such as nautical radars, may be required to ensure the safety of maritime traffic and for enforcement and supervision purposes. The development thereof will take place within the framework of the implementation agenda to this Roadmap. I shall be discussing this issue in part III of this letter.
Finally, the allotment process for the Hollandse Kust (west) and IJmuiden-Ver Wind Farm Zones will take into account the integration of a shipping corridor for larger vessels, such as the ferry traffic between the United Kingdom and our country. The fact that the wind farm zone north of the North Hinder shipping lane junction (before the 'New Waterway' estuary) is unused ensures that shipping is unrestricted in terms of manoeuvrability and that there is no detrimental impact on the accessibility of the Port of Rotterdam.

It is expected that oil and gas extraction will decrease in the years to come due to the depletion of the fields. The Government aims to have the remaining extraction of oil and gas take place concurrently to the operation of offshore wind farms. A key point of consideration in this regard is the space that would be required for helicopter traffic to and from the oil and gas platforms. To this end, a review of the accessibility and safety aspects was conducted in consultation with the stakeholders, on which basis agreements will be made with mining companies, likewise regarding the dismantling and removal of oil and gas infrastructure that is no longer used for the extraction of oil and gas and that cannot be used for sustainable energy facilities. It will also be reviewed whether or not and how any gas infrastructure may be (re-)used for the storage of CO_2 (CCS). The Government, alongside the relevant mining companies, is currently also reviewing whether a number of platforms that will be remaining in the North Sea for a longer period of time will be able to draw the energy required for the installations on those platforms from the offshore wind farms. This way, additional savings could be made on CO_2 emissions. Given the estimated distances between the wind farm zones and most mining platforms, the required additional investment and the brief time period expected within which wind farms will be present while the mining platforms are still operational, there is a real chance that electrification of

[10] Parliamentary Paper 33561, no. 11, encl. 384771.

the oil and gas platforms would ultimately make no economic sense in most cases. The announced revision and integration of the Electricity Act 1998 (*Elektriciteitswet 1998*) and the Gas Act (*Gaswet*) into a new Energy Act[11] should allow offshore mining platforms to be connected to the grid.

From the perspective of the other interests and values in play in the North Sea, such as in relation to defence, telecommunications and other cables, aviation, sand and shell extraction, recreation and cultural and historical values, there are no preconditions that would guide the decision of (the sequence of) use of all the designated wind farm zones for this Roadmap 2030. Naturally, the relevant parties will be consulted once again for the allotment process for these areas.

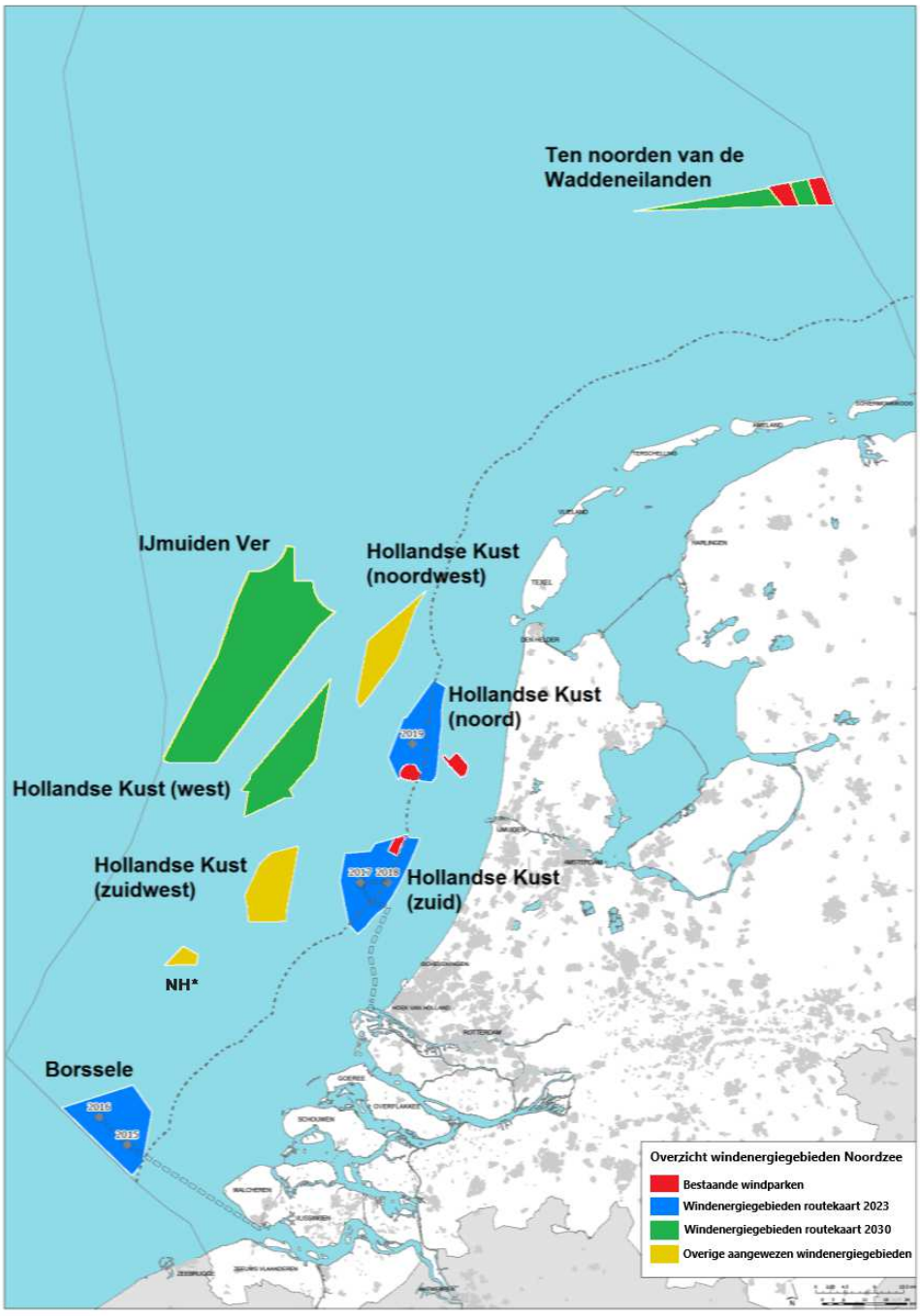
Roadmap 2030
The Roadmap 2030 provides a number of wind farms with a total output of approximately 6.1 GW. This 6.1 GW makes optimum use of the ecological offshore space available and of the availability of transport capacity on the high-voltage grid on land:

- Based on the data currently available and the relationship with the conservation goals for species of birds and mammals that arise from the European Birds Directive and Habitats Directive, the conservation goal for seabirds constitutes a limiting factor. In addition, the largest additional capacity (being 6.1 GW worth of additional offshore wind farms) can be achieved if the wind farms are located in the Hollandse Kust (west), IJmuiden-Ver and North of the Frysian Islands wind farm zones. A condition designed to limit the number of fatalities among seabirds is the installation of wind turbines with a capacity of at least 10 MW. Such large turbines are set to be introduced onto the market shortly.
- The supply of electricity from offshore wind farms and the supply thereof into the high-voltage grid on land will also increasingly result in congestion. A capacity of 2.1 GW worth of wind farms that can be connected close to the coast using the current alternating current concept can be integrated before substantial congestion should occur. In addition, 4 GW can be connected to shore beyond the congestion-sensitive parts of the high-voltage grid. Other options with shorter high-voltage routes on shore for the 4 GW are currently being reviewed.

The Government will be making a decision regarding the remaining 0.9 GW, in order to achieve the required 7 GW, at a later point in time (see below). The Roadmap assumes the realisation of wind farms in the following consecutive zones:

- 1.4 GW in the Hollandse Kust (west) Wind Farm Zone. With a potential of 1.4 GW, this zone is the largest zone that has already been designated after IJmuiden-Ver. This scale advantage can be used by tendering the entire zone on one single occasion, which may support a further reduction in costs.

[11] Parliamentary Paper 30 196, no. 566.



*Map listing existing wind farms (red), wind farm zones corresponding to the Roadmap 2023 (blue), wind farm zones corresponding to the Roadmap 2030 (green) and all other designated wind farm zones (yellow). *NH: wind farm zone north of the North Hinder junction.*

The call to tender could take place in 2021. An additional argument in favour of starting with this zone lies in the possibility of partially combining the route of the grid connection with that of the Hollandse Kust (noord) Wind Farm Zone from the current Roadmap 2023. This would yield opportunities for sustainable and limited use of space by infrastructure for both wind farms, both offshore and onshore. This would also allow time to be gained in the permit procedure for Hollandse Kust (west), and ensure as little impact as possible to the environment as a result of the construction works;

- 0.7 GW in the North of the Frysian Islands Wind Farm Zone. This zone is situated approximately 60 kilometres north of Vlieland and partly between the existing Gemini wind farms, Buitengaats and ZeeEnergie. By exploiting this area, the Government will be responding to the ambition of the Province of Groningen to make a larger contribution to the sustainable development of the Netherlands' energy supply. I shall be returning to this issue in due course. The grid connection of the future wind farms in this area requires careful selection of its route and integration, given that it must be installed under the Waddenzee. Given the vulnerability of the ecological capacity of the Waddenzee, the number of cables that can be installed in this area is limited;
- approximately 4 GW in the IJmuiden-Ver Wind Farm Zone. This is the largest continuous area that has already been designated for offshore wind energy. However, part of the southern side of the zone will not be used for wind farms, given the (potential) designation of the partially overlapping "Bruine Bank" area as a Natura 2000 area. The calls for tender are planned for 2023 and thereafter, with the commissioning of the wind farms to take place from 2027. I should like to outline the size of the tender further. For example, two calls for tender can be held, each relating to 2 GW (in 2023 and 2025), but four tenders of 1 GW each can also be held between 2023 and 2026. When choosing the optimum size of the tender, the optimal capacity of this part of the offshore grid to the high-voltage grid on land is expected to play a part, as will the optimum scale size for wind farms of 1 to 1.5 GW expressed by the wind energy sector, and the wish for very large tenders present among some parties and consortiums.

Both the wind farms in the Hollandse Kust (west) zone and in the North of the Frysian Islands zone will be connected to the high-voltage grid on land via offshore substations using the current connection concept as much as possible (alternating current, standardised platforms with a capacity of 0.7 GW). This means that existing transformer substations must be expanded and/or that sites must be found for new substations.
Given the significant size of the IJmuiden-Ver zone and the relatively large distance of connection sites to the high-voltage grid onshore, a new connection concept is required. The current AC concept would result in too much power loss.

In 2018, a separate assessment and selection process will take place for grid connections in order to arrive at (variants for) connection sites, taking into account the routes to gain access to land from the water. In addition, multiple solutions are being considered for the IJmuiden-Ver Wind Farm Zone regarding

transmission of the electricity produced, including direct current transmission connections (HVDC) with a link to the high-voltage grid further inland, but also non-electric options (such as conversion and transmission in the form of hydrogen). The Government wishes to make this decision with the early involvement of stakeholders and regional authorities. Given the call to tender in 2023 and the required certainty regarding consumption of the electricity produced (in the near future, approximately 13% of electricity consumption in the Netherlands will be provided by the 4 GW produced in IJmuiden-Ver), it is likely that the non-electric option would at that point be too immature to serve as an alternative.

In this context, I shall also have further research conducted into the option that was explored at the behest of TenneT of constructing a relatively small island in IJmuiden-Ver on which direct current converters and transformers can be placed, as an alternative to the large and relatively costly HVDC platforms offshore. In addition, the potential role of such an island for other functions and interests in the North Sea will be considered as well as possible future international cooperation with the wind farms of the United Kingdom.
This island concept should not be confused with a concept put forward by a number of parties (including TenneT, GasUnie and the Port of Rotterdam Authority) for a (large) international energy island far out at sea at Dogger Bank. Such a proposition could come into play in conjunction with the possible growth of offshore wind energy beyond 2030, but does not play a role in the Offshore Wind Energy Roadmap 2030. An island located at IJmuiden-Ver, however, may yield crucial experience for a potential energy island far out at sea in the future.
In the autumn of 2018, a decision will be made regarding the initiation of the permit procedure for an island within the IJmuiden-Ver zone. At that juncture, the design of the offshore grid for the Roadmap will also be laid down in the Development Framework for Offshore Wind Energy, which the Minister of Economic Affairs and Climate Policy will establish under the Electricity Act 1998. In anticipation thereof, I shall be requesting that TenneT further develop the connection of IJmuiden-Ver in regard of both the HVDC platform option and the construction of an island.

Further growth from 6.1 GW to 7 GW (Coalition Agreement task) will become possible upon additional ecological space becoming available. In order to expedite this, and with a view to any future further growth of offshore wind energy, I shall be reviewing this matter with my counterpart at Agriculture, Nature and Food Quality in the current Offshore Wind Energy Ecological Programme (Wozep).
The following options are available for the final part of the task to achieve 7 GW, according to current insights available, which must be considered in conjunction with possible further growth of offshore wind energy:

- 0.7 GW in the Hollandse Kust (zuidwest) Wind Farm Zone. However, this zone is relatively valuable to fisheries, and the gas fields in the vicinity of this zone are expected to be considered first for the storage of CO_2;
- a tender for one or more wind farms in the as yet unused part of the IJmuiden-Ver zone, given that this zone is capable of storing at least approx.

4,8 GW with due consideration of the Bruine Bank, and a possible expansion of this wind farm zone is among the possibilities, in contrast to the Hollandse Kust (zuidwest) Wind Farm Zone, which is surrounded by shipping routes;
- a new wind farm zone elsewhere to be designated in due course.

The Government will make a decision regarding one of these options in due course, in conjunction with possible further growth of wind energy beyond 2030 and in coordination with stakeholders and international cooperation with neighbouring states. In addition, the optimum size of the tender for the IJmuiden-Ver zone, as yet to be determined, also plays a role within this context. This has resulted in the following schedule for the Roadmap 2030.

Roadmap 2030 schedule

Capacity (GW)	**Wind farm zone**	**Shortest distance from the coast**	**Start of procedure Wind Farm Site Decisions**	**Year of tender**	**Year of commissioning**
1.4	Hollandse Kust (noord)	51 km from Petten	2018	2020/2021	2024 to 2025
0.7	North of the Frysian Islands.	56 km from Schiermonnikoog	2019	2022	2026
approx. 4.0	IJmuiden-Ver	53 km from Den Helder; 80 km from IJmuiden	2020	2023 to 2026	2027 to 2030
approx. 0.9	to be determined				

Please note: the schedule assumes the developments will fit within the ecological frameworks and that the permit procedures for the export and supply of electricity into the high-voltage grid will have been completed in a timely manner.

The Hollandse Kust (noordwest) Wind Farm Zone will (as yet) not be used under the Offshore Wind Energy Roadmap 2030, given that this would take up a(n) (overly) large part of the total amount of ecological space available. In addition, it is an area subject to relatively intensive fishing. The wind farm zone north of the North Hinder junction, upstream of the Rotterdam estuary, is too small (approx. 30 km^2) for offshore wind energy to be used effectively. For that reason, the Government intends to withdraw the wind energy designation of this zone. This will be implemented in the National Water Plan or the National Environmental Vision in due course.

The Government wishes to initiate the necessary exploratory steps no later than 2021, with a view to the possible expansion of offshore wind energy beyond 2030. A later start will allow national government to better respond to the current state of the requirements for new wind farm zones, both in the interest of wind energy itself and with regard to other interests in the North Sea. Within that context,

ecology and energy system integration are the greatest challenges, although spatial integration and interactions with other functions, activities and values on the North Sea (primarily fishing and nature) also require a thorough consideration of the various interests involved in the search for and identification of new wind farm zones. This new consideration process will take place alongside the parties involved.
In this search, the Government will be responding to the Province of Groningen's desire to develop offshore wind energy projects on a large scale to the north of the Frysian islands. In the Coalition Agreement, the Government indicated a desire to work alongside the province to improve the region's economic prospects. National government wishes to work with the province and stakeholders to study how offshore wind energy can contribute to that objective.
The designation of (and corresponding assessment and decision regarding) new wind farm zones will ultimately be implemented in an amendment to the National Water Plan or under the National Environmental Vision.

Economic opportunities, innovation and required resources for the Roadmap 2030
The implementation of the Roadmap 2030 provides for a range of opportunities for Dutch businesses and for the economy in the near future:

- Ongoing cost reductions may result in offshore wind energy gaining a competitive advantage for the industry due to the availability of a large volume of cheap, sustainable energy.
- Further large-scale realisation of offshore wind energy may have a long-term positive impact on the earning capacity of the Dutch economy. The Dutch maritime sector holds a market share of approximately 25 percent of the total European offshore wind energy market and will be able to further bolster that strong position. There will also be export opportunities related to the growth of offshore wind energy elsewhere in Europe, as well as in Asia and America.
- Direct employment within offshore wind energy in the Netherlands will see a further increase. It is estimated that this will involve some €15 to 20 billion worth of investments and 10,000 jobs between 2024 and 2030. At present, the government is already working with (coastal) municipalities, ports and provinces to identify the planning and location possibilities and to seize the associated economic opportunities.
- The Roadmap 2030 may also stimulate relevant technologies, such as those relating to transport, storage and application of the electricity produced, its integration in the energy system and its conversion into other energy carriers, such as hydrogen fuel. As a gas-producing country, the Netherlands has a unique position in this regard.

At the same time, innovation is needed to make this possible. In this regard, the focus of offshore wind energy innovation policy will primarily have to be on the issue of the integration of the electricity produced into the energy system and into the environment, including the relevant ecology.

The Government, however, wishes to ensure that offshore wind farms can be realised without state subsidies as soon as possible. The recent call to tender for

the Hollandse Kust I and II sites marks an important step in that direction. To that end, I shall be putting a Bill before the House for the amendment of the Offshore Wind Energy Act, if possible before the summer, as announced in my letter on the legislative agenda on energy transition.[12] Within the context of the announced revision and integration of the Electricity Act 1998 and Gas Act into a new Energy Act, I wish to explore the manner in which the offshore grid can continue to be funded.

III. Development prospects for the North Sea as a sustainable energy source

Given a production capacity of approximately 11.5 GW of offshore wind energy, there will be times in 2030 where the supply of electricity by offshore energy and sources on land is expected to be greater than the demand. Wind energy and the continued increase in the contribution of solar power will lead to a strong growth in the proportion of renewable electricity in national electricity production. By 2025, this share will have increased to around half, and it will be close to two-thirds by 2030.
The realisation of additional offshore wind farms in that case would only be prudent if it could result in the prevention of a surplus supply of electricity, given that an oversupply would undermine the electricity prices – and consequently the profitability of the wind farms – and that energy storage would entail additional costs.

In order to render the entire energy supply of the Netherlands carbon neutral, the non-electricity energy demand would also have to be made more sustainable. At present, electricity makes up roughly 20% of the energy mix of the Netherlands, with 80% of energy provided as a liquid or gas and used for heating at high and low temperatures and for mobility. The Dutch part of the North Sea can potentially fulfil a significant role as a sustainable energy source if the energy derived from wind can also be used for such energy functions.

This can be achieved through electrification of industrial production processes, heating of buildings and mobility purposes, or by realising other energy carriers from electricity derived from offshore energy. These other energy carriers may then be used to heat buildings, but equally as fuels or even as raw materials in industrial processes. Examples of such energy carriers include hydrogen and ammonia, which are produced from electricity derived from offshore wind energy. The North Sea has the potential to play a significant role in the large-scale production of these "green molecules". An additional advantage is that such molecules can be stored and transported more easily and cheaply in comparison to electrons. Furthermore, these molecules could already be produced at sea and could subsequently be transmitted to the shore in a gaseous state.

[12] Parliamentary Paper 30196, no. 566.

In the management of the supply of sustainably produced offshore energy, there must be a particular emphasis on the desired interaction with the overall energy system. Hydrogen appears to be particularly suitable as an energy carrier in the process of making gaseous fuels and raw materials more sustainable. At my request, TKI Gas recently published a hydrogen roadmap to map out its potential and to identify what steps should be taken in the short term to realise this potential.

A short while ago, various port authorities expressed their wish to make the industries present in their port more sustainable using electrification of industry processes and the application of hydrogen and ammonia, which are produced from electricity derived from renewable sources. These parties explicitly expressed an interest in purchasing large volumes of electricity from offshore wind farms in this manner. If such an additional demand for sustainable electricity were indeed to come about, this would provide a prospect for a prudent and sensible further expansion of offshore wind farms beyond 2030. The Government wishes to review in what way and within what time frame this transition to sustainable industry can be given shape in consultation with the foregoing parties and similar industrial clusters. For that reason, national government wishes to invite the relevant parties to make mutual agreements in this regard within the Climate Agreement.

The development of the North Sea as a sustainable energy source will also have an impact on spatial planning. First and foremost, it will have an impact on the sea itself, where energy production may impact other uses and values and for which the North Sea Strategy 2030 will offer a vision. In addition, a sharp increase of sustainable energy offshore will also have spatial consequences on land. After all, the energy produced offshore must be exported, for which routes for cables and/or pipelines will be needed. In addition, there must be space for the expansion or construction of transformer substations. Coordination with provincial and local authorities is crucial to ensure that this is managed effectively.

The North Sea as a sustainable energy source will also impact existing energy infrastructure. The input of large volumes of sustainable electricity, for example, may result in congestion in the onshore high-voltage grid. In addition, for offshore connection with the high-voltage grid further inland past the congestion points, the high-voltage grid would require expansion in the long term. These types of expansions require considerable investment and are characterised by lengthy turnaround times; in addition, they have spatial implications. One alternative that could limit congestion would be to convert the electricity produced offshore into other energy carriers either offshore or on the coast, have the electricity stored or have it used in the vicinity of the location where it is exported to shore, instead of supplying it to the high-voltage grid. Finally, a more stable price of the wind energy produced may be obtained as a result of further integration and coordination of the electricity grids and markets of neighbouring countries, with the construction of more international electricity connections (interconnection) for that purpose. The Netherlands is committed to achieving this through its bilateral

contacts with neighbouring countries within the European Union and the North Sea Energy Programme.

Given the scope and complexity of the challenges of the energy transition in general and the role of the Dutch North Sea in this regard, the Roadmap 2030 requires an implementation agenda that sets out the first crucial steps and through which knowledge is collected for the period beyond 2030.

IV Implementation agenda

On the basis of the key points outlined in this letter for the Offshore Wind Energy Roadmap 2030, national government will undertake the further development, preparation and implementation thereof. Initial essential activities include:

- allotment of the wind farm zones into sites, including the kicking off of the preparatory studies into the geophysical conditions and cultural-historical values offshore;
- further development of the design of the offshore grid by TenneT and any possible alternatives, including the potential application of an island;
- exploration of the connection points and corresponding routes for the offshore grids to and over land;
- update of the Ecology and Cumulation Framework for the offshore wind farms, which includes the Roadmap 2030.

In addition to adopting the conclusions inter alia in the Development Framework for Offshore Energy, the Government may initiate the permit procedures for the wind farms and for corresponding components of the offshore grid. This will be followed by the issuance of the sites in the wind farm zones by way of tenders.

Concurrently, the Government will be undertaking further policy preparation in relation to the wind farm zones of the Roadmap 2030 in consultation with the offshore stakeholders. This includes:

- research into and the definition of guidelines for shipping corridors through wind farms and the necessary measures and facilities to ensure safe shipping traffic, Search and Rescue, monitoring and enforcement. The Government will be reviewing the initial experiences of the existing wind farms in 2018 and 2019 with shipping corridors in relation to this end;
- drafting of an assessment framework for joint use within wind farms subject to permit obligations (fisheries, aquaculture, other forms of energy production, etc.) in relation to shipping corridors through and nature development within wind farms;
- agreements with mining companies regarding accessibility, options regarding electrification and the dismantling of oil and gas platforms. This will also involve a review of the possibilities of (re-)use of carbon dioxide storage infrastructure (CCS). The Government will be producing a CCS roadmap in due course, which will be developed in close cooperation with the market;
- review of the need for an adaptation of the applicable law concerning offshore grids, in consideration of any direct connections to the grid for industrial customers, conversion installations (e.g. power2gas), oil and gas platforms

(electrification) and CCS installations. This will take shape within the framework of the legislative agenda recently submitted to the House.

Furthermore, as part of the foregoing development, preparation and implementation process, I shall be developing a financial section in consultation with the ministers most closely involved. This financial translation of the Roadmap will ensure the further implementation of the proposed wind farm roll-out.

With a view to an expected further growth beyond 2030, the Government's efforts will largely focus on the integration of wind energy into the energy system and demand management, to allow fossil fuels and raw materials to be replaced by alternatives that can be produced using electricity generated by offshore wind farms. It is expected that this will also form part of the national Climate Agreement. Furthermore, as part of the North Sea Strategy 2030, the Government will be conducting a review to identify the most suitable areas for a further expansion of offshore wind energy in light of the other interests and values in play on the North Sea, such as those of the fishing industry and nature development and recovery in particular.

In addition, the Government wishes to intensify international and regional cooperation in relation to sustainable energy in the North Sea, inter alia in the form of an exploratory review conducted jointly with neighbouring North Sea countries regarding the combination of wind farm connection and offshore interconnection.

The Offshore Wind Energy Roadmap 2030 is emblematic of the next step the Netherlands is taking to achieve valuable and responsible use of the North Sea in terms of nature conservation and food supply and the transition to a low CO_2 energy supply by 2050.

Eric Wiebes
Minister of Economic Affairs and Climate Policy

1.9. Norway

MSP in Norway

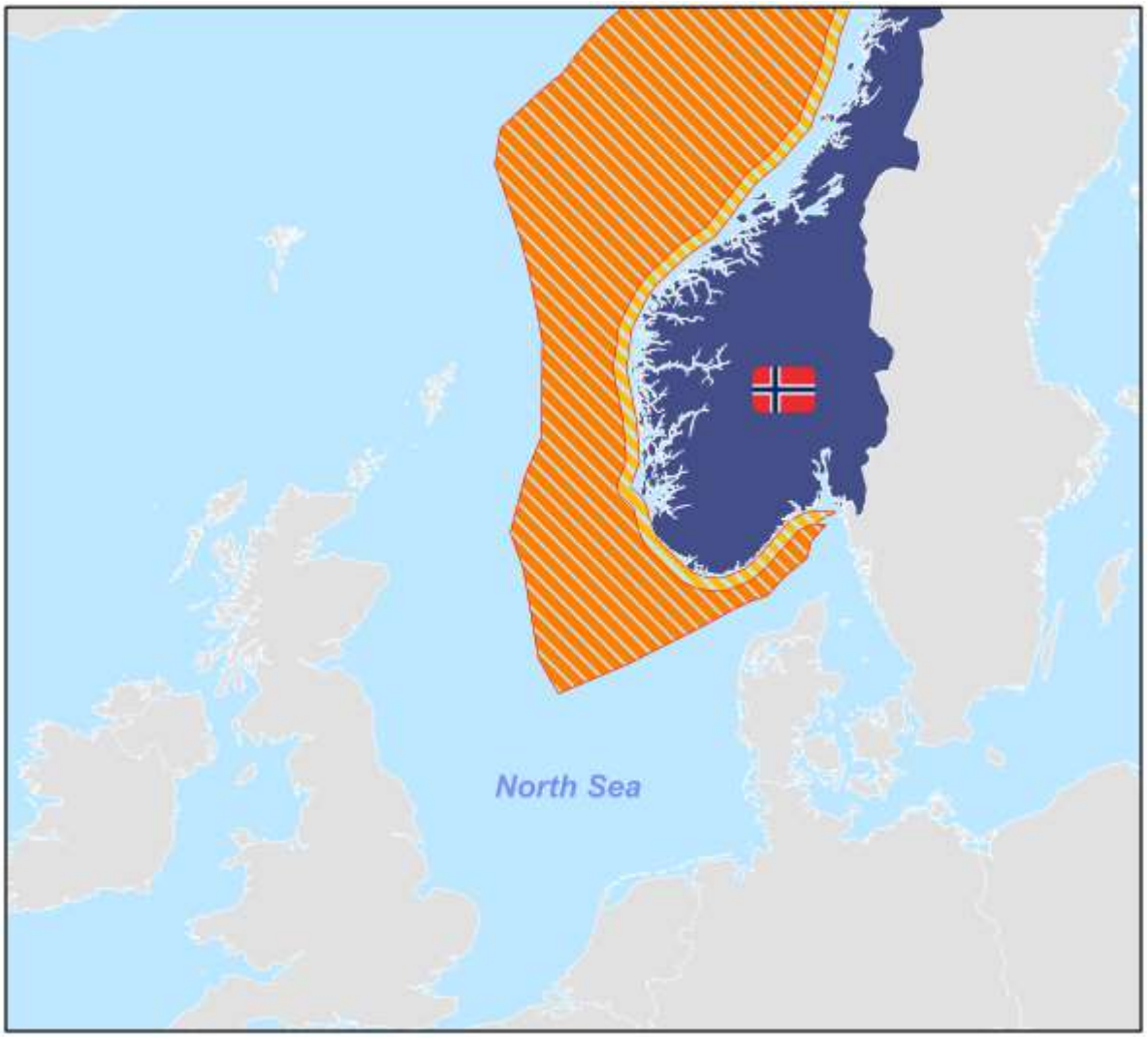


Figure 13: Norway's marine waters in the North Sea. Created by: Christian Aden, University of Oldenburg.

Norwegian Exclusive Economic Zone (EEZ) and Territorial Water (TW) area cover 819.620 km^2, however the EEZ and TW in the North Sea is roughly 125000 km^2. Norway does not have a single plan for all of its EEZ, but rather breaks its EEZ into three regions; The Barents Sea, the Norwegian Sea, and the North Sea.

A main goal for the area based management plan is to adjust the activities and measures to the quality of the ecosystems – in order to maintain/achieve sustainable use. Oil and gas, aquaculture and fisheries represent the most important marine industries in Norway, but climate change, pollution and cumulative impacts challenge their sustainability, thus requiring an integrated approach to their management. The oil and gas industry wants to explore new areas, and there may be conflicts with fisheries and environment. To solve the conflicts and secure

sustainable use, marine area based management plans are worked out. The Norwegian management plan of the North Sea area, called Integrated Management of the Marine Environment of the North Sea and Skagerrak, was approved by the Parliament in 2013.

The Norwegian principle for ocean planning distinguishes clearly between the descriptive phase (Agency level, with steering group from the Ministries) and the decision phase (Government). The process and most important outcomes are described in Figure 14.

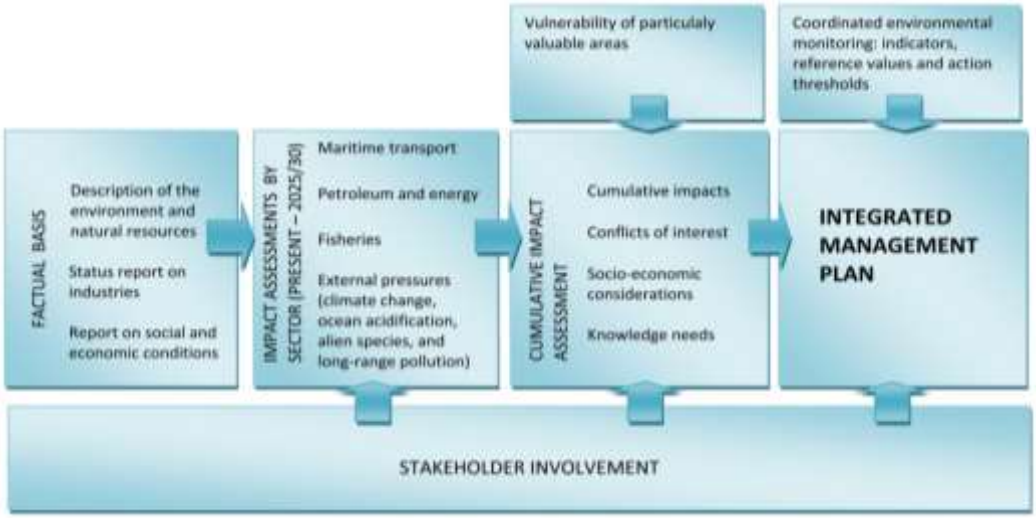


Figure 14. The four steps of working out the management plan. A cross-sector management group (10 agencies, steering group from 7 Ministries) is responsible for organising the three first steps. A first step is that scientists/consultants describe the environment, industries and socioeconomic conditions. Second is the impact assessments, where each sector is responsible, and the environment sector is responsible for the report on external pressures. Third step is for the cross-sector management group to describe cross- sector topics, e g cumulative impacts and conflicting interests. The reports from all this work are made public and sent over to the government, who, as a fourth step, takes the decisions necessary in the integrated management plan. Stakeholders from outside the cross-sector management group participate in hearings, workshops and other consultations. All gathered knowledge is open to the public.

When the reports (preferably consensus reports) are finished from the Management group, the Management group formally send them over to the government to make the final decisions and work out the integrated management plan, in the form of a White paper to the Parliament.

In May 2013 the management plan for the Norwegian part of North Sea and Skagerrak was adopted by the Parliament. It covers about 125000 km^2. The goal of the management plan is to facilitate the coexistence of the various industries, and at the same time protect the environment and secure a sustainable future. Reviews are undertaken at regular intervals, and for the first time for the North Sea and Skagerrak in 2020.

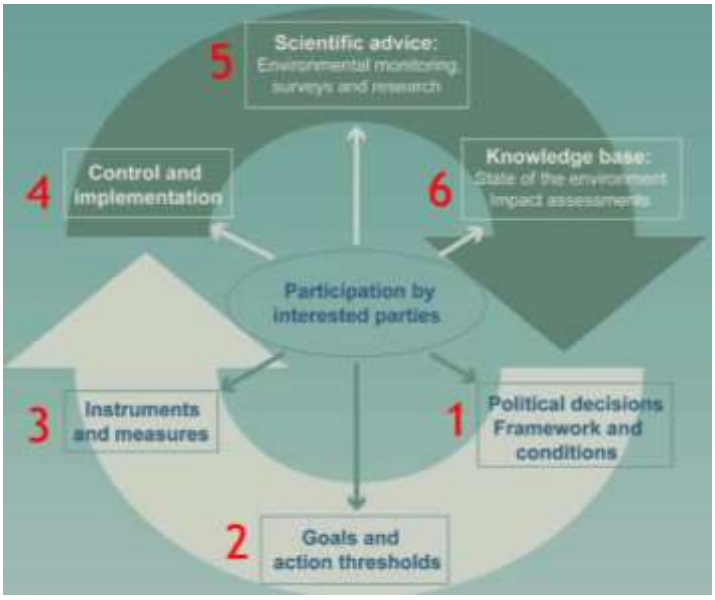


Figure 15. The Norwegian system for adaptive management and review

The management plans aims both to facilitate coexistence between activities through management measures, as well as they decide spatial limitations for activities. Therefore, it is necessary to have a strong knowledge base.

Norway does not have a separate law for MSP outside the coastal baseline. Each sector is regulated through its sector legislation and under the authority of the relevant ministry, who are responsible to follow the frames and measures that are set in the Integrated management plans. Within the coastal baseline, the Planning and Building Act regulates the MSP.

Offshore energy planning

In Norwegian ocean areas, the oil and gas are the dominant energy sources, and the wind energy production is almost totally on land.

Outside the baseline, renewables are regulated after the Offshore Energy Act, while within the baseline it is regulated after the Law on production, conversion, transfer, turnover, distribution and use of energy, etc. (Energy Act).

Under the Offshore Energy Act, the construction of offshore wind power and other renewable energy production units/facilities can only take place after the Norwegian Government has opened specific geographical zones for licence applications. No zones have been opened so far, but a strategic environmental assessment (SEA) has been carried out for 15 zones along the Norwegian coast from the Barents Sea in the North to the southern parts of the North Sea. The SEA was carried out by the Norwegian Water Resources and Energy Directorate (NVE), and handed over to the Ministry of Oil and Energy (OED) in 2013.

Based on the results from the SEA, NVE has divided the considered zones into three categories: category A, B and C. For category A, wind power development within the zone is considered technically and economically feasible, with relatively

few negative impacts, and with possible grid connection before 2025. Five zones have been given category A. Eight zones have been categorized under B, where wind power development is considered having challenges related to technical aspects or regarding conflict of interest/negative impacts. NVE considers that zones in this category can be opened when technology matures, or when existing use of the areas changes. Two zones are given category C where wind power development represents greater challenges. The recommendation for this category is that the zones should not be opened on the expense of zones in category A and B.

The 15 zones considered in the SEA include zones considered for bottom-fixed and floating turbines. In total, the 15 zones have a capacity from 4600 – 12600 MW. The areas differ in size. In total, the areas considered cover a total area of 9000 km^2, approximately 1% of the Norwegian Exclusive Economic Zone.

There are no set targets from the Norwegian Government regarding offshore renewable energy production.

National Data Portals

A mapping programme called MAREANO was launched in 2006 and is funded by the Ministry of Trade, Industry and Fisheries and the Ministry of Climate and Environment. Biological, geological and chemical samples of the seabed have been studied and images of the seabed have been gathered to form a database of habitat type, providing the baseline conditions supporting the implementation of the plans.

The website www.havmiljø.no displays the areas of ecological importance and vulnerability in Norwegian waters. These areas have been assessed upon data from the seabirds monitoring programme (SEAPOP), the seabed mapping programme (MAREANO) and other national sources, which provide high spatial and temporal resolution datasets. Other data layers are available on environmental, human activities and administrative aspects.

Moreover, the website www.miljøstatus.no held by governmental authorities disseminates information on the state of the environment. It provides maps on a range of sectors of activities (e.g. shipping, oil and gas, aquaculture) and environmental information (e.g. coral habitats, ocean depth, indicators of fish distribution) and layers are available to download.

These websites are based on databases provided by different governmental agencies and research institutes such as the Coastal Administration, the Norwegian Mapping Authority, the Norwegian Polar Institute, the Petroleum Directorate, the Climate and Pollution Agency, the Directorate, the Climate and Pollution Agency, the Directorate for Nature Management, the Institute of Marine Research and the Norwegian Institute for Water Research. These data are generally free to access.

The government is working on developing a mapping tool that would integrate all sectors of activities and would support the implementation of the marine management plans.

Norway is developing a tool for area based management, and this will be dedicated to the needs for the management plans. The tool will be launched at the end of 2017.

Stakeholder engagement

The work with the ocean management plans is done in round-table arrangements with relevant sectors participating. Stakeholders not directly involved, are invited to meetings, hearings and/or workshop on specific topics during the development of the marine management plans.. This applies to non-governmental stakeholders, that means stakeholders from industry and interest organizations, from research institutions, authorities from municipalities/counties, consulting firms, etc.

Be aware that this is about ocean management plans, not coastal marine spatial planning.

There have not been transnational consultations.

Regarding the plans for offshore wind power, a report on strategic impact assessment was published in 2010 and consultation was held until 2013.

Marine licensing

Norwegian Water Resources and Energy Directorate (NVE) is given the licence authority from the Ministry of Oil and Energy (OED) under the Energy Act (within the baseline). The OED is the appeal body. Licence authority under the Offshore Energy Act is formally under the Ministry of Oil and Energy. Although there has not yet been opened zones under the Offshore Energy Act, pilot projects outside the baseline have been managed. In such cases the NVE gives a recommendation to the OED. NVE prioritize the proceeding of pilot projects outside and within the baseline. The process is likely to take from three to six months.

As the Norwegian Government has not yet opened any zones for licence applications under the Offshore Energy Act, there is no existing practice on licensing process for commercial projects under this act. It is not yet known if or when an opening is likely to happen.

1.10. Sweden

MSP in Sweden

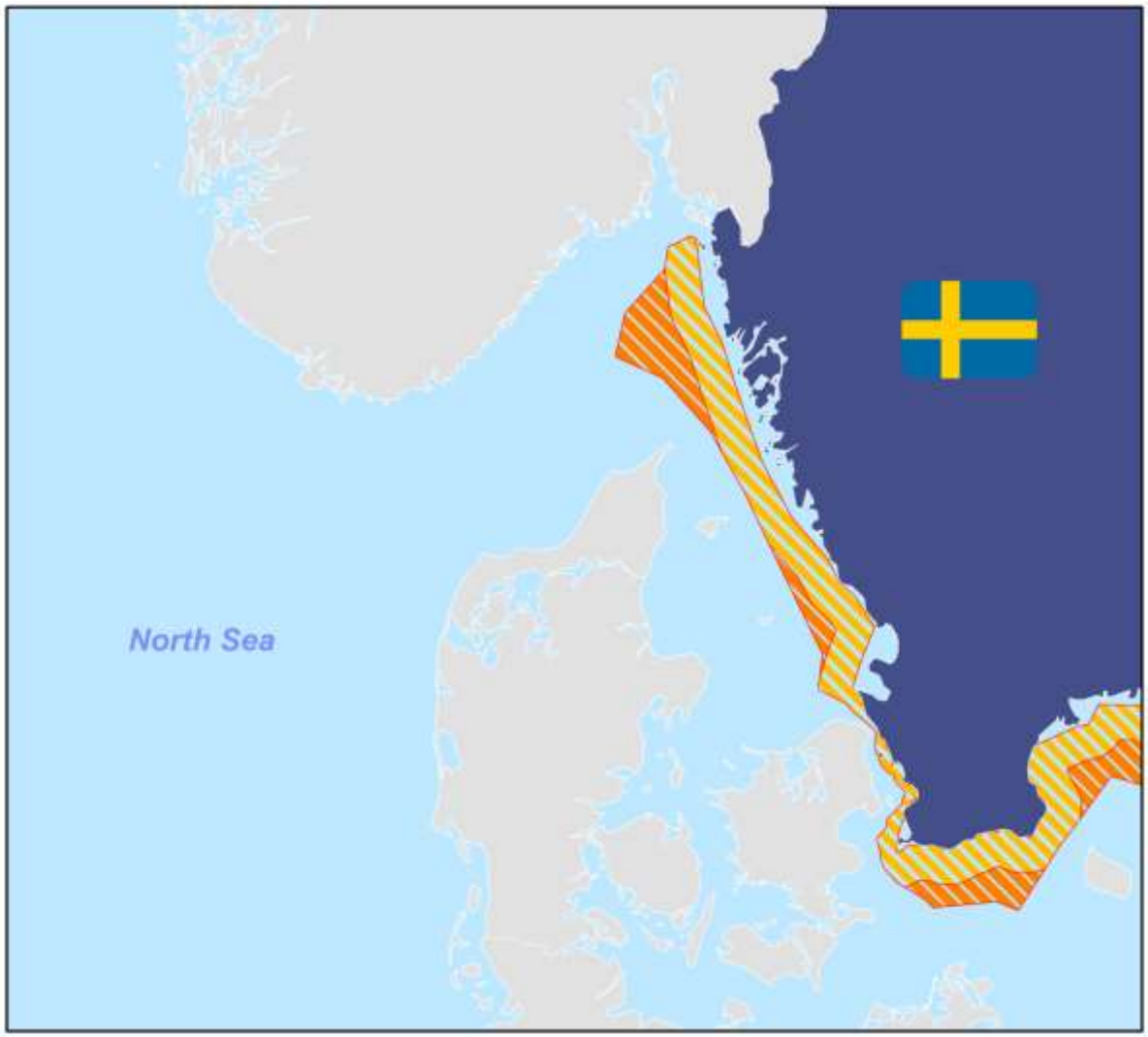


Figure 16: Swedish marine waters. Created by: Christian Aden, University of Oldenburg.

The Swedish marine area covers a total of 130,000 km^2, with 70,000 km^2 of territorial waters and 60,000 km^2 of EEZ. Legislation for national marine spatial planning has been in place since September 2014. National marine spatial plans covering the territorial sea and the EEZ in Sweden are currently being developed and will go out for public consultation during 2018.

In September 2014, MSP was introduced in the Environmental Code of Sweden, entailing the creation of three marine spatial plans in the Baltic Sea, the Gulf of Bothnia and the Skagerrak/Kattegat region. The plans will cover the Swedish EEZ as well as territorial waters. The Swedish Agency for Marine and Water Management is the authority in charge of the development of the plans.

In 2014, the “Marine Spatial Planning – Current status 2014” report[72] was published. It provided an overview on the state of the marine ecosystem and the different uses of the marine space. Central and local authorities, groups of interest and research institutes provided input data on which the report was based.

Subsequently in 2015 the Agency put forward a proposal for the marine spatial plans called “Proposal for the direction of the marine spatial planning and the delimitation of the environmental assessment”. It is a scoping report of the proposed areas for the implementation of marine spatial plans which discusses the issues to address within each plan. It also includes a discussion on the MSP process and the EIA framework.

In parallel with the development of marine spatial plans, the Swedish government put forward a National Maritime Strategy that was adopted in 2015, constituting a tool to implement MSP in Swedish waters. The goal of the Swedish government, highlighted in the Strategy is to make the Swedish maritime industries competitive by promoting growth of companies and creating new jobs, sustain a balanced marine environment, and make coastal areas attractive for people and industries. The Strategy includes policies for regional economic growth, sectoral policies for the use of marine space, and environmental policies. In this purpose, marine spatial plans will be implemented regionally by giving responsibility to groups of municipalities. Regional and city councils will be working together to implement the marine plans within regions. It was already established in the Planning and Building Act that municipalities have the responsibility on territorial sea waters. The new regulation introduced in the Environmental code means that the Swedish Agency for Marine and Water Management and the municipalities have overlapping responsibilities in the territorial seas. To overcome this problem, The Goteborg Region Association of Local Authorities which is a regional planning body appointed by the government, has initiated a preliminary study on inter-municipal coastal planning.

Offshore energy planning

The Swedish Agency for Marine and Water Management (SwAM) is responsible for drafting the MSP which includes prioritization of areas. They are also responsible for mediating the dialogue between conflicting interests.

Currently for offshore energy, Sweden has no specific target goals and no spatial areas officially designated, however targets will be set by sectorial authorities and incorporated in the plan where possible. The Swedish Energy Agency under the Ministry of Energy and Environment is the authority responsible for sectoral offshore energy planning and their aim is to facilitate offshore developments by 2040. On the

72 https://www.havochvatten.se/download/18.44319c4a145d364b807436c/1448618458195/marine-spatial-planning-current-status-2014-english.pdf

other hand, the industry wants to start developments by 2025 as they view MSP as a process with the possibility of protecting their interests. Also involved in the MSP process, is the authority, Svenska Kraftnät, who is responsible for transmission cables. MSP is linked to licensing only as a guiding document and MSP is linked to sectoral offshore energy planning authorities via consultation on energy requirements.

National Data Portal

There is no centralised data repository for spatial information in Swedish waters. However, there is a new regulation on data collection, the "Data Collection Framework (DCF)[73] is being developed by the European Commission, and a number of experts from Sweden are involved in this process. This framework aims at harmonised data collection methods in Europe and facilitates the sharing of knowledge. The existing DCF from 2008 is implemented by the Swedish Agency for Marine and Water Management which role is to coordinate data collection between the competent authorities which are individually responsible for collecting their own data. Data concerning the exploitation of the seas are collected by the Swedish Agency for Marine and Water Management and catch data[74] are available publically on their website.

Stakeholder engagement

First drafts of the Marine Spatial Plans for the 3 different areas were circulated in December 2016 and comments were sought during April 2017. This involved coastal council boards and central authorities sharing opinions on planning objectives and the MSP framework, under the form of meetings, workshops and online questionnaire. International consultation took place in the form of consulting neighbouring countries in May 2017. Based on the feedback obtained during the consultation process, the draft report was reviewed and adopted in March 2015.

This stakeholder engagement process is currently being followed up with additional sector meetings as the draft plans are being revised. The first official stakeholder consultations will be opened between 15 February and 15 August 2018, which will also have additional meetings.

Marine licensing

The permitting process in Sweden is rather complicated as several pieces of legislation apply at several stages. For offshore wind (the only offshore renewable technology developed at this stage), the legislation is differentiated between coastal areas, territorial waters and the EEZ.

[73] https://www.havochvatten.se/en/swam/eu--international/international-cooperation/data-collection-framework-dcf.html

[74] https://www.havochvatten.se/en/swam/policy--regulation/commercial-fishing/catch-statistics.html

The use of the EEZ in Sweden must be permitted by the Ministry of Enterprise, Energy and Communications under the Exclusive Economic Zone Act, while permission for the use of territorial waters is legally bound to the Continental Shelf Act. The main legislation that marine licensing falls under is the Swedish Environmental Code and corresponding legislation for power transmission. Within territorial waters, licenses for offshore installations are granted by the Swedish Land and Environmental Court (and corresponding higher instances). Within the EEZ the National Government are the licensing authority. Licences are given by the Environmental Court or the Government (EEZ).

The following assessments and permits are required in order to build an offshore wind farm:

- The Environmental Impact Assessment (EIA)/Environmental approval in accordance with the requirements of the Environmental Code,
- Grid connection to the high voltage (HV) grid in accordance with the Electricity Law,
- Building permit from the local municipality in accordance with the Building and Construction Act – a separate permit is required under Chapter 7 of the Environmental Code for NATURA 2000 areas, to be issued by the County Administrative Board,
- Cable laying permission under the Continental Shelf Act and the Exclusive Economic Zone Act,
- Permission for the use of territorial waters approved by Swedish Government (Ministry of Enterprise, Energy and Communications) and dealt with at regional level while taking account of national interests;
- Permission for the use of the Exclusive Economic Zone : to be obtained from the Swedish Government (Ministry of Enterprise, Energy and Communication).

The Environmental Authority (for the EIAs), the Swedish Energy Agency (for the grid consents), Municipalities and National/County Administrative Boards for spatial planning (concessions) and on-land cable laying, the central government and other related Ministries (for offshore cable permits, the use of territorial waters and the EEZ, and spatial planning) are all involved in this process. No international parties are involved in the process directly. These are engaged through the Swedish government asking neighbouring countries for comments, before including the comments as the official government reply.

Duration for a typical project, from submitting first proposal to first decision is about 2 years. All in all it can take 10-15 years to get permission, from submitting first project to having permit (this case: Kattegat Offshore). Permits are typically valid for 10 years.

1.11. UK - Scotland

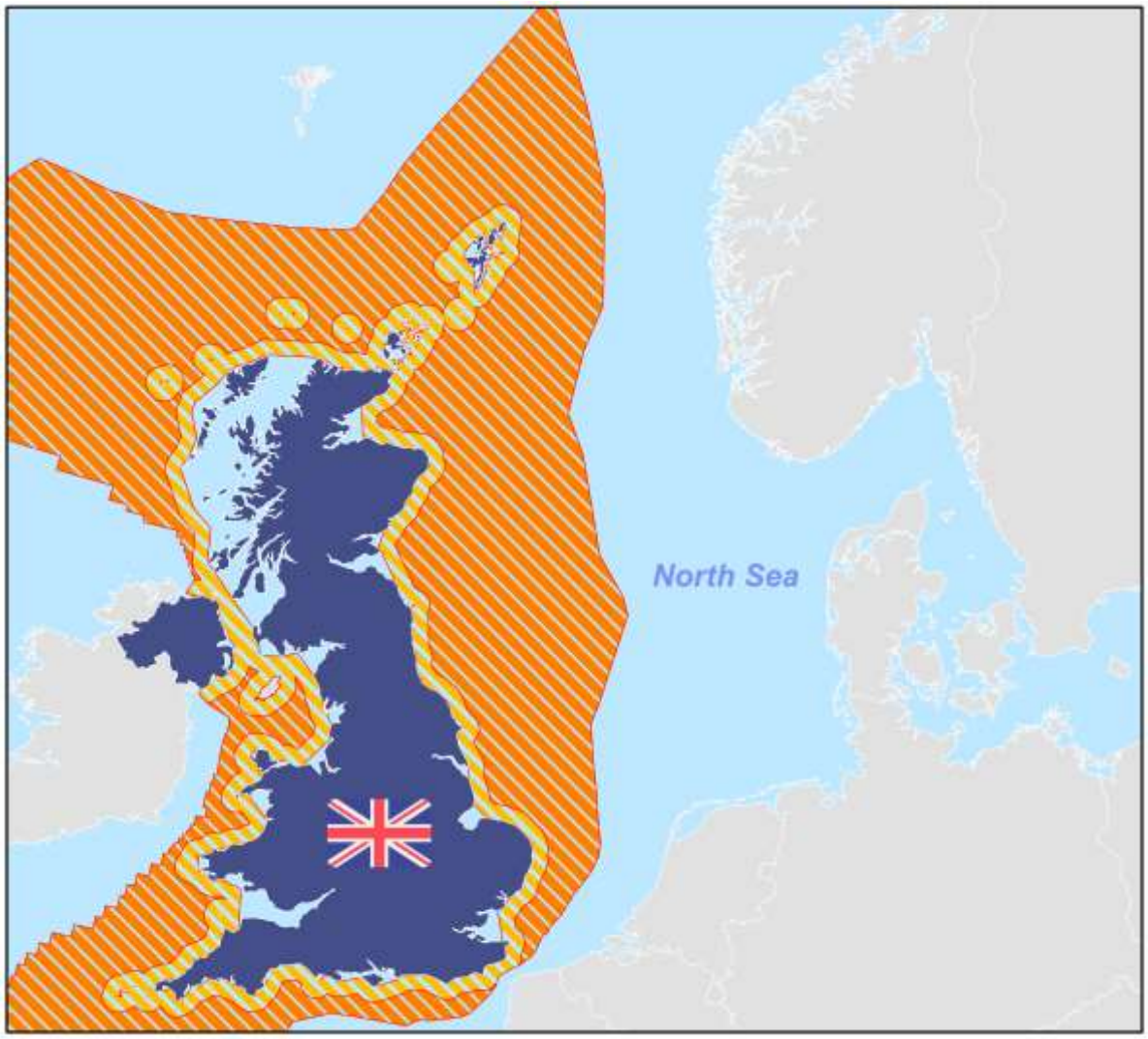


Figure 17: United Kingdom's marine water. Created by: Christian Aden, University of Oldenburg.

MSP in the UK

Following the development of the UK Marine and Coastal Access Act 2009 and the Marine (Scotland) Act 2010, the UK Marine Policy Statement (MPS) 2011 was jointly prepared by the UK, Scottish, Welsh and Northern Ireland governments. The MPS provides the policy framework for the preparation of all UK marine plans and for all decisions capable of affecting the marine area. It reiterates the UK vision for the marine environment which is for 'clean, healthy, safe, productive and biologically diverse oceans and seas', and the UK's High Level Marine Objectives.

The preparation of marine plans is the responsibility of the respective governments within the UK, reflecting the devolution of powers to Scotland, Wales and Northern Ireland. In England, the Department for Environment, Food & Rural Affairs (DEFRA) is the statutory body for marine planning, while the body responsible for preparing marine plans is the Marine Management Organisation (MMO). The

organisations responsible for delivering marine planning in Scotland, Wales and Northern Ireland are; Marine Scotland, the Welsh Government and the Department of Agriculture, Environment and Rural Affairs (DAERA), respectively.

MSP in Scotland

Scotland's planning area covers more than 100,000 km^2 and this planning area is area is covered by Scotland's National Marine Plan. Scotland's EEZ is 462,263 km² and its TW is 55,484 km². In Scotland, the Marine (Scotland) Act 2010[75] provides the framework for marine spatial planning and for the marine licensing system. The Act supports the creation of national and regional marine plans under the authority of Marine Scotland, the Scottish Government's marine management authority, who also delivers licenses for marine activities through the Marine Licensing Operations Team (MS-LOT). The National Marine Plan (NMP) for Scotland[76], adopted on 25 March 2015, reflects the environmental objectives from the EU's Marine Strategy Framework Directive that Scotland wants to achieve through the management of all its marine sectors.

The NMP particularly focuses on the development of the marine renewable energy sector that is already composed of an extensive network of offshore wind farms and emerging tidal and wave energy sites. The NMP also set economic objectives for the energy sector, and provides a framework for marine licensing. The plan will be implemented at the regional level by local Marine Planning Partnerships (MPP), which will develop the marine plans in territorial waters (12 nautical miles). However the Partnerships do not have power for consenting and licensing. These MPP will be local authorities, inshore fisheries groups or local coastal partnerships that will have delegated powers from Scottish Ministers. This will allow adapting the NMP to local issues. The Clyde region and the Shetland Islands are the first Marine Planning Partnerships that have been delegated responsibility for preparing their Regional Plans in February and March 2016, respectively. The Scottish Coastal Forum will play an important role in Regional Marine Planning for providing a network of information and encourage debate on coastal management practices.

The Marine (Scotland) Act 2010 regards coastal management as being an aspect of marine planning and the requirement to take all steps to ensure that a regional marine plan is compatible with the terrestrial marine plan. Locally, voluntary groups of localised interests called Local Coastal Partnerships (LCPs) have been formed around Scotland to deliver Integrated Coastal Zone Management (ICZM). The Scottish Coastal Forum is a stakeholder group providing independent advice on coastal and marine management, with a particular interest in ICZM and LCPs.

Offshore energy planning

[75] http://www.gov.scot/Topics/marine/seamanagement/marineact
[76] http://www.gov.scot/Publications/2015/03/6517

Scotland is developing sectoral plans for offshore wind, tidal and wave energy to meet their energy targets. The authority responsible for sectoral offshore energy planning and for setting energy policy and targets is Marine Scotland, on behalf of the Scottish Ministers.

Offshore Wind

The offshore wind energy plan for Scotland, called Blue Seas Green Energy, was published in March 2011 and adopted in 2013. The first step of the sectoral planning process was the agreement for lease awarded by the Crown Estate. The Scottish Government initially performed a Strategic Environmental Assessment (SEA) to evaluate the impact of offshore renewables installations on the marine environment.

The Areas of Search for offshore wind were identified in 2011 in the scoping report for Offshore Wind Farm Developments in Scottish Waters. These areas were identified as suitable areas for offshore wind developments, inform key stakeholders and other interested parties of the key regional issues and inform the process for determining marine license applications to develop offshore renewable energy in Scottish Waters. Regional Locational Guidance documents have been created in 2012 for offshore wind in order to capture local issues relating to these developments.

Pre-statutory consultation was undertaken involving workshops with relevant sectors and communities in order to raise awareness on the overall process for developing the plans and invited comments on the Draft Initial Plan Framework. The Initial Plan Framework, which presented the Areas of Search by considering the comments made during the pre-consultation, was subject to Sustainability Appraisal in order produce the Draft Plan. The Draft Plan went through public and statutory authorities consultation. After consultation analysis and review of the Draft Plan, the Plan for Offshore Wind Energy was adopted in 2013.

Also associated with offshore wind planning is determining possible onshore implications. Marine Scotland has worked with Argyll and Bute Council to promote developer community engagement to examine and better understand any potential onshore implications associated with the then proposed Argyll Array offshore wind farm (off Tiree). This approach involved the participation of key partner organisations - Argyll and Bute Council, The Crown Estate, Tiree Community Development Trust, Highlands and Islands Enterprise and ScottishPower Renewables (the developer).

A draft report was produced by consultants and was subject to a six week public consultation which ended on 27 April 2012. The study was concluded with a presentation on Tiree of the key findings, Q&A session and around the next steps and recommendations in September 2012. The final Tiree Onshore Scenario Mapping Report which concluded this study was published on the Argyle and Bute Council website in October 2012.: http://www.argyll-bute.gov.uk/node/33828

Marine Scotland, Scottish Enterprise, Highlands & Islands Enterprise, The Crown Estate and East Coast Renewables are currently undertaking a scenario mapping exercise to gain a greater understanding of the onshore planning and supply chain implications of offshore wind developments in the East and North East Regions. The scenarios, a low, medium and high scenario for the level of offshore wind developments are currently being revised. The Final Project Report is likely to be available in early 2017.

Marine Energy

The Scottish Government aims at installing a tidal capacity of 398 MW by the early 2020s. In this purpose the Scottish Government has developed a Marine Plan for Tidal Energy in Scottish Waters for the development of tidal renewable energy in Scottish Waters (0 – 200 nautical miles). The development of wave and tidal energy were realised upon the same framework the offshore wind development process was based on. In July 2012, The Scottish Government published the Scoping Study for Tidal Energy Development in Scottish Waters. There are currently 11 projects of tidal energy development in Scotland, and there are several other planned developments that received agreements of lease from the Crown Estate Commissioners.

Scotland also has an estimated 10% of Europe's wave power, and the Scottish Government is developing a Sectoral Marine Plan for Wave energy in Scottish waters (0-200 nautical miles). A Draft plan options for wave energy were published in May 2013.

Regional Locational Guidance documents have been created in 2014 for deep-water floating wind, in order to capture local issues relating to these developments.

Carbon Capture and Storage

As part of the UK's new Clean Growth Strategy, the UK minister for Climate announced up to £100 million of funding for carbon capture technology in October 2017. This investment in carbon capture is to enable the UK to reach their 2050 climate targets. Carbon Capture and Storage (CCS) technology can help to cut harmful greenhouse gas emissions from industry and heating networks. CCS technology will work by stripping carbon from factory flues and capturing the gas before piping it into permanent storage sites below the North Sea seabed.

It could also help transform the UK's gas grid to run on cleaner hydrogen gas by trapping and removing the carbon dioxide produced in the process of breaking methane down to hydrogen.

UK Commitments to CCS so far include The Scottish Government's 'Nordic Baltic Policy Statement' which was published in September 2017. In this Policy Statement, the Scottish Government aims to build on their First Minister's recent announcement to provide financial support to the Acorn Carbon Capture and Storage (CCS) Project in Aberdeenshire. This project is exploring opportunities to learn from Norway in CCS, particularly in relation to its Sleipner project which has

stored 17 million tonnes of CO2 deep beneath the Norwegian North Sea, and its new CCS projects proposed in the offshore Smeaheia area.

National Data Portal

Marine Scotland developed an interactive web portal/tool, the National Marine Plan Interactive (NMPi)[77] that has been designed to assist in the development of national and regional marine planning by taking account of all uses of the marine space, such as fishing, shipping, cables and pipelines, renewable energy developments, and considering the associated pressures on the marine ecosystem.

NMPi is composed of spatial layers in Geographic Information System (GIS) format. It has been developed by following several guidelines for managing open data infrastructures, among which INSPIRE Directive, SG Open Data Strategy, UK Gemini, MEDIN Standards etc. Some of the data available on NMPi come from Marine Scotland and are free to download, while others come from a wide range of data providers (government departments, NGOs, research institutes, commercial companies). These third parties data are provided free of charge to Marine Scotland for use on NMPi provided there are made available on a view only basis. Environmental data are also available via the Scottish Spatial Data infrastructure EDINA and the government web portal (www.data.gov.uk). The access to environmental data in Scotland in ensured by a mixture of Directives, among which the INSPIRE Directive, and a wish to be open and transparent.

[77] https://marinescotland.atkinsgeospatial.com/nmpi/

Stakeholder engagement

Stakeholder consultation is an important part of the development of the marine plans in Scotland and early and on-going engagement with stakeholders should be undertaken in the process. The marine Acts require a statement of public participation to be written to state how and when the public will be consulted. The draft plans and Sustainability Appraisal Reports are then available on the government website for public consultation. The duration of public consultation is at least 16 weeks for the Report (containing SEA, HRA and Socio-economic Assessment) and 16 weeks for the draft plans. The aim is to communicate, inform, and enhance dialogue between stakeholders in order to identify issues, gather evidences and information and build consensus for plan formulation. Consultees include for example, industry, bordering municipalities, general public, Local Community and Councils, academics and any other interested parties or groups. Consultation communication is via emails to individual stakeholders, local and national newspaper, consultation conferences/meetings. The consultation is also open to international consultees to provide input.

Marine licensing

Under the Marine (Scotland) Act 2010 the Marine Scotland Licensing Operations Team ("MS-LOT") is a one-stop shop in the consenting process. On behalf of the Scottish Ministers, MS-LOT are responsible for marine licensing system and enforcement in the Scottish inshore region (0-12 nautical miles) and under the Marine Coastal Access Act 2009 they are responsible for licensing and enforcement in offshore waters (12-200 nautical miles). The licensing regime allows regulation of the deposit and removal of substances and objects in the seas around Scotland above mean high water springs (MHWS). Activities must take place in accordance with licence conditions.

In terms of the licensing process for renewable energy developments, Developer's must apply for a marine licence to occupy Scottish waters, and consent must be obtained from MS-LOT for stations generating over 1 MW in offshore waters and lower than 50 MW in territorial waters. MS-LOT also determines whether an EIA and Habitats Regulation Assessment are needed, after consultation with statutory and non-statutory consultees. At this point, if an EIA is required, the developer may ask for a scoping opinion be sending a scoping report to MS-LOT. After a three week consultation, the licensing team will write a scoping opinion and has up to 9 weeks to do so. Then, the developer must send documentation to MS-LOT to check whether they fulfil all the requirements of the legislation. The developer can start the formal application for a licence if no issues arise at this point.

The consenting process is:

- Pre-Application – Screening and Scoping
- Surveys undertaken by applicant
- Environmental Statement preparation and Gate check period
- Submission of marine licence application and supporting documents to Marine Scotland – Licensing Operations Team ("MS-LOT")
- Review of application by MS-LOT and gate check period
- Acceptance of application
- Consultation with statutory (Scottish Natural Heritage, Northern Lighthouse Board, Maritime Coastguard Agency and SEPA and Local Authorities) and non-statutory consultees for 42 days
- Public notice placed in national and local newspapers for 2 consecutive weeks to allow the general public to comment
- Application available at public locations
- Gap analysis – review of comments from consultees and the public
- Environmental Assessment - Habitats Regulations Appraisal - Appropriate Assessment and Marine Protected Area assessment
- Conditions requested by consultees added to the licence
- Recommendation sent to Scottish Minister
- Determination by Scottish Minister
- MS-LOT issues licence
- All documentation uploaded to the Marine Scotland website and publically available[78]
- Post determination phase - financial investment decision, pre-construction, construction, partial generation, fully commissioned, decommissioning

MS-LOT aims to process marine licence applications in 14 weeks however the process is much longer for offshore energy developments as they are granted simultaneously with the section 36 consent to generate electricity under The Electricity Act 1989 and this can take 9 months or longer. Offshore energy development licenses are granted for 25 years in line with the section 36 consents.

[78] http://www.gov.scot/Topics/marine/Licensing/marine/scoping