



# WP7.1 Deliverable 1 Intermediate report for stakeholder review:

## *Legal framework and legal barriers to an offshore HVDC electricity grid in the North Sea*

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## EXECUTIVE SUMMARY

The present deliverable elaborates the current legal framework for offshore wind and grid development on international, European and national level. It is shown that often, the legal framework needs to be adapted in order to facilitate the development of a meshed offshore electricity grid. This is because offshore wind and offshore grid connections have developed strongly in the past few years while the legal framework lags behind. It becomes clear that while solutions have been sought in order to facilitate offshore wind, hybrid solutions that combine interconnection with offshore wind connection are often not yet supported by legal frameworks.

Concerning international law, the legal framework is mainly based on UNCLOS, the convention on the law of the sea. This convention differentiates between different functions of grid components: when an installation, structure or cable is used for the production of energy or other economic exploitation of the EEZ, it falls under the functional jurisdiction of the coastal state. When a cable is not linked to such an activity, there is much less jurisdiction: only related to safety, environmental impact and cable delineation. However, it is problematic under international law when these functions are combined, for example in a hybrid asset or in a meshed HVDC grid. This issue can be solved by drafting bilateral treaties between bordering states, by drafting a multilateral treaty focusing specifically on this issue or by amending existing treaties. Which option is best for the purpose of facilitating the development of a meshed offshore HVDC grid will be treated in future work of WP7.1.

On the level of European law, it is shown that the applicability of EU law at sea follows jurisdiction of national states under international law. Nevertheless, competence also depends on whether states have given the EU competence to regulate over a certain issue in the EU founding treaties. There are sufficient competences for the EU to regulate an offshore electricity grid, with competences for both trans-European networks and energy in general. Another issue discussed here is the applicability of EU law in non-EU states, such as Norway in the EEA and the UK after Brexit. This has to be taken into account when drafting a legal framework for a meshed offshore electricity grid in the Northern Seas. Concerning substantive EU law, the main issue is that the concept of hybrid assets is not yet reflected in current EU law, which creates legal uncertainty and holds back development of such assets.

With regard to national law, several issues relating to offshore grid planning and construction are researched. It can be observed that there are many differences between the different national legal regimes. The choice for a certain legal framework can significantly affect whether offshore wind energy and offshore grid development are stimulated or restrained. Therefore, the legal frameworks are analysed and compared to see which different options there are and how they influence offshore wind and grid development. Some legal issues also arise not from one legal framework but from the combination between two legal frameworks in a cross-border context. Moreover, the issue of offshore grid operation is treated separately, along the lines of the EU network codes. The legal issues discovered in this deliverable will serve as a basis for future work in the context of WP7.1. An overview of this future work is given in the last chapter, Key take-aways for further research.

# 1 INTRODUCTION

One of the many prerequisites of an offshore high voltage direct current (HVDC) grid is sufficient legal and regulatory certainty. However, it seems that the legal framework currently in place does not create enough legal and regulatory certainty for more complex projects, such as an offshore HVDC grid. Moreover, it seems that at several points, regulatory intervention is necessary to facilitate combined solutions (such as an offshore HVDC grid) rather than radial lines.<sup>1</sup> PROMOTiON WP7 aims to analyse the key regulatory barriers and to propose solutions for them. WP7.1 (Legal) will put forward a legal framework that addresses these barriers adequately and that incorporates the proposed solutions, thereby creating legal certainty for investments in this sector.

Before examining the possibilities for a legal framework for an offshore HVDC electricity grid, it is necessary to make clear what competences coastal states and the EU have to legislate on this issue. Moreover, it is important to understand what legislation is already in place, i.e. to what extent the EU and the Member-States have made use of that competence to legislate. These issues will be addressed in this deliverable. The deliverable will thus provide an overview of the current legal framework on international, European and national level. With this overview, legal barriers will be identified and analysed. This will serve as a basis for further research in the context of WP7.1, working towards solutions for the identified legal barriers.

This deliverable is structured as follows: the first part will address the competences of states under international law, applied to the topologies identified by WP1, which reveals the legal barriers that exist under international law. The second part is on the competences under European law. This relates first to the question of applicability of EU law offshore, secondly to the relevant competences conferred to the EU by the Member States under the treaties, which forms the legal basis of secondary EU law, and thirdly to the rights and competences of non-EU Member States, such as Norway in the European Economic Area. The third part of the deliverable describes the currently existing body of EU law. This encompasses Directives, Regulations, Network Codes and other relevant documents that are useful for the interpretation of European law. In this part, the documents are categorised in subchapters according to the PROMOTiON 'building blocks'. The fourth part of the deliverable provides an overview of the legal framework on country-level, for eight coastal states of the Northern Seas, namely Belgium, Denmark, France, Germany, Netherlands, Norway, Sweden and the United Kingdom. At the end of every subchapter, conclusions are made on the implications for the development of an offshore grid. At the end of the deliverable, there is a chapter on key take-aways for further research. This deliverable and specifically the key take-aways will serve as a basis for future work in the context of WP7.

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<sup>1</sup> THINK Report, topic 5, Offshore Grids: towards a least-regret policy, January 2012, p. 27.



## 2 INTERNATIONAL LAW

### 2.1 INTRODUCTION

When discussing the legal side of the construction and operation of an electricity grid, one needs to distinguish between onshore and offshore grids. This is because the competences of states to make rules and to enforce them onshore differ from offshore. This competence is called 'jurisdiction'.<sup>2</sup> Onshore, jurisdiction over the activities that take place on their territory is part of states' sovereignty. However, the subject of PROMOTioN is an *offshore* electricity grid, which is mostly outside states' territory. The question therefore arises, to what extent do States have the competence to regulate outside their territory?

The rules on sovereignty and jurisdiction can be found in international law. As international law also regulates the rights and duties of states at sea, it is of particular importance to the topic of PROMOTioN. It stands above national and European law and, therefore, it has to be treated first in a document concerning the competences and legal basis. After explaining some key concepts of international law that are necessary to understand the further explanation of international law applied to offshore electricity grids, this part will focus on the main source of international law of the sea, namely the 1982 UN Convention on the Law of the Sea (UNCLOS).<sup>3</sup> Subsequently, this legal regime will be applied to the topologies used in PROMOTioN so that the effects in practice of international law can be shown. This part will conclude with possible approaches to deal with the legal questions that arise under international law.

There are different sources of international law.<sup>4</sup> Some are more specific than others and thus more useful as a basis for a legal framework for an offshore grid in the Northern Seas. Two important sources of international law are treaties between states and customary international law. Customary international law exists when states have a certain practice or custom and perceive this practice as a legal norm. It does not have to be explicitly noted down to have legal value. Often, at some point, the customary international law is codified in a treaty. A treaty is binding to all states that have signed and ratified it. Treaties can be concluded by large groups of states but also on a bilateral level to clarify the legal situation between two states.

The most important source of international law relating to the sea is UNCLOS. This convention will be dealt with extensively below. It is worth noting that there are also other conventions applicable to the Northern Seas area that create duties and obligations for the states surrounding it. One important example is OSPAR, the Convention

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<sup>2</sup> Jurisdiction entails the right of a State to govern over a certain territory, property or person. Main aspects of jurisdiction are the right to legislate (to make rules), to apply these rules and to enforce them. Jurisdiction only exists if there is an implicit or explicit basis for it. The most common form of jurisdiction in international law is territorial jurisdiction, meaning that a state can legislate over what happens on its territory. However, there are also other forms of jurisdiction, of which the most important form for the topic of PROMOTioN is treaty-based jurisdiction. This is jurisdiction that is made explicit through the means of a treaty under international law.

<sup>3</sup> United Nations Convention on the Law of the Sea (UNCLOS), Montego Bay, 1982.

<sup>4</sup> United Nations, Statute of the International Court of Justice, New York, 1946, art. 38.



for the Protection of the Marine Environment of the North-East Atlantic. However, that convention is not decisive for the *jurisdiction* of states at sea. Therefore, it will not be dealt with in more detail in this part.

## 2.2 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

UNCLOS (1982) codifies international law relating to the sea. It is a follow-up of the Geneva Conventions on the law of the sea (1958) and of customary international law. All states bordering the Northern Seas have ratified UNCLOS. Thus, the Convention is applicable to all states in geographical area that is covered by the PROMOTiON project. Therefore, this convention is taken as the basis for the legal framework under international law.

UNCLOS divides the sea into different maritime zones, and lists the rights and duties of coastal states in those zones. The rule of thumb is that the further away from the coast, the less jurisdiction of the coastal state. The maritime zones and the rights and duties of coastal states and other states in these zones will be treated below, for as far as relevant for the development of an offshore grid. The last geographical zone of UNCLOS, the High Seas, will not be treated here, as it is not relevant to the North Sea area.

Schematical overview of the maritime zones:

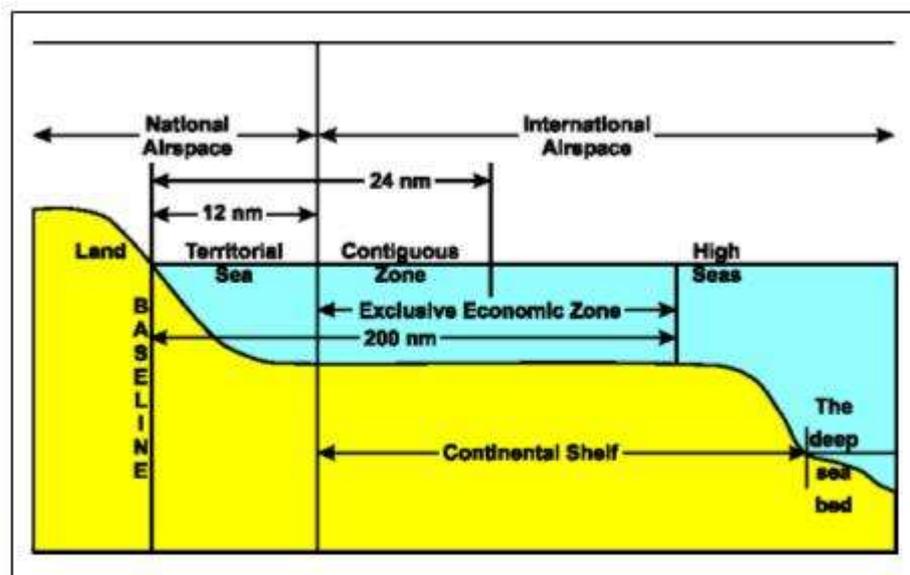


Figure 1: Maritime Zones. Source: Schofield 2003

## 2.2.1 TERRITORIAL ZONE

The first zone seen from the coast, the territorial zone, extends to 12 nautical miles (22.2 kilometres) from the shore.<sup>5</sup> The seabed and the subsoil are also part of this zone.<sup>6</sup> This zone is seen as an extension of the land territory. Thus, the full territorial sovereignty that States have on their land territory is extended to the territorial waters as well.<sup>7</sup> Therefore, all national laws also apply to this zone. When offshore cables enter the territorial zone, they are thus also subject to the coastal State's jurisdiction, meaning that it can impose conditions and without its consent, the cable cannot be built.<sup>8</sup>

One important limitation to the coastal State's sovereignty is the right of innocent passage, which is part of the concept of freedom of navigation. Therefore, a coastal state cannot build so many obstacles that it hampers the other states' innocent passage. However, coastal States may regulate innocent passage of ships for (amongst others) the protection of cables and pipelines.<sup>9</sup> This is done for example by having shipping lanes into place. It is important to note that the laying of cables or pipelines by other states is *not* an activity of innocent passage. Therefore, as soon as any cable enters the territorial zone of a state, it falls under its jurisdiction.

## 2.2.2 EXCLUSIVE ECONOMIC ZONE

Following from customary international law, and codified in UNCLOS art. 55 and 57, coastal States may declare an Exclusive Economic Zone (EEZ) in the maritime area stretching unto 200 nautical miles from their coastline. This zone does not exist automatically; it has to be actively claimed. However, the states within the Northern Seas area all claimed an EEZ. The Exclusive Economic Zone gives coastal States the right to exclusive economic exploration and exploitation of the natural resources in the waters, seabed and subsoil of that area.<sup>10</sup>

The rights obtained by declaring an EEZ are *sovereign rights*, which must certainly not be confused with *sovereignty*. The difference is that sovereign rights give states jurisdiction only over the activities related to the economic exploration and exploitation of the natural resources, and not to all other activities. In other words, this is a limited jurisdiction, which only exists where it has a function (namely regulating the economic exploitation of natural resources). This is called *functional* jurisdiction. Thus, to mention examples from case law, a coastal State will be able to regulate fisheries in the EEZ, but cannot impose value added tax on (telecommunication) cables that are not related to economic exploitation of that zone.<sup>11</sup>

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<sup>5</sup> UNCLOS, art. 3.

<sup>6</sup> UNCLOS, art. 2 (2).

<sup>7</sup> UNCLOS, art. 2 (1), although there is a limitation in art. 2(3): the sovereignty over this zone is exercised subject to this Convention and to other rules of international law.

<sup>8</sup> See also UNCLOS, art. 79 (4).

<sup>9</sup> UNCLOS, art. 21 (1) c.

<sup>10</sup> UNCLOS, art. 56 (1) a, art. 57.

<sup>11</sup> CJEU, Case C-111/05 *Aktiebolaget v. Skatteverket*, [2007] ECR I-2697, para 43.

In UNCLOS, the production of energy and the construction of artificial islands, installations and structures are explicitly mentioned as falling under economic exploration and exploitation.<sup>12</sup> Therefore, coastal States have functional jurisdiction over OWFs in their EEZ.<sup>13</sup>

### 2.2.3 CONTINENTAL SHELF

The next zone described in UNCLOS is the continental shelf, which is defined as the seabed and subsoil beyond the territorial zone which can be seen as a “natural prolongation of [the state’s] land territory”.<sup>14</sup> The continental shelf is mostly relevant for the extraction of resources that lie in the seabed or subsoil, such as oil and gas. Coastal states have sovereign rights over these resources, as far as that does not limit the rights of all other States, such as the freedom of navigation.<sup>15</sup>

Normally, this zone reaches to the geographical end of the shelf, or to 200 nautical miles from the shore (if the continental shelf extends beyond this distance). However, the Northern Seas all lie on the same geographical continental shelf, which is why the area is divided according to delineations based on bilateral treaties between the coastal States.

### 2.2.4 THE RIGHT TO LAY CABLES

Next to the maritime zones, there is an important principle that spans across different zones. This is the principle of the ‘freedom of the sea’ or *mare liberum*. Concerning cables and pipelines, this means that all States are entitled to lay submarine cables and pipelines.<sup>16</sup> On the high seas, states only have to take into account that they should not damage already existing cables or pipelines. On the continental shelf, the coastal state has to accept the laying of cables and pipelines in its territory, or, in other words, that “the coastal State may not impede the laying or maintenance of such cables or pipelines”.<sup>17</sup> However, the delineation of the cable is subject to the coastal state’s consent.<sup>18</sup> Additionally, the coastal state retains the right to take reasonable measures for the exploration and exploitation of the natural resources on the continental shelf and to limit pollution from pipelines. Therefore, coastal states have jurisdiction over the environmental aspects and the spatial planning of the cable or pipeline.

### 2.2.5 DECOMMISSIONING

It is important to note that whereas UNCLOS gives states the right to construct ‘installations and structures’ in the EEZ, there is also a duty connected to this: “*Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards*”

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<sup>12</sup> UNCLOS, art. 56(1)a and (1)b.

<sup>13</sup> H.K. Müller, *A Legal Framework for a Transnational Offshore Grid in the North Seas*, Antwerp, Intersentia, 2016, (hereinafter Müller 2016) p. 36

<sup>14</sup> UNCLOS, art. 76.

<sup>15</sup> UNCLOS, art. 78 (2), Müller (2016), p. 30.

<sup>16</sup> UNCLOS, art. 79 (1), see also art. 87 (1) c.

<sup>17</sup> UNCLOS, art. 79 (2).

<sup>18</sup> UNCLOS, art. 79 (3).



*established in this regard by the competent international organization.*<sup>19</sup> Installations, such as wind turbines and converter stations, thus need to be removed when they are not in use anymore. It can be discussed whether electricity cables would also need to be removed after use. The purpose of the removal obligation is the safety of navigation, according to UNCLOS. As cables lie in the sea bottom, there is much less danger compared to installations that reach to or above the water level and that form a collision danger. Nevertheless, the removal should also take into account the rights and duties of other states.<sup>20</sup> If there are too many cables in a certain area, the right of other states to lay cables might be limited.

The 'international standards' established by 'the competent international organization' are to be found in the 1989 Resolution by the International Maritime Organisation, 'the 1989 Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone'.<sup>21</sup> Next to these Guidelines, for installations in the North Sea and the North East Atlantic, the OSPAR Decision on Disposal of Disused Offshore Installations is also relevant.<sup>22</sup>

## 2.3 INTERNATIONAL LAW APPLIED TO THE TOPOLOGIES OF WP1

The relevance and effects of international law to PROMOTioN are best explained when applied to possible practical cable configurations. At this stage, the topologies that are defined in WP1 can serve as example. Please note that the topologies mentioned below are only preliminary. However, for the purpose of explaining the legal basis and competences, the current topologies cover all relevant options. Therefore, in the following section, the legal regime applicable to various assets will be described using the preliminary topologies. The schematic designs of the topologies are as follows:

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<sup>19</sup> UNCLOS, art. 60(3).

<sup>20</sup> Ibid.

<sup>21</sup> IMO, RESOLUTION A. 672 (16), Adopted by the International Maritime Organization on 19 October 1989.

<sup>22</sup> OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations.



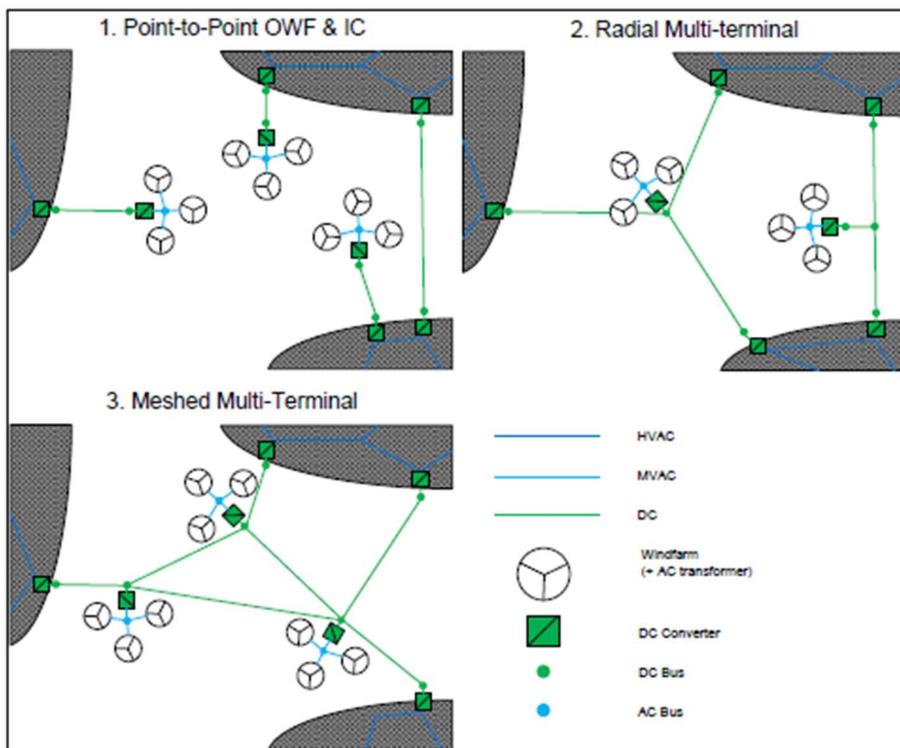


Figure 2: Topologies PROMOTioN WP1, 2016.

### 2.3.1 POINT-TO-POINT OFFSHORE WINDFARMS AND INTERCONNECTORS

The first topology (Point-to-point OWF and IC) is based on offshore windfarms (OWFs) connected to one state and separate interconnectors that connect two States. In fact, UNCLOS does not mention the term interconnector, only ‘cables and pipelines’ in general are mentioned. However, UNCLOS does differentiate on the basis of function of the cable, namely whether or not the cable is used for the exploitation of natural resources (in the EEZ). Therefore, it is very important to note here that interconnectors and park-to-shore cables are separate assets in this topology. They will be treated separately here, as Topology 1A (interconnectors) and 1B (park-to-shore cables) – the letters have been added in the image above.

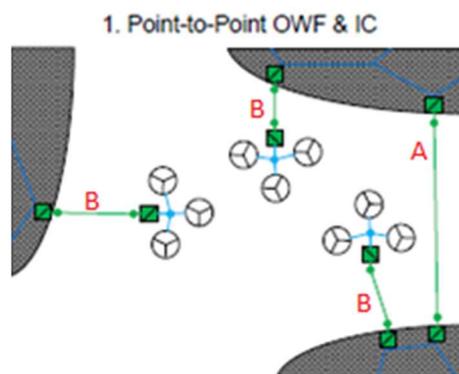


Figure 3: Topology 1. Source: PROMOTioN WP1.

#### 2.3.1.1 INTERCONNECTORS (TOPOLOGY 1A)

It is necessary to distinguish between the different maritime zones. In the territorial sea, the coastal state has full jurisdiction over everything in its territory, and thus also over all aspects of the cable. However, when the cable leaves the territorial sea, the coastal state has far less jurisdiction. This is because the cable connecting the onshore grids is not part of an activity that is associated with the economic exploration or exploitation of the natural

resources in the EEZ. Thus, the regime of functional jurisdiction does not apply. Moreover, other states also have the right to lay cables and the coastal state cannot impede them from doing so. The construction and operation of interconnectors falls under the freedom to lay cables.<sup>23</sup>

Nonetheless, coastal states still have some jurisdiction related to the protection of their EEZ: they can legislate over safety and environmental criteria, and they have to approve of the delineation of the cable. When the interconnector crosses the border between the EEZs of two different states, the legal situation remains the same, although then the other coastal state becomes competent to rule over safety and environmental criteria etc. It falls under full jurisdiction of that state only at the point where the interconnector reaches the territorial zone of the other state.

### 2.3.1.2 CONNECTING OFFSHORE WINDFARMS (TOPOLOGY 1B)

Concerning the connection of offshore windfarms (OWFs), the legal situation is entirely different from interconnectors. Under UNCLOS, producing renewable energy at sea is seen as an activity of exploitation of the natural resources in the EEZ. Therefore, the functional jurisdiction regime is applicable here. It is generally accepted that, next to the OWFs themselves, also the cables that are needed to bring offshore produced electricity to the shore are part of this economic activity. Therefore, these connecting cables normally also fall under the functional jurisdiction regime.

It is not clear from the picture of the topology whether the OWFs are located in the EEZ of the state they are connected with or in another state's EEZ. In the first scenario, the OWFs are located in the EEZ of the state they are connected with, this means that this coastal state has jurisdiction over the cable and can legislate over all aspects relating to the economic exploitation of the OWF including the cables. In the second scenario, where the OWFs in the EEZ of one state are connected to another state's shore, the cable will fall under the functional jurisdiction of the state in whose EEZ the OWF until it crosses the sea frontier to the continental shelf of the other state. There, it will fall under the freedom to lay cables, with very limited jurisdiction.

### 2.3.1.3 PARK-TO-SHORE VS. HUB-TO-SHORE

Currently, most offshore windfarms are connected through single radial connections, from one OWF to the shore. However, several states now have adopted a hub-based approach for the connection of new windfarms. One example is Germany, where Dolwin, Helwin, Sylwin and Borwin are examples of hub-connected OWFs. The Netherlands also recently switched to a hub-based approach. Topology 1B only shows OWFs that are connected to a hub rather than with individual connections. Therefore, the question arises whether there are differences under the law of the sea between the legal regimes of simple radial connections of offshore windfarms and of hub-based connections.

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<sup>23</sup> UNCLOS, art. 79. See also chapter 2.2.4.



A characteristic of a hub-based approach is that an extra station is needed to combine the cables and to bring the electricity to the right voltage.<sup>24</sup> Additionally, in scenarios involving HVDC cables, the station will also need to convert the electricity from alternating to direct current (AC to DC). Consequentially, the cables from the windfarm do not run directly to the shore but first go via a converter station. UNCLOS allows the construction of installations and structures for the purposes of economic exploitation of the EEZ *and other economic purposes*.<sup>25</sup> Although the converter station is not directly necessary to produce (electrical) energy in the EEZ, it is necessary for the most efficient connection of the offshore windfarms. That is an economic purpose, and thus, it can be presumed that converter stations will fall under the jurisdiction of the coastal State as well, provided that they do not obstruct other states' use of their right to free navigation.<sup>26</sup> Therefore, hub connected OWFs do not have a significantly different legal framework than single-connection OWFs.

**Interim conclusions for the first topology:**

- **Two legal regimes are applicable alongside each other.**
- **Interconnectors: States have full jurisdiction in the territorial zone, and only jurisdiction relating to safety, environmental requirements and the delineation of the cable.**
- **Connecting cables: These fall under functional jurisdiction, giving the coastal state competence to legislate over all aspects of the cable.**

2.3.2 RADIAL MULTI-TERMINAL

2.3.2.1 JURISDICTION UNDER UNCLOS

Based on the second topology, radial multi-terminal, different scenarios are possible:

- A. An existing interconnector is used to connect a newly built OWF hub
- B. An OWF hub is first connected to one state and later connected to (an)other state(s)
- C. An OWF hub is built partially in one state's EEZ and partially in another state's EEZ and connected to two (or more) states

These scenarios are depicted below: the dotted lines depict that the windfarm or cable is built later. The red lines depict the maritime frontiers between the countries.

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<sup>24</sup> At the same time, substations within the windfarm can be smaller when there is a hub-converter station nearby.

<sup>25</sup> UNCLOS, art. 60 (1) b. Judging from the travaux préparatoires, the reason why it was formulated in this way was to exclude military structures. However, other structures that serve some economic purpose should be allowed. Nordquist, UNCLOS 1982 Commentary, part 2, p. 584.

<sup>26</sup> Müller (2016) concludes the same, p. 42/43

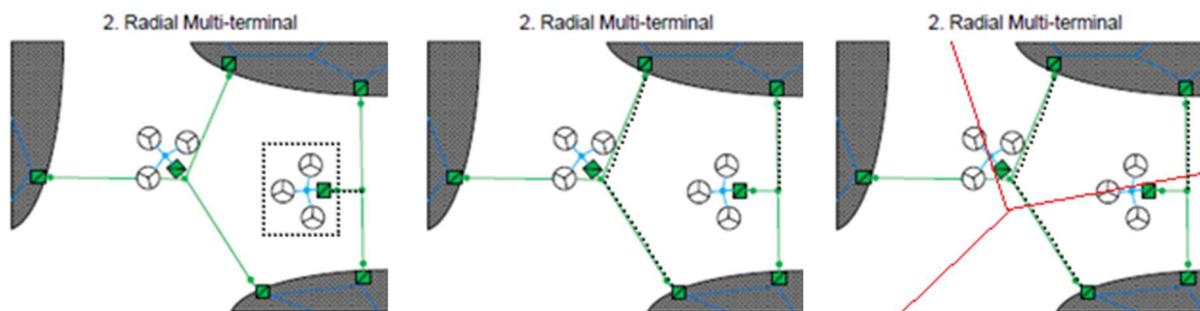


Figure 4: Topology 2A

Topology 2B

Topology 2C

Source: PROMOTiON WP1.

In all of these cases, it becomes possible to bring the offshore generated energy to any of the two or three connected countries. However, when the electricity production is not at its maximum capacity, and consequentially, when there is spare capacity on the cables, they can function to transport electricity between two (or more) states, as a normal interconnector cable. Therefore, such a construction is an ever-changing (depending on the amount of wind energy generated) combination of connecting cables for offshore generated electricity with interconnection between States.

The legal situation of offshore windfarms themselves and installations such as converter stations is clear: they fall under the functional jurisdiction of the State in whose EEZ the construction is located. If this is one state (scenario A or B), the situation concerning the constructions is relatively simple. If it concerns a hub that connects OWFs in multiple states (scenario C), it is already possible that multiple states claim jurisdiction over certain shared (intra-hub) cables or constructions.

The legal situation of the cables connecting the hubs is much more complicated: it is established that the coastal state has jurisdiction over environmental and safety requirements and the delineation of all cables. It is also clear that as soon as the cable enters the territorial waters and land territory of this state, the cable will fall under the jurisdiction of that State. However, as pointed out above in topology 1, as soon as the cable leaves the territorial zone, there is a clear separation in legal regimes for interconnectors and for connection of OWFs. Combining these two functions of cables leads to uncertainty about the extent to which states have jurisdiction over the assets.

For example, in Topology 2A, (OWFs tee-ed in to an existing interconnector), the interesting legal situation is that a cable that at first did not fall under the functional jurisdiction of either state it was connected to may become subject to the functional jurisdiction of the state in whose EEZ the OWF is located. What consequences does this have for the regulatory regime that was applicable to the cable beforehand?

Scenario 2B (OWF-hub is located in one state's EEZ, and connected with the shore of two or more states) leads to situations where one could say that the cable from the hub (in one state) to the shore of another state is part of the functional jurisdiction of the first state, but one could also argue that it does not fall under this jurisdiction and instead falls under the freedom to lay cables.

In topology 2C (OWF-hub across different states' EEZ is connected to different states), it is possible that an OWF in one state's EEZ is connected to a hub in another state. The cable that runs from that hub to the shore of the state in whose EEZ the OWF is located, then falls under the freedom to lay cables, and not under the functional jurisdiction of that state. This could lead to the perverse situation in which every state would require a hub to be built in their EEZ, even if this is not more efficient from a technical or economic point of view, solely to gain jurisdiction over the cable.

In conclusion, these situations in which it is unclear on the basis of UNCLOS whether states can claim jurisdiction, or in which multiple states can claim jurisdiction over the same cable (concurrent jurisdiction) lead to legal uncertainty, for example about which law is applicable (if any at all) and what will happen in case of conflicts. This is undesirable as such legal uncertainty will reduce willingness to invest in offshore grid infrastructure. Therefore, a solution on another basis than UNCLOS needs to be found to approach the problem of concurrent jurisdiction and other problems related to jurisdiction over the cables at sea.

### 2.3.2.2 POSSIBLE SOLUTIONS

As the scope of the jurisdiction between States cannot be concluded decisively on the basis of UNCLOS, a solution on another basis needs to be sought. In practice, states exercise jurisdiction as far as there is a genuine link to the object, unless there is a reason why they should not have jurisdiction.<sup>27</sup> This is based on the principle of 'balance of interests', whereby all possible interests are weighed and if the balance of interests turns out positive for the state involved, its jurisdiction is just and reasonable.<sup>28</sup> However, this alone cannot solve the problematic situation around offshore electricity cables in this topology, as it leaves the possibility of multiple states having a claim to jurisdiction over the same object (concurrent jurisdiction).

Both active and passive solutions to concurrent jurisdiction have been proposed in literature.<sup>29</sup> The passive solution is self-restraint of the states involved, so that not all states that could claim jurisdiction actually make use of this. However, this option avoids the problem rather than solving it definitively. A positive aspect is that it does not require much effort to implement. Nevertheless, as states' governments and interests over time can change, this option still leaves legal uncertainty for future developments. Especially if the second topology is seen as a first step of a larger grid, bringing legal certainty in from the beginning is important. Therefore, this option is less useful for the development of an offshore HVDC grid.

The active solution is to conclude an agreement under international law between the states involved that addresses the conflict of jurisdiction directly. This is similar to the approach used in the offshore oil and gas industry since the early 1970s. There, this approach is used for pipelines that connect the production facility in

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<sup>27</sup> M.M. Roggenkamp, *Petroleum Pipelines in the North Sea: Questions of Jurisdiction and Practical Solutions*, *Journal of Energy and National Resources Law*, 1998, (hereinafter, Roggenkamp 1998), p. 98

<sup>28</sup> *Ibid.*

<sup>29</sup> Müller (2016), p. 63 and the literature cited there



one state's EEZ to the shore of another state. In the Northern Seas area, Norway has concluded many treaties and Memoranda of Understanding (MoUs) with other states concerning pipelines that run from production facilities on the Norwegian continental shelf to onshore landing stations in other states. It is observed that the first of these agreements, the Ekofisk agreement, served as a model for later agreements. These agreements can be specific to one pipeline, typical for the earlier agreements, or more general for any existing or future pipeline between the countries involved, which was done in later agreements.<sup>30</sup>

Such agreements could also possibly be useful for electricity cables in the Northern Seas. However, one should be aware of the differences between the situations. In the (early) Norwegian pipeline agreements, there is a clear 'sending' state, namely Norway, and a 'receiving' state. The gas that is produced in the EEZ will only be transported to the shore, and not vice versa. This had a clear impact on the pipeline agreements, which gave much more power to the sending state.<sup>31</sup> The sending/receiving dichotomy is in some way similar to an OWF that is connected only to one state, which is another state than the state in whose EEZ the OWF is located. However, in the PROMOTiON scenarios, OWFs are connected to multiple states' shores, or to multiple offshore hubs: there is no longer one clear 'sending' and 'receiving' state.

Therefore, with a grid that encompasses OWF hubs in multiple states, all states involved can have a genuine link. This makes it more difficult to see a natural division of jurisdiction for one state on the basis of a balance of interests approach. However, if multiple states have concurrent jurisdiction, they also have the power to negotiate together and make agreements on how legal issues, such as the choice of forum in case of disputes, or the nationality for tax purposes, should be solved. This is a grey area between public international law (law between states) and private international law (the complete body of conventions, national law, case law, customary law related to legal conflicts between individuals in international context) because often, the activities in states' EEZ are heavily regulated, and the entities responsible for offshore connections are sometimes also (partially) owned by the state. In any case, having a treaty that makes clear which states' laws are applicable to which part of the grid will greatly improve the legal certainty over these cables under international law.

Concerning international agreements, there are multiple options. First of all, it is possible to have bilateral treaties between bordering states. In the Northern Seas, this would mean that many different bilateral treaties have to be concluded. Another option is to amend existing treaties,<sup>32</sup> such as the maritime delimitation treaties that are concluded between all North Sea coastal states that border each other. Such amendment processes usually take

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<sup>30</sup> Roggenkamp (1998), p. 100

<sup>31</sup> Norway is the 'sending' state, the state on whose initiative the gas field is exploited. In the Pipeline Agreements, it is stated that the pipelines shall be owned by a Norwegian pipeline company, under Norwegian law, with its central place of business in Norway, being Norwegian resident for tax purposes. This suggests that, as the legal person owning the pipeline has Norwegian nationality, the pipeline itself also has Norwegian nationality. This fortifies the genuine link Norway has with the pipeline. Moreover, as it is Norway's EEZ that is economically exploited and Norway has a larger interest in how this is done as sending state, the balance of interests approach would be in favour of Norway having jurisdiction over the pipeline. This balance of interests is typically more clear in the case of a 'sending' and 'receiving' state. Roggenkamp (1998), p. 103, 1973 Ekofisk Pipeline Agreement, art. 3.

<sup>32</sup> As described in the Vienna Convention on the Law of Treaties, Vienna, 1969, part IV.

a long time but it might, in some cases, be more acceptable to governments than drafting an entirely new treaty. On the other hand, revision of a treaty requires both parties to agree, and opening negotiations on a treaty that primarily has another purpose, i.e. maritime delimitation, might in practice cause more discussion between states than an entirely new treaty with one specific topic. A third option is to have one multilateral treaty for all states bordering the Northern Seas. The drafting process for multilateral treaties is more difficult than for bilateral treaties, as multiple parties are involved and might have different, contradicting opinions.

An approach that goes a step further than an international agreement, but in the same direction of ‘active’ solutions, is to harmonise substantive national law applicable to electricity cables. This solution will help to avoid possible legal conflicts because the legal framework of one state does not differ anymore from the other state. Some topics are already harmonised or are relatively easy to harmonise, in the interest of all states involved. Examples are technical requirements and safety standards. Other substantive law is much harder to harmonise, especially where it concerns fundamental differences between countries and their legal systems. One example is the rules on who can own such cables and substations or regarding how they are financed in the different countries. Even if all rules are harmonised, there can still be complicated issues, such as which state can impose taxes on which activity. Moreover, this would also require harmonisation of all possible future laws relating to these cables. In any case, the harmonisation of substantive national law is a very far-reaching approach to the problem of jurisdiction, which will take many years to complete.

#### Interim conclusions for the second topology:

- **Multiple states can possibly claim jurisdiction over (part of) the cables. This creates legal uncertainty.**
- **There are several solutions to this, namely self-restraint of the states involved, harmonisation of applicable laws and treaties that specifically address jurisdiction.**
- **Treaties that specifically address jurisdiction have proven their use in the oil and gas sector.**
- **Although they will probably be more complicated to negotiate for electricity cables, they will clarify the legal situation of offshore cables and thus reduce legal uncertainty.**

#### 2.3.3 MESHED MULTI-TERMINAL

The third topology (meshed multi-terminal) introduces a meshed grid as it links different offshore windfarm hubs and countries. In essence, the legal difficulties that appear in the second topology continue to exist in the third topology. Again, different functions of the cables come together and this makes the question whether the cable falls under the jurisdiction of a State, or whether multiple states could have concurrent jurisdiction, more difficult. The fact that the different offshore hubs are connected to each other and to multiple States does not make a difference in this view. However, the more

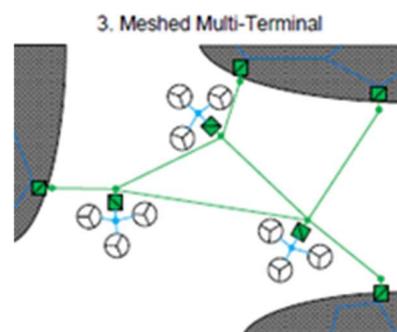


Figure 5: Topology 3. Source: PROMOTioN WP1

States are connected to the meshed offshore grid, the more impact the lack of clarity over the jurisdiction of States over certain cables starts to have.<sup>33</sup>

Before reaching a truly meshed grid, one possible step is the connection of OWFs in two different states. Thus, the situation would be, for example, one country has an OWF-hub with a cable to the shore, another country has an OWF-hub with a cable to the shore, and these OWF-hubs are connected with a separate cable. In that case, both states will be engaged in exploitation of their EEZ and will thus have functional jurisdiction over the cables reaching from hub to shore. However, the cable between the two OWF hubs could be seen either as a variety of the hub-to-shore cable, over which the State would have functional jurisdiction. Alternatively, this cable could also be seen as an interconnector, over which States normally have very limited jurisdiction. This situation would also require the states involved to agree on the extent and division of jurisdiction.

Re-examining the different solutions proposed above, it seems that self-restraint becomes even harder when the grid connects multiple countries instead of only two or three. Thus, an active approach also seems necessary here. When the agreements are bilateral, like with the Norwegian pipeline agreements, only two states need to agree, which makes the negotiation process simpler. However, when the grid connects multiple states, the number of bi/trilateral treaties also becomes much higher. Moreover, if these bilateral agreements differ from each other, the legal framework applicable to the whole grid would become increasingly complicated. Therefore, it might be more effective to create a multilateral treaty clarifying the jurisdiction and related legal issues over the cables at once for all participating states. An approach such as with the Norwegian pipeline agreements could help here: one bilateral treaty can serve as a model for the other bilateral treaties.

#### **Interim conclusions for the third topology:**

- **The uncertainty over jurisdiction as described for topology 2 persists in this topology.**
- **A passive approach would be problematic with regard to legal uncertainty. Therefore, it is not in line with the aim of PROMOTioN/WP7, which is to increase legal certainty.**
- **There is a choice between concluding bi/trilateral treaties between all states, or one multilateral treaty for all states involved, or to amend existing treaties (i.e. maritime delimitation treaties).**
- **The trade-off in this topology is between a simpler negotiating process with a more complex end result (multiple bilateral agreements), and a more difficult negotiating process with a more uniform end result (one multilateral agreement).**
- **Which of these choices is most appropriate for a meshed offshore grid in the Northern Seas should be researched in further detail in further deliverables.**
- **The main topic that should be addressed in such treaties is the division of jurisdiction over the cables. However, other topics (related to governance) can be addressed as well, depending on the will of the parties involved and the nature of the treaty (changing an existing treaty provides less room for this than drafting a specific new treaty).**

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<sup>33</sup> Müller (2016), p. 58.



## 2.4 CONCLUSION ON THE LEGAL FRAMEWORK UNDER INTERNATIONAL LAW

On the basis of UNCLOS, the competences of coastal states differ per maritime zone. Within 12 nautical miles from the shore a coastal state has full territorial jurisdiction, irrespective of the type of cable. Beyond that distance, there is only functional jurisdiction, meaning that a coastal state has the right to legislate over activities that are related to the economic exploitation of that zone but not over other activities. Cables used for the production of electricity fall under functional jurisdiction. Regarding other cables, states can only legislate as far as safety, environmental requirements and delineation of the cable are concerned. This also includes interconnection cables, as they do not serve for the economic exploitation of the EEZ. These two separate legal regimes are reflected in Topology 1A and B.

The second and third topologies combine OWF-hubs with interconnector cables. This creates uncertainty with regard to the scope of the jurisdiction of the states. In such uncertainty, it is possible that multiple states can claim jurisdiction over (part of) the cables, which is called concurrent jurisdiction. From a legal perspective, there are no major differences between topologies 2 and 3, except that in topology 3 more countries are involved. Several solutions to the questions of competence have been proposed, both active and passive. The passive solution is self-restraint of the states that could possibly claim jurisdiction: if they do not make use of their right to claim jurisdiction, there is no problem. However, as this does not make the legal situation explicit, it will not solve the legal uncertainty, and thus, this solution is not in line with the aim of WP7, which is (amongst others) to increase legal certainty. Active options are the adoption of international treaties that specifically address the question of jurisdiction or the harmonisation of substantive laws. The latter option will take a very long time to implement, and is dependent on strong political will, which is often difficult to reach in all involved countries. Considering the need to clarify the legal framework within reasonable time, this option is not preferred for a meshed offshore grid in the Northern Seas.

That leaves the option of concluding (an) international treaty(ies) to clarify the legal situation under international law and to avoid the situation of concurrent jurisdiction. This practice is used in the offshore oil and gas sector for pipelines running from a production facility in one state's EEZ to the onshore system of another state, which has similar legal complications as offshore electricity cables. The experience states have with this practice in the offshore oil and gas sector can serve as an additional benefit to reduce legal uncertainty. International treaties could come in the form of multiple bi- or trilateral treaties or one multilateral treaty. One multilateral treaty will have a longer and more complex negotiations process, but the end result will be more uniform. On the other hand, although different bilateral treaties will be easier to negotiate, the end result will be more complex, with a different legal regime between each combination of states. However, having one model agreement that will be re-used for the next agreements can possibly mitigate that. Alternatively, states can also choose to amend existing treaties, such as the maritime delimitation treaties. However, this can open discussions on other aspects of these treaties as well, which might in fact take longer than concluding separate treaties. Moreover, amending existing treaties provides less room to create an entirely new approach. Which option (i.e. bilateral or multilateral treaty, amendment of existing treaties or new treaty) is most appropriate as a basis of the legal framework has to be subject of further research within the PROMOTioN project WP7.1.



## 3 COMPETENCES UNDER EUROPEAN LAW

### 3.1 INTRODUCTION

All states that fall under the geographical scope of the PROMOTioN project are currently either Member-State of the European Union or member of the European Economic Area (EEA) in which the majority of EU law is also applicable. An important part of the legislation they have in place derives from EU law, be it directly via Regulations or indirectly via transposition of Directives into national law. This is also true for the energy sector, where legislative efforts to create a single energy market date back to the 1990s and a detailed system of EU legislation now is in place.

However, before examining the current body of EU law that is applicable to offshore windfarms and/or to offshore electricity cables, it is necessary to establish whether EU law is applicable to the Northern Seas in the first place. Furthermore, as the EU can only act when the Member States have conferred competence to the EU,<sup>34</sup> it is important to analyse what competences that are relevant for an offshore grid are actually conferred to the EU. This is necessary in order to establish the legal basis of the secondary EU law, both the currently applicable EU law and the potential additions to the legal framework necessary in order to create a well-functioning legal framework for an offshore electricity grid in the Northern Seas.

Therefore, the objective of this part is: first to give an overview of the extent to which the EU has competence to legislate at sea, i.e. whether EU law is applicable to the North Sea; secondly, to address the competences that Member-States have conferred to the EU that might be relevant for legislation concerning an offshore grid; thirdly, to examine the situation for non-EU Member-States, such as Norway in the EEA.

### 3.2 APPLICABILITY OF EU LAW AT SEA

According to the EU founding treaties, EU law is applicable to the Member States of the European Union.<sup>35</sup> Therefore, except for a few specific cases, EU law is applicable to the territory of the Member States. However, it is not evident to what extent EU law is applicable to the Northern Seas. Looking at the different maritime zones, the territorial waters fall under the territory of the Member States, as if it was land territory. Therefore, in that zone, EU law is territorially applicable. It becomes more difficult with the continental shelf and the EEZ. As explained above, the jurisdiction of States in these zones is limited to functional jurisdiction. No further clarity is provided in the EU Treaties, but on the basis of a logical reasoning, it can be found that EU law can only be applicable where its Member States have jurisdiction. This is because only if they have jurisdiction, they are able to transfer their competence to legislate to the EU in a particular field.

<sup>34</sup> The principle of conferral is laid down in the Treaty on European Union (TEU), art. 5(2).

<sup>35</sup> TEU, art. 52; Treaty on the Functioning of the European Union (TFEU) art. 355



There are several cases at the Court of Justice of the EU (CJEU) where the Court had to judge on the applicability of EU law at sea.<sup>36</sup> Although none of these cases dealt specifically with offshore electricity cables, they can still be useful by analogy. The first case that is relevant for the issue of competence of the EU at sea is case C-286/90 *Anklagemyndigheden v Peter Michael Poulsen and Diva Navigation Corp.* (Poulsen). In this case, the CJEU looked at the limits of jurisdiction of a state, and thus of the EU, in the different maritime zones. The case concerned a non-EU fishing vessel that pleaded that its freedom of navigation would be threatened if EU law were applicable to it. Two important conclusions of the Court in this case were first, that the EU has competence to legislate over fisheries in the EEZ, following the jurisdiction of the coastal state, and secondly, that this competence is not absolute but limited by international law, in this case the freedom of navigation.<sup>37</sup> This makes clear that EU law 'follows' national jurisdiction at sea: where states have sovereignty or sovereign rights, the EU also has competence, but where the national jurisdiction is limited by international law, EU jurisdiction is also limited.

The next case with relevance to the competence of the EU at sea relates to the applicability of the Habitats Directive in the EEZ and on the continental shelf of the United Kingdom. According to the European Commission, the UK had unlawfully limited the scope of the Habitats Directive to the territorial zone. The Commission argued that as the UK exercises its sovereign powers beyond the territorial zone and thus, that the Habitats Directive should also apply there, in as far as the UK exercised its sovereign rights. The Court agreed to this reasoning and thus confirmed its earlier stance that EU law 'follows' national sovereignty. Thus, the Habitats Directive was applicable to the maritime zones of the UK in so far as the UK exercised its jurisdiction there.<sup>38</sup>

The first case that deals with offshore cables in the continental shelf is *Aktiebolaget vs. Skatteverket* (2005).<sup>39</sup> Here, the case is about plans to build submarine fibre-optic cables between Sweden and other EU Member States. Such cables would cross the continental shelf beyond the territorial waters. The question at stake is whether this activity is subject to the VAT (Value Added Tax) Directive or not. As the laying of cables cannot be seen as an economic exploitation of the EEZ, and as all states have the right to lay such cables under international law (under certain conditions), this activity does not fall under the exercise of sovereign rights by the Member State. Therefore, the VAT Directive was not applicable. By analogy, this reasoning could be used for interconnector cables, as these cables also do not fall under the economic exploitation of the EEZ. However, this does not hold for cables that are connected with OWFs.

A last case worth mentioning is *Salemink*<sup>40</sup>. This case concerned employment insurances for an employee of an offshore gas production platform. The Court judged that EU law concerning the free movement of persons was applicable here. This is an interesting case because there is no logical link between the activity that constitutes

<sup>36</sup> Müller (2016), p. 68

<sup>37</sup> CJEU, Case C-286/90 *Anklagemyndigheden v Peter Michael Poulsen and Diva Navigation Corp.* (Poulsen) [1992] ECR I-6019, para 24, 25.

<sup>38</sup> CJEU, Case C-6/04 *Commission v. United Kingdom* (Habitats) [2005] ECR I-9017, para 115, 117.

<sup>39</sup> See above, footnote 11

<sup>40</sup> CJEU, Case C-347/10 *Salemink v. Raad van Bestuur van het Uitvoeringsinstituut Werknemersverzekeringen* (Salemink), ECLI:EU:C:2012:17



Member State jurisdiction at sea, namely in this case the production of natural gas, and the part of EU law that was declared applicable to it, namely the free movement of persons.

**Interim conclusion on the applicability of EU law at sea:**

- **The Court uses a consistent line of reasoning on the applicability of EU law at sea.**
- **EU law ‘follows’ national competence: when Member States make use of their sovereign rights at sea, EU law is also applicable to that activity.**
- **Likewise, for activities where the Member State does not have jurisdiction, EU law is also not applicable, which could also apply to interconnector cables.**
- **A link between the activity that constitutes the jurisdiction at sea and the subject matter of the applicable EU law is not necessary.**

### 3.3 COMPETENCES OF THE EU TO REGULATE OFFSHORE GRIDS AND WINDFARMS

According to the principle of conferral, the European Union can only act on the basis of competences given to it by the Member States in the Treaties.<sup>41</sup> EU Competence can be exclusive or shared with the Member States. Three competences are relevant to the offshore grid, namely ‘energy’, ‘trans-European networks’ and ‘environment’. They all fall under the category of shared competence.<sup>42</sup> Therefore, both the Union and Member States may legislate and adopt legally binding acts – but the Member States shall only exercise that competence to the extent that the Union has not exercised it.<sup>43</sup> As soon as the EU decides to act, the Member States’ competence is reduced.

The competence to legislate on a certain area are then further described in specific Treaty articles. Legal instruments with the establishment and functioning of the internal market as their object can be based on art. 114 TFEU. Before the entry into force of the Treaty of Lisbon, EU legislative action in the field of energy was mostly based on this article and thus focused on the internal market for energy. Examples of the use of this legal basis for the energy sector are the Electricity Directive and Electricity Regulation.

The competences the EU has in the energy sector in general are based on art. 194 TFEU, which is newly introduced in the Treaties with the Treaty of Lisbon. It stipulates that Union policy shall aim, amongst other things, to promote the development of new and renewable forms of energy and the interconnection of energy networks.<sup>44</sup> The European Parliament and the Council shall adopt measures in order to achieve these objectives via the Ordinary Legislative Procedure.<sup>45</sup> One important exception to the competence of the EU in the energy field is

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<sup>41</sup> TEU, art. 5 (2)

<sup>42</sup> TFEU, art. 4 (2) e, h and i.

<sup>43</sup> TFEU, art. 2 (2).

<sup>44</sup> TFEU, art. 194 (1) c and d.

<sup>45</sup> TFEU, art. 194 (2).

Member States' sovereignty over how they exploit their energy resources and over the structure of their energy supply.<sup>46</sup>

The EU also has competence to legislate on trans-European networks. Energy infrastructures fall under these networks as well.<sup>47</sup> The Union aims 'at promoting the interconnection and interoperability of national networks as well as access to such networks'.<sup>48</sup> Therefore, the EU shall establish guidelines which cover the objectives, priorities and broad lines of measures and which identify projects of common interest.<sup>49</sup> Moreover, the EU gets a very broad competence in the sense that it 'shall implement any measures that may prove necessary to ensure the interoperability of the networks, in particular in the field of technical standardisation'.<sup>50</sup> An example of legislative action on this legal basis is the Regulation on Trans-European Energy Networks (TEN-E Regulation).

Then, another necessary element is the competence of the EU on environmental issues. This competence is elaborated in art. 191-193 TFEU. Legislation with the goal to preserve, protect and improve the quality of the environment will be based on these articles. Examples are the Renewable Energy Directive as well as the Habitats Directive.

Since there is one treaty article for energy-related acts now, namely art. 194 TFEU, this will most likely be the legal basis for further legal action in the energy sector.<sup>51</sup> However, it could still be that multiple legal bases are possible. For example, the Renewable Energy Directive was drafted partially under the environmental legal basis, and partially under the legal basis for approximation of laws in the internal market.<sup>52</sup> Under EU law, the general doctrine is that the legal basis should be decided on the basis of objective factors, such as in particular the aim and content of the measure.<sup>53</sup> If two legal bases are possible, it should be evaluated on which possible legal basis the proposed act builds most, the so-called 'centre of gravity test'.<sup>54</sup> This should solve most issues. When there is no clear centre of gravity, a legal act can have multiple legal bases.<sup>55</sup> However, recourse to two legal bases is only possible if the procedures for adoption are not incompatible and if the use of two legal bases does not undermine the powers of the Parliament.<sup>56</sup> That is not a problem here, as all legal bases mentioned utilise the same legislative procedure.

#### **Interim conclusion on the competences of the EU to regulate offshore cables and windfarms:**

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<sup>46</sup> TFEU, art. 194 (2).

<sup>47</sup> TFEU, art. 170 (1).

<sup>48</sup> TFEU, art. 170 (2).

<sup>49</sup> TFEU, art. 171 (1).

<sup>50</sup> TFEU, art. 171 (1).

<sup>51</sup> The new legislative proposals in the 'Clean Energy for all Europeans' package all have art. 194 TFEU as their legal basis, except for the Governance of the Energy Union, which has a joint legal basis of 192(1) and 194(2).

<sup>52</sup> At the time the Directive was adopted, articles 175 and 95 TEC, now 192 and 114 TFEU.

<sup>53</sup> CJEU, Case C-300/89 *Commission v. Council* (Titanium Dioxide), [1991] ECR I-2867, para 10.

<sup>54</sup> CJEU, Case C-42/97 *Parliament v Council* [1999] ECR I-869, paras 39 and 40. Case C-36/98 *Spain v Council* [2001] ECR I-779, para 59.

<sup>55</sup> CJEU, Case C-178/03 *Commission v. Parliament and Council* (Dangerous Chemicals) [2006] ECR I-107, para 43.

<sup>56</sup> CJEU, Case C-300/89 (Titanium Dioxide), paras 17-21.



- **The EU can only act where Member States have conferred power to the EU, normally via the EU Treaties (Principle of conferral). Competence can be exclusive for the EU or shared, meaning that Member-States can legislate as far as the EU has not made use of its competence.**
- **Both ‘energy’, ‘trans-European networks’ and ‘environment’ fall under shared competence.**
- **Since the Treaty of Lisbon, ‘energy’ has a dedicated article in the TFEU, art. 194. New measures will most likely be based solely on this article (see ‘Clean Energy for all Europeans’ package).**
- **When multiple legal bases are possible, the ‘centre of gravity’ test dictates that the legal basis that the instrument builds on most should be used. If there is not one centre of gravity, multiple legal bases can be used, but only when the legislative procedures behind the legal bases do not conflict.**
- **There is sufficient legal basis in the existing TFEU articles for the regulation of the offshore grid in the North Sea, no change in competences is needed. However, such regulation still has to follow the general EU principles of subsidiarity and proportionality.**

### 3.4 RIGHTS AND COMPETENCES OF NON-EU MEMBER STATES

The majority of the states in the geographical scope of PROMOTioN are EU Member States. This paragraph aims to explain what differences there are for non-EU Member States. This relates mostly to Norway, and possibly in the future to the UK. After the recent Brexit referendum, the future status of the United Kingdom is not yet clear. Whether or not the current legislation will still be applicable to the UK in a few years’ time will depend on the negotiations between the EU and the UK. As these negotiations are nowhere near their end, any conclusions about the future status of the UK are speculative. Therefore, this document will only focus on the current legal situation. If there will be more clarity about this topic at a later time during the PROMOTioN project, extra information on this can be added later. Therefore, this part focuses only on the EEA Agreement, which is relevant to Norway.

Norway is a special case in the legal framework of EU law on the energy sector. It is part of the European Economic Area, together with Iceland and Liechtenstein and all EU Member-States. Through the EEA Agreement and its first Protocol, the legal rights and obligations in all EU legal instruments mentioned in the Annexes are also applicable to the EEA members.<sup>57</sup> Therefore, legal instruments adopted by the EU are automatically applicable to EU Member-States, but only applicable to EEA States after their adoption in the Annexes. This normally but not necessarily happens when a legal instrument is marked ‘with relevance to the EEA’.<sup>58</sup> It requires a Joint Committee Decision (JCD) to officially incorporate an EU legislative act in the EEA Agreement, either integrally or with adaptations.

This process is very relevant to the substantive EU law on the energy sector. Energy as general topic is incorporated in the EEA agreement, and a separate Annex (Annex IV) exists for all energy-related acts. In general,

<sup>57</sup> EEA Agreement, Brussels, 17-5-1993, art. 7 in combination with Protocol 1 and the Annexes.

<sup>58</sup> Handbook EEA p. 54



the EEA used to adopt the energy law related acts without any problem. However, the Third Energy Package, which will be explained in detail in the next part, is not adopted in the EEA yet. Therefore, for example the Electricity Directive and Regulation of 2009 which replaced the 2003 legislative package are so far not applicable to Norway. Instead, the EEA still follows the rules of the second energy package (2003). However, the EEA is in the process of adopting the Third Energy Package at the moment. The EEA did adopt several other legal instruments, such as the Renewable Energy Directive or the Inter TSO Compensation Mechanism Regulation. The Annex to this document provides an overview of which EU energy law is applicable to Norway and which is not.

#### **Interim conclusions on the rights and competences of non-EU Member States:**

- **Norway is not an EU Member State but member of the European Economic Area. In principle, all legislation concerning the internal market is applicable to the EEA, but not automatically.**
- **It requires a JCD Decision to officially incorporate an EU legislative act in the EEA Agreement.**
- **Concerning the energy sector, most EU acts are incorporated. However, the Third Energy Package is not incorporated yet.**
- **The future legal situation of the UK is too unclear to treat at the moment. This can be addressed at a later time when more information is available.**

### 3.5 CONCLUSION

All states surrounding the North Sea are currently Member-State of the European Union or of the EEA (Norway). This means that much of the national legislation is based on EU-law. This is also the case for the energy sector. However, before going into substantive EU law, the legal basis and competences of the EU with regard to the offshore grid should be investigated. This part focused on the competence of the EU to legislate at sea, the competences of the EU to legislate in the field of energy and infrastructure, and rights and competences of non-EU Member-States.

On the first question, competence of the EU at sea, the conclusion is that EU law 'follows' national jurisdiction. Thus, when an EU Member-State has (functional) jurisdiction over a certain entity or topic, the EU law will also be applicable to this, but only in as far as the EU Member-State makes use of its competence. This rule is derived from case law of the Court of Justice of the EU. In practice, this means that the EU has the competence to regulate hub-to-shore cables, but in principle not interconnectors for which the coastal state itself also only has very limited jurisdiction.<sup>59</sup> Following from case law as well, it can be concluded that there does not need to be a link between the activity that constitutes jurisdiction and the subject matter of the EU legislation.

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<sup>59</sup> However, in practice, it seems that both states and the EU do regulate interconnector cables to some extent, for example with regard to the regulated income or the third party access regime.

Concerning the competences of the EU to legislate in general, it is important to note that the EU only has competence as far as Member-States have conferred that competence to the EU, via the Treaties. The EU thus has competence to regulate over 'energy', 'trans-European networks' and 'environment'. These competences are all shared competences, meaning that both the EU and Member-States can legislate in that area, but that Member-States can only exercise it as far as the EU has not made use of its competence. If multiple legal bases could be used as the basis for a legislative act, the basis that the act relies most on, will be used. If there is no clear centre of gravity, multiple legal bases could be used. However, most new legal acts relevant to the offshore grid in the North Sea will be based on the 'energy' legal basis of art. 194 TFEU.

Most states around the North Sea are EU Member-States. In these states, EU legislation will be applicable automatically, in the case of Regulations, or via compulsory transposition, in the case of Directives. However, Norway is not a member of the EU, but of the EEA. This means that EU legislative acts are applicable to Norway only after adoption in the annexes to the EEA Agreement, via a Joint Committee Decision. Most EU legislative acts related to the electricity sector are also applicable in Norway, but some are not, such as for example the Third Energy Package. An overview of which act is also applicable in the EEA is given in the Annex to this document.



## 4 SUBSTANTIVE EU LAW

### 4.1 INTRODUCTION

The current body of substantive EU law with possible relevance to an offshore HVDC electricity grid is extensive. The aim of this part is threefold: first, to give an overview of the EU acts that are currently applicable to the electricity sector; secondly, to clarify the relevance of these acts to an offshore grid; thirdly, to provide a guide to the key points of the different legislative acts, for as far as relevant to the offshore grid. Several studies have identified regulatory barriers in the current framework under European law.<sup>60</sup> This chapter does not aim to repeat these reports but rather to give an overview of the currently applicable law as a basis for further work in WP7.1. Throughout this chapter, the currently applicable law is described. Nevertheless, where relevant, reference is also made to the recently introduced legislative proposals of the ‘Clean Energy for all Europeans’ package (Winter Package). However, it has to be taken into account that these proposals will still have to go through the entire legislative procedure before being adopted as law. As such, the current proposals can still change significantly over the coming years.

In order to increase clarity as to which legislation covers which topic(s), the acts will be categorised into different thematic subchapters, which follow the ‘building blocks’ of the PROMOTioN project, ‘Offshore Grid Planning’, ‘Offshore Grid Investment / Construction’ and ‘Offshore Grid Operation’. However, some acts cannot be categorised under one of these building blocks, as they span over multiple building blocks or fit to none of them. Therefore, these have been categorised under the chapter ‘General Organisation of the Electricity Sector’.

It must be noted in advance that this chapter uses a broad definition of what is relevant to the offshore grid. Thus, not only documents related to (offshore) transmission of electricity are presented, but also documents related to generation or (wholesale) supply. These subjects cannot be seen in isolation, as they are linked and influence each other. For example, a document with provisions on the requirements for OWFs influences the development and operation of the offshore grid where it requires OWFs to be balancing responsible parties in order for them to be eligible for financial (or other) aid. Similarly, for ‘Offshore Grid Planning’, environmental assessments for OWFs are taken into account as well, as they are a very important step for strategic planning in the North Sea. The geographical locations of the OWF-hubs obviously influence the grid that connects them.

The categorisation in this chapter is made irrespective of the legislative character (i.e. Directive, Regulation, and Network Code). However, the legislative character is clear from the name of the act. Directives form a legislative framework that is transposed into national law of the Member States. Regulations are directly applicable and usually cover a more specific topic. Network Codes are complementary to the existing national rules on the electricity sector and aim to tackle cross-border issues. The relevance of the various Network Codes for the offshore grid varies. Therefore, only a selection of the codes that are most relevant for the offshore grid is

<sup>60</sup> 3E, DWG, DNV GL, ECN, CEPS, NorthSeaGrid Study, Final Report, 24-3-2015, p. 94. See also PwC, Tractebel, Ecofys, Study on regulatory matters concerning the development of the North Sea offshore energy potential, Jan. 2016, p. 92.



presented here. Moreover, only the parts of the Network Codes that are relevant for the offshore grid will be presented below. As Network Codes are very detailed, the description aims to highlight possible points of relevance, rather than a full explanation of all articles.

## 4.2 GENERAL ORGANISATION OF THE ELECTRICITY SECTOR

### 4.2.1 ELECTRICITY DIRECTIVE

The Electricity Directive has the goal to establish common rules for the internal market in electricity.<sup>61</sup> This is the same goal as for the previous Electricity Directives. The 2009 Directive is part of a legislative package, the Third Energy Package, which also includes the Electricity Regulation and the Regulation to create ACER (see below in parts 4.2.2 and 4.2.3), and a Directive and Regulation for the gas sector. The Electricity Directive covers the entire electricity sector, from production to consumer-related issues. However, only the parts on generation and on transmission will be treated here, as they are relevant for the offshore grid.

One very important characteristic of the EU electricity sector is vertical unbundling. This means that the grid-related activities of transmission and distribution are separated from the activities of production and supply. Already with the previous Directives, Transmission System Operators (TSOs) and Distribution System Operators (DSOs) were established.<sup>62</sup> When offshore cables are qualified under national law as part of the transmission grid, which is generally the case,<sup>63</sup> the topic of unbundling becomes very relevant for the offshore grid. This is because such a grid hosts generation activities via OWFs as well as transmission activities, and these two activities will have to be unbundled from each other.

In the current Directive, there are three options for unbundling, namely ownership unbundling, independent system operators or independent transmission operators. In ownership unbundled systems, there is a complete separation of ownership between the production and the transmission companies.<sup>64</sup> The Independent System Operator (ISO) approach separates the grid ownership from the system operation.<sup>65</sup> Grid ownership can thus remain at the production company, but it is operated independently.<sup>66</sup> The drawback from this system is that it creates many difficulties when the grid ownership and grid operation are separated, for example with regard to investment decisions. With the Independent Transmission Operator (ITO) approach, the transmission system and

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<sup>61</sup> Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (*E-Directive*) OJ L 211/55

<sup>62</sup> Directive 96/92/EC, chapter IV and chapter V, Directive 2003/54/EC, chapter IV and chapter V.

<sup>63</sup> In most systems, offshore cables are part of the transmission grid. However, not in all cases. For example, in the Netherlands, before 2016, park-to-shore cables were seen as part of the OWF installation, and therefore not seen as part of the grid. Thus, there was no unbundling requirement for these park-to-shore cables. See Müller 2016, p. 146 and further. However, this legal regime changed with a recent amendment. See also chapter 5.6 (Legal Framework of the Netherlands).

<sup>64</sup> Directive 2009/72/EC, art. 9.

<sup>65</sup> The European ISO system is not to be confused with the American ISO system. Although the abbreviation is the same, there are many differences in practice.

<sup>66</sup> Directive 2009/72/EC, art. 13.

its operation are still part of the vertically integrated company, but many measures described in the Directive should ensure that the system is operated independently from the mother company.<sup>67</sup> Both Ownership Unbundling and the ITO approach are used often. On the contrary, the ISO approach is barely used in the EU. In the legislative proposal for a revision of the Electricity Directive, TSO unbundling and other provisions on TSOs have been brought together in one chapter.<sup>68</sup> There are only minor differences between the current text and the new text with regard to unbundling.

Concerning the generation part of the electricity sector, there are two provisions on new generation capacity, dealing respectively with authorisation procedures for new generation capacity and with tendering procedures for new generation capacity.<sup>69</sup> The authorisation procedure is the default option, and the tendering procedure can be used only when the authorisation procedure does not provide sufficient security of supply. The authorisation procedure shall be decided by Member States on the basis of objective, transparent and non-discriminatory criteria. In the new proposal, only the authorisation procedure is mentioned.<sup>70</sup>

In order to make the internal market for electricity function well, it is indispensable that all relevant parties have access to the transmission and distribution systems under transparent and fair conditions. This is called Third Party Access (TPA) and it is regulated via this Directive, in combination with national laws and decisions on tariffs and other conditions.<sup>71</sup> The tariffs have to be published beforehand and are applicable to all eligible customers of the grid. The Directive also stipulates that TSOs and DSOs may refuse access to the grid where it lacks the necessary capacity. This must be done with duly substantiated reasons for the refusal, and in line with objective and technically and economically justified criteria.<sup>72</sup> There is an important link here with priority access for renewable energy sources, introduced with the Renewable Energy Directive.<sup>73</sup> This is highly relevant for the offshore grid, and will be treated further in part 4.2.4. Again, this is dependent on whether or not the offshore grid in a country is seen as a transmission grid under the national law of the countries involved. If this is not the case, TPA is not applicable.

It is important to make the distinction between connection and access. The Court of Justice ruled in the *Sabatauskas* case, that ‘connection’ is used in a technical context and relates to the physical connection to the system, whereas ‘access’ includes the right to use the electricity system.<sup>74</sup> This means that the TPA regime only relates to the right to use the electricity system and not to the physical connection. Thus, users have right to non-discriminatory access to the system, but the state “may decide that the connection should be made to one or

<sup>67</sup> Directive 2009/72/EC chapter V.

<sup>68</sup> COM(2016) 864 Final, chapter VI, articles 43 – 56.

<sup>69</sup> Directive 2009/72/EC artt. 7-8.

<sup>70</sup> COM(2016) 864 Final, art. 8.

<sup>71</sup> Directive 2009/72/EC art. 32.

<sup>72</sup> *Ibid.*, art. 32 (2)

<sup>73</sup> Under the new proposals, priority access for RES will be scrapped. See COM(2016) 767 Final (Renewable Energy Directive), art. 20.

<sup>74</sup> CJEU Case C-239/07 *Julius Sabatauskas and others* [2008] ECR I-07523, para 42.



another type of system”, as long as this done on the basis of objective and non-discriminatory criteria.<sup>75</sup> This could also be relevant in the context of the connection of OWFs to the offshore grid.

Under the Clean Energy Package, network access is moved to the Electricity Regulation. There, an entire chapter is dedicated to network access and congestion management.<sup>76</sup> This will be dealt with further in chapter 4.2.3.

Another relevant provision for the offshore grid is the promotion of regional cooperation.<sup>77</sup> The Directive promotes regional cooperation as a step towards full internal market cooperation. This relates to the Member States as well as to the National Regulatory Authorities (NRAs), which should facilitate the regional cooperation of TSOs. ACER, the Agency for the Cooperation of European Energy Regulators, must work together with the national regulators to ensure *compatibility* of regulatory frameworks.<sup>78</sup> ACER can even recommend the usage of binding instruments for this.<sup>79</sup> Moreover, the Directive also demands from Member States to establish integrated systems for capacity allocation and network security with two or more countries together (instead of only national systems).<sup>80</sup> This is especially visible in the provisions of various Network Codes, discussed under chapter 4.5. In any case, compatibility of regulatory frameworks is important, as it can take away many potential legal barriers for the offshore grid.

In the new legislative proposals, this article in the Directive is deleted. However, another article in the Directive is amended in order to enhance regional cooperation between regulators.<sup>81</sup> Cooperation between Member States is dealt with in a new proposed Regulation on the governance of the Energy Union.<sup>82</sup> On the other hand, cooperation between TSOs is dealt with in the Regulation, in which Regional Cooperation Centres (ROCs) are established.<sup>83</sup>

#### 4.2.2 ACER REGULATION

Regulation 713/2009, part of the Third Energy Package, establishes an Agency for the Cooperation of Energy Regulators (ACER). The relevance of the ACER Regulation for the offshore grid is indirect: it describes the functions of ACER, and some functions of ACER are relevant for the offshore grid. In concrete terms, this Regulation describes the composition of ACER, its organisation and its tasks, both regarding the cooperation of national TSOs, regarding the NRAs and regarding the terms and conditions for access to cross-border infrastructure. Furthermore, ACER may issue opinions, either requested by one of the EU Institutions or on its

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<sup>75</sup> Ibid., para 47.

<sup>76</sup> COM(2016) 861 Final, chapter III.

<sup>77</sup> Directive 2009/72/EC art. 6

<sup>78</sup> Ibid.

<sup>79</sup> Ibid.

<sup>80</sup> Ibid., art. 6(3).

<sup>81</sup> COM(2016) 864 Final, art. 61.

<sup>82</sup> COM(2016) 759 final, for example, it art. 1, 3, 7, 18.

<sup>83</sup> COM(2016) 861 Final, art. 32. This will be dealt with further in chapter 4.2.3.

own initiative, concerning the purpose for which it is established.<sup>84</sup> ACER does not only cover the electricity sector, but also the gas sector.

Concerning the cooperation of TSOs, ACER advises the Commission on rules of procedure and membership for ENTSO-E, the European Network of TSOs for Electricity. It reviews whether ENTSO-E fulfils its tasks and it provides opinions regarding the Network Codes and the draft annual work programmes. It also participates in the process of drafting Network Codes by submitting framework guidelines, reasoned opinions about draft Network Codes and reasoned opinions where ENTSO-E has failed to implement a Network Code.<sup>85</sup>

Concerning the national regulatory authorities, ACER has the competence to take individual decisions on technical matters, to assist them with good practices and to provide them with a framework to cooperate. It also has the power to give an opinion about the compliance of an NRA's decision with the E-Directive or E-Regulation. Moreover, ACER may decide on conditions for access to, and operational security of, cross-border infrastructure, which is further elaborated in a separate article.<sup>86</sup> This happens only when the responsible NRAs cannot reach an agreement on this by themselves or when they specifically request ACER, and includes issues like capacity allocation, congestion revenues and charges for access.<sup>87</sup> This could be a useful instrument for the offshore grid.<sup>88</sup>

It is important to note that not all competences of ACER can be found in the ACER Regulation. Some are described in other acts. An example is that one important decision-making power of ACER is activated when national NRAs cannot reach an agreement on the cross-border cost allocation (CBCA)<sup>89</sup> for a certain project within six months. In that case, or when NRAs ask this earlier, ACER will make a decision on the CBCA instead.<sup>90</sup> The same happens for exemption decisions for new interconnectors (the so-called 'merchant projects').<sup>91</sup> Moreover, ACER checks the consistency of national ten-year development plans with the EU-wide ten-year network development plan (TYNDP).<sup>92</sup>

In the new legislative proposals, Regulation 713/2009 will be replaced by a new ACER Regulation. The new Regulation largely has the same content as the old Regulation, but with some small textual amendments. Nevertheless, some articles are completely new. The tasks of ACER have expanded since the last Regulation, which is visible in the addition of references to Network Codes and bidding zone review in article 5.<sup>93</sup> Moreover, the focus on regional tasks is augmented. This can be seen in the addition of monitoring of regional tasks by

<sup>84</sup> Regulation (EC) 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators, art. 5.

<sup>85</sup> *Ibid.*, art. 6(4), (5) and (6).

<sup>86</sup> *Ibid.*, art. 7(7) and art 8.

<sup>87</sup> *Ibid.*, art. 8.

<sup>88</sup> Again, provided the offshore grid is a transmission system following national law.

<sup>89</sup> Cross Border Cost Allocation, see chapter 4.4.1 and Deliverable 7.2.

<sup>90</sup> Regulation (EU) 347/2013 of the European Parliament and of the Council of 17 April 2013 on Guidelines for Trans-European Energy Infrastructure (TEN-E Regulation), art. 12(6).

<sup>91</sup> Regulation (EC) 714/2009, art. 17(5), for full citation see *infra*, footnote 77.

<sup>92</sup> *Ibid.*, art. 8(11). For more information on TYNDP, see 4.2.3.

<sup>93</sup> COM(2016) 863 Final, art. 5(2) and (3).



NRAs and coordination of regional tasks by ACER.<sup>94</sup> Additionally, the coordination of new functions such as ROCs and NEMOs is added as task of ACER.<sup>95</sup> Furthermore, generation adequacy and risk assessment methodologies and calculations will also require approval by ACER, which is also added in the Regulation.<sup>96</sup>

#### 4.2.3 REGULATION ON CROSS-BORDER EXCHANGES IN ELECTRICITY

Regulation 714/2009 on cross-border Exchanges in Electricity (E-Regulation), relating to the conditions for access to the network for cross-border exchanges in electricity, is very relevant to the topic of an offshore grid in the Northern Seas, as it specifically regulates cross-border aspects of the electricity sector.<sup>97</sup> This regulation is based on an earlier Regulation that had the same aim.<sup>98</sup> Most of the content is the same as the previous Regulation, but the part on ENTSO-E and on network codes is new to the 2009 version. The current Regulation will be dealt with first. At the end of the chapter, the changes of the new legislative proposal are described.

The Regulation of 2009 provides for the cooperation of the European electricity TSOs through the establishment of the European Network for European Electricity TSOs (ENTSO-E). This is created with the aim to promote cross-border electricity trade, coordinated operation and optimal management of the transmission network and the completion of the internal market in electricity. One of the tasks of ENTSO-E is the development of European network codes (at the initiative of the Commission, and via ACER). These network codes serve specifically to facilitate cross-border trade and transmission of electricity. The Network Codes relevant for the offshore HVDC grid will be treated below.

Another task of ENTSO-E is the development of Ten Year Network Development Plans (TYNDPs) with predictions on the development of electricity supply and demand, and intended changes to the transmission grid.<sup>99</sup> This should also make clear which further investments in transmission infrastructure are necessary. Every two years, a new TYNDP is published, to reflect changing insights in the electricity network development and generation forecasts. Although they are non-binding, TYNDPs are essential for grid planning, especially where it concerns long-term cross-border projects, such as the offshore grid.

Regional cooperation between TSOs is also promoted in this regulation.<sup>100</sup> This cooperation will result in regional investment plans, on which TSOs may take investment decisions. In practice, this regional cooperation is based on five regional groups with synchronous electricity systems.<sup>101</sup> These are Continental Europe; Nordic; Baltic; the UK and Ireland. However, there is also a Voluntary Regional Group for Northern Europe, which includes the Nordic states, Germany, Poland and the Netherlands. This group focuses on HVDC interconnection between the

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<sup>94</sup> Ibid., artt. 6(3) and 7.

<sup>95</sup> Ibid., art. 8 and 9.

<sup>96</sup> Ibid., art. 10.

<sup>97</sup> Regulation (EC) 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003 (*E-Regulation*) OJ 211/55

<sup>98</sup> Regulation (EC) 1228/2003.

<sup>99</sup> Regulation (EC) 714/2009, art. 8(3)b.

<sup>100</sup> Ibid., art. 12.

<sup>101</sup> <https://www.entsoe.eu/about-entso-e/system-operations/regional-groups/Pages/default.aspx>

synchronous system of continental Europe and the Nordic synchronous system. These interconnectors could be in the North Sea. However, this Regional Group thus does not span the entire Northern Seas area, as the UK and Ireland are in different areas.

The Regulation also addresses charges for access to networks in order to create a transparent system across the internal energy market. These charges have to “take into account the need for network security and reflect actual costs incurred insofar as they correspond to those of an efficient and structurally comparable network operator.”<sup>102</sup> This is to prevent ‘gold-plating’ or inefficient use of resources for the TSO’s tasks. The charges shall not be distance-related; instead, they focus on access to the system.

Next to general charges, also congestion revenues are addressed.<sup>103</sup> Congestion occurs when there is more demand than capacity on a certain part of the network, leading to a lack of transmission capacity on certain parts of the grid. Congestion management is the way in which this congestion is handled. Congestion should preferably be solved with methods that do not select and exclude some market participants. Income that stems from congestion revenue shall be used for either guaranteeing the actual availability of allocated capacity or maintaining or increasing interconnection capacities through network investments.<sup>104</sup>

For cross-border connections, an inter-TSO compensation mechanism is put in place to provide for “compensation for costs incurred as a result of hosting cross-border flows of electricity on their networks”.<sup>105</sup> The Regulation allows for guidelines to be made on this issue. This has resulted in Commission Regulation (EU) No 838/2010 of September 23<sup>rd</sup> 2010 on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging which specifies the mechanism laid down in article 13 in greater detail. The Inter-TSO compensation mechanism Regulation is explained in further detail in chapter 4.4.3.

There is a special provision in this Regulation concerning interconnectors. First of all, it is important to look at the definition of interconnectors. Whereas in the Electricity Directive, interconnectors are defined as “equipment to link electricity systems”,<sup>106</sup> the definition is specified for the purpose of Regulation 714/2009 to the following wording: “‘interconnector’ means a transmission line which crosses or spans a border between Member States and which connects the national transmission systems of the Member States.”<sup>107</sup> It is relevant to know whether a certain cable is to be seen as an interconnector, since this has consequences for the applicability of certain rules, such as the rules on congestion revenues and unbundling.

For the development of the offshore grid, an important question to be answered is whether a cable that connects OWF hubs in two countries’ EEZ (hub-to-hub approach) can or will fall under this definition as well. This is

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<sup>102</sup> Ibid., art. 14.

<sup>103</sup> Ibid., art. 16.

<sup>104</sup> Ibid., art. 16(6).

<sup>105</sup> Ibid., art. 18 and 13.

<sup>106</sup> Directive 2009/72/EC, art. 2(14). ‘Electricity Systems’ is not further defined.

<sup>107</sup> Regulation 714/2009, art. 2(1).

dependent on whether the OWF hub is seen as part of the national transmission system of the countries involved or not. However, there is no official definition of national transmission system. One can argue that any cable operated by a TSO that is connected to the main transmission system of a country is part of the national transmission system. In that case, all cables that are not owned and operated by OWF-owners/operators are part of the national transmission system. In that case, even Offshore Transmission System Operators (OFTOs), the operators of specific cables to bring electricity from OWFs to shore in the UK, that are independent of National Grid, the onshore TSO, could be seen as part of the national transmission system. Concluding, if the converter stations and hub-to-shore cables can be seen as part of the national transmission system, the cable between two offshore converter stations can be seen as an interconnector.

For new DC<sup>108</sup> interconnector cables, an exemption regime can be applied at the request of the project promotor. If this exemption is granted, the interconnector does not have to follow the rules of the Regulation concerning congestion revenue (mentioned above), nor the rules concerning unbundling, third party access and the fixing of tariffs by the regulatory authority, as mentioned in the Electricity Directive.<sup>109</sup> This turns them into 'merchant' interconnectors. However, they can only be exempted for a limited amount of time. Nevertheless, there is no legal specification of what entails a limited amount of time in this context.

In any case, in order to obtain the exemption, the interconnector will need to fulfil a list of conditions. First, the interconnector must enhance competition in electricity supply. Secondly, the level of investment risk should be so high that the cable would not be constructed without such an exemption. Thirdly, the interconnector must be owned by a legal or natural person that is at least separate in legal form from the national transmission systems it connects. Fourthly, charges should be levied on the users of the interconnector. Fifthly, cross-subsidizing is not possible: neither capital expenses (CAPEX) nor operational expenses (OPEX) of the new interconnector cable may be financed, wholly or partially, by the charges levied to users of the transmission or distribution grids linked by the interconnector. Finally, the exemption must not be to the detriment of competition, the effective functioning of the internal market or the effective functioning of the regulated systems it connects.<sup>110</sup> Together, these six requirements form a high threshold for interconnectors to be exempted. This is why the system is not often used at the moment.

The new legislative proposal with which this Regulation is amended entails many significant changes. First of all, the Regulation is no longer only on cross-border exchanges in electricity. Instead, its title now reads 'Regulation on the internal market for electricity'.<sup>111</sup> This name change portrays the shift in focus towards a fully-integrated functioning internal market for electricity, rather than national markets with cross-border elements.<sup>112</sup> The Regulation contains a new article that sets out the principles that should govern the electricity market. Such

<sup>108</sup> The general rule is for DC interconnectors. However, in exceptional cases, AC interconnectors can also apply for this exemption. Regulation 714/2009, art. 17(2). Moreover, significant increases of capacity can also benefit from an exemption as if they were 'new' interconnectors. Regulation 714/2009, art. 17(3).

<sup>109</sup> Regulation 714/2009, art. 17(1).

<sup>110</sup> Regulation 714/2009, art. 17(1).

<sup>111</sup> COM(2016)861 final.

<sup>112</sup> This is also one of the goals of the Energy Union, [https://ec.europa.eu/priorities/energy-union-and-climate/fully-integrated-internal-energy-market\\_en](https://ec.europa.eu/priorities/energy-union-and-climate/fully-integrated-internal-energy-market_en).



principles are related to the reflection of supply and demand in prices, participation of consumers, decarbonisation, investment incentives for energy efficiency and indiscriminatory access of all generators to the market. Moreover, the proposal changes the order of the subjects: first, it deals with the electricity markets (balancing, day-ahead and intraday and finally forward markets).<sup>113</sup> These articles are not an adaptation of earlier articles, they are newly added in this Regulation. It is important to note that the Regulation prescribes a clear rule for balancing: every party is responsible for balancing, except when it receives state aid that was approved before the entry into force of this Regulation.

The Regulation then deals with dispatching and re-dispatching. The priority dispatch rules of the Renewable Energy Directive (dealt with further in chapter 4.2.4) will be moved to the Regulation.<sup>114</sup> Moreover, priority dispatch for RES will only be possible for small installations or installations that were commissioned before entry into force of the new Regulation.<sup>115</sup> Network access, previously regulated in the Directive, is now also addressed in this Regulation. This chapter deals mainly with bidding zone delineations and capacity allocation, including cross-zonal capacity allocation across timeframes (after gate-closure of the day-ahead or intraday markets).<sup>116</sup> There are also many new provisions on resource adequacy assessment and reliability, as well as on capacity mechanisms.<sup>117</sup> The chapter on transmission of electricity, which used to be at the beginning of the Regulation, only comes after this now.<sup>118</sup> The provisions on transmission do not change fundamentally. Afterwards, Regional Operational Centres (ROCs) are described.<sup>119</sup> ROCs support regional cooperation between TSOs as they perform certain functions of regional relevance, such as capacity calculation, system models, outage planning coordination and regional crisis management.<sup>120</sup> In the long term, this could be interesting in the Northern Seas region as well. However, at the moment, the geographic scope of ROCs will be defined by ENTSO-E on the criteria of the grid topology (i.e. the amount of interconnection in a certain region), synchronous connection of the system, the size of the region and the geographic optimisation of balancing reserves.<sup>121</sup> The proposal for a regional division will have to be worked out in more detail once the Regulation is adopted. ACER will have to approve the proposal by ENTSO-E.<sup>122</sup>

#### 4.2.4 RENEWABLE ENERGY DIRECTIVE

The Renewable Energy Directive (RED) aims to promote the use of renewable energy.<sup>123</sup> The famous 20-20-20 goals are laid down in this Directive, including mandatory targets per Member-State. One of the goals aims at

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<sup>113</sup> COM(2016)861 final, artt. 4-8.

<sup>114</sup> *Ibid.*, artt. 11 and 12.

<sup>115</sup> *Ibid.*, art. 11(4).

<sup>116</sup> *Ibid.*, artt. 13-15.

<sup>117</sup> *Ibid.*, artt. 18-24.

<sup>118</sup> *Ibid.*, chapter V.

<sup>119</sup> *Ibid.*, artt. 32-44.

<sup>120</sup> *Ibid.*, art. 32 and 34.

<sup>121</sup> *Ibid.*, art. 33.

<sup>122</sup> *Ibid.*, art. 33(2).

<sup>123</sup> Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (*Renewable Energy Directive, RED*), OJ L 140/16.

increasing the RES share in total energy consumption, to an EU average of 20%.<sup>124</sup> This is a big driver for investments in renewable energy, including offshore wind energy. The RED requires Member-States to draft National Renewable Energy Action Plans (NREAPs), in which they indicate how they will reach their targets.<sup>125</sup>

A very interesting feature of the RED is the fact that although the targets are national, Member-States can still help each other in achieving them. For example, if one state has already reached renewable energy consumption beyond its national target, it can transfer renewable energy counting for the national target to other states that might otherwise not be able to reach their target. This can be done in various ways, but the umbrella name is 'cooperation mechanisms'. Potentially, cooperation mechanisms can have a role in the meshed offshore grid, namely in supporting projects with OWFs connected to two or more different Member-States. This is because, in such a case, one important question is to which state's renewable energy target such an OWF would count. With a cooperation mechanism, states can make an agreement on a division of the electricity generated by the OWF, for example on the basis of the relative costs and benefits, or on any other basis that the states involved deem appropriate. This could potentially reduce some barriers related to connecting subsidised OWFs to more than one country.

Several options for cooperation mechanisms have been provided in the Directive. The first cooperation mechanism is statistical transfers between Member States. This is an agreement that will allow part of the renewable energy produced in one State to count for the targets of another state, instead of the targets of the first state, without any physical transfer of electricity.<sup>126</sup> The second mechanism relates to joint projects between Member States, and a variety to this is joint projects between a Member State and a third state.<sup>127</sup> Such projects would allow Member States to participate in renewable energy projects and specify how the generated electricity will be divided to count for the respective national renewable energy targets. Thirdly, it facilitates joint support schemes, where two or more Member States can integrate their entire renewables support scheme.<sup>128</sup> At the moment, however, cooperation mechanisms are not often used. Nevertheless, one successful example of a cooperation mechanism is the joint RES support scheme between Sweden and Norway.

Another provision in this Directive that is very important for offshore wind energy is the provision dealing with access to and operation of the grids.<sup>129</sup> First of all, Member States are obliged to develop their transmission and distribution grid infrastructure in order for it to accommodate the growth in renewable energy generation. Then, Member States are held to ensure that TSOs and DSOs in their territory give guaranteed access to their grids for renewable energy. Electricity from renewable sources should either get priority access or guaranteed access.<sup>130</sup> With this provision in place, RES generators have the security that they will be able to feed the electricity they produce into the network, so that they can sell it on the wholesale market.

<sup>124</sup> Ibid., Annex I, the individual targets per Member-State differ, according to the base scenario and the RES potential of that Member State.

<sup>125</sup> Ibid., art. 4.

<sup>126</sup> RED, art. 6.

<sup>127</sup> RED, artt. 7-10.

<sup>128</sup> RED, art. 11.

<sup>129</sup> RED, art. 16.

<sup>130</sup> RED, art. 16(2)b.

Priority access is very relevant for the offshore grid when it comes to rules about access to the system: when OWFs and interconnection are combined in one cable, the capacity available for interconnection would vary according to how much electricity is produced by the OWFs, and thus how much capacity will be needed for that electricity to access the system. Whether it is possible to reconcile priority access, causing a variable remaining capacity for interconnection, with the rules on cross-border capacity allocation and congestion management is not clear yet.<sup>131</sup> This has to be researched in greater detail.

Additionally, the RED stipulates that Member-States shall ensure priority for RES concerning *dispatching*. This means that when TSOs decide over which generation installations will meet the system load and which will be turned off, RES have priority over conventional energy sources. There is one important condition to priority dispatch for RES: the rule only holds “in so far as the secure operation of the national electricity system permits”. The Directive further obliges Member States to ensure the minimisation of curtailment of RES electricity through grid and market-related measures. However, with an offshore grid, all electricity produced in that grid will be from renewable sources, while at the same time there is no demand for electricity at sea (only in the onshore grids). Therefore, it is not possible to speak of priority dispatch in the offshore grid as such.

The rules on priority access and dispatch reduce the risk on investments for RES, as the certainty that the generated electricity can be sold on the market is increased when the access to the grid is prioritised. However, in a meshed offshore grid where connection of OWFs is mixed with interconnection between countries, clear agreements have to be made. For example, it should be decided whether the full capacity of the cable is available for transportation of the offshore generated electricity (which means that this electricity always has priority access), or whether part of the cable is separated in some way and reserved for interconnection, as is suggested in some studies.<sup>132</sup> This should be examined in more detail.

In the recast of the Renewable Energy Directive, proposed in the ‘Clean Energy for all Europeans’ package, the binding targets at national level disappear for 2030. Instead, a Union-wide target of 27% is aimed at.<sup>133</sup> Member-States submit their contribution in Integrated National Energy and Climate Change Plans.<sup>134</sup> A provision on support schemes is added.<sup>135</sup> It codifies the criteria that are laid down in the Guidelines on State Aid for Environmental Protection and Energy (which will be treated in more detail in chapter 4.2.5). Moreover, an important provision in the proposal is the opening up of national support schemes for applicants from other countries, for 10% from 2021 to 2025 and at least 15% from 2026 to 2030.<sup>136</sup> The energy produced across the border should in principle count towards the RES production percentages of the country that funds the RES.<sup>137</sup> Opening up of the support schemes could help in diminishing the legal barrier that exists for connecting offshore

<sup>131</sup> These rules are stipulated in the Network Code on CACM, which will be dealt with in chapter 4.5.3.

<sup>132</sup> See, for example, NSCOGI Market Arrangements Paper, 31-7-2014, p. 5/6 (virtual case 1).

<sup>133</sup> COM(2016) 767 final, art. 3.

<sup>134</sup> *Ibid.*, art. 3(2).

<sup>135</sup> *Ibid.*, art. 4.

<sup>136</sup> *Ibid.*, art. 5.

<sup>137</sup> *Ibid.*, art. 5(3).



wind in hybrid solutions (i.e. connecting OWFs to interconnectors). A last provision that is relevant for PROMOTiON is that the Directive provides for the streamlining of the permit granting process.<sup>138</sup> This is similar to the current practice for PCI-listed projects (which will be explained in more detail in chapter 4.4.1). Grid access for electricity produced from renewable sources is taken out of this Directive. Instead, it is now adopted in the proposal for a Regulation on the internal electricity market, as discussed above in chapter 4.2.3.

#### 4.2.5 STATE AID (107 TFEU) AND RES SUPPORT SCHEMES

Under the EU Treaties, “any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market.”<sup>139</sup> State subsidies to producers of certain sources of energy, such as RES, could thus in principle fall under this prohibition, as they distort competition with other energy producers, and with the interconnected internal energy market, such subsidies will affect trade between Member States. As offshore wind energy is currently not yet able to effectively compete with conventional sources on the electricity market, the sector needs (financial or other) support to develop. Therefore, it is likely that the offshore grid, especially concerning the OWFs connected to it, will be affected by the rules on state aid.

There are exceptions to the general prohibition of state aid, listed in articles 107(2) and 107(3) TFEU. For example, following art. 107(3)c TFEU, aid to facilitate the development of certain economic activities may be considered compatible with the internal market.<sup>140</sup> This article could be used in order to approve RES support schemes. In order to create legal certainty about whether a state aid measure is prohibited or falls under one of the exemptions, intended aid should be notified by Member-States beforehand.<sup>141</sup> The European Commission, charged with enforcement of the state aid rules, issued guidelines in order to inform governments (and the stakeholders that rely on the subsidies) on how it will deal with support schemes related to environmental protection and energy.<sup>142</sup> Although the guidelines are not legally binding, they do provide an interpretation of the Commission on the legality of RES subsidies. Therefore, they will be treated in more detail below.

The Guidelines indicate that there are certain general requirements for aid to be compatible with the Treaties, and specific requirements for various techniques, amongst others ‘aid to energy from renewable energy sources’ and ‘aid to energy infrastructure’. Concerning the general requirements, the aid needs to contribute to an objective of common interest, and it should be described by states how exactly the measure is expected to contribute to this objective.<sup>143</sup> Moreover, there must be a need for state intervention, for example for the correction of a market failure or another problem that cannot be solved by the market alone.<sup>144</sup> The aid must also be the appropriate

<sup>138</sup> *Ibid.*, art. 16.

<sup>139</sup> TFEU, art. 107(1).

<sup>140</sup> TFEU, art. 107(3)c.

<sup>141</sup> TFEU, art. 108(3).

<sup>142</sup> Communication from the Commission, Guidelines on State aid for environmental protection and energy 2014-2020, 28.6.2014, OJ C 200/01.

<sup>143</sup> *Ibid.*, art. 31.

<sup>144</sup> *Ibid.*, art. 34.



instrument to address the objective mentioned above, compared to other (non-aid) policy instruments as well as different aid instruments.<sup>145</sup> This can be seen as a proportionality test. Finally, there must be an incentive effect, so that the aid induces the receiver to change its behaviour to improve the functioning of a secure, affordable and sustainable energy market.<sup>146</sup> Such an incentive effect does not exist, for example, when the work on the project has already started before the aid was applied for.<sup>147</sup>

There are also specific requirements for aid to RES, either through investment aid or operational aid. It is important that the electricity is sold directly on the market and that it is subject to market obligations.<sup>148</sup> One example is that aid can only be accepted if the beneficiary is responsible for balancing.<sup>149</sup> Moreover, aid will only be allowed if measures are put in place so that “generators have no incentive to generate electricity under negative prices.”<sup>150</sup> This should prevent market distortions that happened through earlier forms of aid. Additionally, from 2017 onwards, aid should in principle only be given through a competitive bidding process, except where this is not possible or would lead to unwanted effect such as strategic bidding or underbidding, resulting in too much aid being given or projects not being realised.<sup>151</sup> Furthermore, not all technologies are fully developed yet, and to compensate this, technology specific tenders can be organised.<sup>152</sup>

Although the Guidelines provide much clarity on whether certain forms of aid will be acceptable or not, new aid will still have to be notified in case it exceeds certain thresholds (investment aid above 15 mln for one undertaking; operating aid for RES with a capacity of more than 250 MW per site; energy infrastructure of more than 50 mln per project) and is not granted on the basis of a competitive bidding process.<sup>153</sup> It thus depends on the case, whether new aid in the context of the offshore grid will have to be notified to the Commission.

Most RES projects that are currently in place profit from aid that was decided upon before the new Guidelines were accepted. Therefore, they don't have to follow the requirements prescribed in the Guidelines. These Guidelines are only relevant for support scheme decisions that were taken after the entry into force of the Guidelines. As such, it will take some time before the measures prescribed in the Guidelines, such as the balancing responsibility for RES projects, are common to the majority of installed RES capacity.

### 4.2.6 REGULATION ON WHOLESALE ENERGY MARKET INTEGRITY AND TRANSPARENCY (REMIT)

The Regulation on wholesale energy market integrity and transparency (REMIT) aims to protect the wholesale energy markets from abusive practices such as market manipulation, insider trading etc. The Regulation is applicable to ‘market participants’, which is defined as any person who enters in transactions on the wholesale

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<sup>145</sup> Ibid., art. 40 and further.

<sup>146</sup> Ibid., art. 49

<sup>147</sup> Ibid., art. 50.

<sup>148</sup> Ibid., art. 124.

<sup>149</sup> Ibid., art. 124(b).

<sup>150</sup> Ibid., art 124(c).

<sup>151</sup> Ibid., art. 126.

<sup>152</sup> Ibid., art. 110.

<sup>153</sup> Ibid., art. 20.



energy market. Relevant wholesale energy products traded on this market are both the supply of electricity where delivery is in the Union and contracts relating to the transportation of electricity, or derivatives of these supply or transportation contracts.<sup>154</sup> This is a very broad definition. Transportation of electricity over offshore cables will also fall under this definition, as this relates specifically to transport between two (or more) bidding zones. Moreover, as the electricity that is produced in OWFs will have to be sold on the wholesale market, REMIT will also be applicable to this activity.

Under Commission Implementing Regulation 1348/2014, which entered into force in October 2015, there is a standard catch-all reporting obligation for contracts. There is a '*de minimis*' provision that indicates that contracts for physical delivery of electricity by a production unit with combined capacity of less than or equal to 10 MW only have to report the contract when this is requested by ACER. However, as OWFs normally have a far greater combined capacity than 10 MW, they do not fall under this exemption. Another exemption is made for intra-group transfers. If the produced electricity is transferred to another company in the same group, there is no notification obligation, until the electricity is traded with a third party. The amount of information that has to be reported differs, based on a division between standard contracts and non-standard contracts.<sup>155</sup> In any case, the information comes down to identification of who is buying, who is selling, and order, contract, option, delivery and lifecycle details. An overview of what information exactly has to be supplied can be found in the Annex to the Implementing Regulation.

## 4.3 OFFSHORE GRID PLANNING

### 4.3.1 ENVIRONMENTAL IMPACT ASSESSMENT DIRECTIVE

The Environmental Impact Assessment Directive obliges Environmental Impact Assessments (EIAs) to be carried out before projects that are likely to have an impact on the environment are approved.<sup>156</sup> The first EIA Directive dates back to 1985 but it has been amended three times since then, leading to a codification of the whole document in 2011,<sup>157</sup> with a revision in 2014. The scope of the EIA Directive is wide; it also covers cumulative effects of projects, and also positive environmental impacts have to be assessed.<sup>158</sup> The types of projects are listed in the Directive in Annexes I and II: Annex I lists activities for which an EIA is compulsory and Annex II lists activities for which the national authorities decide whether an EIA is necessary.

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<sup>154</sup> Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (REMIT), OJ L326/1, art. 2(4).

<sup>155</sup> REMIT, art. 5

<sup>156</sup> Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (EIA Directive), as amended by directives 97/11/EC and 2003/35/EC.

<sup>157</sup> Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, OJ L26/1 28-1-2012.

<sup>158</sup> J.H. Jans, H.H.B. Vedder, European Environmental Law, Europa Law Publishing, 2012, fourth edition, p. 346/347, CJEU Case C-142/07, *Ecologistas en Accion-CODA* [2008] ECR I-06097, para 41.



The following activities have a connection with the offshore grid: In Annex II, “installations for the harnessing of wind power for energy production (windfarms)” are listed.<sup>159</sup> Therefore, the EIA Directive is applicable to windfarms as far as national authorities determine so. There is no specific mention of OWFs, so it seems that these fall under the same rules as onshore windfarms, namely, at the discretion of the national authorities.

Concerning electric cables, in Annex I, there is a mention of *overhead* electrical lines with a voltage of 220 kV or more and a length of more than 15 km.<sup>160</sup> In Annex II 3(b), industrial installations for (...) transmission of electrical energy by overhead cables (projects not included in Annex I) are mentioned. However, there is no similar mention of specifically *underground* (or even sub-sea) cables in either of the Annexes. Interestingly, it is mentioned in a Commission working document on the application and effectiveness of the EIA Directive, as a potential subject of amendment, especially relating to the transboundary nature of the cables.<sup>161</sup> Nevertheless, this has not led to any concrete change in the revision of the EIA Directive of 2014.<sup>162</sup> Therefore, the EIA Directive does not impose EIAs on (offshore) underground electricity cables at this moment.

Yet, there are some ways in which an EIA can still be required for offshore cables. First, where the cables are seen as part of the OWF, such as in the case of inter-array cables<sup>163</sup> or in the case of the Dutch system before 2016,<sup>164</sup> they will be assessed in the context of the EIA of the OWF project.<sup>165</sup> Secondly, in their transposition of the EIA Directive into national law, Member-States may still require EIAs to be carried out for other projects that are not mentioned in the Directive. As such, underground cables can also be included. If these national laws are declared applicable to the EEZ as well, they will still require EIAs for offshore cables (interconnectors as well as hub-to-shore cables).

According to the Directive, the EIA should describe the project itself, the likely significant effects on the environment, measures to avoid prevent or reduce the adverse effects, reasonable alternatives relevant to the project, a non-technical summary and additional information if so required.<sup>166</sup> Any further requirements are laid down through national law. If the developer requests this, the national authority has to give an opinion on the scope and the level of detail it expects from the developer in the EIA.<sup>167</sup>

<sup>159</sup> EIA Directive, Annex II, 3(i).

<sup>160</sup> *Ibid.*, Annex I (20).

<sup>161</sup> Report from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the application and effectiveness of the EIA Directive (Directive 85/337/EEC, as amended by Directives 97/11/EC and 2003/35/EC), COM(2009) 378 final, 23.07.2009, p. 3.

<sup>162</sup> Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014, amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, OJ L 124.

<sup>163</sup> Cables to connect the different windmills in an OWF to each other and to an offshore substation.

<sup>164</sup> See chapter 5.6.

<sup>165</sup> NIRAS, Subsea Cable Interactions with the Marine Environment, Expert Review and Recommendations Report, dec. 2015, p. 65.

<sup>166</sup> EIA Directive, art. 5(1).

<sup>167</sup> *Ibid.*, art. 5(2).



Following the Convention on Environmental Impact Assessment in Transboundary Context (Espoo Convention), states have special duties if the project has transboundary environmental impact.<sup>168</sup> This is reflected in the Directive as well. If the project is likely to affect the environment in another Member State, the Member State in which the project is situated should inform that other Member State, not later than when the public of the own State is informed, so that the other Member State can participate in decision making. However, especially when the North Sea grid is based on bi- or multilateral projects, it is probable that these States will already be informed of possible projects at an earlier stage.

### 4.3.2 STRATEGIC ENVIRONMENTAL ASSESSMENT DIRECTIVE

The Strategic Environmental Assessment (SEA) Directive requires SEAs for public plans and programmes, at national, regional or local level, which are likely to have significant environmental effects.<sup>169</sup> Both plans that are prepared for projects listed in the two Annexes of the EIA Directive, and that are required in light of the Habitats Directive are subject to this obligation.<sup>170</sup> As the EIA is applicable to OWFs as well (including park-to-shore cables), the SEA will also be applicable to public plans and programmes related to these OWFs and the cables related to it.

Similarly to the EIA, the SEA shall be carried out *before* the adoption or submission to legislative procedure of the plan or programme.<sup>171</sup> The SEA should lead to an environmental report, which shall be taken into account in the decision making process around the plan or programme.<sup>172</sup> Also similarly to the EIA Directive, there is a special provision on transboundary consultations, in order for bordering states to have influence on the preparation of the SEA in the form of participation in the consultation process.<sup>173</sup>

### 4.3.3 MARITIME SPATIAL PLANNING DIRECTIVE

The Maritime Spatial Planning Directive aims for a coordinated approach of maritime spatial planning across the EU.<sup>174</sup> Member States will be obliged to install an authority that will draft maritime spatial plans and to submit these plans to the European Commission. Moreover, they will need to share best available data with neighbouring Member States.<sup>175</sup> This should lead to a reduction of conflicts in maritime spatial planning and possibly also to utilisation of synergies across national maritime borders. This can be especially relevant in the context of spatial planning of OWFs and their cables.

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<sup>168</sup> Convention on Environmental Impact Assessment in Transboundary Context, Espoo, 1991.

<sup>169</sup> Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (SEA Directive), OJ L197, 21-7-2001 (SEA Directive), art. 1, art. 2(a)

<sup>170</sup> *Ibid.*, art. 3(1) and (2).

<sup>171</sup> SEA Directive, art. 4(1).

<sup>172</sup> *Ibid.*, art. 5 and 8.

<sup>173</sup> *Ibid.*, art. 7.

<sup>174</sup> Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014, (*Maritime Spatial Planning Directive*) OJ L 257, 28.8.2014.

<sup>175</sup> Maritime Spatial Planning Directive, art. 11.

As the Directive was only adopted in summer 2014, the proposed mechanisms are not already all in place. The deadline for transposition concerning the establishment of a maritime spatial planning authority is September 18<sup>th</sup> 2016.<sup>176</sup> The deadline for establishing the first national maritime spatial plans is scheduled much later, namely in 2021, to allow the national maritime spatial planning authorities to commence their work. Nevertheless, several Member States, such as the Netherlands,<sup>177</sup> Belgium,<sup>178</sup> and Germany,<sup>179</sup> already have such maritime spatial plans in place.

In the national maritime spatial plans the Member-States should take into account “economic, social and environmental aspects to support sustainable development and growth in the maritime sector.”<sup>180</sup> Certain minimum requirements for the plans are listed as well. One important requirement with relevance for the offshore grid is that Member-States have to cooperate with each other in the planning and management process.<sup>181</sup> This should ensure coherence and coordination of the plans, especially where it concerns issues of a transnational nature, such as a meshed offshore grid.

#### 4.3.4 MARINE STRATEGY FRAMEWORK DIRECTIVE

The Marine Strategy Framework Directive aims for adoption of good environmental policy for the marine areas of the European Union.<sup>182</sup> This includes the Northern Seas.<sup>183</sup> There is a strong link between the requirements that Member-States bordering the Northern Seas have according to this Directive and the obligations under international law as signatories of the OSPAR Convention, which guides the international cooperation for protection of the North-East Atlantic.<sup>184</sup> According to DG Environment, OSPAR is willing to facilitate the implementation of the Marine Strategy Framework Directive by the Member-States.<sup>185</sup>

The Directive, as well as the OSPAR Convention,<sup>186</sup> requires Member-States to take measures to preserve the marine environment, and to draft strategies in order to do so.<sup>187</sup> This includes efforts to reduce and prevent the

<sup>176</sup> Ibid. art. 15.

<sup>177</sup> Noordzeeloket, Nationaal Waterplan, [https://www.noordzeeloket.nl/images/Nationaal-waterplan-2016-2021%20H\\_4776.pdf](https://www.noordzeeloket.nl/images/Nationaal-waterplan-2016-2021%20H_4776.pdf) (in Dutch)

<sup>178</sup> Minister van Noordzee, Marien Ruimtelijk Plan voor de Noordzee, [http://economie.fgov.be/nl/binaries/BROCHURE\\_MRP\\_NL\\_tcm325-245492.pdf](http://economie.fgov.be/nl/binaries/BROCHURE_MRP_NL_tcm325-245492.pdf) (in Dutch)

<sup>179</sup> Bundesamt für Seeschifffahrt und hydrographie, Raumordnungsplan Nordsee (Textteil) [http://www.bsh.de/de/Meeresnutzung/Raumordnung\\_in\\_der\\_AWZ/Dokumente\\_05\\_01\\_2010/Anlage\\_Nordsee.pdf](http://www.bsh.de/de/Meeresnutzung/Raumordnung_in_der_AWZ/Dokumente_05_01_2010/Anlage_Nordsee.pdf) (in German).

<sup>180</sup> Ibid., art. 5(1).

<sup>181</sup> Ibid., art. 11.

<sup>182</sup> Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L164/19.

<sup>183</sup> The ‘North East Atlantic Ocean’ includes the Greater North Sea, the Channel, the Kattegat, the Celtic Seas. Directive 2008/56/EC, Marine Strategy Framework Directive, art. 4(1)b and 4(2)a.

<sup>184</sup> Convention for the Protection of the Marine Environment in the North-East Atlantic (OSPAR), Paris, 22-9-1992.

<sup>185</sup> [http://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/ospar/index\\_en.htm](http://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/ospar/index_en.htm)

<sup>186</sup> This chapter further refers only to the obligations based on the Directive, as these obligations are more specific than the obligations under international law.

<sup>187</sup> Ibid., art. 1.

inputs in the marine environment, with a view to phase out pollution. This is relevant for the offshore grid, as pollution is defined as the introduction of human induced substances *or energy* in the marine environment, “which results or is likely to result in deleterious effects such as harm to living resources and marine ecosystems (...).”<sup>188</sup> As such, pollution can also include underwater noise (for example from the construction of the foundations of OWFs or cable laying) and electromagnetic energy and thermal radiation from submarine cables.<sup>189</sup>

Member-States are required to have such a marine strategy that a ‘good environmental status’ of their marine areas will be reached or kept.<sup>190</sup> A good environmental status does not preclude the construction of OWFs or cables, but they should not adversely affect the marine environment, which can be judged by the qualitative descriptors of Annex I.<sup>191</sup> Member-States are bound to establish environmental targets in order to reach this ‘good environmental status’.

There is an important exception to this framework with particular relevance to the offshore grid. If an activity has to take place because of overriding public interest, which results in an inability to achieve the targets, this can be exempted by the Commission under certain conditions. This is possible if the targets cannot be reached as a result of modifications of the physical characteristics of marine waters, brought about by actions taken for reasons of overriding public interest which outweigh the negative impact on the environment, including transboundary impact.<sup>192</sup> The Member-States have to inform the Commission about this.<sup>193</sup> Ensuring a low-carbon energy supply and meeting the climate strategy goals could be seen as overriding public interest. Nevertheless, although such an activity could be exempted from the obligations from the Directive, the Member State should still take appropriate ad-hoc measures in order to keep pursuing the targets and to limit pollution as much as possible.<sup>194</sup> Moreover, States should ensure that the activity does not permanently hinder the achievement of ‘good environmental status’ of the area.<sup>195</sup> In the case of OWFs and subsea cables, there are various ways in which the environmental impact can be mitigated.<sup>196</sup> These measures should, however, also already be taken in line with the EIA Directive. In that sense, the only requirement this Directive adds, is that Member States should adopt these measures in their marine strategies.

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<sup>188</sup> *Ibid.*, art. 3(8)

<sup>189</sup> OSPAR, *Assessment of the environmental impact of cables*, Biodiversity Series, 2009, p. 10-11

<sup>190</sup> Marine Strategy Framework Directive, art. 9.

<sup>191</sup> See for instance, MSFD Annex I (6), (7) and (11).

<sup>192</sup> *Ibid.*, art. 14(1).

<sup>193</sup> *Ibid.*

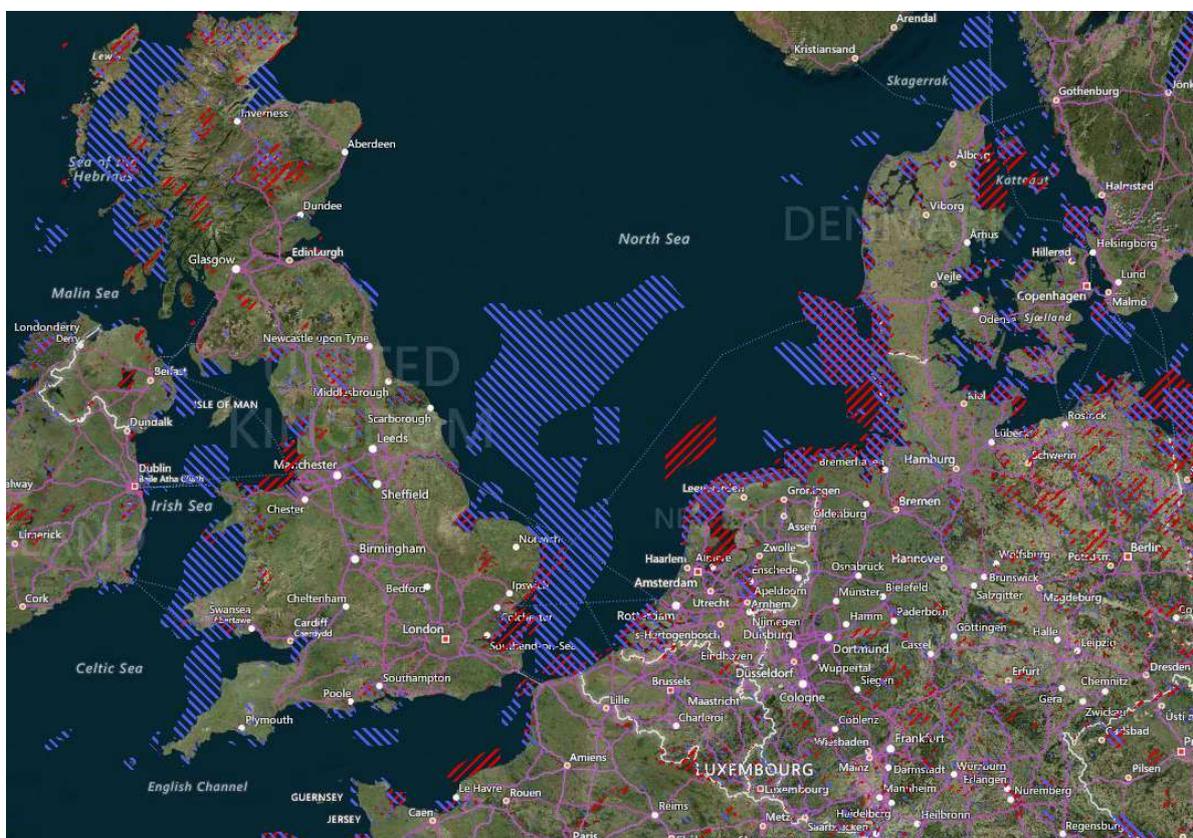
<sup>194</sup> *Ibid.*

<sup>195</sup> *Ibid.*, art. 14(2).

<sup>196</sup> See for instance OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development, 2008-3.

4.3.5 HABITATS DIRECTIVE AND BIRDS DIRECTIVE

The Habitats Directive aims at the conservation of natural habitats and wild flora and fauna.<sup>197</sup> The Birds Directive does the same for wild birds.<sup>198</sup> These two Directives are relevant for offshore wind energy generation and electricity grids in that they designate specific areas as protected zones, which might potentially overlap with possible locations of OWFs or offshore grid activity. The Birds Directive is mainly relevant for the collision danger and other disturbance caused by the wind mills, while the Habitats Directive relates to the underwater construction and maintenance of windmill foundations, substations and subsea cables in these specific areas as well.



Natura 2000 sites in the Northern Seas: blue – designated area under Habitats Directive, red- designated area under Birds Directive. Source: Natura 2000 Network Viewer, visited 14.6.2017.

In these special protected areas, Member States shall take the appropriate measures to minimise pollution, deterioration of habitats and disturbance of the animals. In general, windfarms do not pose a serious threat to

<sup>197</sup> Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (*Habitats Directive*) OJ L 206, 22.7.1992, art. 2.

<sup>198</sup> Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (*Birds Directive*), OJ L 20, 26.1.2010, art. 1.

wildlife, but it all depends on the strategic siting of the windfarm.<sup>199</sup> It is of course advisable to place windfarms outside areas that are of particular importance to biodiversity. However, if this is not possible otherwise, and if there is an overriding public interest, and the procedural safeguards of the Habitats and Birds Directive are followed, an OWF can be placed in a Natura 2000 area, or in an area affecting the Natura 2000 area.<sup>200</sup> These reasons of overriding public interest and procedural safeguards are described in a Guidance document on art. 6(4) Habitats Directive.<sup>201</sup> This includes searching for alternative solutions and compensatory measures to mitigate the adverse effects to the affected Natura 2000 areas.

## 4.4 OFFSHORE GRID INVESTMENT / CONSTRUCTION

### 4.4.1 TEN-E REGULATION

There is a European aim for 10% interconnectivity of Member States' installed capacity of electricity production by 2020.<sup>202</sup> This interconnectivity should lead to trans-European electricity networks. There is a Regulation to facilitate and speed up the process of developing interconnectors, the Regulation on guidelines for Trans-European energy infrastructure (TEN-E Regulation).<sup>203</sup> The TEN-E Regulation has as its main aim to identify projects that will significantly contribute to the interconnectivity of electricity systems in Europe, the Projects of Common Interest (PCIs) and to facilitate the timely construction of these PCIs. This is done by streamlining and accelerating the planning and permitting phase, providing rules for cross-border cost allocation and risk-related incentives and, in certain circumstances, provide financial assistance to certain projects, via the Connecting Europe Facility (CEF).

In practice, the Regulation functions as follows. There is a list of eligibility requirements that projects must adhere to. The Regulation first determines 'priority corridors', and the North Sea Offshore Grid is the first corridor mentioned.<sup>204</sup> Individual PCIs should contribute to either one of these priority corridors. The Annexes of the Regulation contain a list of the PCIs, the so-called 'Union list', organised per priority corridor. The Commission adopts an update of this list every two years, the latest update being of November 18<sup>th</sup> 2015.<sup>205</sup> Projects can become a PCI by application of their project promoter (such as a TSO, DSO or another investor) to the regional group to which the project would belong. After a process of consultation, stakeholder meetings or hearings, the regional group decides which projects become PCIs.

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<sup>199</sup> European Commission, Guidance Document Wind Energy Developments and Natura 2000, 2011, p. 5.

<sup>200</sup> Ibid, p. 63 and further.

<sup>201</sup> European Commission, Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Opinion of the Commission, Jan. 2007.

<sup>202</sup> The European Council of March 2002 already encouraged Member-States to work towards an interconnection target of at least 10%. The October 2014 Council called on States again with the same message, but with a deadline of 2020. The Commission also proposed to the Council to extend this target to 15% in 2030, and will report regularly on this to the Council.

<sup>203</sup> Regulation (EU) 347/2013 of the European Parliament and of the Council of 17 April 2013 on Guidelines for Trans-European Energy Infrastructure (TEN-E Regulation).

<sup>204</sup> TEN-E Regulation, article 1 in combination with Annex 1(1)1.

<sup>205</sup> Commission Delegated Regulation (EU) 2016/89 of 18 November 2015 amending Regulation (EU) No 347/2013 of the European Parliament and of the Council as regards the Union list of projects of common interest.

The benefits of being on the PCI-list on the issue of planning and permitting relate to the project having a 'priority status' in the treatment by national authorities for the permit granting process. This means that the national authorities should 'the most rapid treatment legally possible' to these files.<sup>206</sup> Member States also have to assess whether they can streamline the environmental assessment process by means of legislative and non-legislative measures, and then they have to implement these measures. The Regulation also provides for a one-stop-shop for facilitating and coordinating the permit-granting process.<sup>207</sup> Another very important provision in light of the normally lengthy process of planning and permitting is that there are maximum time limits for PCIs: the pre-application procedure will not take longer than 2 years indicatively, and the period between application and the granting of the permits shall not exceed 18 months.<sup>208</sup> Combined, the two periods shall not exceed 3,5 years, which can be prolonged by 9 months.<sup>209</sup> This should considerably speed up the planning and permitting process that is normally very lengthy. However, the duration of such processes is often increased significantly by administrative appeal procedures and judicial remedies. These are not counted as part of the time limits mentioned above.<sup>210</sup> Therefore, even PCIs might still have very lengthy planning and permitting procedures.

The financial/economic regulatory treatment of PCIs is also described in the Regulation. The Regulation gave ENTSO-E (and ENTSO-G for gas) the task to draft harmonised energy system-wide cost-benefit analysis (CBA), which is developed in the meantime. How CBAs work for the offshore electricity grid is subject of the first deliverable of Task 7.2 and, therefore, will not be dealt with further in this document. Nevertheless, that CBA should show significant positive externalities for the project, in order to pass to the next stage. Then, there should be a cross-border cost allocation (CBCA) decision for the project, that allocates the costs and benefits to the countries involved. Finally, if, although this CBCA should lead to a fair distribution of costs and benefits, the project is still not commercially viable for one (or more) of the parties, according to the business plan and other assessments, the project shall be eligible to apply for funding.<sup>211</sup> The financial assistance that some projects could benefit from, come from the Connecting Europe Facility. However, eligibility to obtain support from this fund is subject to the specific rules of the CEF-Regulation.<sup>212</sup>

#### 4.4.2 COUNCIL REGULATION ON NOTIFICATION OF INVESTMENT PROJECTS IN ENERGY INFRASTRUCTURE

The Council Regulation on notification of investment projects in energy infrastructure follows from the competence of the European Commission to gather information for the performance of the tasks entrusted to it. In practice, the Regulation does nothing more than imposing on the Member States an obligation to share data regarding investment in the development of new energy sources, the transforming of existing infrastructure and

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<sup>206</sup> TEN-E Regulation art. 7(2).

<sup>207</sup> *Ibid.*, art. 8(1).

<sup>208</sup> *Ibid.*, art. 10(1).

<sup>209</sup> *Ibid.*, art. 10(2).

<sup>210</sup> *Ibid.*, art. 10(6).

<sup>211</sup> *Ibid.* art. 14.

<sup>212</sup> Regulation (EU) 1316/2013, establishing the Connecting Europe Facility, amending Regulation (EU) 913/2010 and repealing Regulations (EC) 680/2007 and (EC) 67/2010.



decommissioning of this infrastructure.<sup>213</sup> In order to keep the reporting burden within proportions, Member-States only have to send their data bi-annually.<sup>214</sup>

The aim of the data collection is mainly to monitor the development of production capacity and, related to this, security of supply in the different Member-States.<sup>215</sup> The Commission will then use these data for monitoring and reporting to the Parliament, the Council and the Economic and Social committee. The analysis focuses on whether there are gaps between demand and supply, identifying investment obstacles and providing transparency to market participants and new entrants.

According to the Annex, this Regulation is applicable to windfarms of 20MW capacity or more (3.1), to submarine transmission cables with a capacity of 150 kV or more (3.2), and to PCI-projects (3.2). OWFs typically have a capacity far greater than 20MW, and offshore transmission cables also normally have a higher voltage. Therefore, it is likely that the projects commissioned as part of the Northern Seas meshed offshore grid will be subject to this Regulation.

### 4.4.3 REGULATION ON THE INTER-TSO COMPENSATION MECHANISM

The Inter-TSO Compensation (ITC) Mechanism is mentioned in the Regulation on Cross-border Exchanges in Electricity, but further elaborated in a Commission Regulation.<sup>216</sup> The Inter-TSO compensation mechanism was introduced in order to replace the cross-border access tariff that TSOs (and the tariff-pancaking that existed for trade over multiple borders).<sup>217</sup> The mechanism is mostly in place to compensate TSOs for the losses they have as a result of cross-border flows through their networks and the extra costs incurred by infrastructure reinforcement in order to accommodate these flows. The ITC mechanism started as a voluntary scheme and was made obligatory in 2004, and has since been amended by the current Regulation. The present Regulation presents guidelines relating to the ITC mechanism, including the set-up of an ITC fund, in Annex A, and a common regulatory approach to transmission charging, in Annex B. Although the ITC should also compensate TSOs for current flows, which should rather fall under the next chapter, concerning grid operation, the ITC is also relevant for grid reinforcement, which falls under grid investment and construction. Therefore, this regulation is treated under that chapter.

The ITC mechanism will be relevant for the offshore meshed grid, as there will be cross-border flows over the electricity cables at sea. Especially with the third topology, the meshed multi-terminal grid (Topology 3), where multiple countries can be connected to one hub, calculations will be more complicated compared to purely bilateral

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<sup>213</sup> Council Regulation (EU, EURATOM) 617/2010 of 24 June 2010 concerning the notification to the Commission of investment projects in energy infrastructure within the European Union, art. 1.

<sup>214</sup> *Ibid.*, art. 3.

<sup>215</sup> *Ibid.*, recital (1) to the preamble of the Council Regulation 617/2010.

<sup>216</sup> Commission Regulation 838/2010 on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging, L-250/5.

<sup>217</sup> S. Hadush, C. de Jonge, R. Belmans, The Implication of the European inter-TSO compensation mechanism for cross-border transmission investments, *International Journal of Electrical Power and Energy Systems*, vol. 73, dec. 2015, p. 674.

flows. However, it seems that the ITC is only a very small part of a TSO's costs.<sup>218</sup> In any case, the exact financial implications of the ITC mechanism for the offshore grid are beyond the scope of this document.

There are various criticisms to the ITC, relating for instance to unfair compensations for transit flows, the fund size and the fact that it does not take into account the benefits of the flows.<sup>219</sup> In 2013, ACER recommended to modernise the ITC mechanism to take into account the recent developments, such as CACM methodology,<sup>220</sup> and to provide TSOs with the right incentives to develop their grid.<sup>221</sup> This has, however, not led to any new regulation.

## 4.5 OFFSHORE GRID OPERATION

### 4.5.1 NETWORK CODE ON REQUIREMENTS FOR GRID CONNECTION APPLICABLE TO ALL GENERATORS

A general principle in EU electricity law is non-discriminatory access to networks. Also the Electricity Regulation stipulates that there should be non-discriminatory access to networks for cross-border exchanges in electricity.<sup>222</sup> Harmonised rules for grid access contribute to non-discriminatory access. The aim of the Network Code on requirements for grid connection applicable to all generators is to provide for these harmonised rules.<sup>223</sup>

The Network Code introduces a significant amount of new terminology, necessary for technical accuracy. For example, it has separate chapters on synchronous power-generating modules, power park modules and offshore power park modules.<sup>224</sup> Conventional electricity generation is synchronous, meaning that the frequency of the voltage of the generated electricity and the frequency of the network voltage are constant, and made synchronous.<sup>225</sup> This is not necessarily the case for OWFs, but depends on the technology that is used. If they are non-synchronously (or asynchronously) connected or connected through electronics, and they have a single connection point to the grid, they are 'power park modules'.<sup>226</sup> It is important to note that concerning *offshore* power park modules, the definition is that these power park modules have an offshore connection point.<sup>227</sup> This is relevant as it is also possible that national legislation establishes that OWFs have onshore connection points (the cable transporting the electricity to the onshore connection point being part of the production installation). This is also specifically mentioned in Chapter 4, that is dedicated expressly to offshore power park modules.<sup>228</sup>

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<sup>218</sup> *Ibid.*, p. 682.

<sup>219</sup> *Ibid.*, p. 674.

<sup>220</sup> Discussed further in 4.5.3.

<sup>221</sup> ACER Recommendation 5/2013 'Recommendation on a new regulatory framework for ITC' of 25-3-2013, p. 2.

<sup>222</sup> E-Regulation, art. 14. See also in general E-Directive, art. 5; art. 12(f)

<sup>223</sup> Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators, OJ L112/1 (Network Code on Requirements for Grid Connection).

<sup>224</sup> *Ibid.*, art. 1.

<sup>225</sup> *Ibid.*, art. 2(9).

<sup>226</sup> *Ibid.*, art. 2(17).

<sup>227</sup> *Ibid.* art. 2(18).

<sup>228</sup> *Ibid.* art. 23.

The first chapters in this Network Code treats different configurations of cables. It is clear from art. 23(3)b that also meshed networks that are connected to the onshore grid system at two or more points are foreseen. However, the Network Code refers specifically to AC-connected offshore power park modules. This seems to imply that DC-connected offshore power park modules would follow different rules. Nevertheless, in the HVDC Network Code, see below under 4.5.2, the articles on AC-connected offshore power park modules are declared applicable to DC-connected offshore power park modules as well, although there are also extra rules specifically for DC-connected modules.<sup>229</sup>

The requirements that this Network Code lays down to AC-offshore power park modules (and DC-offshore power park modules via the HVDC Network Code) are related to many aspects that have to do with the stability and safety of the grid. Examples are frequency stability, voltage stability, robustness, fault-ride-through, system restoration and general system management. It goes beyond the scope of this document to treat all these requirements in detail.

### 4.5.2 NETWORK CODE ON HVDC GRID CONNECTION

The Network Code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (Network Code on HVDC Grid Connection) has very recently been adopted by the Parliament and the Council and will enter into force at the end of September 2016.<sup>230</sup> It treats HVDC networks and those power park modules that are directly connected to it. As the offshore grid as envisaged by PROMOTiON will be using HVDC as well, this Network Code is very relevant to the project.

The Network Code regulates requirements for HVDC connections, such as for example active power control and frequency support, reactive power control and voltage support, fault ride through capability, control and protection devices. It also dedicates a chapter to DC-connected power park modules. OWFs would fall in this category as well. As described in chapter 4.5.1, there are also extra requirements that are applicable via the Requirements for Grid Connection Network Code. The exact content of the requirements for the systems as well as the power park modules are too technical to treat in detail here.

### 4.5.3 NETWORK CODE ON CAPACITY ALLOCATION AND CONGESTION MANAGEMENT

The Network Code on Capacity Allocation and Congestion Management (CACM) is officially adopted and already entered into force in 2015. It is very important to note the scope of the Network Code: congestion, the situation in which a network cannot accommodate all physical flows requested from the market over it, can exist both inside countries and between countries. This Network Code only regulates capacity allocation and congestion management as a result of international trade, and thus *between* countries, not congestion on the national grid.

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<sup>229</sup> HVDC Network Code, art. 38: "The requirements applicable to offshore power park modules under Articles 13 to 22 of Regulation (EU) 2016/631 shall apply to DC-connected power park modules subject to specific requirements provided for in Articles 41 to 45 of this Regulation."

<sup>230</sup> Commission Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules, L 241/1.



Additionally, the temporal dimension of the scope should be taken into account. This Network Code aims at optimal capacity allocation on cross-zonal capacity on the day ahead and intraday markets.<sup>231</sup> Cross zonal capacity allocation on longer term is regulated via the Network Code on Forward Capacity Allocation (4.5.4), while capacity allocation after intraday gate closure is regulated via the Network Code on Electricity Balancing (4.5.5).

A crucial notion in this Network Code is ‘bidding zone’, as it regulates capacity across bidding zones. It is not defined in the Network Code, but a bidding zone can be described as the largest area in which electricity can effectively be traded without capacity allocation. Bidding zones can follow national borders, which is the case for France and the Netherlands, but can also span over different countries, such as in the case of Germany – Austria – Luxembourg, or the whole island of Ireland. On the other hand, countries can also host multiple bidding zones, for example in Norway, Sweden and Italy. Bidding zones are important for optimal utilisation of the grid and for keeping down balancing costs. The optimal configuration of bidding zones can change over time, and thus, this Network Code requires regular reviews of the bidding zone configuration.<sup>232</sup>

The CACM Network code describes the function of Nominated Electricity Market Operator (NEMO). Whereas the definition of the Network Code is rather vague, NEMOs are basically power markets, such as Nord Pool, EPEX, APX,<sup>233</sup> which are designated specifically by the Member States. Together with TSOs, NEMOs are in charge of market coupling on the day ahead and intraday market.<sup>234</sup> There can be one or multiple NEMOs per bidding zone of the country involved, and it is left to the Member States whether this is a monopoly function or a competitive function where new NEMOs can enter the market. NEMOs are responsible, both on the day ahead and intraday markets, for performing the function of market coupling, matching the orders and allocating cross-zonal capacity.<sup>235</sup> At the same time, TSOs participate in the market coupling through setting requirements for price coupling and for trading matching algorithms.

The Network Code on CACM also regulates the establishment of various terms and conditions or methodologies; it describes the voting procedure and whether approval by all regulators is necessary, or only by the regulators of the region concerned.<sup>236</sup> The exact terms and conditions, methodologies and models required by the Network Code and their functioning go beyond the scope of this document. The same holds for the single price coupling process (both for day ahead and for intraday trade) and for bidding zone configuration. However, they are described extensively in Title 2.

Title 3 deals with costs and congestion revenues. It requires TSOs to implement methodologies for the division of congestion revenues between TSOs, in such a way that it facilitates the long-term development of the grid, allows

<sup>231</sup> Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management, OJ L 197/24, art. 1.

<sup>232</sup> *Ibid.*, art. 32 and further.

<sup>233</sup> A list of NEMOs can be found here:

[http://www.acer.europa.eu/en/Electricity/FG\\_and\\_network\\_codes/CACM/Pages/NEMO%20list.pdf](http://www.acer.europa.eu/en/Electricity/FG_and_network_codes/CACM/Pages/NEMO%20list.pdf)

<sup>234</sup> *Ibid.*, art. 7.

<sup>235</sup> *Ibid.*, art. 2(30) and art. 7(1).

<sup>236</sup> *Ibid.*, art. 9(6) and (7).



financial planning for the TSOs and establishes arrangements with non-TSO parties that own transmission assets (for example merchant interconnectors, see chapter 4.2.3).<sup>237</sup> It also deals with cost recovery related to the costs the TSOs have to make for the market coupling.<sup>238</sup> At the end, there are two Titles in the Network related to monitoring of the implementation of the Network Code and transitional and final provisions.

The exact effects of the CACM Network Code (and terms and conditions or methodologies it requires) depend on various decisions that still have to be made, such as whether an offshore grid would operate in its own bidding zone or whether it will be part of one of the coastal States' bidding zones. However, these decisions, and in general the elaboration of the Network Code in practice are more of an economic nature than of a legal nature and will be assessed more in the context of WP7.2.

#### 4.5.4 NETWORK CODE ON FORWARD CAPACITY ALLOCATION

The Network Code on Forward Capacity Allocation deals with long term transmission rights on the forwards market.<sup>239</sup> The Network Code sees on “the establishment of a common methodology to determine longterm cross-zonal capacity, on the establishment of a single allocation platform at European level offering long-term transmission rights, and on the possibility to return long-term transmission rights for subsequent forward capacity allocation or transfer long-term transmission rights between market participants.”<sup>240</sup>

There are many cross-references between this Network Code and the Network Code on CACM. For example, this Network Code requires the establishment of common terms and conditions or methodologies, with a procedure that is very similar to the CACM Network Code.<sup>241</sup> Moreover, the capacity allocation regions are the regions decided by the CACM Network Code.<sup>242</sup> The same holds for bidding zones.<sup>243</sup>

One key point of the Network Code for Forward Capacity Allocation is the establishment of a ‘single allocation platform’, which should be operational in at most two years after entry into force of the Network Code.<sup>244</sup> A single allocation platform is the European platform, established by the TSOs, on which the forward capacity is allocated.<sup>245</sup> Forward capacity is allocated through an auction, before the day-ahead timeframe.<sup>246</sup> This single allocation platform is a step in the direction of removing barriers for cross-border (cross-zonal) electricity trade. This is also relevant in the context of the offshore grid, that has interconnection capacity to allocate.

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<sup>237</sup> Ibid., art. 73.

<sup>238</sup> Ibid., art. 74-80.

<sup>239</sup> Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation, OJ L-259/42.

<sup>240</sup> Network Code on Forward Capacity Allocation, art. 1(1).

<sup>241</sup> Ibid., art. 4.

<sup>242</sup> Ibid., art. 8.

<sup>243</sup> Ibid., art. 27.

<sup>244</sup> Ibid., art. 48.

<sup>245</sup> Ibid., art. 2(4).

<sup>246</sup> Ibid., art. 2(1).

#### 4.5.5 NETWORK CODE ON ELECTRICITY BALANCING (NOT YET FORMALLY INTO FORCE)

The Network Code on electricity balancing is currently waiting for adoption by the European Parliament and the Council before it enters into force. The description below is thus based on the version accepted by the Member States, which is the final draft of March 16<sup>th</sup> 2017.<sup>247</sup> The Network Code on Electricity Balancing is applicable to the entire network of the participating TSOs and regulates all aspects related to balancing from a cross-border perspective.

Balancing is currently defined as “all actions and processes, on all timelines, through which TSOs ensure, in a continuous way, the maintenance of system frequency within a predefined stability range”.<sup>248</sup> However, for HVDC grids, there is no system frequency. Moreover, where the Network Code refers to DC, it is only in the case of DC interconnectors. This Network Code does not yet take into account the utilisation of DC circuits for other purposes than interconnectors. Nevertheless, with significant offshore wind on an offshore DC grid, also some kind of balancing capacity will be needed. It should be researched further to what extent this could be covered in the context of the current Network Code.

TSOs have one or several scheduling areas. They have the responsibility to procure balancing services for these areas.<sup>249</sup> The possibility to exchange balancing capacity between two scheduling areas is provided for in the Network Code.<sup>250</sup> If TSOs are willing to engage in this, they can develop a proposal to harmonise their rules on balancing in order to make this possible. Balancing capacity can also be transferred by balancing services providers within the balancing area, under certain conditions and time limits.<sup>251</sup>

One important aim of the Network Code is to create a European Platform for the Exchange of Balancing Energy.<sup>252</sup> This platform will be operated by the TSOs jointly, or by an entity created by the TSOs.<sup>253</sup> Within six months after entry into force, the TSOs should create a framework for this platform, including a roadmap for implementation and proposals for governance rules for such a platform. Moreover, a platform will be created for the imbalance netting process.<sup>254</sup>

Furthermore, the Network Code requires TSOs to make terms and conditions related to balancing within six months after entry into force of the code, both for the balancing service providers and for the balancing responsible parties.<sup>255</sup> Their respective roles are also described. The Network Code leaves it open which market model is used for balancing. Likewise, both TSO-TSO and TSO-Balancing System Provider relations for exchange of

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<sup>247</sup>To be found at:

[https://www.entsoe.eu/Documents/Network%20codes%20documents/NC%20EB/Informal\\_Service\\_Level\\_EBGL\\_16-03-2017\\_Final.pdf](https://www.entsoe.eu/Documents/Network%20codes%20documents/NC%20EB/Informal_Service_Level_EBGL_16-03-2017_Final.pdf)

<sup>248</sup> Network Code on Electricity Balancing, Final Draft, art. 2.

<sup>249</sup> *Ibid.*, art. 4, 16-18.

<sup>250</sup> *Ibid.*, art. 33(1).

<sup>251</sup> *Ibid.*, art. 34.

<sup>252</sup> *Ibid.*, art. 19.

<sup>253</sup> *Ibid.*, art. 19(2).

<sup>254</sup> *Ibid.*, art. 22.

<sup>255</sup> *Ibid.*, art. 4.

balancing capacity are provided for. Nevertheless, the Network Code aims to harmonise the imbalance settlement period to 15 minutes within three years after entry into force of the Network Code.<sup>256</sup> However, TSOs from a synchronous area may ask for an exemption from this requirement.

## 4.6 CONCLUSION

A meshed offshore HVDC grid can be linked to an extensive amount of substantive EU law. Not only acts related to the organisation of the electricity sector are relevant, but also for example spatial planning and environmental protection, and state aid law. This part of the deliverable was aimed at giving an overview of the substantive EU law that is (potentially) applicable to the offshore grid. In order to keep the collection of information manageable, this is limited to those acts that have a direct link to either offshore generated renewable electricity or to the electricity system to connect them, or both. This still leaves ample relevant substantive law to describe.

The assessment of the applicable law shows that there is a multitude of requirements for the governments, TSOs, NRAs and OWF developers listed in this part. There are also various instances where it is not yet clear how the legislation will apply to the offshore grid. For example, it is clear what provisions are applicable to interconnectors, but it is not fully clear whether electricity cables between hubs within a meshed offshore grid will be seen as interconnectors or as another type of cable. In other instances, the legal instruments are there, but it is not yet clear whether, and how, Member States will make use of the instruments. An example is the system of cooperation mechanisms, introduced in the Renewable Energy Directive, which could be of use to the offshore grid, but this depends on whether the countries involved make use of the system. Furthermore, several acts are so recent, that they barely entered into force or have not yet produced the plans, rules or reports that are described. Examples are the Network Codes, in which TSOs are asked to produce terms and conditions in the coming few years, but also the Maritime Spatial Planning Directive, which requires transposition and formation of Maritime Spatial Planning Authorities by September 2016, but which only requires the first Spatial Plans by 2021.

This winter, a legislative proposal, the 'Clean Energy for All Europeans' package, was published. It contains proposals to replace or amend amongst others the Electricity Directive, Regulation on cross-border electricity exchange, Renewable Energy Directive and the ACER Regulation. Although the proposals will first have to go through the ordinary legislative procedure and treatment of the proposals in the European Parliament and the Council will probably lead to significant changes again, the legislative changes will have significant impact on the legal framework for offshore wind energy and an offshore grid. The process of adoption of the new Directives and Regulations will be followed closely in WP7.1.

**This leads to four conclusions on the legal framework of substantive EU law for the meshed HVDC offshore grid:**

- **The legal framework still needs to be clarified on various points (see Key Take-aways)**
- **The framework needs to be filled in with terms and conditions (Network Codes) and national plans**

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<sup>256</sup> Ibid., art. 53.

- **The application of the legal framework to the offshore grid is to a large extent dependent on how Member States, NRAs and TSOs make use of it. This is the subject of the next chapter.**
- **The legislative changes of the ‘Clean Energy for all Europeans’ package will significantly impact the legal framework for offshore wind energy and offshore grids. They will be followed closely in WP7.1.**



## 5 COUNTRY-SPECIFIC LEGAL FRAMEWORKS

### 5.1 INTRODUCTION

This chapter sets out the national legislative frameworks of several Northern seas coastal States, namely Belgium, Denmark, France, Germany, the Netherlands, Norway, Sweden and the United Kingdom, with regard to the planning, construction and operation of offshore windfarms (OWFs) and offshore grids. These countries are chosen because they are situated in key positions around the North Sea. Therefore, they could greatly contribute to the formation of an offshore electricity grid. However, it is not only the geographical location of a country that matters for its possible contribution to the offshore grid. A legal framework that incentivises coordinated grid planning with clustering of OWFs and integration with interconnectors matters as well. The country-specific subchapters are in alphabetical order.

The aim of this chapter is to identify which legal system or lack of legal system facilitates the development of offshore meshed grids and which could hold back the development of an offshore meshed grid or form a legal barrier. A legal barrier can be a choice for a particular legal system that holds back offshore grid development in one country or an incompatibility between the legal systems of different countries although the legal systems themselves are not problematic. The investigation of legal barriers in this deliverable is done in two steps. First, an overview of the national regulatory regimes is given in chapter 5. Secondly, an analysis and comparison of the national regulatory regimes is provided in chapter 6. This part thus consists of a chapter with the country-specific legal frameworks, organised first per country and then per topic, and a chapter with analysis and comparison. Moreover, topic-based overviews of the national regulatory regimes are provided in the Annex to the deliverable.

The country-specific information includes various topics. First, a short general overview of offshore wind energy and a general overview of the applicable laws will be given. Then, several aspects related to offshore grid planning are treated: maritime spatial planning, licensing and permitting procedures and renewable energy subsidy schemes relevant for offshore wind. Then, offshore grid construction topics are addressed: the legal classification of different grid components and the possibility of clustering of OWFs. Lastly, a description of the decommissioning regime is given. The chapter concerning analysis and comparison of the national legal frameworks is also structured according to these three main topics. 'Offshore grid operation' is treated in a separate chapter afterwards.



## 5.2 LEGAL FRAMEWORK OF BELGIUM

### 5.2.1 INTRODUCTION

Although the Belgian maritime space is relatively small, Belgium dedicated several large areas to offshore wind energy in the EEZ already. Belgium currently has an installed capacity of 712 MW, divided over six OWFs.<sup>257</sup> In order to avoid visibility from the shore, most OWFs are planned outside the territorial sea.<sup>258</sup> Belgium has a renewable energy target of 13% in 2020 under the Renewable Energy Directive.<sup>259</sup> The current plans for offshore wind energy, including the already installed capacity and areas for which concessions have been issued, amount to approximately 2 GW.<sup>260</sup> When technical improvements allow for a higher capacity per km<sup>2</sup>, this will increase the projected installed capacity, as the exact areas for offshore wind are already set and will not decrease.<sup>261</sup>

A specific characteristic of Belgium is that it has a federal system with regional authorities. The regulation of renewable energy is a task normally given to the regional authorities.<sup>262</sup> However, the regional authorities are only competent within the geographic area of their region. Thus, offshore wind energy, both in the EEZ and in the territorial sea, falls outside that system and is dealt with on federal level.<sup>263</sup> The competent regulator for the energy activities on federal level, such as the high voltage transmission grid and offshore wind energy, is the Commission for the Regulation of Electricity and Gas (CREG). The TSO of the high voltage grid is Elia.

The main legislation relevant for this topic can be found in the Electricity Act of Belgium, the 1999 Act on the organisation of the electricity market.<sup>264</sup> There is an act on the protection of the maritime environment that is relevant for maritime spatial planning (*Wet Marien Milieu*).<sup>265</sup> The Belgian maritime spatial plan is based on a Royal Decree of March 20<sup>th</sup> 2014.<sup>266</sup> The support scheme for offshore wind is based on a Royal Decree, dated July 16<sup>th</sup> 2002, in combination with the Electricity Act.<sup>267</sup>

<sup>257</sup> WindEurope, *The European Offshore Wind Industry, Key Trends and statistics 2016*, published January 2017 (hereinafter: WindEurope, Statistics 2016), p. 18.

<sup>258</sup> Only the domain of planned OWF Northern lies partially within the 12 mile zone.

<sup>259</sup> Renewable Energy Directive, Annex I.

<sup>260</sup> [http://economie.fgov.be/nl/ondernemingen/energie/hernieuwbare\\_energie/offshore\\_windenergie/#.WlizGVMrLcs](http://economie.fgov.be/nl/ondernemingen/energie/hernieuwbare_energie/offshore_windenergie/#.WlizGVMrLcs) (in Dutch).

<sup>261</sup> *Ibid.*

<sup>262</sup> Bijzondere Wet van 8 augustus 1980, BS 15-8-1980, p. 9434, art. 6 par. 1 VII.

<sup>263</sup> [http://economie.fgov.be/nl/ondernemingen/energie/hernieuwbare\\_energie/offshore\\_windenergie/#.WHS-rIMrLcs](http://economie.fgov.be/nl/ondernemingen/energie/hernieuwbare_energie/offshore_windenergie/#.WHS-rIMrLcs) (in Dutch).

<sup>264</sup> Wet van 29 april 1999 betreffende de organisatie van de elektriciteitsmarkt, [http://www.ejustice.just.fgov.be/cgi\\_loi/change\\_lg.pl?language=nl&la=N&table\\_name=wet&cn=1999042942](http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&table_name=wet&cn=1999042942).

<sup>265</sup> Wet tot wijziging van de wet van 20 januari 1999 ter bescherming van het marine milieu in de zeegebieden onder de rechtsbevoegdheid van België, wat de organisatie van de mariene ruimtelijke planning betreft, 20 juli 2012 (*Wet Marien Milieu*) [http://www.ejustice.just.fgov.be/cgi\\_loi/change\\_lg.pl?language=nl&la=N&cn=2012072039&table\\_name=wet](http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=2012072039&table_name=wet).

<sup>266</sup> Koninklijk Besluit van 20 maart 2014/ Arrêté royal de 20 mars 2014, [http://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth\\_theme\\_file/19086901/Koninklijk%20Besluit%20MRP.pdf](http://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/19086901/Koninklijk%20Besluit%20MRP.pdf)

<sup>267</sup> Koninklijk besluit betreffende de instelling van mechanismen voor de bevordering van elektriciteit opgewekt uit hernieuwbare energiebronnen, 16-7-2002, (hereinafter: Royal Decree 16-7-2002) Elektriciteitswet, art. 7.

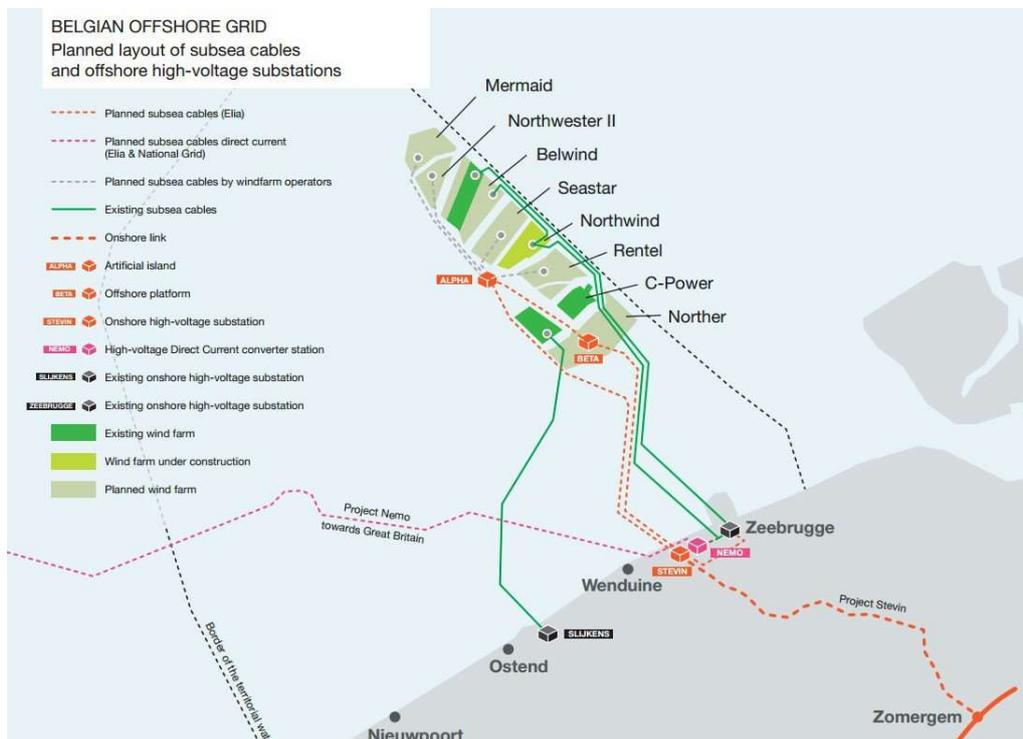


Figure 6: Planned layout of OWFs, subsea cables and offshore high voltage substations. Source: Elia.

## 5.2.2 OFFSHORE GRID PLANNING

### 5.2.2.1 MARITIME SPATIAL PLANNING

Maritime space in Belgium is relatively small but intensively used, for example for navigation to the large ports in the area. Therefore, Belgium drafted a master plan for the North Sea already in 2003. This plan attempted to balance the different interests with regard to maritime space. It also included a concrete delineation of offshore wind energy zones. However, it was not a document with an official legal basis. Therefore, in 2012, the Marine Environment Act was amended to make an official maritime spatial planning possible.<sup>268</sup> Concessions for OWFs have already been issued on the basis of the master plan of 2003. Therefore, the OWF locations in the official maritime spatial planning are the same as in the master plan of 2003.

The entity in charge of drafting maritime spatial plans is the Maritime Environment Service of the Directorate General for the Environment. The first plan that was drafted on the basis of the Marine Environment Act was approved in 2014.<sup>269</sup> The plan includes strategic objectives, information monitoring, but also mainly concrete delimitations of different maritime zones.<sup>270</sup> It designates zones for offshore wind energy but also for fishing, nature conservation areas and navigation. In the appendix, also a long-term vision on maritime policy is included. The

<sup>268</sup> Wet Marien Milieu, art. 7, changing art. 5(bis) of the original act.

<sup>269</sup> Koninklijk Besluit van 20 maart 2014 tot vaststelling van het marien ruimtelijk plan, [http://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth\\_theme\\_file/19086901/Koninklijk%20Besluit%20MRP.pdf](http://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/19086901/Koninklijk%20Besluit%20MRP.pdf)

<sup>270</sup> Ibid.

territorial scope is the entire Belgian maritime territory, both the territorial sea and the EEZ.<sup>271</sup> The maritime spatial plan is revised at least every six years and updated where necessary.<sup>272</sup>

#### 5.2.2.2 LICENSING AND PERMITTING PROCEDURES

As mentioned before, the Belgian government has designated specific areas for offshore wind energy. Parties interested in constructing and operating an OWF apply for a domain concession for the particular area in which they would like to build.<sup>273</sup> This concession application needs to be published in a register for concession applications.<sup>274</sup> In this way, potential competitors can apply to enter into competition and send their own application for the domain involved.<sup>275</sup> Concessions are thus handled in an open-door procedure. After this, the application(s) are sent to the responsible departments, which will advise the minister on a decision.<sup>276</sup> Although the federal minister is officially responsible for the approval, the CREG takes care of the approval process.<sup>277</sup>

The concession includes specific conditions on timing: the exploitation phase of the concession has to start within three years after the official award of the concession.<sup>278</sup> Moreover, the total term of the concession is 20 years, which can be prolonged once to 30 years.<sup>279</sup> After this period, OWFs have to be decommissioned.

Domain concessions also include a description of the cable trajectory, as under the current system, the project developer is also responsible for the cable. However, this will probably change within the coming few years. This will be discussed further in chapter 1.1.3. Nevertheless, the construction of electricity cables (as well as pipelines and telecommunication cables) requires another permit under another Royal Decree.<sup>280</sup> Furthermore, it is interesting to note that there is a separate royal decree for hydro-electric storage at sea, for which a separate permit can be obtained.<sup>281</sup> Hydro-electric storage at sea is also included in the maritime spatial plan.

<sup>271</sup> Ibid.

<sup>272</sup> Wet Marien Milieu, art. 7(2).

<sup>273</sup> Domain Concession: on the basis of Koninklijk besluit betreffende de voorwaarden en de procedure voor de toekenning van domeinconcessies voor de bouw en de exploitatie van installaties voor de productie van elektriciteit uit water, stromen of winden, in de zeegebieden waarin België rechtsmacht kan uitoefenen overeenkomstig het internationaal zeerecht, BS 30.12.2000, p. 43557.

[http://www.ejustice.just.fgov.be/cgi\\_loi/change\\_lg.pl?language=nl&la=N&cn=2000122035&table\\_name=wet](http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=2000122035&table_name=wet)

<sup>274</sup> Ibid., art. 5(2).

<sup>275</sup> Ibid., art. 7.

<sup>276</sup> Ibid., art. 8-9.

<sup>277</sup> PwC, Tractebel, Ecofys, Study on regulatory matters concerning the development of the North Sea offshore energy potential, January 2016, p. 205.

<sup>278</sup> Royal Decree 30.12.2000, art. 14(4).

<sup>279</sup> Ibid., art. 13.

<sup>280</sup> Koninklijk besluit betreffende de nadere regels voor het leggen van kabels die in de territoriale zee of het nationaal grondgebied binnenkomen of die geplaatst of gebruikt worden in het kader van de exploratie van het continentaal plat, de exploitatie van de minerale rijkdommen en andere niet-levende rijkdommen daarvan of van de werkzaamheden van kunstmatige eilanden, installaties of inrichtingen die onder Belgische rechtsmacht vallen, BS 09-05-2002, p. 19339, [http://www.ejustice.just.fgov.be/cgi\\_loi/change\\_lg.pl?language=nl&la=N&cn=2002031237&table\\_name=wet](http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=2002031237&table_name=wet)

<sup>281</sup> Koninklijk besluit betreffende de voorwaarden en de procedure voor de toekenning van domeinconcessies voor de bouw en de exploitatie van installaties voor hydro-elektrische energie-opslag in de zeegebieden waarin België rechtsmacht kan uitoefenen overeenkomstig het internationaal zeerecht, BS 06-06-2014, p. 43599.

The construction of OWFs, as well as the laying of cables and various other activities at sea, requires an environmental permit under the Marine Environment Protection Act.<sup>282</sup> In the application for the environmental permit, the applicant has to include an EIA.<sup>283</sup> For both the environmental permit and the EIA, more detailed criteria can be added through a Royal Decree. It is possible to obtain a domain concession in an earlier phase than the environmental permit. However, the domain concession is suspended until the environmental permit and the cable permit are awarded as well.<sup>284</sup>

Whereas regular electricity production installations require an individual authorisation for the production of electricity under the Electricity Act, this is not the case for offshore electricity installations.<sup>285</sup> Instead, this is already included in the concession.

### 5.2.2.3 SUPPORT SCHEME(S)

Belgium has a support scheme in the form of a combination between a feed-in premium and renewable power certificates (Groenestroomcertificaten / certificats verts) that are issued by CREG and bought by Elia for a fixed minimum price.<sup>286</sup> End consumers are charged with a levy on green energy certificates. For end consumers connected directly to the high voltage grid, this is via Elia. For end consumers connected to the distribution grid, Elia charges DSOs for the electricity they take from the grid. DSOs can then invoice the levy at consumer level.<sup>287</sup> The minimum price a producer receives for a renewable energy certificate of a certain source is normally set by the regional regulatory authority, but for offshore wind, the price is set at federal level.

Belgium has been through a transition of the support scheme for offshore wind, meaning that there is a different scheme for OWFs for which the financial close<sup>288</sup> was reached before May 1<sup>st</sup> 2014 and for OWFs with a financial close after that date.<sup>289</sup> Before May 1<sup>st</sup> 2014, there was a fixed minimum price of EUR 107 per green certificate (1 MWh) for the first 216 MW of installed capacity and EUR 90 per certificate for capacity above 216 MW.<sup>290</sup> However, this fixed minimum price led to overcompensation and incentivised production at negative prices. Therefore, a legislative change introduced a more flexible support scheme.

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[http://www.ejustice.just.fgov.be/cgi\\_loi/change\\_lg.pl?language=nl&la=N&cn=2014050828&table\\_name=wet](http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=2014050828&table_name=wet)

<sup>282</sup> Wet Bescherming Marien Milieu, art. 25(1).

<sup>283</sup> Ibid., art. 28.

<sup>284</sup> Royal Decree 20 December 2000, art. 12. See also: <http://www.mumm.ac.be/NL/Management/Sea-based/windmills.php>.

<sup>285</sup> Electricity Act, art. 4(1) jo. Art. 6(3).

<sup>286</sup> Electricity Act, art. 7(1)1, Royal Decree 16-7-2002. See also: <http://www.elia.be/en/products-and-services/green-certificates/Minimumprice-legalframe>

<sup>287</sup> Royal Decree 16-7-2002, art. 14bis,

[http://www.ejustice.just.fgov.be/cgi\\_loi/change\\_lg.pl?language=nl&la=N&cn=2002071639&table\\_name=wet](http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=2002071639&table_name=wet).

<sup>288</sup> Financial close is not defined in the Royal Decree. However, from its general meaning, it can be assumed to mean the moment when all documentation is ready and all conditions are fulfilled (or waived).

<sup>289</sup> Royal Decree 16-7-2002, art. 14.

<sup>290</sup> Ibid., art. 14(1).



After May 1<sup>st</sup> 2014, the price for certificates is determined through the formula 'minimum price = LCOE – (electricity reference price – correction factor)'. Then, in February 2017, this was amended again regarding OWFs with a financial close after May 2016.<sup>291</sup> Now, the compensation per MWh is LCOE – ((electricity reference price x (1 – correction factor) + value of the Guarantee of Origin) x (1 – grid loss factor). This formula is more complicated than the former method, but it does allow for more flexibility in adapting the subsidy to changing market circumstances.

LCOE is the levelised cost of electricity, currently set at EUR 138 per MWh in general, but this can be set per individual OWF; for Rentel and Norther, the latest OWFs that reached financial close, it was a little bit lower.<sup>292</sup> The correction factor is 10% of the electricity reference price.<sup>293</sup> The grid loss factor is calculated on a monthly basis by CREG, on the basis of the difference between the amount of electricity that was produced and the amount of electricity that was injected into the grid.<sup>294</sup>

This support scheme provides for a special rule for balancing, namely that the minimum price will be EUR 0 when generation takes place when the imbalance tariff for a positive balance is equal to or lower than EUR - 20 per MWh.<sup>295</sup> This disincentivises OWF operators to feed into the grid at times when there is already a redundancy of electricity. This rule is limited to be applicable at most 288 quarters of hours per year.<sup>296</sup> The duration of the support schemes mentioned in this paragraph have a duration of 20 or 19 years.<sup>297</sup>

Next to the support scheme for the *operation* of OWFs, there is another form of support for the *construction* of offshore cables from OWFs to the shore. There are two systems, one for OWFs with a concession from before July 1<sup>st</sup> 2007, and one for OWFs with a concession granted after that date. For OWFs who were awarded a domain concession before July 1<sup>st</sup> 2007, Elia pays for 1/3 of the costs of this cable, with a maximum of EUR 25 mln for projects of above 216 MW, spread over 5 years.<sup>298</sup>

On the other hand, for OWFs that were awarded a domain concession after this date, there is a choice. One option is that they are connected by Elia to the offshore substation that is to be constructed.<sup>299</sup> In this way, they are not responsible for the cable to the shore, but only for the cable to the converter station. If the distance between the OWF and the converter station is more than 9 km, part of the cable to the converter station will be paid by Elia. Which part this is, will be decided through a Royal decision, on the basis of a proposal by the CREG.<sup>300</sup>

<sup>291</sup> Ibid.

<sup>292</sup> Royal Decree 16-7-2002, art. 14 para 1bis and ter. This amount can change according to the procedure provided for in art. 14 para 1ter. Rentel has a LCOE of EUR129,80 and Norther of EUR124.

<sup>293</sup> Ibid., art. 14(1)bis, introduced by Royal Decree 2014-04-04/60, art. 4.

<sup>294</sup> Ibid., art. 14(1) ter – c.

<sup>295</sup> Ibid., art. 14 para 1erquinquies. See also: PwC, Tractebel, Ecofys, Study on regulatory matters concerning the development of the North Sea offshore energy potential, January 2016, p. 207.

<sup>296</sup> Ibid.

<sup>297</sup> This depends on the date of financial close: if this took place before May 2016, it is 20 years, and afterwards, 19 years. Ibid., art. 14 para 3(1) and (2).

<sup>298</sup> Electricity Act, art. 7 para 2.

<sup>299</sup> Ibid., art. 13/1. For more information about this offshore substation, see chapter 5.2.1.

<sup>300</sup> Ibid., art. 7 para 2.



Alternatively, they can choose to apply for a Royal Decision not to be connected to the offshore converter station.<sup>301</sup> In the latter case, the 'old' system will apply: Elia will pay 1/3 of the costs of the cable to the shore, with a maximum of EUR25 mln. In the latter case, the subsidy per MWh (on the basis of the support scheme explained above) will also increase with EUR 12 per MWh.<sup>302</sup> There is also a special regime for OWFs with a financial close after May 1<sup>st</sup> 2016. In that case, the minimum price that is part of the formula to calculate the premium will be increased by a sum that equals the total costs of financing of the subsea cable, as offered by the domain concession holder.<sup>303</sup> Concerning all these categories (i.e. both before and after July 2007), the EUR 25 mln has to be refunded when, five years after the start of the construction phase, the capacity of the OWF is still below 216 MW.<sup>304</sup>

The Belgian support scheme for offshore wind energy provides for legal certainty for OWF developers with regard to their income, but there is no competitive process, which might render the compensation per MWh possibly higher than necessary for the construction and operation of OWFs.<sup>305</sup> This sparked a discussion about whether the Belgian support system should be changed and whether some concessions should be withdrawn.<sup>306</sup>

### 5.2.3 OFFSHORE GRID CONSTRUCTION

#### 5.2.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

Currently, the concession holder of the OWF is also responsible for connection to the (onshore) grid in Belgium.<sup>307</sup> Thus, all OWFs that are constructed so far are radially connected to the onshore grid. The cables from the OWF to the onshore connection point are part of the offshore installations and they do not form part of the grid that is owned and operated by the TSO. However, in the coming year, this system will probably change to a model in which the TSO builds the cable from the onshore electricity grid to an offshore electricity connection point. This is explained further in the next paragraph.

Concerning interconnectors, the Belgian Electricity Act differentiates between 'interconnectors' and 'offshore interconnectors'.<sup>308</sup> Interconnectors are defined as installations used to couple transmission grids or distribution grids with another. This can be between different countries but is not necessary. Offshore interconnectors are the installations (including electricity cables and high voltage stations connected to these cables), which have as their main goal the coupling of the Belgian electricity grids with the electricity grids of another State and which partially

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<sup>301</sup> Electricity Act, art. 7 para 2.

<sup>302</sup> Ibid.

<sup>303</sup> Ibid.

<sup>304</sup> Ibid.

<sup>305</sup> According to a confidential study by CREG, the difference in compensation between the Dutch OWFs at Borssele and the Belgian OWFs Norther and Rentel is possibly more than EUR2 billion, although they are partially built by the same parties and with principally similar circumstances (oceanographic, distance to shore etc.).

<sup>306</sup> This discussion is currently ongoing. See for example the minutes of a discussion between the Belgian Chamber and the secretary of state responsible for the North Sea CRIV 54 653, <https://www.dekamer.be/doc/CCRI/pdf/54/ic653.pdf>.

<sup>307</sup> Electricity Act, art. 7 para 2.

<sup>308</sup> Ibid., art. 2(7)bis and 2(55).

use the maritime areas over which Belgium can exercise its jurisdiction.<sup>309</sup> Currently, Belgium does not yet have any offshore interconnectors. However, the 'NEMO Link', an interconnector between the UK and Belgium, is currently under preparation.<sup>310</sup> This interconnector combines the regulated regime with the exempted regime in a cap-and-floor regulation.

Normally, the TSO should own the entire capital and all voting rights of a daughter company that owns the Belgian transmission grid (except for two shares).<sup>311</sup> However, for offshore interconnectors, this is changed into the condition that the TSO has to have at least half of the capital and the voting rights of a daughter company that owns, develops and maintains grid infrastructure.<sup>312</sup> Partners of the TSO in such a company should also adhere to art. 9(1) of Directive 2009/72/EC (unbundling requirements).<sup>313</sup>

When the definitions and requirements mentioned above are applied to potential hybrid projects and eventually an offshore grid, the legal classification is still clear. The national high voltage electricity grid is extended to the offshore cluster(s), at which OWFs connect. Cables (and related infrastructure) that are used to connect such offshore clusters to the transmission grid of other countries are classified as 'offshore interconnectors'. The cable from the shore to the offshore installation is owned and operated by Elia, the national TSO. The offshore interconnectors will then be owned and operated by a company that is owned for at least 50% by the Belgian TSO. However, it will be interesting to see how this 50%-rule will be maintained when the infrastructure in question goes beyond regular interconnector cables, but rather forms a European offshore grid with a combination of interconnection and offshore windfarm connection.

#### 5.2.3.2 CLUSTERING OF WINDFARMS

Elia is currently investigating whether it is possible to build a modular offshore grid, a 'power socket at sea' (stopcontact op zee / prise électrique) to connect its OWFs. With such a power socket, clustering of all new OWFs is facilitated. Elia already performed an EIA and obtained the necessary concession and permits for constructing and operating an offshore high voltage station on an artificial island (Alpha), a platform with another converter station (Beta) and several cables.<sup>314</sup> A prerequisite for this offshore platform is onshore grid reinforcement. This is being done at the moment, in the so-called 'Stevin Project'. Another step that is currently being prepared is a more detailed design of the modular offshore grid.<sup>315</sup>

With this system, the official grid connection would not take place onshore anymore but offshore at the converter station. This system is already inserted in the Electricity Act through art. 13/1, concerning domain concessions for

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<sup>309</sup> Ibid., art. 2(55).

<sup>310</sup> <http://www2.nationalgrid.com/About-us/European-business-development/Interconnectors/belgium/>

<sup>311</sup> Ibid., art. 9bis.

<sup>312</sup> Ibid.

<sup>313</sup> Ibid.

<sup>314</sup> See picture in chapter 5.2.1. for a map of these cables and converter stations.

<sup>315</sup> [http://www.elia.be/en/projects/grid-projects/North\\_Sea](http://www.elia.be/en/projects/grid-projects/North_Sea)

these installations, and art. 7 para 2, concerning grid connection of OWFs with a financial close that took place after May 1<sup>st</sup> 2016.<sup>316</sup>

Regarding the conditions in Belgium for the clustering of OWFs, a first favourable condition becomes clear from a spatial planning perspective. The OWF domains are geographically close to each other and they form one line to the coast. Moreover, in the future, only one party, namely Elia, will be responsible for the (offshore) connection to the grid at a converter station. Moreover, an advantage of the Belgian approach is that it is already clear for a long time where the OWFs will be built, due to the domain concessions that were awarded long ago. However, an aspect that may negatively influence the possibility to create an offshore grid is that there is a long time gap between the construction of different OWFs. This may increase the risk to stranded assets in case OWFs that are planned now do not go ahead after all. Moreover, if anticipatory investments are made in stronger grid connections while part of the OWFs that should be connected to it are only built years later than the first OWFs, this may lead to suboptimal usage of the cable capacity for the time before commissioning of the last OWF.

#### 5.2.4 DECOMMISSIONING

One of the criteria for the award of a domain concession for the construction of an OWF is the plan for financial and technical aspects of decommissioning after retirement of the installations.<sup>317</sup> This entails especially the composition of a reserve which is levied on the exploitation results for the purpose of 'recovery of the area'.<sup>318</sup> With this provision, Belgium explicitly dedicates attention to the end of the lifetime of installations already before the concession award.

Moreover, the Royal Decree includes an article on the actual decommissioning which elucidates what is meant with recovery of the area. When the concession ends, the measures prescribed for the definitive decommissioning will have to be realised by the holder of the concession.<sup>319</sup> This relates to the removal of the installation, securing the area concerned and conservation and protection of the maritime environment.<sup>320</sup> However, to what extent removal, securing of the area and conservation of the maritime environment need to be executed remains unclear from these requirements.

As the decommissioning measures are already proposed before construction, it is probable that technological insights have advanced at the moment when the installation reaches the end of its lifetime. Therefore, the article provides that other measures could be used than the measures foreseen at the award of the domain concession.<sup>321</sup> This requires permission from the Minister, advice from the relevant administrative authorities and the CREG.<sup>322</sup> Additionally, alternative measures can only be taken when it can be guaranteed that they lead to at

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<sup>316</sup> Electricity Act, art. 13/1 and art. 7 para 2.

<sup>317</sup> Royal decree of 30-12-2000 concerning domain concessions, art. 3(5).

<sup>318</sup> *Ibid.*

<sup>319</sup> *Ibid.*, art. 24.

<sup>320</sup> *Ibid.*

<sup>321</sup> *Ibid.*

<sup>322</sup> *Ibid.*

least an equivalent result.<sup>323</sup> It seems that with this provision, it is possible to deviate from the measures originally proposed but that there is no margin of discretion with regard to the question whether the installations have to be removed.

#### 5.2.5 INTERIM CONCLUSION

Belgium has a maritime area that is comparatively small and intensively used for shipping. However, as it already developed a clear maritime spatial planning strategy long ago, it manages to designate specific zones for offshore wind energy and for other maritime area usages. For the construction and operation of an OWF, a domain concession, marine environment permit and submarine cable permit are necessary. Concerning support schemes, Belgium provides for a fixed minimum price per MWh, issued through buying up renewable energy certificates, from which the electricity reference price will be deducted again. The system provides for legal certainty for OWF developers with regard to their income, but there is no competitive process which might render the compensation per MWh possibly higher than necessary for the construction and operation of OWFs.<sup>324</sup> There is an extra support system with regard to the cables, in which the TSO contributes with 33% of the costs until a certain maximum price level.

With regard to offshore grid construction, Belgium is currently in the transition from a system in which the OWF developer constructs the cable to the onshore electricity grid to a system in which an offshore connection point is created, to which different OWFs 'plug in'. This allows for clustering of OWFs. This is already reflected in some legislative changes but not yet in practice. The classification of grid infrastructure under the new system will probably be that the cable and converter stations needed for the offshore electricity 'socket' are part of the national transmission system and that grid infrastructure used to connect this offshore electricity socket to other countries' transmission grids falls under the term 'offshore interconnector'.

With regard to decommissioning, Belgium has a requirement for a decommissioning plan already at the phase of the award of concessions for offshore wind. The law leaves room to change to different measures when technology advances, but it is not possible to refrain from decommissioning once the concession expires.

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<sup>323</sup> Ibid.

<sup>324</sup> See above, footnote 299.



## 5.3 LEGAL FRAMEWORK OF DENMARK

### 5.3.1 INTRODUCTION

Denmark is an early explorer when it comes to offshore wind energy, with more than 25 years of experience. Currently, it has an installed capacity of 1,271 GW of offshore wind, divided over 13 OWFs.<sup>325</sup> Most of these are located in the territorial waters. However, the OWFs to be constructed in the coming years (Kriegers Flak, Horns Rev III) are situated in the EEZ.

Denmark has ambitious targets, namely a 35% renewables share in the gross final energy consumption,<sup>326</sup> and a 50% share of electricity consumption from onshore and offshore wind energy.<sup>327</sup> This goes beyond the target under the Renewable Energy Directive, which is 30% in 2020.<sup>328</sup> The Danish government also has ambitious targets for the long-term future: it aims to be independent from fossil fuels in 2050.<sup>329</sup> This requires substantial investments in renewables. The plan contains concrete measures, such as for example tendering 600 MW at Kriegers Flak, as has been done past year. There are no goals on the total amount of (offshore) wind energy to be deployed on the long term.

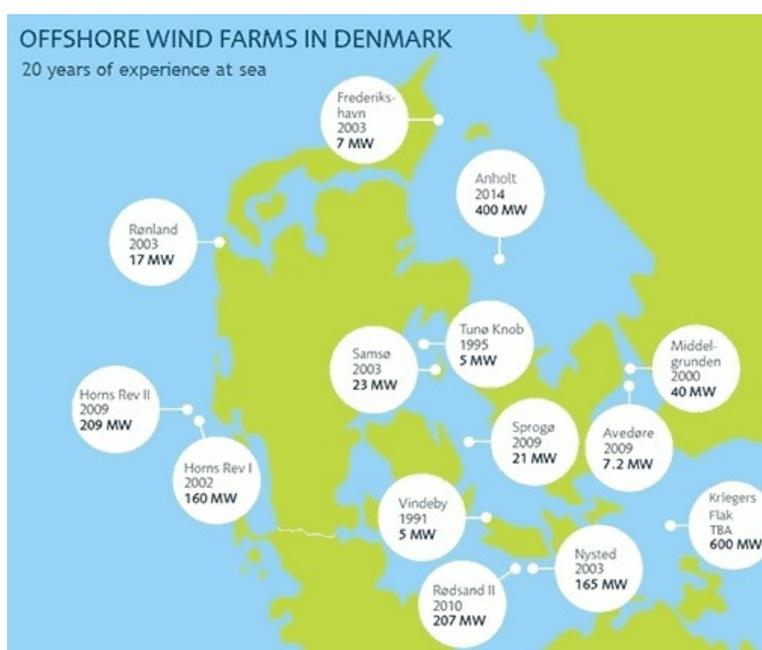


Figure 7: Offshore windfarms in Denmark. Source: Southbaltic-offshore.

The regime as described below is the current regulatory regime. As the history of the Danish offshore windfarms goes back to the 1990's, several OWFs still fall under various older regimes.<sup>330</sup> The Danish electricity sector is regulated by the Electricity Supply Act and the Promotion of Renewable Energy Act.<sup>331, 332</sup> These acts are both

<sup>325</sup> WindEurope, Statistics 2016, p. 18

<sup>326</sup> This stems from an agreement between the government and other political parties about the Danish energy policy 2012-2020 of 22 March 2012.

<sup>327</sup> Danish Ministry of Climate, Energy and Building, DK Energy Agreement, 22-3-2012 (this is the English summary of the Danish energy agreement).

<sup>328</sup> Renewable Energy Directive, annex 1.

<sup>329</sup> Danish Government: Energy Strategy 2050, 2011.

<sup>330</sup> See for example Promotion of Renewable Energy Act, lov om fremme af vedvarende energi, entered into force 27-10-2016, LBK nr. 1288, <https://www.retsinformation.dk/Forms/R0710.aspx?id=184376>, art. 38 and 39.

<sup>331</sup> Ibid.

<sup>332</sup> Electricity Supply Act, Lov om elforsyning, LBK nr. 418, entered into force 25-4-2016, <https://www.retsinformation.dk/forms/R0710.aspx?id=174909>

also applicable to the territorial sea and to the EEZ.<sup>333</sup> The TSO, Energinet.dk, established by law in 2004, is regulated by the Act on Energinet.dk.<sup>334</sup> Concerning spatial planning, the Maritime Spatial Planning Act is relevant as well.<sup>335</sup> In 2000, Denmark has founded an independent NRA, the Danish Energy Regulatory Authority (DERA, in Danish: *Energitilsynet*).<sup>336</sup> Moreover, the government agency 'Danish Energy Agency' (DEA, in Danish: *Energistyrelsen*) serves as a one stop shop for energy projects.<sup>337</sup>

## 5.3.2 OFFSHORE GRID PLANNING

### 5.3.2.1 MARITIME SPATIAL PLANNING

Denmark recently adopted a Maritime Spatial Planning Act.<sup>338</sup> This is an implementation of the Maritime Spatial Planning Directive.<sup>339</sup> Officially, maritime spatial planning falls under the competence of the Minister of Economic and business affairs.<sup>340</sup> In practice, however, the maritime plan under this Act will be prepared by the Danish Maritime Authority.<sup>341</sup> It takes into account the offshore energy sector, maritime transport, fisheries and aquaculture, mineral resources extraction and environmental protection. In principle, once there is a maritime spatial plan, spatial planning decisions cannot go against it, except in urgent cases where the Minister cannot wait until the maritime spatial plan is changed, or when it is necessary in order to comply with international or European law, or when it is necessary for maritime safety.<sup>342</sup> As is also stressed in the Maritime Spatial Planning Directive, this act dedicates a chapter to cooperation with other EU-Member States and third countries, to come to a coordinated maritime planning in the region.<sup>343</sup> Finally, as this act was only passed very recently, a concrete maritime spatial plan is not yet available.

Next to the recent developments of maritime spatial planning in general, Denmark has a long history with centralised spatial planning concerning the locations for OWFs. In 1997, it drafted the Offshore Wind Turbine Action Plan, which described in which areas offshore wind energy could be developed. Private parties could develop these OWFs. In the Energy Strategy of 2004, it was decided that most future wind energy farms should

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<sup>333</sup> Promotion of Renewable Energy Act, art. 3(1), Electricity Supply Act, art. 2(2).

<sup>334</sup> Act on Energinet.dk, Lov om Energinet.dk, LBK nr. 1097, entered into force 8-11-2011, <https://www.retsinformation.dk/forms/r0710.aspx?id=139077>, Unofficial English translation can be found here: <http://energinet.dk/SiteCollectionDocuments/Engelske%20dokumenter/Om%20os/Danish%20Act%20on%20Energinet%20dk.pdf>

<sup>335</sup> Act on Maritime Spatial Planning, Lov om maritim fysisk planlaeging, LBK 615, 8-6-2016, <https://www.retsinformation.dk/Forms/R0710.aspx?id=180281>

<sup>336</sup> <http://energitilsynet.dk/tool-menu/english/>.

<sup>337</sup> <https://ens.dk/en>

<sup>338</sup> Ibid.

<sup>339</sup> Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, 28-8-2014, L 257/135.

<sup>340</sup> Act on Maritime Spatial Planning, art. 4

<sup>341</sup> <http://www.dma.dk/news/Sider/DanishMaritimeAuthoritytoberesponsibleforDenmark'sfirstmaritimespatialplan.aspx>

<sup>342</sup> Act on Maritime Spatial Planning, kapitel 5.

<sup>343</sup> Ibid., kapitel 7.

be located offshore.<sup>344</sup> In the following years, Denmark formed a Committee for future offshore wind power sites that published a report concerning OWF planning to 2025.<sup>345</sup>

There are two types of licensing procedures in Denmark. The most used procedure is a centralised tender procedure in which the locations from the spatial planning are developed. However, there is also an open-door procedure. In this procedure, which is rarely used in practice, the OWF developer can freely choose from all available areas.<sup>346</sup> Thus, in this procedure, maritime spatial planning is not used. Nevertheless, areas that are already designated as offshore wind areas by the government are excluded from this procedure.<sup>347</sup> Therefore, it is possible that an OWF is not sited according to the official OWF spatial planning.

### 5.3.2.2 LICENSING AND PERMITTING PROCEDURES

An OWF in Denmark requires three licenses: the approval for preliminary investigations,<sup>348</sup> the construction approval,<sup>349</sup> and the license to exploit the wind energy.<sup>350</sup> The Promotion of Renewable Energy Act lays down the broad framework of these licenses, but specific conditions are stipulated in the licenses themselves.<sup>351</sup> Next to these OWF-specific licenses, the owner must have a general license to produce electricity if the project has a capacity of more than 25 MW,<sup>352</sup> which is normally the case for new OWFs. This license is awarded to producers who have the necessary technical and financial capabilities to produce. If the owner already has this license on the basis of another electricity production installation, it is not necessary to obtain a separate one.

There are two possible procedures for the licensing of OWFs: this happens either via a government-led tender, organised by the Danish Energy Agency, or via an open-door procedure. In the open-door procedure, applicants take the initiative to submit an unsolicited application for a license. They contact DEA and apply for the different licenses necessary for the construction of an OWF. DEA functions as a one-stop-shop and organises a hearing with other public bodies to investigate whether there are any overriding interests that would block the construction of an OWF.<sup>353</sup> Additionally, other interested parties must have been given the opportunity to apply.<sup>354</sup> Based on this hearing, DEA decides on whether the area in question can be developed. If this is the case, the applicant can carry out preliminary investigations, including an EIA. If these investigations prove that the project can be developed, the applicant can obtain a license to develop the project.<sup>355</sup> In practice, this open-door procedure is rarely used.

<sup>344</sup> Danish Ministry of Transport and Energy, Energy Strategy 2025 (2004), English translation: <http://ec.europa.eu/ourcoast/download.cfm?fileID=982>, p. 39.

<sup>345</sup> The Committee for future offshore wind power sites, Future Offshore Wind Power Sites – 2025, april 2007.

<sup>346</sup> Müller 2016, p. 168.

<sup>347</sup> Ibid.

<sup>348</sup> Promotion of Renewable Energy Act, art. 22(1).

<sup>349</sup> Ibid., art. 25.

<sup>350</sup> Ibid., art. 29. M. Roggenkamp, C. Redgwell, A. Ronne, I. del Guayo, Energy Law in Europe, Oxford, 2016, Oxford University Press (hereinafter: Energy Law in Europe), p. 466.

<sup>351</sup> Energy Law in Europe, p. 466.

<sup>352</sup> Electricity Supply Act, art. 10. Energy Law in Europe, p. 644.

<sup>353</sup> <https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits>

<sup>354</sup> Energy Law in Europe, p. 644.

<sup>355</sup> Ibid.

The other procedure is an EU tender procedure organised by DEA. Here, as well, DEA is the one-stop-shop for all licenses. In this procedure, the Minister may decide that Energinet.dk has to carry out the preliminary investigations, and to make the result of these observations available for the tender participants.<sup>356</sup> In this way, preliminary investigations can already be prepared before the tender takes place, which saves time and resources. However, additional preliminary investigations may take place. The other two licenses are awarded in combination with the tender procedure.

Independently of which procedure is followed, an Environmental Impact Assessment (EIA) is necessary when the OWF in question is deemed to have significant impact on the environment.<sup>357</sup> This has been the case for all OWFs so far.<sup>358</sup> The detailed requirements of the EIA are to be found in an Executive Order.<sup>359</sup>

For the construction of submarine electricity cables, it is also necessary to have a permit.<sup>360</sup> The permit is awarded by the Energy and Climate Minister. This applies to all offshore electricity cables except for inter-array cables.<sup>361</sup> No distinction is made between interconnectors and other cables.<sup>362</sup> One exception to this rule is for offshore electricity cables that have no connection to the Danish transmission grid, such as transit cables.<sup>363</sup> However, this is not used in practice at the moment.

For all new grid projects of over 100 kV, the procedure to obtain a permit is to first include it in a grid extension plan, at least six weeks before the new cable is constructed.<sup>364</sup> It is important for interconnector projects that they bring socio-economic benefits to the Danish consumers, in order for them to be approved.<sup>365</sup> They also have to be included in the System Plan, an annually updated plan with a detailed description of grid extension plans.<sup>366</sup>

### 5.3.2.3 SUPPORT SCHEME(S)

All projects that are organised via the centralised planning and tendering procedure mentioned above benefit from a feed-in premium. The height of the premium is determined through the tender that is organised by DEA. DEA announces a tender for the permission to construct a windfarm with a predetermined capacity and specified site.<sup>367</sup> Tender applicants propose a fixed price at which they are willing to produce electricity according to a certain

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<sup>356</sup> Promotion of Renewable Energy Act, art. 23(3).

<sup>357</sup> Promotion of Renewable Energy Act, art. 26(1).

<sup>358</sup> Energy Law in Europe, p. 644.

<sup>359</sup> Executive Order No 68 of 26 January 2012, <https://www.retsinformation.dk/Forms/R0710.aspx?id=175836>.

<sup>360</sup> Electricity Supply Act, art. 22a.

<sup>361</sup> *Ibid.* art. 22a(3). Inter-array cables are the cables between installations within an OWF.

<sup>362</sup> *Ibid.*, see also H.K. Müller 2016, p. 175.

<sup>363</sup> *Ibid.*, art. 21(5).

<sup>364</sup> Act on Energinet.dk, art. 4(2).

<sup>365</sup> Müller 2016, p. 175.

<sup>366</sup> The most recent plan can be found here: (English version)

[http://www.energinet.dk/SiteCollectionDocuments/Danske%20dokumenter/Om%20os/vindomministeret%20energisystem\\_UK.pdf](http://www.energinet.dk/SiteCollectionDocuments/Danske%20dokumenter/Om%20os/vindomministeret%20energisystem_UK.pdf).

<sup>367</sup> Renewable Energy Act, art. 22(7).

number of full-load hours, namely 10 TWh.<sup>368</sup> The award of the permit is determined by which party can construct and operate the OWF for the least amount of subsidy.

The successful tenderer can only profit from the support scheme within a maximum period of 20 years from the moment the OWF was connected to the grid.<sup>369</sup> The winning applicant will sell the electricity on the market and receives subsidy to cover the difference between the market price and the fixed bid price.<sup>370</sup> At the same time, when the market price is higher than the fixed bid price, there is a negative subsidy that compensates for the normal positive subsidy.<sup>371</sup> With this system, the earnings of the OWF developer are limited when the electricity price is high, but supported when the electricity price is low. Also, because some of the subsidy flows back when the electricity price is higher than the fixed bid price, the scheme is less expensive than without such a provision.

Before the tender is published, there is already much preparation. For example, the EIA will already be performed beforehand for the windfarm, the substation and the cables.<sup>372</sup> The EIA is approached from the perspective of greatest conceivable environmental impact, so that afterwards, no new EIAs are necessary any more.<sup>373</sup> Moreover, geological data as well as wind, current and wave data are publicised in advance, for tender applicants to take into account when deciding on the bidding price.<sup>374</sup>

As mentioned before, an open-door procedure exists alongside the tender procedure. OWFs commissioned under the open-door procedure can also receive support, but via a different support scheme. They profit from the same scheme as onshore wind turbines. It entails a premium of DKK 0,25 per kWh for the first 22,000 hours at the installed output (peak-load hours) after connection to the grid.<sup>375</sup> However, this subsidy will be reduced if the sum of the market price and the subsidy exceeds DKK 0,6 per kWh.<sup>376</sup> Next to the general premium, there will be a refund for balancing costs of DKK 0,023 for these OWFs, during the entire lifetime of the project.<sup>377</sup>

An interesting development is that Germany and Denmark introduced a joint tender for solar PV. With this tender, they introduced a form of the cooperation mechanisms that are mentioned in the Renewable Energy Directive. Such a system could also possibly be an interesting solution for support for cross-border offshore wind projects. In the case of Germany and Denmark, the joint tender is based on an international agreement between the two countries and on a legal basis in each of the countries. Whereas in Germany, a generally applicable opening of support schemes for 5% of the capacity was introduced, Denmark passed a specific Act on this pilot scheme.<sup>378</sup>

<sup>368</sup> Or 20 TWh (for Horns Rev 3 and Anholt), Renewable Energy Act, art. 37(2) jo. (4)

<sup>369</sup> Ibid., art. 37(4).

<sup>370</sup> <https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits>

<sup>371</sup> Ibid., art. 51(5).

<sup>372</sup> DEA and Energinet.dk, New Offshore Wind Tenders in Denmark,

[http://www.windpower.org/download/1811/energistyrelsen\\_udbud\\_af\\_havmoelleparkerpdf](http://www.windpower.org/download/1811/energistyrelsen_udbud_af_havmoelleparkerpdf), p. 7

<sup>373</sup> Ibid.

<sup>374</sup> Ibid.

<sup>375</sup> Renewable Energy Act, art. 36(2).

<sup>376</sup> Ibid., art. 39(3). See also: <https://ens.dk/en/our-responsibilities/wind-power/offshore-procedures-permits>

<sup>377</sup> Ibid., art. 36(3).

<sup>378</sup> Act on a pilot tender for solar PV construction, Lov om pilotudbud af pristillaeg for elektricitet fremstillet pa solcelleanlaeg, lov nr. 261 of 16 March 2016, <https://www.retsinformation.dk/forms/r0710.aspx?id=178945>.

### 5.3.3 OFFSHORE GRID CONSTRUCTION

#### 5.3.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

The difference in approach of application procedures (tenders or open-door procedure) are also reflected in the responsibility for cable-laying and connection of the OWFs. With the open-door procedure, the grid connection takes place onshore. Therefore, the OWF developer has the responsibility to lay and operate the cable that is necessary to bring the offshore produced electricity to the shore. There, it is linked to the onshore grid, owned and operated by Energinet.dk.<sup>379</sup> In that case, the cable is part of the OWF installation.

For tendered OWFs, the situation is different. There, the TSO has the responsibility to connect the OWF to the grid offshore. Energinet.dk is responsible to connect the windfarms to an offshore converter station. The TSO is thus responsible for the converter station and the cable from the converter station to the shore. It also bears the costs of these assets.<sup>380</sup> The offshore converter station and the cable to the shore will form part of the onshore grid.<sup>381</sup> This also has consequences for the financing: the costs are mostly socialised among the electricity consumers.<sup>382</sup> The converter station is where the ownership shifts from the TSO to the OWF owner.<sup>383</sup> If Energinet fails to deliver the connection in time according to the tender conditions, it is subject to strict liability for the loss the OWF developer suffers from the impossibility to market the produced electricity.<sup>384</sup> The amount of compensation is described in the tender conditions.<sup>385</sup>

As mentioned above, the Danish Electricity Act does not differentiate between interconnectors and other offshore electricity cables that are part of the Danish electricity grid. Therefore, when a combination is made between connection of offshore wind energy and interconnection with other electricity grids, the question of whether the asset should be classified as an interconnector or as part of the Danish transmission grid does not seem to be problematic from a legal perspective.

#### 5.3.3.2 CLUSTERING OF WINDFARMS

Concerning the clustering of OWFs, this is theoretically possible when the Danish Energy Agency decides to tender OWFs strategically near to each other. However, in the current spatial planning, the OWFs are not sufficiently close to each other. Therefore, OWFs are not yet clustered in Denmark. However, if this differs in the future, Energinet.dk has to decide how to make the most cost-efficient connection. There is nothing in the Danish law that would fundamentally prevent hub connections of OWFs. One possible difficulty would be how to split the

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<sup>379</sup> Act on Energinet.dk, art. 1.

<sup>380</sup> Müller 2016, p. 172.

<sup>381</sup> Ibid.

<sup>382</sup> Ibid.

<sup>383</sup> The division of property takes place where the electricity is converted from medium to high voltage. Müller 2016, p. 172.

<sup>384</sup> Promotion of Renewable Energy Act, art. 31(2).

<sup>385</sup> Ibid., art. 31(3).

costs of the converter station between the different parties in the hub. However, this is not an insurmountable difficulty.

A very interesting and recent development is the interaction between Denmark and Germany in the 'Combined Grid Solution' (see image). In this project, the Danish OWF Kriegers Flak is connected to the Danish shore but also to another OWF located in the German EEZ, Baltic 2.<sup>386</sup> In this way, the cable is a 'hub-to-hub' cable, it serves as an interconnector while also connecting OWFs. This project provides for an interesting legal situation that should be investigated in more detail. Relevant questions are how the cable between the two hubs would be classified (e.g. as an interconnector or not), how the division between export capacity and interconnection capacity is regulated in law and how the two countries approach the competence under international law to regulate the cable between the two hubs. This should be investigated further in next deliverables.

### 5.3.4 DECOMMISSIONING

Recently, the process of decommissioning of the eldest OWF in the world, Vindeby, has started. This OWF, located 1,5 to 3 km offshore in the Danish sea, has lasted for 25 years and is now at the end of its term.<sup>387</sup> From a legal perspective, decommissioning is mentioned in the article on the construction permit for OWFs.<sup>388</sup> The award of the permit can be made subject to conditions by the Minister for Energy and Climate. The conditions can cover several technical and safety-related topics, one of which is decommissioning. Not only OWF construction is subject to a permit requirement; the extension or modification of existing projects is also subject to a permit by the Minister.<sup>389</sup> When the activity probably has a significant impact on the environment, the application for the permit needs to be accompanied by an EIA and the environmental impact needs to be weighed in the decision.<sup>390</sup>

In practice, we can see this procedure for the decommissioning of Vindeby. The legal basis of the decommissioning lies in the approval decision by the Minister of Traffic (who was the responsible authority in 1989) that Elkraft (the addressee of the decision) has to remove the installations and restore the area in its original state at the end of the project's lifetime.<sup>391</sup> It has to do this at its own cost.<sup>392</sup> At the end of the lifetime of a project, the developer makes a decommissioning plan.<sup>393</sup> In the EIA, it was concluded that the decommissioning of Vindeby would not have a negative impact on the environment.<sup>394</sup> The decommissioning plan is approved by the

<sup>386</sup> <http://www.energinet.dk/EN/ANLAEG-OG-PROJEKTER/Anlaegsprojekter-el/Forbindelse-til-Tyskland-Kriegers-Flak-CGS/Sider/Anlaegget.aspx>

<sup>387</sup> <http://www.dongenergy.com/en/media/newsroom/news/articles/the-worlds-first-offshore-wind-farm-is-retiring>.

<sup>388</sup> Renewable Energy Act, art. 25(3).

<sup>389</sup> Ibid., art. 26(1) jo. 25(1).

<sup>390</sup> Ibid., art. 26(1).

<sup>391</sup> Approval of decommissioning by NRA (in Danish):

[https://ens.dk/sites/ens.dk/files/Vindenergi/tilladelse\\_til\\_nedtagning\\_af\\_vindeby\\_havvindmoellepark.pdf](https://ens.dk/sites/ens.dk/files/Vindenergi/tilladelse_til_nedtagning_af_vindeby_havvindmoellepark.pdf), p. 7/8.

<sup>392</sup> Ibid., p. 8.

<sup>393</sup> Find the decommissioning plan for Vindeby here (in Danish):

[https://ens.dk/sites/ens.dk/files/Vindenergi/nedtagningsplan\\_for\\_vindeby\\_havmoellepark\\_final\\_update\\_okt.pdf](https://ens.dk/sites/ens.dk/files/Vindenergi/nedtagningsplan_for_vindeby_havmoellepark_final_update_okt.pdf).

<sup>394</sup> EIA for the decommissioning of Vindeby here (in Danish), p. 7.

[https://ens.dk/sites/ens.dk/files/Vindenergi/miljoevurdering\\_for\\_nedtagning\\_af\\_vindeby\\_havmoellepark\\_inkl\\_bilag.pdf](https://ens.dk/sites/ens.dk/files/Vindenergi/miljoevurdering_for_nedtagning_af_vindeby_havmoellepark_inkl_bilag.pdf)

NRA.<sup>395</sup> When the OWF was approved, the developer had to deposit a security. With the approval of the decommissioning plan, this security can be released by DEA when all requirements of the decommissioning approval are fulfilled.<sup>396</sup> However, it will only be released after DEA has made a written statement that the security can be released.<sup>397</sup>

### 5.3.5 INTERIM CONCLUSION

Denmark is an early developer of offshore wind. By now, the Danish legal system with regard to the planning of offshore wind energy and cables is well developed. Offshore spatial planning has recently been addressed with a specific maritime spatial planning act that incorporates different interests with regard to the use of the sea, including offshore renewable energy production. However, before that, there was already a spatial planning with regard to offshore windfarms. It has to be noted, however, that OWFs can also be constructed outside the official spatial planning in an open-door procedure.

Concerning support schemes, Denmark has a feed-in premium whereby the price per MWh is determined through a tender organised by the energy regulator. In preparation for a tender, crucial information for applicants to set a competitive bid is already published beforehand. This relates for example to the oceanographic data, the EIA and information about the maximum compensation period and amount of electricity that are compensated. Therefore, the main tender subject is the height of the premium that participants need to operate the OWF. This system gives sufficient legal certainty while still leading to competitive results.

The onshore TSO, Energinet.dk, is in charge of constructing and operating the cable from the shore to the converter station and the converter station itself.<sup>398</sup> The grid connection of OWFs thus takes place at the converter station. From the converter station to the shore, the cables form part of the onshore grid. These cables are also regulated as such, and the costs are socialised. Clustering of OWFs could be possible with this system under the condition that OWFs are situated close to each other and are tendered around the same time.

Finally, Denmark experiments with first steps of a future meshed offshore grid, by building a hub-to-hub cable together with Germany. This poses many interesting new legal questions that will have to be investigated further in coming deliverables of PROMOTiON.

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<sup>395</sup> Approval of decommissioning by NRA (in Danish):

[https://ens.dk/sites/ens.dk/files/Vindenergi/tilladelse\\_til\\_nedtagning\\_af\\_vindeby\\_havvindmolepark.pdf](https://ens.dk/sites/ens.dk/files/Vindenergi/tilladelse_til_nedtagning_af_vindeby_havvindmolepark.pdf).

<sup>396</sup> Ibid., para 3.1. One condition that does not have to be fulfilled is the requirement to check the area three years after decommissioning, para 2.7.

<sup>397</sup> Ibid., para 3.3.

<sup>398</sup> An exception to this is that in the open door procedure, the OWF developer is in charge of the connection to the onshore grid as well.

## 5.4 LEGAL FRAMEWORK OF FRANCE

### 5.4.1 INTRODUCTION

Developments in the French offshore electricity sector are only recent. However, France has an extensive EEZ, although it is mostly situated on the Atlantic Ocean. Currently, France has tendered concessions for offshore windfarms in three rounds, 2011, 2013 and 2016. These are not yet in the construction phase. Next to this, there was a separate tender for floating offshore wind pilot projects. All OWF domains tendered so far are located in the territorial waters.

France has an interconnector with the United Kingdom, and there are plans for several other interconnectors, amongst which a project that brings together interconnection between France and the United Kingdom via the isle of Alderney, where renewable energy generation (tidal energy) will be linked to the grid. This project, called FAB Link, is interesting as it aims to combine interconnector cables with renewable energy connection, which is similar to certain problems that exist when linking offshore wind to interconnectors.

France has the following ambitions regarding renewable energy. First of all, the target for 2020 under the Renewable Energy Directive is 23%.<sup>399</sup> In order to inform the parliament and the public about how to reach these ambitions for renewable energy production, the government made a multi-annual plan for investment in electricity production for the period 2009 – 2020.<sup>400</sup> This plan makes clear what ambitions France has with regard to investment in the different types of renewable energy. At the same time, there is also a multi-annual plan for energy (*programmation pluriannuelle de l'énergie*), which fixes the actions and ambitions of the government with regard to the energy transition, but which also addresses security of supply, network



Figure 8: French OWF tender winners, first and second round. Source: Ministry of Sustainable Development.

<sup>399</sup> Renewable Energy Directive, annex 1.

<sup>400</sup> Programmation pluriannuelle des investissements (PPI) de production de l'électricité 2009 – 2020, [http://www.developpement-durable.gouv.fr/IMG/pdf/ppi\\_elec\\_2009.pdf](http://www.developpement-durable.gouv.fr/IMG/pdf/ppi_elec_2009.pdf)

development, mobility and energy prices for consumers.<sup>401</sup>

Concerning offshore wind energy, the report acknowledges that most offshore areas of France are not suitable for wind energy, because of the water depth.<sup>402</sup> However, it still confirms that offshore wind energy will contribute significantly to the 2020 goals for France, although no concrete capacity is given.<sup>403</sup> In terms of actions, the report promises that the procedure shall be simplified by removing the (redundant) law on the wind energy development zones,<sup>404</sup> by facilitation of construction of OWFs in the exclusive economic zone and through the creation of an agency for coordination and spatial planning under the maritime prefects.<sup>405</sup>

France recently passed a new Act concerning the energy transition for green growth, of August 17<sup>th</sup> 2015. This act is very broad in scope, and many parts of it are not directly relevant for offshore wind energy. However, it is important to note that it codifies targets for renewable electricity for 2020 as well as 2030,<sup>406</sup> which allows for planning on the longer term. Further relevant acts in France concerning offshore wind and offshore cables are the *Code de l'énergie* (Electricity Code),<sup>407</sup> *Code de l'environnement* (Environmental Code),<sup>408</sup> and the *Decret relative à la réglementation applicable aux îles artificielles, aux installations, aux ouvrages et à leurs installations connexes sur le plateau continental et dans la zone économique écologique ainsi qu'au trace des câbles et pipelines sous-marins* (Decree on the regulation applicable to artificial islands, installations and works and their related installations on the continental shelf and in the EEZ and the ecological protection zone, as well as to submarine cables and pipeline trajectories, hereinafter 'the decree').<sup>409</sup> The French TSO is *Réseau de transport de l'électricité* (RTE), and the French NRA is *Commission de régulation de l'énergie* (CRE).

## 5.4.2 OFFSHORE GRID PLANNING

### 5.4.2.1 MARITIME SPATIAL PLANNING

In general, spatial planning is regulated in the context of the Urban Planning Code (*Code de l'urbanisme*). However, offshore wind energy and the cables to connect offshore wind energy to the onshore grid are excluded from this Act.<sup>410</sup> Moreover, that is the case for all constructions at sea.<sup>411</sup> Nevertheless, the Environmental Code

<sup>401</sup> Programmation pluriannuelle de l'énergie (PPE), 2016, fixed by decree 2016-1442, <http://www.ecologique-solidaire.gouv.fr/programmations-pluriannuelles-lenergie-ppe>.

<sup>402</sup> Ibid., p. 72.

<sup>403</sup> Ibid.

<sup>404</sup> There are already regional wind energy schemes, and these zones are thus redundant.

<sup>405</sup> PPI, p. 72.

<sup>406</sup> Loi no. 2015-992 du 17 août 2015 relative à la transition énergétique pour la croissance verte, JORF no. 0189 du 18-8-2015 p. 14263, texte no. 1, art. 1 (III).

<sup>407</sup> Energy Code, Code de l'énergie

<https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000023983208&dateTexte=20120406>

<sup>408</sup> Environmental Code, Code de l'environnement,

<https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006074220>

<sup>409</sup> Décret no. 2013-611 du 10 juillet 2013, JORF no 0160 du 12 juillet 2013 page 11622, texte no 16

<sup>410</sup> Urban Planning Code, Code de l'urbanisme, R-421-8-1,

<https://www.legifrance.gouv.fr/affichCodeArticle.do?idArticle=LEGIARTI000025147929&cidTexte=LEGITEXT000006074075&dateTexte=20150410&oldAction=rechCodeArticle&fastReqId=1905773539&nbResultRech=1>

<sup>411</sup> Urban Planning Code, L421-5(e).

(*Code de l'environnement*) stipulates that there should be an integral management of the sea and coastal areas.<sup>412</sup> This Act also stipulates that a strategic document should be drafted.<sup>413</sup>

Spatial planning is part of this strategic document as well, in order to promote sustainable development of the maritime space.<sup>414</sup> The French maritime space is subdivided into different areas, and a fitting spatial plan has to be drafted for each area.<sup>415</sup> The strategic document then includes all maritime plans, in a way that promotes coherence and an integrated management of the sea and coastal areas.<sup>416</sup> The spatial plans cover the offshore energy sector, maritime transport, fishing and aquaculture, nature conservation and improvement and climate change resilience.<sup>417</sup> They may also include sustainable tourism and mineral resources extraction.<sup>418</sup>

The French maritime strategy is composed by the State, in cooperation with the territorial authorities, the scientific community, socio-economic actors and environmental protection associations.<sup>419</sup> Afterwards, the strategy is made subject to a public consultation process. In the end, it is adopted by decree.<sup>420</sup> The temporal scope for these maritime strategy plans is six years. This ensures a medium- to long-term coherent approach but also allows for adaptation of the maritime plans to new developments. This new system of maritime spatial planning was adopted in 2010.<sup>421</sup> An official maritime spatial plan is being drafted now, but it has not yet reached the stage of adoption by decree.

The OWFs in France in the first tender rounds were localised on the basis of a consultation with the regional maritime authorities. The tender process was directed towards OWFs of which the exact location and capacity in MW was already known in advance. In that sense, France has a proactive approach to planning of OWFs.

#### 5.4.2.2 LICENSING AND PERMITTING PROCEDURES

Several different documents are necessary for the construction and operation of OWFs and cables, dependent on whether the asset is located in the territorial waters or in the EEZ. For installations in the territorial zone, a concession for the use of public space is required. The scope of these concessions is limited to the territorial zone because under French law, the State can only give concessions under the public property act for the seabed that it actually owns.<sup>422</sup> Such 'Concessions for the use of public space' can be concluded for a maximum duration of 30 years, but concessions for renewable energy projects and electricity production can have a maximum duration

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<sup>412</sup> Environmental Code, art. L-219-1.

<sup>413</sup> *Ibid.*, art. L-219-3. This document has been adopted: Décret n° 2017-222 du 23 février 2017 Stratégie nationale pour la mer et le littoral, JORF n°0047 du 24 février 2017, texte n° 5.

<sup>414</sup> *Ibid.*, art. L-219-5-1.

<sup>415</sup> *Ibid.*

<sup>416</sup> *Ibid.*

<sup>417</sup> *Ibid.*

<sup>418</sup> *Ibid.*

<sup>419</sup> *Ibid.*, art. L-219-2.

<sup>420</sup> *Ibid.*

<sup>421</sup> Grenelle II, loi no. 2010-788 du 12 juillet 2010, art. 166.

<sup>422</sup> A. Monaco, P. Prouzet, *Governance of Seas and Oceans*, 2015, Wiley p. 191.

of 40 years.<sup>423</sup> Concession applications have to be addressed to the *préfet maritime*, the maritime prefect. There are three maritime prefects, for the Atlantic coast, for the Channel and for the Mediterranean sea.<sup>424</sup> Concessions in the context of this Act are only given to projects for public use, public services or for operations of general interest. The latter would be most suitable as a legal basis for offshore electricity generation and transmission.

Projects that have a significant environmental impact require an environmental authorisation under the Environmental Code as well. It is important to note that the scope of this Code covers the territorial zone, but not the EEZ.<sup>425</sup> In a chapter dedicated specifically to water activities and offshore activities, the Environmental Code provides for two procedures: an authorisation procedure and a declaration procedure.<sup>426</sup> Activities on a large scale or with high environmental impact require an authorisation, referred to as (A) in the Code.<sup>427</sup> Smaller scale activities with a limited impact are regulated under the lighter procedure, declaration, referred to as (D) in the Code.<sup>428</sup>

Regarding offshore wind energy and cables, several activities can trigger the requirement of an authorisation. First of all, the authorisation procedure is used for projects in connection with the maritime environment with direct consequences for the environment, worth more than EUR 1.900.000,<sup>429</sup> which is generally the case for offshore wind energy, converter stations and cables. Projects of less than that amount would require a declaration procedure. Secondly, an authorisation is necessary for some types of dredging and moving sediments.<sup>430</sup> This is relevant for the construction phase of OWFs and cables. Additionally, an EIA is required for every project that may affect the environment above certain thresholds.<sup>431</sup> This is also the case for offshore windfarms in the territorial waters.<sup>432</sup>

Concerning OWFs and cables beyond the territorial sea,<sup>433</sup> the following regime is applicable. France, in exercising sovereign rights over the natural resources in the EEZ, adopted a decree on the regulation applicable to artificial islands, installations, structures and their connected installations, as well as submarine cables and pipelines on the continental shelf and the exclusive economic zone and the ecological protection zone.<sup>434</sup> The offshore production of electricity beyond the territorial waters is specifically mentioned in the decree's preamble. Moreover, the construction of cables and pipelines is already mentioned in the decree's title.

<sup>423</sup> Code général de la propriété des personnes publiques (CGPPP), art. R-2124-1.

<sup>424</sup> Décret no. 2004-112 du 6 février 2004 relatif à l'organisation de l'action de l'Etat en mer, art. 6.

<sup>425</sup> Code de l'environnement, art. R214-1, Titre IV.

<sup>426</sup> Ibid., art. L-214-1.

<sup>427</sup> Ibid., art. L-214-3(I).

<sup>428</sup> Ibid., art. L-214-3(II).

<sup>429</sup> Ibid., 4.1.2.0.

<sup>430</sup> Ibid., 4.1.3.0.

<sup>431</sup> Code de l'Environnement, L-122-1(II).

<sup>432</sup> See for example the EIA for an OWF at St. Brieuc (in French) [http://www.cgedd.developpement-durable.gouv.fr/IMG/pdf/160504\\_-\\_Parc\\_eolien\\_offshore\\_de\\_Saint-Brieuc\\_22\\_-\\_delibere\\_cle011d88.pdf](http://www.cgedd.developpement-durable.gouv.fr/IMG/pdf/160504_-_Parc_eolien_offshore_de_Saint-Brieuc_22_-_delibere_cle011d88.pdf)

<sup>433</sup> Thus relevant for the windfarm developer as well as for RTE as the party responsible to construct the cables at sea.

<sup>434</sup> Décret no. 2013-611 du 10 juillet 2013, JORF no 0160 du 12 juillet 2013 page 11622

The decree describes an authorisation procedure. As with installations in the territorial sea, applications have to be directed to the maritime prefect.<sup>435</sup> The authorisation can last for a maximum of 30 years.<sup>436</sup> However, there is also a special authorisation for pilot projects that last for maximum two years.<sup>437</sup> The application for an authorisation has to include information on various subjects, such as the nature, timing and financial guarantees of the project.<sup>438</sup>

After an application has been submitted, a number of consultations follow. First, the administrative committee of the Environmental Code, the Maritime Council, the Prefect of the region, and, in case the area under application lies in a marine natural park, the competent authority for marine heritage have to be consulted.<sup>439</sup> If the area is at such a location that it also influences the environment of other EU Member States, the competent authorities of that other State have to be involved as well.<sup>440</sup> Parallel to this, a public consultation also needs to be organised.<sup>441</sup> There is a separate provision for offshore cables and pipelines in the EEZ and the continental shelf that come to shore in France: the trajectory has to be notified to the maritime prefect at least six months in advance.<sup>442</sup>

Finally, after building an OWF, another authorisation is necessary for the exploitation of an installation for the production of electricity. This is regulated via the Energy Code.<sup>443</sup> The authorisation for exploitation is awarded by the administrative authority (CRE) which has to take into account the criteria of impact between demand and supply of electricity; the nature and source of the primary energy source; the energy efficiency of the installation, compared to best techniques available and for acceptable economic costs; the technical and financial capacities of the applicant and the impact of the installation on the climate targets.<sup>444</sup> Moreover, the authorisation has to be compatible with the multiannual programme for energy.<sup>445</sup>

The Council of State (*Conseil d'Etat*) has been asked whether the difference in treatment between onshore and offshore windfarm permitting was justified or not, and it concluded that the difference was justified.<sup>446</sup> Furthermore, there are legal actions against the authorisations of several OWFs in France. Recently, the Administrative Court of Appeal ruled that the authorisations for the OWFs at St. Nazaire and Fécamp were legitimately awarded.<sup>447</sup> The Administrative Court of Appeal is the instance in first and only resort for this type of procedures. Therefore, the OWFs at St. Nazaire and Fécamp can now go ahead.

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<sup>435</sup> *Ibid.*, art. 3.

<sup>436</sup> *Ibid.*, art. 14.

<sup>437</sup> *Ibid.*, art. 3.

<sup>438</sup> *Ibid.*, art. 4.

<sup>439</sup> *Ibid.*, art. 7.

<sup>440</sup> *Ibid.*, art. 7iii, based on the Espoo Convention

<sup>441</sup> *Ibid.*, art. 8.

<sup>442</sup> *Ibid.*, art. 19.

<sup>443</sup> Code de l'énergie, art. L311-5

<sup>444</sup> *Ibid.*

<sup>445</sup> *Ibid.*, <http://www.developpement-durable.gouv.fr/programmations-pluriannuelles-lenergie-ppe>.

<sup>446</sup> Conseil d'Etat, Decision Nos. 353565, 353577 (Volkswind), 13-7-2012.

<sup>447</sup> <http://www.lefigaro.fr/flash-eco/2017/06/21/97002-20170621FILWWW00340-fecamp-rejet-d-un-recours-contre-un-parc-eolien-en-mer.php>, <http://nantes.cour-administrative-appel.fr/Actualites-de-la-Cour/Actualites-jurisprudentielles/Parc-eolien-au-large-de-Saint-Nazaire>. For Courseulles-sur-mer, there is also a procedure at the Administrative Court of Appeal in Nantes. The judgment in this case is expected soon.

The French OWFs face

#### 5.4.2.3 SUPPORT SCHEME(S)

France has different support schemes for different types and sizes of renewable energy installations. For several specified categories, there is a feed-in tariff with a guarantee that its electricity will be bought, a power purchase obligation.<sup>448, 449</sup> Moreover, for certain categories, there is a feed-in premium, an additional remuneration.<sup>450</sup> However, these schemes are only for particular sources of renewable energy. In the case of wind energy, this entails floating offshore windfarms,<sup>451</sup> windfarms in areas that are particularly sensitive to cyclones and onshore wind.<sup>452</sup> Moreover, the system is also applicable to wave and tidal energy offshore.<sup>453</sup> Thus, it seems that fixed offshore wind energy cannot profit from these schemes.

Nevertheless, there is a form of remuneration applicable to fixed offshore wind turbines. This is due to the competitive dialogue procedure, which is a type of tender procedure not particularly linked to renewable energy. This procedure gives developers of certain pre-identified projects the right to produce with a remuneration for the produced energy by Electricité de France (EDF), in a contract to buy the electricity.<sup>454</sup> The height of this remuneration is determined through a competitive dialogue procedure. The duration of the support and specific information concerning the tender conditions can be found in the *Cahier des charges* of the respective tender round. Normally, the duration of the remuneration cannot exceed 20 years. The first two tender rounds of this competitive dialogue resulted in prices of around EUR 200 per MWh, which is rather high compared to neighbouring countries. According to the regulatory authority “next to the specificities of the chosen sites, also the result of the modalities of the organisation of the calls for tender that contributed to a limitation of competition.”<sup>455</sup>

With the third round of tenders, France has amended this system. A competitive dialogue is introduced as an extra phase in the tender process.<sup>456</sup> This will facilitate competition between different companies and cause a decrease in costs. The procedure will consist of three steps: a preselection of eligible candidates, the real competitive dialogue and a last step that resembles the previous call for tender.<sup>457</sup> In the preselection, candidates

<sup>448</sup> A. Monaco, P. Prouzet, *Governance of seas and oceans*, 2015, Wiley, p. 193. See also: *Solar and Wind Energies in France: From Feed-in Tariffs to Feed-in premiums*, <http://www.lexology.com/library/detail.aspx?g=9a5c03fb-e0bf-4130-b322-4fcc4073d526>.

<sup>449</sup> Code de l'énergie, art. L314-1.

<sup>450</sup> Code de l'énergie, art. L314-18 and Décret n° 2016-691 du 28 mai 2016 définissant les listes et les caractéristiques des installations mentionnées aux articles L. 314-1, L. 314-2, L. 314-18, L. 314-19 et L.314-21 du code de l'énergie, art. 2.

<sup>451</sup> Pilot projects for floating wind power are currently developed in Groix/Belle Ile (Bretagne) and Gruissan (Occitanie)

<sup>452</sup> Décret n° 2016-691 du 28 mai 2016, art. 1.

<sup>453</sup> Ibid.

<sup>454</sup> Energy Code L311-10 jo. 311-12 and 311-13.

<sup>455</sup> CRE, Délibération de la Commission de régulation de l'énergie du 26 mai 2016 portant avis sur le projet de décret relatif à la procédure de dialogue concurrentiel pour les installations de production d'électricité, p. 2.

<sup>456</sup> Décret n° 2016-1129 du 17 août 2016 relatif à la procédure de dialogue concurrentiel pour les installations de production d'électricité, <https://www.legifrance.gouv.fr/eli/decree/2016/8/17/DEVR1608834D/jo/texte>.

<sup>457</sup> CRE, délibération de 26 Mai 2016, <http://www.cre.fr/documents/deliberations/avis/installations-de-production-d-electricite>, <http://www.developpement-durable.gouv.fr/eolien-en-mer>.

would be screened and preselected by the CRE.<sup>458</sup> Then, the competitive dialogue is organised by the minister responsible for energy.<sup>459</sup> The goal of this procedure is to adapt and precise the project further. Project specifications on the technical level, exact location, time planning and tender conditions can be discussed in this competitive dialogue. In this phase, candidates cannot be excluded from the process.<sup>460</sup> However, they can withdraw their candidacy if they wish so. The third stage asks candidates that participated in the second stage to submit an offer.<sup>461</sup> These offers will be examined by CRE, which gives an advice, after which the Minister for energy chooses the winning bid.<sup>462</sup> CRE was of the opinion that this competitive dialogue does not suffice to enhance competition in the tenders,<sup>463</sup> but it seems that the procedure has been adopted in French law without major changes.

Although OWFs receive remuneration via either the competitive dialogue or via the subsidy regime applicable to floating installations, there is also a special tax for OWFs, which partially offsets the subsidy again. This tax is payable for OWFs that are located in the territorial sea or internal waters. It is an annual sum to be paid over installations that produce electricity from the mechanic energy of the wind, based on the capacity of the OWF in MW, with a fixed sum per MW (currently EUR 15.471).<sup>464</sup> The money raised by means of this tax is transferred to the local municipalities from which the OWF is visible (50%), the national fund for the development of sustainable exploitation of fish stocks (35%) and other projects for the sustainable development of other coastal activities (leisure, tourism, aquaculture).<sup>465</sup> The tax should form an incentive to construct OWFs beyond the territorial sea.

### 5.4.3 OFFSHORE GRID CONSTRUCTION

#### 5.4.3.1 LEGAL CLASSIFICATION

Grid connection of OWFs is done at sea by RTE.<sup>466</sup> RTE is responsible for the cable from the converter station, the *poste électrique en mer*, to the shore.<sup>467</sup> In this sense, the cables from the converter station to the shore are seen as part of the national transmission grid. One practical issue in France is that there is a long list of OWF projects that still need to be connected to the transmission grid.<sup>468</sup> Although it is RTE's responsibility to construct, operate and maintain the grid connection, it is the OWF developer that has to pay the connection.<sup>469</sup>

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<sup>458</sup> Décret 2016-1129, art. R311-25-6.

<sup>459</sup> Ibid., art. R311-25-8.

<sup>460</sup> Ibid., art. R311-25-11.

<sup>461</sup> Ibid., art. R311-25-14.

<sup>462</sup> <http://www.actu-environnement.com/media/pdf/news-26961-avis-cre-dialogue-concurrentiel.pdf> p. 1.

<sup>463</sup> Délibération <http://www.actu-environnement.com/media/pdf/news-26961-avis-cre-dialogue-concurrentiel.pdf>

<sup>464</sup> Ibid., art. 1519 B

<sup>465</sup> General Tax Code (Code générale d'impôts), art. 1519 B and C, jo. Décret no 2012-103 du 27 janvier 2012 relatif à l'utilisation des ressources issues de la taxe instituée par l'article 1519 B du code général des impôts.

<sup>466</sup> <http://www.rte-france.com/sites/default/files/rte2015-raccordementmr-web.pdf?profil=32>, p. 4.

<sup>467</sup> RTE, Mémoire Descriptif, Raccordement électrique du parc éolien en mer de Saint-Nazare, 9-1-2015, <http://www.rte-france.com/sites/default/files/memoire-descriptif-09-01-2015.pdf>, p. 10.

<sup>468</sup> 3.123 MW in 2014, RTE, SER, ERDF, ADEEF, Panorama de l'électricité renouvelable 2014, p. 6. [http://www.rte-france.com/sites/default/files/panorama\\_des\\_energies\\_renouvelables\\_2014.pdf](http://www.rte-france.com/sites/default/files/panorama_des_energies_renouvelables_2014.pdf).

<sup>469</sup> ADEME, Coûts des énergies renouvelables, 2016, p. 13

Concerning offshore interconnectors, there is no specific definition in the French energy code. However, the French energy code mentions that interconnection with other European electricity networks is one of the missions of the TSO.<sup>470</sup> It can be seen from current practice that ownership of offshore interconnectors is shared between the French TSO and another party in a 50-50 joint ownership. In the case of the currently existing interconnector IFA, this is National Grid Interconnectors Limited.<sup>471</sup> In the case of the project France-Alderney-Britain, RTE shares the ownership with FAB Link Limited.<sup>472</sup> FAB Link Limited currently has two shareholders, namely Transmission Investment LLP and Alderney Renewable Energy (ARE) Limited.<sup>473</sup>

### 5.4.3.2 CLUSTERING OF WINDFARMS

This approach is in principle favourable to a clustered approach, as RTE could then construct a *poste électrique en mer* for several OWFs close to each other. However, the OWFs commissioned in France until now are remote from each other and relatively close to the shore. In such configurations, clustering of OWFs is not economically beneficial, which is why there is no tendency towards clustering of OWFs yet. However, France has several ambitions in the field of offshore electricity generation, also beyond the territorial sea. As the distance to shore increases and OWFs are planned closer together, there might be demand for clustering in the future.

It seems that the conditions for possible future clustering of OWFs are favourable. First, there is centralised planning by the maritime prefects. Secondly, OWFs are now developed on the basis of tenders organised in tender rounds, which means that the time gap between the construction of OWFs could be limited in the tender conditions. Lastly, the TSO has to connect the OWF at the converter station, which means that multiple OWFs could possibly be connected to the same converter station.

### 5.4.4 DECOMMISSIONING

In France, the area of an OWF should be restored to its previous state after the lifetime of the installation, or at the end of the concession period. Decommissioning is already discussed in the tender process for the concession.<sup>474</sup> It is one of the criteria that needs to be addressed in the project proposal.<sup>475</sup> The decommissioning has to be performed according to the concession conditions which are part of the project proposal.<sup>476</sup> The principle is that the area has to be recovered in its original state.<sup>477</sup>

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<sup>470</sup> Energy Code, art. L-321(6)l.

<sup>471</sup> <http://www2.nationalgrid.com/About-us/European-business-development/Interconnectors/france/>.

<sup>472</sup> <http://www.fablink.net/about-us/>

<sup>473</sup> Ibid.

<sup>474</sup> Ministère de l'Écologie, du développement durable et de l'énergie, Cahier des charges de l'appel d'offres portant sur des installations éoliennes de production d'électricité en mer en France métropolitaine, <http://www.cre.fr/documents/appels-d-offres/appel-d-offres-portant-sur-des-installations-eoliennes-de-production-d-electricite-en-mer-en-france-metropolitaine2/cahier-des-charges>.

<sup>475</sup> Ibid., p. 23.

<sup>476</sup> Ibid.

<sup>477</sup> Ibid., p. 42/43.

In order to finance this, there needs to be a financial guarantee of at least EUR 50.000 per MW.<sup>478</sup> The guarantee can either be vested at a financial institution, or at the *Caisse des Dépôts et Consignations*.<sup>479</sup> At most five years before the finalisation of the exploitation phase, the project developer has to contact the maritime *préfet* that awarded the concession.<sup>480</sup> Then, at most two years before the finalisation of the exploitation, the project developer has to perform a study on the optimisation of the conditions of decommissioning and recovery in the original state of the area, taking into account environmental aspects and maritime safety.<sup>481</sup> It is possible to change the decommissioning requirements from the concession conditions, and when the maritime prefect deems it necessary to do this, he will precise another date for when the optimisation study has to be done.<sup>482</sup>

### 5.4.5 INTERIM CONCLUSION

France adopted a new system of maritime spatial planning several years ago. With this new system, maritime spatial planning is organised by the State but in coordination with regions and civil society. Such an inclusive approach may help to increase acceptance of the spatial plans. Finally, it will be adopted in the form of a decree. Although the system is already in place for several years, there is no official spatial plan yet. The licensing and permitting procedures in France are based on several permits. These procedures could be streamlined more, with one authority as one-stop-shop for all permits. This would facilitate offshore wind development. The support scheme for offshore wind depends on the technique used: there is a difference between standing turbines and floating turbines. In any case, for the currently consented offshore windfarms, tenders have been organised. However, these tenders led to high prices per MWh compared to OWFs in other countries, which the NRA explains with regard to the modalities of the tender procedure, which did not lead to sufficient competition. This brought France to change their procedure to a competitive dialogue. However, the exact lay-out of the system is not yet clear, as there is a discussion between the French government and CRE about whether the proposed new system would improve the competitiveness of the tender.

Concerning the legal classifications of cables, the cable from an OWF to the shore is owned and operated by the TSO from the moment it leaves the converter station. The converter station itself is thus still part of the OWF and owned by the developer. Interconnectors are also owned by the TSO. A combination of export cables and interconnectors would be possible under this regime, although the fact that the converter station is not owned by the TSO complicates a combined connection slightly. Clustering of OWFs is not yet done in France, as the OWFs that have been commissioned so far are geographically further apart from each other than from the shore. However, the conditions for potential clustering in the future are relatively favourable, as there is centralised planning and there is one entity that bears the responsibility to connect the OWFs until the converter station.

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<sup>478</sup> Ibid., p. 38.

<sup>479</sup> Ibid.

<sup>480</sup> Ibid., p. 42.

<sup>481</sup> Ibid., p. 42/43.

<sup>482</sup> Ibid., p. 43.



## 5.5 LEGAL FRAMEWORK OF GERMANY

### 5.5.1 INTRODUCTION

The German energy policy has changed significantly over the past few years, with the nuclear phase-out (*Atomausstieg*) and the considerable increase in electricity from renewable sources (*Energiewende*). Under the Renewable Energy Directive, Germany has a goal of 18% renewable energy consumption in 2020.<sup>483</sup> With the latest legislative changes, Germany also adopted policy for the timeframe until 2030. This includes an exact ambition of 15 GW offshore wind energy in 2030.<sup>484</sup> It has to be noted that this entails both the North Sea and the Baltic Sea.

Main acts that regulate the energy sector are the Energy Industry Act (*EnergieWirtschaftsGesetz*, EnWG),<sup>485</sup> and the Renewable Energy Act (*Erneuerbare Energien Gesetz*, EEG).<sup>486</sup> The latter act was changed in 2016 and entered into force on January 1<sup>st</sup> 2017. With the same legislative change, a new act was adopted that deals specifically with offshore wind energy: The Act on the development and construction of wind energy at sea (*Gesetz zur Entwicklung und Förderung der Windenergie auf See*, WindSeeG), hereinafter Act on offshore wind energy.<sup>487</sup> This act is applicable both to the EEZ and to the territorial sea.<sup>488</sup> The temporal scope of the Act is that it relates to all OWFs that are taken into operation after December 2020. Moreover, for offshore activities in general, the Federal Maritime Responsibility Act (*Seeaufgabengesetz*) is also relevant. This Act is further implemented by the Marine Facilities Ordinance (the *Seeanlagenverordnung*).

Main actors for the regulation of German (offshore) grids and generation installations are the federal authority for maritime and hydrographic affairs (*Bundesamt für Seeschifffahrt und Hydrographie* (BSH)) and the German NRA *Bundesnetzagentur*, or BNetzA. German has four TSOs. However, the only TSO with connection to the North Sea is TenneT GmbH.

<sup>483</sup> Renewable Energy Directive, Annex I.

<sup>484</sup> Act on offshore wind energy, art. 1(2).

<sup>485</sup> Energy Industry Act: *Energiewirtschaftsgesetz* vom 7. Juli 2005 (BGBl. I S. 1970, 3621), das durch Artikel 1 des Gesetzes vom 27. Januar 2017 (BGBl. I S. 130) geändert worden ist, [https://www.gesetze-im-internet.de/bundesrecht/enwg\\_2005/gesamt.pdf](https://www.gesetze-im-internet.de/bundesrecht/enwg_2005/gesamt.pdf).

<sup>486</sup> Renewable Energy Act, *Erneuerbare-Energien-Gesetz* vom 21. Juli 2014 (BGBl. I S. 1066), das durch Artikel 2 des Gesetzes vom 22. Dezember 2016 (BGBl. I S. 3106) geändert worden ist (EEG 2017), [http://www.gesetze-im-internet.de/eeg\\_2014/BJNR106610014.html](http://www.gesetze-im-internet.de/eeg_2014/BJNR106610014.html).

<sup>487</sup> Gesetz zur Einführung von Ausschreibungen vor Strom aus erneuerbaren Energien und zu weiteren Änderungen des Rechts der erneuerbaren Energien, 13-10-2016, BGBl Teil I nr. 49, art. 2, <https://www.buzer.de/gesetz/12211/index.htm>,

<sup>488</sup> WindSeeG, para 2(2).

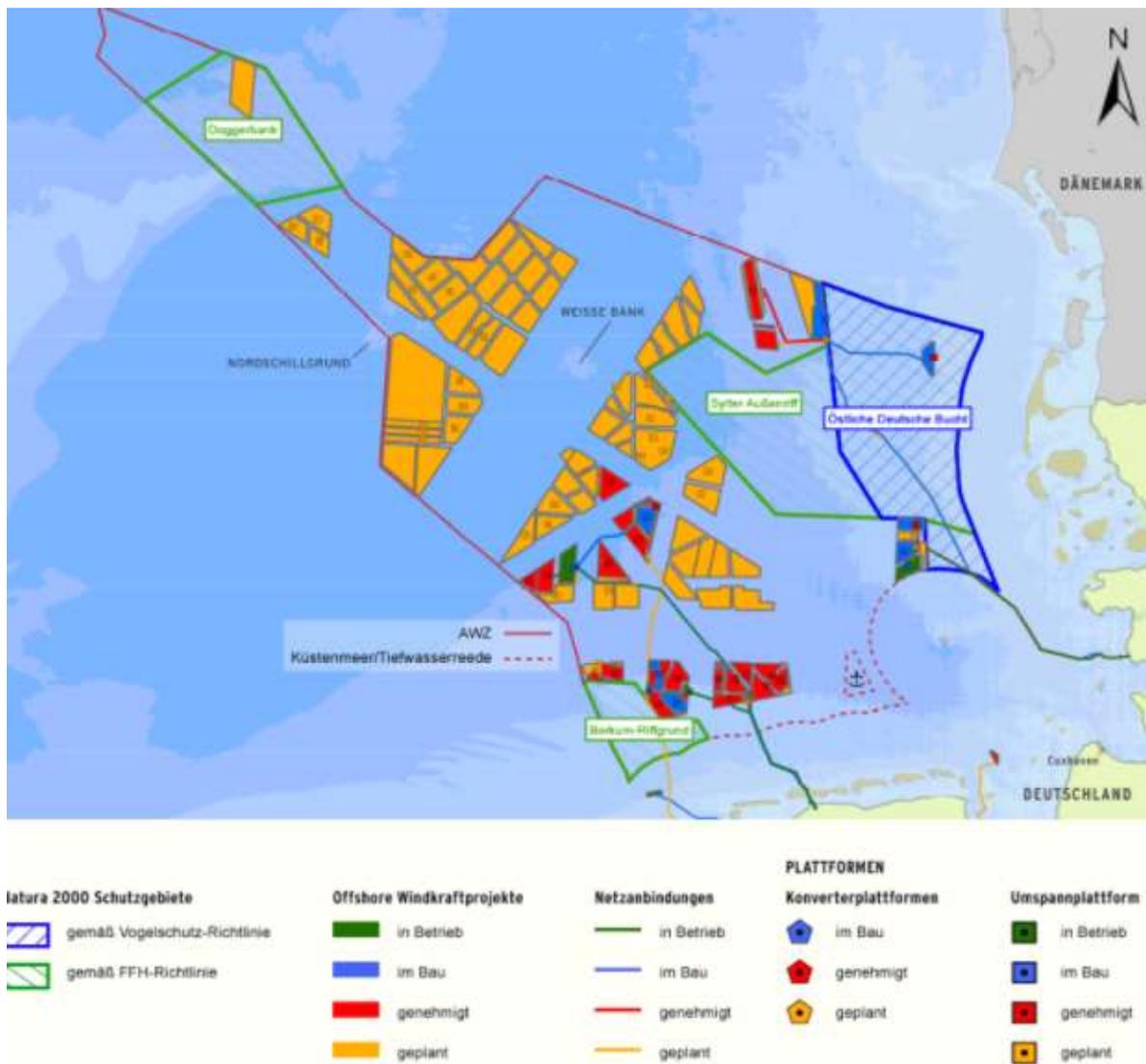


Figure 9: OWF zones in the German North Sea EEZ. Source: Bundesamt für Naturschutz.

## 5.5.2 OFFSHORE GRID PLANNING

### 5.5.2.1 MARITIME SPATIAL PLANNING

There is a distinction between the legal regime for OWFs in the territorial waters and in the EEZ. In the territorial waters, the local regime of the concerned *Bundesland* is applicable. Most of the territorial sea on the North Sea side is the *Wadden* Sea, which is a protected nature reserve area in which it is very difficult to construct OWFs and cables. Therefore, most OWFs are constructed further from the shore, in the EEZ. Only the federal system will be treated here.

Before 2009, parties interested in developing OWFs could choose freely from all available locations.<sup>489</sup> However, from 2009 onwards, a spatial plan for the EEZ was adopted.<sup>490</sup> This spatial plan is made on the basis of the Spatial Planning Act (*Raumordnungsgesetz*).<sup>491</sup> The spatial plan designates *Vorranggebiete*, special areas in which offshore wind energy has priority. Within such areas, developers can still choose the exact location of their OWF, but they have to adhere to various rules and principles.<sup>492</sup> For example, an OWF should not threaten the safety of navigation;<sup>493</sup> separate turbines in OWFs should be constructed in the way that uses the least space;<sup>494</sup> there is a height restriction of 125 meter for turbines within sight from the coast;<sup>495</sup> OWF construction or operation should not hinder the circulation/flow of maritime navigation.<sup>496</sup> Moreover, the German spatial plan rules that OWFs in Natura 2000 areas are inadmissible, unless they are in a designated wind energy area.<sup>497</sup> Additionally, OWFs have to be decommissioned after finishing their operational phase, unless the decommissioning has more negative consequences than leaving the OWF fully or partially in place.<sup>498</sup> It is interesting to note that the Spatial Planning Act specifically refers to cross-border cooperation as well, especially in light of trans-European networks.<sup>499</sup>

With the entry into force of the Act on Offshore Wind Energy, there will be a more specific spatial plan that lists which wind energy areas will be developed in which year, the *Flächenentwicklungsplan*.<sup>500</sup> For the time period between 2026 and at least 2030, it should specify where the OWFs will be located, but also where cables and converter stations will be sited.<sup>501</sup> For the period between 2021 and 2025, the *Flächenentwicklungsplan* can also decide which cables should be constructed. The plan is drafted by the BSH.<sup>502</sup> Afterwards, the BNetzA asks the TSOs to react to the draft. Moreover, the BSH also drafts a Strategic Environmental Assessment for the plan if necessary. Eventually, the BSH makes a final plan in cooperation with the BNetzA and the after coordination with the *Bundesamt für Naturschutz*, the *Generaldirektion Wasserstrassen und Schifffahrt* and the German *Ländern* on the coast.<sup>503</sup>

In the Spatial Planning Act, there is also a separate chapter for cables and pipelines.<sup>504</sup> However, the main planning of offshore cables comes from a different document, namely the *Bundesfachplan Offshore*. The BSH

<sup>489</sup> Müller 2016, p. 195.

<sup>490</sup> Verordnung über die Raumordnung in der deutschen ausschliesslichen Wirtschaftszone in der Nordsee vom 21 september 2009, BGBl. I S. 3107. [https://www.gesetze-im-internet.de/bundesrecht/awz\\_nordsee-rov/gesamt.pdf](https://www.gesetze-im-internet.de/bundesrecht/awz_nordsee-rov/gesamt.pdf) especially chapter 3.5.

<sup>491</sup> Spatial Planning Act, Raumordnungsgesetz vom 22. Dezember 2008 (BGBl. I S. 2986), das zuletzt durch Artikel 124 der Verordnung vom 31. August 2015 (BGBl. I S. 1474) geändert worden ist, art. 17.

<sup>492</sup> *Ibid.*, 3.5.1.

<sup>493</sup> *Ibid.*, 3.5.1(2).

<sup>494</sup> *Ibid.*, 3.5.1(4).

<sup>495</sup> *Ibid.*, 3.5.1(8).

<sup>496</sup> *Ibid.*, 3.5.1(7).

<sup>497</sup> *Ibid.*, 3.5.1(3).

<sup>498</sup> *Ibid.*, 3.5.1(5).

<sup>499</sup> *Ibid.*, 2.2(8).

<sup>500</sup> Act on offshore wind energy, Teil 2 Abschnitt 1.

<sup>501</sup> *Ibid.*, para 5(1).

<sup>502</sup> *Ibid.*, para 6(1).

<sup>503</sup> *Ibid.*, para 6(7).

<sup>504</sup> *Ibid.*, 3.3.

needs to draft a new *Bundesfachplan Offshore* biannually, starting in 2016.<sup>505</sup> This document has as its goal to coordinate the spatial planning and the grid connection of OWFs. Another layer is the *Offshore Netzentwicklungsplan* (offshore grid development plan, or O-NEP 2025).<sup>506</sup> This plan is rather about grid planning than about spatial planning. This can be seen for example from the competent authorities to draft the plans. The *Bundesfachplan Offshore* is drafted by the BSH, while the *Offshore Netzentwicklungsplan* has to be developed by the TSOs and agreed by the BNetzA.<sup>507</sup> As the O-NEP deals specifically with the grid connection of OWFs, it will be treated further under Offshore Grid Construction.

### 5.5.2.2 LICENSING AND PERMITTING PROCEDURES

Until the latest amendment, thus before January 2017, the permitting process took place on a first-come-first-served basis, without tender rounds.<sup>508</sup> This led to an uncoordinated and explosive growth of connection demands in 2012-2013 which the TSO could not satisfy.<sup>509</sup> Therefore, this process has since been amended to lead to a more coordinated consenting process in which the construction of new OWFs is spread over multiple years. With the last legislative review, the process was given its own place in a new act, the Act on offshore wind energy. Currently, the process is different for OWFs constructed under the transitional regime (until 2025) and for OWFs constructed under the central regime (after 2025).

#### *Transitional Regime*

For already existing projects which have not been constructed yet, namely OWFs which will be constructed between 2021 and 2025, there is a special auction regime, with auctions taking place from April 1<sup>st</sup> 2017 and April 1<sup>st</sup> 2018.<sup>510</sup> These auctions should both deliver 1550 MW, so 3100 MW in total.<sup>511</sup> OWFs can only be built after they have acquired a location (*Zuschlag*) in such a tender round conducted by BNetzA.<sup>512</sup> The connection of these windfarms will take place following the 'old' regime which was also applicable before 2017. These OWFs have already obtained their plan approval: the German legal regime requires a plan approval (*Planfeststellung*) for the construction of an OWF. Moreover, this is confirmed by the *Seeanlagenverordnung*, which rules that both installations that generate energy from wind, water or currents and installations that transmit energy from wind, water or currents, thus both OWFs and grid connection assets, need such a plan approval.<sup>513</sup> The plan should

<sup>505</sup> Energy Industry Act, para 17a.

<sup>506</sup> Netzentwicklungsplan: <https://www.netzausbau.de/bedarfsermittlung/2025/nep-ub/de.html>

<sup>507</sup> Energy Industry Act, para 12b.

<sup>508</sup> Müller, p. 195.

<sup>509</sup> <http://www.sueddeutsche.de/wirtschaft/probleme-mit-offshore-windparks-nordsee-ohne-anschluss-1.1190286> and <http://www.spiegel.de/wirtschaft/unternehmen/teurer-netzausbau-offshore-windenergie-droht-kollaps-a-798074.html>.

<sup>510</sup> Act on offshore wind energy, para 26(1).

<sup>511</sup> *Ibid.*, para 27(1)-(3). When less than 1550 is tendered in 2017, more will be tendered in 2018 in order to reach 3100 MW in 2018.

<sup>512</sup> Act on offshore wind energy, para 46(1).

<sup>513</sup> *Seeanlagenverordnung* vom 23. Januar 1997 (BGBl. I S. 57), die zuletzt durch Artikel 55 der Verordnung vom 2. Juni 2016 (BGBl. I S. 1257) geändert worden ist, para 2 jo. para 1(2).

include proof that the project developer indeed acquired the area that it refers to, information on safety and precautionary measures, a time schedule including the measures to be taken, documents on the environmental impact analysis and, if requested by the BSH, information on whether the technology used reflects state of the art technology and corresponds to safety requirements.

The BSH is the entity in charge of approving the plans.<sup>514</sup> It can only approve a plan when certain criteria are met. First of all, the maritime environment is not jeopardised, which refers specifically to the dangers of pollution and danger to migratory birds.<sup>515</sup> Moreover, it should not interfere with the safety and circulation of maritime traffic, defense activities, mineral resources extraction and existing and planned cables and pipelines as well as converter stations and substations.<sup>516</sup> Possibly, other criteria could also be added.<sup>517</sup> Next to this procedure of plan approvals, another procedure (*Plangenehmigung*) exists in specific situations.<sup>518</sup> Both types of approval last for 25 years, with a possibility of extension to 30 years.<sup>519</sup>

When the process of plan approval has commenced, the BSH can take measures for the preparation of the construction phase that speed up the timely commissioning of a project, in the general interest.<sup>520</sup> This relates for example to efficient electricity grid use.<sup>521</sup> These measures are taken in a provisional ordinance (*Vorläufige Anordnung*).

Once the location award (*Zuschlag*) and the plan approval are ready, the project can go ahead. In order to prevent project developers to withdraw, there are certain rules about the legal status and expectations of the location award and the plan approval. For example, the timing of different steps of the procedure is limited:<sup>522</sup> 12 months after the location has been awarded, the project developer has to send the plan mentioned above to the BSH. Moreover, at least 2 years before the commissioning date, the project developer has to provide proof that the project is financed. It is interesting to note that the '*Fertigstellungstermin*' is not the commissioning date, as the article indicates that at the latest six months after this date, the first installation has to be ready, while the whole OWF (or at least 95% of it) has to be commissioned within 1.5 year after this date.

### *Central Regime*

In the new permitting process under the Act on offshore wind energy which is applicable to OWFs tenders from 2021 to 2025 (this with construction dates between 2026 and 2030), the locations for OWFs will be determined centrally by the BSH, via the *Flächenentwicklungsplan*. The tender rounds are then based on the areas

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<sup>514</sup> Act on offshore wind energy, para 45(2).

<sup>515</sup> *Ibid.*, para 48(4)1.

<sup>516</sup> *Ibid.* para 48(4)2-6.

<sup>517</sup> *Ibid.*, para 48(4)8. The original proposal was 20 years, but this was amended to 25 years at the request of the OWF developers. It was changed with the latest amendment (22-12-2016) of the Act on offshore wind energy.

<sup>518</sup> *Ibid.*, para 48(6).

<sup>519</sup> *Ibid.*, para 48(7).

<sup>520</sup> *Ibid.*, para 49.

<sup>521</sup> *Ibid.*, para 49.

<sup>522</sup> *Ibid.*, para 59.

determined through the plan. Just as with the transitional regime, OWFs require a plan approval and the *Zuschlag*. This is also coupled to the subsidy scheme, which will be treated in more detail in next paragraph.

### *Interconnectors*

Concerning interconnectors, two different licenses are required.<sup>523</sup> First of all, a permit under the Federal Mining Act is needed for ‘underwater cables and pipelines’.<sup>524</sup> The responsible authority for this permit with regard to the North Sea is the *Landesamt für Bergbau, Energie und Geologie*.<sup>525</sup> The other permit is a planning approval that can be awarded by the BSH.<sup>526</sup> The procedure for this permit is the same as for OWFs and export cables.<sup>527</sup>

### 5.5.2.3 SUPPORT SCHEME(S)

Before 2014, Germany used to have a fixed feed-in tariff for renewables, including all offshore wind energy.<sup>528</sup> Next to this, there was an optional feed-in premium system. However, after a major legislative revision of the Renewable Energy Act in 2014, the system was changed in that the feed-in premium became mandatory for all installations of more than 500 kW. Smaller installations could still use the fixed feed-in tariff. In 2016, the threshold of 500 kW was changed to 100 kW.<sup>529</sup>

The feed-in premium should bring market incentives to the renewable energy subsidy system.<sup>530</sup> It is available for renewable energy that is brought to the market and actually fed into the system.<sup>531</sup> Generally, for installations after 2014, the German law aims for renewable energy to be brought directly to the market, with the underlying aim of better market integration.<sup>532</sup> This system is also applicable to offshore wind energy. However, the procedure differs for OWFs constructed between 2014 and 2020 and OWFs constructed after 2020.

With the latest legislative change, the Renewable Energy Act was changed and offshore wind was taken out of the Act. Instead, it is given its own Act, the already mentioned Act on offshore wind energy, in which the process for OWFs to acquire support is also amended.<sup>533</sup> Under the transitional system, as explained in 5.5.2.2, BNetzA tenders 3100 MW. These are ordered according to how high the offered price is, and the lowest offers will be accepted first. It has to be noted that the tender price cannot be higher than 12 eurocents per kWh.<sup>534</sup>

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<sup>523</sup> See also Müller 2016, p. 205/206.

<sup>524</sup> Bundesberggesetz (BBergG), art. 133(1). The article refers only to pipelines, but in the last clause, it declares the article also applicable to submarine cables. BBergG, art. 133(4).

<sup>525</sup> Müller 2016, p. 206.

<sup>526</sup> BBergG, art. 133(1).

<sup>527</sup> Müller 2016, p. 206.

<sup>528</sup> *Ibid.*, p. 198. The fixed feed-in tariff still exists for small installations (up to 100 kW).

<sup>529</sup> *Ibid.*, para 37.

<sup>530</sup> Renewable Energy Act, para 20.

<sup>531</sup> *Ibid.*, para 19(1)1.

<sup>532</sup> *Ibid.*, para 2(2).

<sup>533</sup> Gesetz zur Einführung von Ausschreibungen vor Strom aus erneuerbaren Energien und zu weiteren Änderungen des Rechts der erneuerbaren Energien, 13-10-2016, BGBl Teil I nr. 49, art. 2.

<sup>534</sup> Act on offshore wind energy, para 33.

In the system after 2025, the central regime, BNetzA organises tenders for the market premium that OWF operators can receive. With this Act, a yearly 700-900 MW of capacity is tendered with regard to new areas that have already been subject to preinvestigation.<sup>535</sup> These preliminary investigations are organised in order to provide potential applicants with sufficient information to participate in the tender on a level playing field, and in order to investigate the suitability of the different areas for offshore wind energy.<sup>536</sup> They cover for example environmental aspects and data on wind and oceanography.<sup>537</sup> This system was already used in Denmark and in the Netherlands for several tenders.

The tender is performed according to the general tender provisions of the Renewable Energy Act, but the Act on offshore wind energy provides several specific deviations to the general rules.<sup>538</sup> The tender conditions are made public at least six months before the tender takes place.<sup>539</sup> It is based on a predetermined volume, predetermined area(s) and a term within which the OWF should be constructed. Winning the tender gives the successful applicant the right to have the OWF connected to the grid by the predetermined time.<sup>540</sup> A cap on the maximum tender price ensures a limit on the costs of the renewable energy produced from these OWFs.<sup>541</sup> The support will also be limited in time to 20 years from the start of operation of the installation.<sup>542</sup>

There are special tenders for projects that already exist, for example on the basis of an earlier *Bundesfachplan Offshore*, but that are not operational before the end of 2020.<sup>543</sup> The tender volume will then be 1.55 GW per tender procedure, and this will only be open for the existing projects mentioned above.<sup>544</sup> There are two tender procedures, in 2017 and 2018. The projects that fall under this regime will be connected to the grid according to the *Offshore Netzentwicklungsplan*.<sup>545</sup> This should lead to a good division of when the projects become operational. In order to ensure the actual construction and operation of the OWFs that receive the market premium, a sanction system is put in place.<sup>546</sup> Moreover, in order to be sure that applicants are able to pay a potential penalty, a guarantee relating to the tender price times EUR 200 per KW.<sup>547</sup> It is now clear that the new tender system is very fruitful in bringing down costs. The first tender round resulted in a new record for offshore wind: EUR 0,00 per MWh subsidy.<sup>548</sup> It has to be said that this does not include the costs of grid connection, which are borne by the TSO and socialised under network users. Moreover, the winning bid is based on certain technological advancement assumptions, electricity and CO<sub>2</sub> price assumptions and it concerns an OWF that is planned to be constructed only after 2023.<sup>549</sup>

<sup>535</sup> Act on offshore wind energy, para 16.

<sup>536</sup> *Ibid.*, para 9(1).

<sup>537</sup> *Ibid.*, para 10(1).

<sup>538</sup> *Ibid.*, para 15. As such, the Act on offshore wind energy is the *lex specialis* to the Renewable Energy Act.

<sup>539</sup> *Ibid.*, para 19.

<sup>540</sup> Energy Industry Act, para 17d.

<sup>541</sup> Act on offshore wind energy, para 22.

<sup>542</sup> Renewable Energy Act, para 25.

<sup>543</sup> Act on offshore wind energy, para 26.

<sup>544</sup> *Ibid.*, para 27(1).

<sup>545</sup> *Ibid.*, para 28 jo. EnWG, para 17b and c.

<sup>546</sup> *Ibid.*, para 60 jo Renewable Energy Act para 55 and further.

<sup>547</sup> *Ibid.*, para 21 jo para 31.

<sup>548</sup> [https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/DE/2017/13042017\\_WindSeeG.html](https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/DE/2017/13042017_WindSeeG.html).

<sup>549</sup> <http://www.dongenergy.com/en/media/newsroom/company-announcements-details?omxid=1557851>.

A specifically interesting provision in the German EEG is the possibility to fund projects outside Germany.<sup>550</sup> This is possible for up to 5% of the tendered capacity, under the conditions that the project is located in a country that also opens its subsidy system for German projects, and that it is physically possible to transmit the current to Germany, or at least that it has a similar effect on the German market.<sup>551</sup> This is an implementation of the cooperation mechanisms under the Renewable Energy Directive.<sup>552</sup> However, as this is a new provision, it is not yet clear how this provision will work in practice. In any case, the joint tender between Denmark and Germany, mentioned already in chapter 5.3.2.3 for solar PV also makes use of this system.<sup>553</sup> Nevertheless, in this tender, almost all solar PV-projects take place in Denmark, even though solar resources might not be better in Denmark than in Germany. This shows that it is important to have a level playing field for joint tenders, also with regard to planning and permitting issues.

### 5.5.3 OFFSHORE GRID CONSTRUCTION

#### 5.5.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

In Germany, TSOs are responsible since 2006 for the connection of OWFs to the grid at sea, until the converter station.<sup>554</sup> This was originally decided in order to facilitate offshore wind energy development. The offshore connections are part of the same network as the onshore grid and they are also regulated as such.

In recent years, there were many struggles between TSOs and OWF developers with regard to connection delays due to the clustering approach in combination with HVDC technology which still had to be developed further.<sup>555</sup> This led to several legislative changes, which should reduce the pressure on the TSOs to deliver many connections at the same time. Therefore, since the legislative change, the order of construction of (permitted) OWFs is based on whether there is capacity on the infrastructure to connect them.<sup>556</sup> Grid connection is now coupled to the tender system, so that when an applicant wins a tender, it will also obtain the right to be connected.<sup>557</sup>

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<sup>550</sup> Renewable Energy Act, para 5 jo 88a.

<sup>551</sup> Ibid., para 5(3).

<sup>552</sup> Ibid., para 5(3)1.

<sup>553</sup> Lov om pilotudbud af pristillaeg for elektricitet fremstillet pa solcelleanlaeg, lov nr. 261 of 16 March 2016, <https://www.retsinformation.dk/forms/r0710.aspx?id=178945>.

<sup>554</sup> Energy Industry Act, para 17a.

<sup>555</sup> In a report from a few years ago, it is stated that it takes over 50 months to connect an OWF. However, right now, it may take as much as 60 months before a grid connection is realised. For AC connections, there are no such delays. Stiftung Offshore Windenergie, Lösungsvorschläge für die Netzanbindung von Offshore-Windparks der AG Beschleunigung Offshore Netzanbindung, p. 7, [http://www.offshore-stiftung.com/60005/Uploaded/Offshore\\_Stiftung%7CAGBeschleunigung\\_Loesungsvorschlaege.pdf](http://www.offshore-stiftung.com/60005/Uploaded/Offshore_Stiftung%7CAGBeschleunigung_Loesungsvorschlaege.pdf)

<sup>556</sup> Müller 2016, p. 197.

<sup>557</sup> Act on offshore wind energy, para 24(3)b.

In Germany, every electricity transport with the goal to deliver electricity to end users (although not the actual delivery itself) is seen as transmission.<sup>558</sup> This includes cross-border connections (interconnectors).<sup>559</sup> Therefore, in Germany, interconnectors form part of the transmission system.<sup>560</sup> They fall under the responsibility of the TSO of the area in which the cable lands. However, there is one exempt interconnector, Baltic Cable, which links Sweden and Germany but is owned by Norwegian energy producer Statkraft.<sup>561</sup>

### *Offshore Netzentwicklungsplan*

As mentioned before, the construction of the cables is done on the basis of an Offshore *Netzentwicklungsplan* (Grid Development Plan) that is drafted by the TSOs and authorised by the NRA.<sup>562</sup> The German offshore grid development plan is determined by the onshore development plan, the estimated future energy demand, the current location of grid junction points, and the legal requirements of the Energy Industry Act. It is not set to define market strategies or determine the locations for power stations or renewable energy facilities. The offshore grid development plan brings together aspects of the development of the transmission grid on land, maritime spatial planning, technical standards, time planning, and costs. The focus is on the planning measures for the offshore grid development based on criteria such as the location of grid connections on land, the progress of OWFs, and the location of divided zones and clusters. The plan has to be ratified by BNetzA.<sup>563</sup> It is interesting to know that interconnector planning is addressed in the onshore *Netzentwicklungsplan*, rather than in the offshore plan, even though these interconnectors may cross the sea. This is also relevant in the context of hybrid projects where interconnection is combined with OWF connection.

Nevertheless, concerning these hybrid projects, it is clear that these also fall under the responsibility of the TSO of that region. It seems that a hybrid cable would also be part of the (regulated) transmission grid, as both export cables and interconnector cables are also part of this grid. Therefore, a combination of functions does not seem to be problematic from a legal classification of the cables point of view in Germany. This is an advantage for hybrid projects as first steps towards a meshed offshore grid, but also for the meshed offshore grid itself.

### 5.5.3.2 CLUSTERING OF WINDFARMS

Germany has a clustering regime in place for several years already, resulting in offshore HVDC converter stations that connect several OWFs.<sup>564</sup> The clustering regime started with a Position Paper by BNetzA from 2009.<sup>565</sup> The reasons for clustering, stated in this report, are that with OWFs increasingly far from the shore, it becomes more economical to cluster OWFs than to use radial connections. Thus, clustering would lower the costs that eventually

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<sup>558</sup> Energy Industry Act, art. 3(32).

<sup>559</sup> Ibid.

<sup>560</sup> Müller 2016, p. 206.

<sup>561</sup> <http://www.balticcable.com/aboutindex.html>.

<sup>562</sup> Ibid., para 17b(1).

<sup>563</sup> BNetzA, Bestätigung, [https://www.netzausbau.de/SharedDocs/Downloads/DE/2025/NEP/O-NEP2025\\_Bestaetigung.pdf;jsessionid=475166D55BBC36CD82EE6032EDA8A77D?\\_\\_blob=publicationFile](https://www.netzausbau.de/SharedDocs/Downloads/DE/2025/NEP/O-NEP2025_Bestaetigung.pdf;jsessionid=475166D55BBC36CD82EE6032EDA8A77D?__blob=publicationFile).

<sup>564</sup> For example, BorWin, DolWin, HelWin and SylWin are constructed in this way.

<sup>565</sup> BNetzA, Positionspapier zur Netzanbindungsverpflichtung, 2009.



electricity consumers have to pay through the network tariffs. On the other hand, with clustering, there will also be a smaller environmental impact as less cables cross through the sensitive natural reserve area *Wadden Sea* compared to radial connections.<sup>566</sup>

The clustering regime can be continued after the legislative changes, as they also facilitate clustering. Through the *Flächenentwicklungsplan*, the OWFs can be constructed in locations that are geographically close to each other and in such an order that OWFs in the same area are constructed around the same time. Moreover, as the grid connection is coupled to the tender for the market premium, the commissioning dates of OWFs can be planned in advance.

Concerning further building blocks towards an offshore meshed HVDC grid, an interesting development is taking place in the Baltic Sea, the Combined Grid Solution (originally named Kriegers Flak). The project is to connect two OWFs in the German part of the Baltic Sea and an OWF in the Danish part. The German TSO for the Baltic Sea, 50Hertz, and Energinet.dk, will build a connection between these OWFs. It is important to note that the connection between these OWFs is in AC, thus making it less complicated than full HVDC connections, such as the new OWF connections in Germany in the North Sea are. The Combined Grid Solution is described further in chapter 5.3.3.

### 5.5.4 DECOMMISSIONING

When the Planning Permit loses its validity (which is 25 years or with extension 30 years for new OWFs in Germany), OWFs have to be decommissioned. In Germany, decommissioning has to take place as far as several interests enumerated in law require this.<sup>567</sup> The interests referred to are the same as in the requirements for the planning approval, namely the maritime environment, including prevention of maritime pollution and no hindrance of migratory birds.<sup>568</sup> It should not hinder the safety of shipping, defence activities and mining activities if they have priority in that area.<sup>569</sup> Also, it has to be compatible with existing and planned cables and pipelines, offshore converter stations etc.<sup>570</sup>

When the BSH decides on the planning permit/approval, it can already order that there need to be guarantees or securities for the decommissioning phase. When the OWF developer transfers the planning approval to another party, the original approval-holder remains responsible for decommissioning until the next holder places the security for decommissioning. In this way, the German policy makes sure that there is always a party responsible for decommissioning. Finally, with regard to the standards of decommissioning, the generally accepted international norms about decommissioning are the minimum standard.<sup>571</sup> In conclusion, it seems that the decommissioning scheme of Germany leaves enough flexibility for developments with regard to an offshore grid.

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<sup>566</sup> Ibid., p. 3.

<sup>567</sup> Act on offshore wind energy, art. 58(1).

<sup>568</sup> Ibid., art. 48(1).

<sup>569</sup> Ibid., art. 48(2)-(4).

<sup>570</sup> Ibid., art. 48(4)-(6).

<sup>571</sup> Ibid., art. 58(2).

### 5.5.5 INTERIM CONCLUSION

Germany has introduced many legislative changes concerning offshore wind energy in the last few years. However, the legal regime that is in place since October 2016 seems to take into account developments and best practices in neighbouring EU countries such as Denmark and the Netherlands. It introduced tenders for a renewable energy market premium and created a detailed system for offshore spatial planning and grid planning, as well as coupling the tenders for a fixed capacity to the right to be connected in line with the grid planning. This has proven to bring the costs for the remuneration of renewable energy down significantly in comparison to the earlier system. Moreover, it seems to prevent the problems that existed before in relation to the grid connection of OWFs.

Concerning offshore grid construction, the TSO is in charge of grid connection of OWFs at offshore converter stations. Moreover, the TSO is also in charge of interconnectors. Germany is already advanced when it comes to the clustering of OWFs in hubs. This development was necessary due to the far distance from shore of the current OWFs (making the grid connection costs much higher than for OWFs close to the shore) and due to the fact that Germany preferred to limit the amount of cables that passes the *Wadden* Sea area. The current legislative approach facilitates a hub-approach well. Moreover, the legal framework also facilitates further developments towards hybrid electricity cables as both export cables and interconnectors are deemed to be part of the transmission grid and operated by the TSO. An interesting development is that Germany is also experimenting with a hub-to-hub approach together with Denmark in the Combined Grid Solution, as mentioned in chapter 5.3. This should be researched further in the context of PROMOTioN, as it could be one of the first steps towards a meshed offshore electricity grid.



## 5.6 LEGAL FRAMEWORK OF THE NETHERLANDS

### 5.6.1 INTRODUCTION

Although the Netherlands has a longstanding tradition in utilising wind energy, the first developments in offshore wind energy only date from 2008, with two OWFs with a capacity of just over 100 MW.<sup>572</sup> However, after the slow start, there was a renewed interest in offshore wind following the entry into force of the ‘Energy Agreement for sustainable growth’ in 2013.<sup>573</sup> Next to a general renewable energy goal of 16%, this agreement includes a goal of 4,5 GW for offshore wind in 2023.<sup>574</sup> The Dutch target under the Renewable Energy Directive is 14% renewable energy in 2020.<sup>575</sup>

The electricity sector in the Netherlands is regulated via the Electricity Act (Elektriciteitswet).<sup>576</sup> The Dutch legal framework of the energy system was supposed to undergo a major transformation with the legislative proposal STROOM.<sup>577</sup> However, it was rejected by the Senate in the legislative phase. The provisions on the offshore grid originally included in this proposal have nevertheless been adopted via a repair Act, the ‘*Wet Tijdig realiseren doelstellingen Energieakkoord*’.<sup>578</sup> Nevertheless, the main Act regarding offshore wind energy is the *Wet Windenergie op zee* (Act on Offshore Wind Energy), adopted in July 2015.<sup>579</sup> Although these provisions are still relatively new, the new system seems to bear fruit already, with the tenders for the first OWFs (Borssele 1,2 and Borssele 3,4) breaking international records with a very steep cost reduction.<sup>580</sup> Other relevant legislative documents are the Water Act, the Water Decision, the Decision on subsidies for renewable energy (*Besluit SDE+*), and various acts that require a permit for OWF activity, such as the Nature Protection Act, the Environmental Act and the Flora and Fauna Act.

<sup>572</sup> ‘Prinses Amalia’ (120 MW) and ‘Windpark Egmond aan Zee’ (108 MW).

<sup>573</sup> Energy Agreement for sustainable growth (in Dutch)

[https://www.ser.nl/~media/files/internet/publicaties/overige/2010\\_2019/2013/energieakkoord-duurzame-groei/energieakkoord-duurzame-groei-4.ashx](https://www.ser.nl/~media/files/internet/publicaties/overige/2010_2019/2013/energieakkoord-duurzame-groei/energieakkoord-duurzame-groei-4.ashx)

<sup>574</sup> *Ibid.*, p. 70.

<sup>575</sup> Renewable Energy Directive, annex 1.

<sup>576</sup> Elektriciteitswet 1998: <http://wetten.overheid.nl/BWBR0009755/2016-07-01>

<sup>577</sup> [https://www.eerstekamer.nl/wetsvoorstel/34199\\_elektriciteits\\_en\\_gaswet](https://www.eerstekamer.nl/wetsvoorstel/34199_elektriciteits_en_gaswet)

<sup>578</sup> Wet tijdig realiseren doelstellingen Energieakkoord, 23-3-2016, <http://wetten.overheid.nl/BWBR0037771/2016-04-01> However, most provisions relevant for offshore wind were adopted already via the Wet Windenergie Op Zee.

<sup>579</sup> Wet Windenergie op zee, 24-6-2016, <http://wetten.overheid.nl/BWBR0036752/2017-01-01>

<sup>580</sup> Borssele 1,2 will receive a subsidy of max. 7,27 ct/kWh, whereas Borssele 3,4 will receive a subsidy of max. 5,45 ct/kWh, <https://www.government.nl/latest/news/2016/12/12/dutch-consortium-to-construct-second-borssele-offshore-wind-farm>.

## 5.6.2 OFFSHORE GRID PLANNING

## 5.6.2.1 MARITIME SPATIAL PLANNING

Spatial planning of all water areas in the Netherlands, including the sea, is regulated via the Water Act (*Waterwet*). In this Act, it is stipulated that the government drafts a National Water Plan.<sup>581</sup> This Water Plan contains the water policy of the government including the spatial planning aspects. The Water Plan encompasses all water in the Netherlands: lakes, rivers but also the North Sea.<sup>582</sup> The Water Act provides for a delegated Act with more details, the Water Decision. It also has more specific information on offshore wind, relating for example to the requirements for the developer to provide certain information to the Ministry, safety measures during the construction work, the robustness of the construction (in line with technical standards), depth of the export cable, handling of accidents and removal of the installations after ending the operational phase.<sup>583</sup>

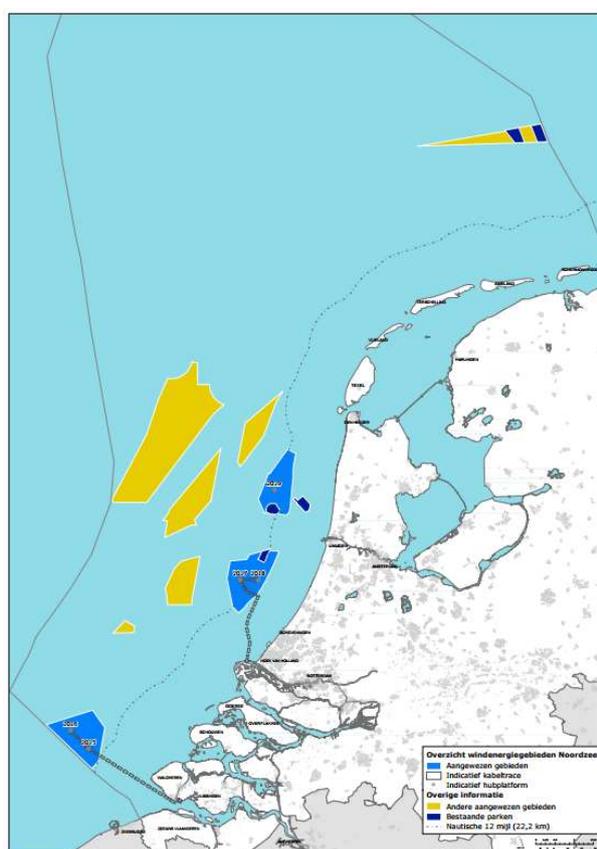


Figure 10: Offshore Wind Energy Zones in the Netherlands.  
Source: Dutch Government, *Routekaart Wind Op Zee*.

For offshore wind energy, specific further requirements with regard to spatial planning are laid down in the Act on Offshore Wind Energy. It regulates the spatial planning and licensing procedure concerning OWF sites. The first step in the procedure is that the Minister for Economic Affairs takes a Wind Farm Zone Decision (*Kavelbesluit*). This Wind Farm Zone has to be within the offshore wind development zones defined by the National Water Plan but it designates a more specific area and as such, it is 'filling in' the general wind development zones.<sup>584</sup>

By decoupling the siting decision from the rest of the licensing procedure, the siting of OWFs can already take place in advance of opening a tender. In this way, possible administrative appeals procedures for designation of wind farm zones can already take place before the tender phase starts. This protects investors from uncertainty concerning how long it will take before the finalisation of appeals, and from the possibility of litigation about this topic. For

<sup>581</sup> Wet van 29 januari 2009, houdende regels met betrekking tot het beheer en gebruik van watersystemen (*Waterwet* 2009), art. 4.1. The most recent version (2016-2021) can be found here:

[https://www.noordzeeloket.nl/images/Nationaal-waterplan-2016-2021%20H\\_4776.pdf](https://www.noordzeeloket.nl/images/Nationaal-waterplan-2016-2021%20H_4776.pdf).

<sup>582</sup> *Ibid.*, art. 4.1(3)b.

<sup>583</sup> *Waterbesluit*, art. 6.16 para 6a, to be found at <http://wetten.overheid.nl/BWBR0026872/2016-07-01#Hoofdstuk6>

<sup>584</sup> Wet *Windenergie op Zee*, art. 3(1) and 3(2).

example, concerning the Borssele site, the definitive Decision was open to appeals until May 20<sup>th</sup> 2016 (there were none), while the tenders for Borssele 3 and 4 took place in September, so after the decision became final.<sup>585</sup>

The Wind Farm Zone Decision (*Kavelbesluit*) also lays down the conditions under which the OWF has to be constructed. The EIA is already incorporated into this process.<sup>586</sup> The EIAs performed for the OWFs so far have used the bandwidth-approach where different alternatives, such as for instance the minimum capacity per turbine, are investigated.<sup>587</sup> As the EIA is part of the Wind Farm Zone Decision, it is already prepared before the bidding process and is publicly available. A separate EIA is made for the export cables.<sup>588</sup>

The next phase, of making an OWF site available in a tender procedure, includes both the license (*Windvergunning*) and the support scheme. These will be treated in the following chapters.

#### 5.6.2.2 LICENSING AND PERMITTING PROCEDURES

There are separate licensing procedures for the OWFs and for the cables and converter stations necessary to connect them. As the offshore grid is closely linked to the installations it needs to connect, both procedures are described below.

Regarding offshore wind energy, as mentioned before, the National Water Plan determines the locations where OWFs may be built.<sup>589</sup> The Wind Farm Zone Decision (*Kavelbesluit*) fills in the exact coordinates of the OWF to be built and the conditions under which it may be built.<sup>590</sup> Moreover, this decision also includes the cable trajectory of the grid at sea until the onshore connection point, with which the OWF will be connected to the onshore grid.<sup>591</sup> This decision requires an EIA under the Environmental Act (*Wet Milieubeheer*).<sup>592</sup> It is the aim that this EIA functions as EIA for the entire project, so that it is not necessary to perform another EIA for the actual license.<sup>593</sup> However, this construction raises some questions among practitioners.<sup>594</sup> In order to allow for some flexibility for project developers, the EIA is performed using a bandwidth-approach that indicates the limits within which a project may be developed.

After adoption of the *Kavelbesluit*, a procedure can start in which all necessary permits, as well as financial support, are awarded to the party that wins the tender procedure. The main license necessary to construct an

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<sup>585</sup> <http://www.rvo.nl/actueel/nieuws/kavels-windparken-op-zee-nu-definitief>

<sup>586</sup> For example, the complete EIA for Borssele 1 (in Dutch, English summary available) can be found here: <https://www.rvo.nl/sites/default/files/2015/07/MER%20kavel%20I%20Borssele%20compleet%203.pdf>

<sup>587</sup> *Ibid.*, chapter 13.

<sup>588</sup> <http://offshorewind.rvo.nl/file/download/44029202>, p. 29.

<sup>589</sup> Waterwet, art. 4.1.

<sup>590</sup> Wet Windenergie op Zee, art. 3.

<sup>591</sup> Wet Windenergie op Zee, art. 1.

<sup>592</sup> E.M.N. Noordover, A. Drahmman, Tailormade Regelgeving voor windturbineparken op de noordzee, *Tijdschrift voor Omgevingsrecht*, okt. 2014, p. 114.

<sup>593</sup> *Ibid.*, p. 114.

<sup>594</sup> *Ibid.*, p. 114 and 124.

OWF is the Wind License (*Windvergunning*). It is forbidden to construct an OWF without a wind license.<sup>595</sup> This license gives the owner the exclusive right to build and exploit an OWF. It is bound to a specific timeframe, which is dependent on the expected lifetime of the installations, until at most 30 years.<sup>596</sup> There are several conditions to the Wind License, such as that the plans have to be technically, economically and financially feasible, and that the building and exploitation starts within four years after the award of the license.<sup>597</sup> With regard to the last point, some point out that it is unclear whether the construction phase has to start within four years or that the exploitation phase has to start within this time, as this difference has large consequences for the timing of the windfarm construction.<sup>598</sup> As mentioned above, no extra EIA is necessary for the Wind License. Both for the Wind License and the Wind Farm Zone Decision, the Minister for Economic Affairs is the competent authority. However, in practice, the Netherland Enterprise Authority, (*Rijksdienst voor Ondernemend Nederland*, RVO) prepares the decisions, gathers information and conducts preliminary investigations.<sup>599</sup>

The construction of the converter stations and export cables requires several administrative decisions. First of all, the spatial plans (*bestemmingsplan*) of certain areas and municipalities has to be changed. This relates only to the onshore cable trajectory, until one kilometre at sea, as this is the border of the area of Dutch municipalities and provinces.<sup>600, 601</sup> This is done in one document, *Rijksinpassingsplan*, by the Ministers of Economic Affairs and Infrastructure and Environment.<sup>602</sup> Next to this, at least five different administrative decisions are needed, namely a permit on the basis of the Water Act, one on the basis of the Nature Protection Act, one on the basis of the Environmental Act, one on the basis of the Flora and Fauna Act and finally a permit for discharging materials in the sea, also on the basis of the Water Act.<sup>603</sup> If the Minister of Economic Affairs takes a decision to that effect, all permits are prepared in one coordinated procedure, the *rijkscoördinatie-regeling*, for which the Minister of Economic Affairs is responsible.<sup>604</sup>

<sup>595</sup> Wet Windenergie op Zee, art. 12.

<sup>596</sup> *Ibid.*, art. 15.

<sup>597</sup> *Ibid.*, art. 14.

<sup>598</sup> Noordover, Drahmman, p. 120.

<sup>599</sup> <http://offshorewind.rvo.nl/>.

<sup>600</sup> Wet van 2 november 1990, houdende regeling provincie- en gemeentegrenzen langs de Noordzeekust van de gemeente Den Helder tot en met de gemeente Sluis en wijziging van de Financiële-Verhoudingswet 1984 (Stb. 1990, 553), Wet van 8 december 1980, tot provinciale indeling van de Waddenzee (Stb. 1980, 670), Wet van 12 december 1985, tot gemeentelijke indeling van de Waddenzee (Stb. 1985, 648).

<sup>601</sup> Electricity Act, art. 20ca also mentions that several of the articles in that Act relating to grid extension (20a-20c) are also applicable to the offshore grid, except that there is no *Rijksinpassingsplan* for the area at sea beyond the municipality/provincial boundaries of 1 km.

<sup>602</sup> For example, the plan for Borssele can be found here:

[https://www.rvo.nl/sites/default/files/2016/03/Inpassingsplan%20noz%20Borssele\\_ontwerp\\_def.pdf](https://www.rvo.nl/sites/default/files/2016/03/Inpassingsplan%20noz%20Borssele_ontwerp_def.pdf).

<sup>603</sup> In Dutch: Watervergunning, Vergunning op basis van de Natuurbeschermingswet, Omgevingsvergunning, Ontheffing Flora- en faunawet and Watervergunning – lozen.

<sup>604</sup> See for example: Decision on the application of the *rijkscoördinatie-regeling* to the cables for the Borssele OWFs:

<https://www.rijksoverheid.nl/documenten/besluiten/2014/12/04/besluit-tot-toepassing-van-rijkscoördinatie-regeling-voor-project-transmissiesysteem-op-zee-borssele>. Similar decision for Hollandse Kust Zuid:

<https://www.rvo.nl/sites/default/files/2016/01/Besluit%20toepassing%20RCR%20vjzomw2m48z.pdf>

## 5.6.2.3 SUPPORT SCHEME(S)

The Dutch system of support schemes, SDE+ (*Stimulerend Duurzame Energie+*) is based on a remuneration per kWh, fixed by a procedure in which projects can participate on a first-come-first-served basis in different subsidy rounds, from which both the long term electricity price (or a minimum 'base electricity price') and the market value of the guarantees of origin are subtracted.<sup>605</sup> The tender procedure for onshore RES is a technology neutral system, based on gradual rounds in which each following round has a higher tender price. However, there is separate tender procedure of the SDE+ for offshore wind. The duration of the support scheme under SDE+ can vary per category of renewables; for offshore wind energy, it is 15 years.

After the legislative changes of 2015, the tender procedure for OWFs is related to specific OWF sites for which the licenses, EIAs and underground surveys are prepared in advance. This information is made public so that a level playing field exists for all possible competitors of the tender. The specific details on a certain OWF tender are laid down in a tender regulation.<sup>606</sup> This includes first of all practical information on which exact OWF site is tendered, the opening and closing times of the tender and the minimum conditions that tender applications have to fulfil. Next to this, it includes financial information such as a minimum bidding price, a cap on the total amount of subsidy available and a fixed base electricity price, which can be different for each tender. The tender regulations for the first two years (2015 and 2016) did not differ fundamentally from each other, but there were a few corrections.<sup>607</sup> Drafting a new tender regulation for each tender allows for changing specific information, such as the base electricity price, but also for clarification and the optimisation of the tender procedure.

The party that wins the tender has to enter into an agreement with the State in order to receive the subsidy. This agreement includes provisions to ensure that the project is indeed executed. First of all, it includes a duty to take the OWF into production before a predetermined date, mentioned in the tender regulation. Next, it includes bank guarantees of EUR 10 mln within four weeks after signing the agreement and EUR 35 mln after 12 months. The bank guarantee can be used to pay for possible fines. Fines are payable for not delivering the project in time, for every month of delay, for asking the State to withdraw the decision to grant a certain OWF to the party involved, and for not paying the bank guarantee in time. Although it is too early to draw conclusions on whether this system indeed ensures effective implementation of the OWFs within the promised time, it seems that a system of fines will help in a timely implementation of OWFs.

<sup>605</sup> Besluit SDE+, <http://wetten.overheid.nl/BWBR0022735/2015-05-30>, art. 22 jo. 20

<sup>606</sup> Regeling Windenergie Op Zee 2016 (the Regulation changes each year):  
<http://wetten.overheid.nl/BWBR0038221/2016-09-15>.

<sup>607</sup> For example, the government limited the amount of applications that can be submitted by one party after noticing in the first tender that one party submitted more than twenty different bids.

### 5.6.3 OFFSHORE GRID CONSTRUCTION

#### 5.6.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

This subchapter will first deal with the connection of OWFs to the onshore grid and then with interconnectors. At the end, the possible combination of interconnection and OWF connection will be treated.

Before the legislative changes, Dutch OWF developers were responsible for the cable to the shore, as the grid connection took place onshore.<sup>608</sup> In this way, for OWFs commissioned under the former regime, the cables from OWFs to the shore formed part of the installation of the OWF. However, after 2015, this was changed fundamentally into a more coordinated approach to grid planning at sea. With the new approach, OWFs are constructed in specific areas under specific conditions and according to a specific time planning. The grid connection takes place at sea, at the converter station. Thus, the construction of the converter station and the cable from the converter station to the shore was shifted from the OWF to a new function, the 'TSO at sea'.<sup>609</sup> Since July 2016, following the requirements of the Electricity Directive,<sup>610</sup> TenneT is certified by the NRA as TSO at sea.<sup>611, 612</sup> On September 5<sup>th</sup> 2016, TenneT was officially appointed as TSO at sea for at least the coming 10 years.

The legal classification of the converter stations and the cables from the converter stations to the onshore grid under the new legal regime is *net op zee*, grid at sea.<sup>613</sup> The grid at sea is defined as the grid intended to be used for the transmission of electricity and that connects one or more OWFs to the onshore high voltage transmission grid.<sup>614</sup> Connections of OWFs to the grid at sea are included in the general definition of 'connection'.<sup>615</sup> It is the task of the national onshore TSO to connect the grid at sea to the onshore grid.<sup>616</sup> It is important to note that these provisions do not extend to the already existing connections of OWFs with the onshore grid, such as for Gemini, OWEZ, Prinses Amalia and Luchterduinen.<sup>617</sup>

The TSO at sea has similar responsibilities as the onshore TSO regarding the duty of transmission of electricity. For example, this TSO also has to maintain the grid, protect the safety of the grid, to expand the grid in light of amongst others measures on renewable energy, to have sufficient reserve capacity available for the transport of electricity, to measure the amount of electricity from a renewable energy source, to realise and repair connections to other grids, to protect it against external influences and to provide the data necessary for efficient access to the

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<sup>608</sup> Müller (2016), p. 148.

<sup>609</sup> It is important to note that this function entails transmission grid operation only. It excludes other services (system services) that the onshore TSO is required to fulfil as well. Therefore, TSO at sea is not exactly the same function as onshore TSO.

<sup>610</sup> Directive 2009/72/EC, art. 10.

<sup>611</sup> The party who wishes to be a TSO has to request this, Electricity Act, art. 10(3).

<sup>612</sup> The certification decision can be found here (in Dutch): <https://www.acm.nl/nl/publicaties/publicatie/16048/Besluit-certificering-TenneT-als-netbeheerder-van-het-net-op-zee/>.

<sup>613</sup> Electricity Act 1998, art. 1(1)ba jo. art. 15a.

<sup>614</sup> *Ibid.*, art. 15a.

<sup>615</sup> *Ibid.*, art. 1(1)b.

<sup>616</sup> *Ibid.*, art. 16(2)n.

<sup>617</sup> *Ibid.*, art. 15a(1).

grid and usage of the grid to connected parties.<sup>618</sup> However, offshore, contrary to onshore, the TSO does not have the duty to provide system services, to manage long term security of supply, to cooperate with foreign TSOs in order to establish an internal market for electricity (it does have the duty to connect with other networks though), and to charge congestion payments.<sup>619</sup>

The responsible Minister creates a Development Framework (*Ontwikkelder*) for offshore wind energy and the offshore grid.<sup>620</sup> Accordingly, the TSO at sea can only develop parts of the offshore grid when they are mentioned in this framework.<sup>621</sup> OWFs described in the framework thus have the right to be connected at a certain 'connection date' which is also included in the framework. When there is a delay in the commissioning date of the grid connection and/or interruption of the grid connection, and when this leads to the situation in which generated electricity cannot be transported, the OWF developer is entitled to compensation of damages by the TSO at sea.<sup>622</sup>

Concerning interconnectors, in the Dutch Electricity Act, interconnectors are defined as grids that cross the borders of at least one country and that couple the national grids of the countries concerned.<sup>623</sup> An interconnector-operator is an operator of such a grid.<sup>624</sup> Offshore electricity interconnectors such as NorNed and BritNed fall under these provisions. NorNed is owned by TenneT and Statnett jointly, whereas for BritNed, a separate joint-venture is set up.<sup>625</sup>

When electricity infrastructure is used to connect OWFs and crosses the border to couple another grid (in another country), it is not yet clear which part of the infrastructure is part of the 'grid at sea' and which part is part of the interconnector. At the moment, it seems that the definition of interconnector does not clarify whether or not an interconnector can also connect the 'grid at sea' to the electricity grid of another country or not. Therefore, this would need to be clarified in order to facilitate hybrid electricity infrastructure and eventually an offshore electricity grid. Nevertheless, in the Development Framework mentioned above, the option of stepping stones for a later offshore grid are already mentioned.<sup>626</sup>

### 5.6.3.2 CLUSTERING OF WINDFARMS

Historically, offshore windfarms in the Netherlands were radially connected to the coast. However, with the policy change of 2013 (Energy Agreement) and the legislative changes of 2015 and 2016, clustering of windfarms is aimed at. All OWFs that are to be constructed between now and 2021 will have a fixed capacity of 700 MW, tendered in pairs of geographically close OWFs. For example, the Borssele Wind Farm zone consists of 5 different

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<sup>618</sup> Ibid., art. 16(1)a to l and q.

<sup>619</sup> Ibid., art. 16(16) jo. 16(2).

<sup>620</sup> Ibid., art. 16e.

<sup>621</sup> Ibid., art. 16e(3).

<sup>622</sup> Ibid., art. 16f.

<sup>623</sup> Ibid., art. 1(as).

<sup>624</sup> Ibid., art. 1(at).

<sup>625</sup> The joint-venture is between National Grid and NLink, a subsidiary of TenneT, <http://www.tennet.eu/nl/ons-hoogspanningsnet/internationale-verbindingen/britned/>.

<sup>626</sup> Development Framework: Ontwikkelder Wind op Zee (in Dutch), <https://www.rvo.nl/sites/default/files/2016/10/Ontwikkelder%20windenergie%20op%20zee.pdf>. p. 14.

OWFs, totalling 1400 MW tendered in three rounds.<sup>627</sup> These OWFs will be connected to the shore with two converter stations,<sup>628</sup> 700 MW each, and each converter station will have two export cables of 350 MW capacity each.<sup>629</sup> The cables from the two converter stations follow the same route to the shore, allowing for benefits from clustering as well.<sup>630</sup> Moreover, standardisation of the capacity of the converter stations and the cables is expected to lead to significant cost reductions.

With the system of coordinated OWF planning, the offshore TSO has the opportunity to coordinate its activities and to construct clustered infrastructure, when this is more cost-effective. This system requires the government (or other competent authority with regard to offshore OWF planning) to take into account the grid connection into account as well. Taking the grid connection into account includes planning the OWFs geographically close to each other and making sure that there is no large time gap between the commissioning dates of OWFs that could be clustered together, in order for the grid connection to be constructed as efficiently as possible. With the Dutch tender system, parties could choose to bid either for one of the wind farm zones separately or for both at the same time, with two OWF sites being tendered at the same time. Until now, this has resulted twice in a single party or consortium constructing the two OWFs next to each other. In this way, the TSO also has to work with one party instead of two that need to be connected to the same converter station.

What are the merits of this system in the long-term goal of constructing a meshed offshore grid? The offshore TSO is now responsible for the connection of OWFs at sea, but the same company is also responsible for interconnection with other countries.<sup>631</sup> When the same entity is responsible for both activities, it is more probable that it will investigate combinations of these activities, if this is possible within the legal framework and if it is more economical to combine the activities. Although not yet applied in practice, it seems that this system will facilitate such combinations rather than hamper them. As cables having the combined function of interconnection and export of OWF-generated electricity are the first step of creating a meshed offshore network, this system is also promising for a future meshed network.

Additionally, the effort of the Dutch government to improve spatial planning at sea and to coordinate the construction of OWFs well in advance, including the description of the Development Framework and the designation of wind farm development zones also plays a role. It gives more time to the TSO to explore different connection possibilities and also to include investigations into combined solutions. Combined solutions in which OWFs are connected to two countries require more time to develop, as they have to be negotiated with two TSOs, require planning and permitting processes in two countries and decisions on economic regulatory matters. Therefore, the government's behaviour in planning and designating wind farm areas well in advance is also

<sup>627</sup> Borssele 1,2 being 700 MW, Borssele 3,4 being 680 MW and a separate testing ground of 20 MW which can be used for demonstration projects, named Borssele 5.

<sup>628</sup> Meaning that two OWFs will be connected to one converter station.

<sup>629</sup> There is so-called dynamic capacity: one cable can be temporarily increased to 380MW if this is necessary due to faults in the other cable. <http://www.tennet.eu/nl/nieuws/nieuws/tennet-sluit-eerste-contract-voor-kabels-net-op-zee-1/>

<sup>630</sup> <https://zoek.officielebekendmakingen.nl/stcrt-2016-13577.html>

<sup>631</sup> The responsibility to connect with other countries' grids does not entail an exclusive right. Other parties can also construct and operate interconnectors. Nevertheless, in practice, it is mainly the TSO who owns and operates interconnectors (in cooperation with the TSO of the grid it connects to).



beneficial for a meshed offshore grid in the sense that it creates the conditions under which a TSO can develop combined solutions as well.<sup>632</sup>

### 5.6.4 DECOMMISSIONING

In principle, both OWFs and the cables used to connect them to the onshore grid have to be removed when they are not in use any more. This also holds for other materials that ended up in the area of the OWF during construction, exploitation or decommissioning of the OWF. This is regulated in the Water Decision.<sup>633</sup> However, it is possible to obtain permission from the responsible Minister to leave the installation or cable in place, under specific circumstances. Moreover, the Minister can decide that the export cable has to be left in place, if removal would lead to ‘damage to the maritime environment or to other rightful usages of the sea’.<sup>634</sup> Removal of the OWF or the export cable follows a removal plan, which is drafted by the project developer at least four weeks before the start of the removal phase.<sup>635</sup> Once the OWF or cable is removed, this has to be notified to the Minister.<sup>636</sup> This system allows for a margin of appreciation for the Minister to decide to what extent decommissioning should take place.

### 5.6.5 INTERIM CONCLUSION

Concerning offshore grid planning, the Netherlands has developed a vision on the North Sea and a deployment plan for offshore wind. Moreover, the Netherlands has recently undergone a major revision of the law applicable to offshore wind energy. With the new system, the OWF locations are selected and prepared in advance. Permitting procedures are streamlined and RVO functions as a one-stop-shop for the tenders and permits. Tenders are then organised for fixed capacities of 700 MW that will be connected by the TSO at sea, TenneT. Thus, the most important tender subject is the height of the premium that a project developer needs on top of the electricity market price in order to construct and operate the OWF. This, including a strong reduction of the risks of developers concerning the connection to the onshore transmission grid, has led to a sharp decline last year in market premiums necessary to facilitate offshore wind.

With the new system, the TSO is responsible for connecting the OWFs at sea, at the converter stations, in what is classified as a ‘grid at sea’. As the TSO bears responsibility both for the grid at sea and for interconnections with other countries, hybrid solutions are facilitated. In fact, in the planning documents, this is already investigated for the case of IJmuiden Ver – East Anglia (UK). However, it is not yet clear how the different components of such a grid would be classified under the current Electricity Act.

Clustering of OWFs is also facilitated. TenneT is responsible for connecting the OWFs, and there is a centralised planning with several OWFs located geographically close to each other being tendered at the same time. This

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<sup>632</sup> Possible stepping stones are already adopted in the Development Framework (Ontwikkeldkader Wind op Zee), p. 14.

<sup>633</sup> Waterbesluit, art. 6.16l.

<sup>634</sup> Ibid., art. 6.16l(4).

<sup>635</sup> Ibid. (6).

<sup>636</sup> Ibid. (7).



facilitates clustering, which is the new standard since 2016. Additionally, as the capacities of the OWFs are equal (700MW), it also facilitates standardisation on behalf of the TSO regarding for example converter stations and cables.<sup>637</sup> The elements of planning well in advance and having one TSO responsible for both the connection of offshore cables and for interconnectors will also contribute to possible development of hybrid connections that can form the first steps of a meshed HVDC grid in the Northern seas.

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<sup>637</sup> For example, TenneT will construct at least five converter stations with the same technical requirements.



## 5.7 LEGAL FRAMEWORK OF NORWAY

### 5.7.1 INTRODUCTION

Norway has an electricity production that is based primarily on renewables, mainly hydropower installations.<sup>638</sup> In addition, Norway has a growing capacity of onshore wind turbines due to good wind resources. Several onshore wind installations are now being developed. On the other hand, there will probably be relatively little development of offshore wind energy in Norway in the coming years due to the costs of installation of both the turbines and the grid infrastructure, as the seabed off Norway's coasts deepens steeply. However, Norway is experimenting with alternative forms of offshore wind energy, such as with floating turbines.<sup>639</sup>

That being said, the Norwegian government decided in 2006-2007 that a national strategy for offshore wind should be established. This resulted in the Offshore Renewable Energy Production Act, regulating amongst others the licensing regime for offshore energy production areas, the connection to the shore, and construction and operation of the production facility.<sup>640</sup> The relevant act for the electricity sector in general is the Norwegian Energy Act (Act relating to the generation, conversion, transmission, trading, distribution and use of energy etc).<sup>641</sup> However, this act is explicitly not applicable to the territorial sea, and presumably thus also not applicable further offshore.<sup>642</sup>

A specific characteristic for Norwegian energy law is that Norway is not an EU Member-State, but still connected to the internal market via the EEA. This is explained in Deliverable 7.1.1 in more detail. In practical terms, it entails that the Third Energy Package is not yet applicable to Norway and that the old provisions of the Second Energy Package are still reflected in Norwegian legislation. It also means that certain EU Directives, such as the Habitats Directive or the Maritime Spatial Planning Directive, are not applicable to Norway as they do not have EEA relevance. Norway does not have a target under the annex of the Renewable Energy Directive, but it set a target of 67,5% renewable energy consumption in 2020 in its National Renewable Energy Action Plan that was drafted under the same Directive.<sup>643</sup>

<sup>638</sup> Energy Law in Europe, p. 875/11.263

<sup>639</sup> Statoil operates a floating Hywind demo project since 2009 and is going to construct a Hywind floating OWF in the UK, <https://www.statoil.com/en/what-we-do/new-energy-solutions.html>.

<sup>640</sup> Act No 21 of 4 June 2010 relating to offshore renewable energy production. Lov om fornybar energiproduksjon til havs (Havenergiloven).

<sup>641</sup> Norway Energy Act, no. 50, 29 June 1990, unofficial translation: [https://www.regjeringen.no/globalassets/upload/oed/vedlegg/lover-og-reglement/act\\_no\\_50\\_of\\_29\\_june\\_1990.pdf](https://www.regjeringen.no/globalassets/upload/oed/vedlegg/lover-og-reglement/act_no_50_of_29_june_1990.pdf).

<sup>642</sup> Ibid., art. 1-1.

<sup>643</sup> [https://ec.europa.eu/energy/sites/ener/files/documents/dir\\_2009\\_0028\\_action\\_plan\\_norway\\_\\_nreap.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/dir_2009_0028_action_plan_norway__nreap.pdf), p. 13.



## 5.7.2 OFFSHORE GRID PLANNING

## 5.7.2.1 MARITIME SPATIAL PLANNING

As mentioned above, offshore wind energy will not play a major role in the Norwegian energy system within the foreseeable future.<sup>644</sup> However, the Offshore Renewable Energy Production Act (*Havenergi-loven*) puts in place a system for offshore wind energy, including production, transformation and transmission to the shore.<sup>645</sup> The Act rules that the right to use offshore energy resources belongs to the Norwegian State.<sup>646</sup> The King and State Council designate specific offshore areas to be suitable areas for offshore wind.<sup>647</sup>

In December 2012, a strategic assessment (strategisk konsekvensutredning) with regard to offshore wind was published.<sup>648</sup> It investigates six areas along the Norwegian coast as offshore wind energy areas.<sup>649</sup> The report takes into account technical and cost considerations as well as nature and environmental considerations and societal aspects. After hearing interested parties on the report, the Ministry of Petroleum and Energy can propose to officially designate certain areas for offshore wind, which has to be approved by the King's Council.<sup>650</sup> Some of the areas are considered to have favourable conditions that exceeded the costs, and for some the costs would exceed the benefits. However, so far, none of the areas have been officially designated as offshore wind energy areas.

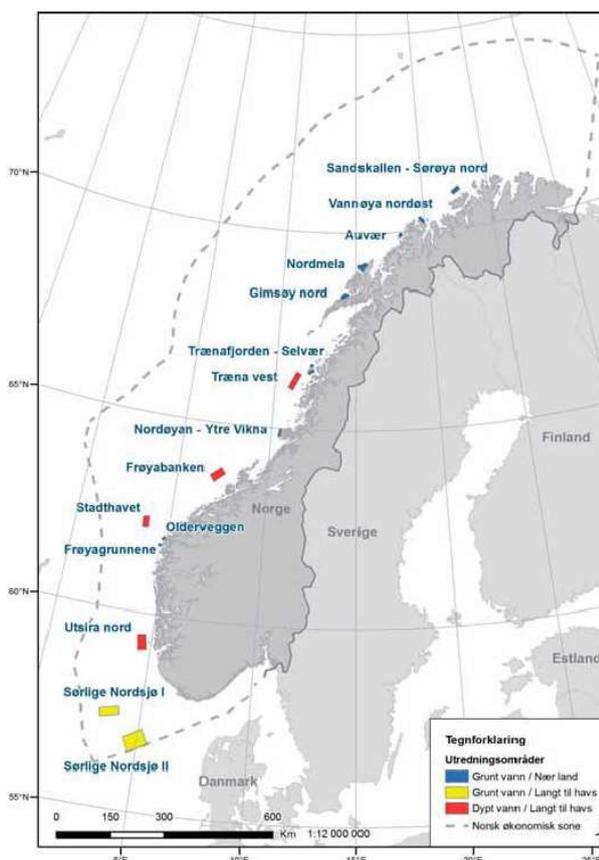


Figure 11: Norway Strategic Assessment of possible OWF areas. Source: Norwegian Government.

<sup>644</sup> Energy Law in Europe, p. 875/11.263

<sup>645</sup> Norway Energy Act, art. 3-4.

<sup>646</sup> Wind Energy Act, art. 1-3.

<sup>647</sup> Ibid., art. 2-2.

<sup>648</sup> NVE (Norwegian Water and Energy Directorate), Havvind – Strategisk konsekvens utvredning, december 2012.

<sup>649</sup> Ibid., p. 7. Two of these are in shallow waters and four in deep waters. It also considers several nearshore locations.

<sup>650</sup> <https://www.regjeringen.no/no/dokumenter/horing---havvind---strategisk-konsekvens/id711151/> (in Norwegian).

## 5.7.2.2 LICENSING AND PERMITTING PROCEDURES

Developers need a concession in order to construct, own and operate OWFs in these areas.<sup>651</sup> Similarly, a concession is needed in order to construct, own and operate cables.<sup>652</sup> The Ministry can decide to collect an area fee from the concession holders for the use of the area for renewable energy.<sup>653</sup> This is done on the basis of a regulation issued by the Ministry of Petroleum and Energy.<sup>654</sup> A concession application should be accompanied by a detailed plan and is scrutinized by the Ministry.<sup>655</sup> When giving the concession, the Ministry can also impose conditions or instructions with information on (amongst others) the timing of the project,<sup>656</sup> safety measures,<sup>657</sup> environmental measures,<sup>658</sup> and other economic use of the sea.<sup>659</sup> There are also provisions on offshore safety and on the removal of the OWFs after the operational phase.<sup>660</sup> This system is similar to the legal situation for offshore petroleum production.<sup>661</sup>

Regarding the offshore grid, concessions are also necessary for the construction of submarine cables. Before such a cable is constructed, a concession from the Ministry is necessary.<sup>662</sup> Moreover, before offshore wind electricity is imported or exported, another concession is necessary.<sup>663</sup> These concessions require detailed plans from the concession holder that have to be submitted to the Department of Petroleum and Energy.

For some activities, an EIA is necessary. This relates to electrical cables of at least 132 kV and over 20 km.<sup>664</sup> This is not necessary for offshore electricity cables, but might be relevant for the connection of the offshore electricity cables to the onshore grid. The EIA should be sent together with the concession application, and is subject to approval of the Norwegian Water Resources and Energy Directorate (NVE).<sup>665</sup> NVE's decision for (dis)approval is not open to appeal.<sup>666</sup>

<sup>651</sup> Offshore Wind Energy Act, art. 3-1. In the Norway Energy Act, art. 3-1, a similar article provides that for the construction of (onshore) electricity production, conversion, transmission, distribution facilities, a concession is also needed.

<sup>652</sup> *Ibid.*, art. 3-2.

<sup>653</sup> *Ibid.*, art. 10-2.

<sup>654</sup> *Ibid.*, second sentence.

<sup>655</sup> *Ibid.*, art. 3-1 and 3-2, second sentence.

<sup>656</sup> *Ibid.*, art. 3-4(1).

<sup>657</sup> *Ibid.*, art. 3-4(3).

<sup>658</sup> *Ibid.*, art. 3-4(5).

<sup>659</sup> *Ibid.*, art. 3-4(8).

<sup>660</sup> *Ibid.*, chapter 5; chapter 6 art. 6-1.

<sup>661</sup> Energy Law in Europe, p. 876, 11.267.

<sup>662</sup> Havenergilova, art. 3-2.

<sup>663</sup> Havenergilova, art. 8-1.

<sup>664</sup> Energy Law in Europe, 11.241.

<sup>665</sup> *Ibid.*

<sup>666</sup> *Ibid.*

## 5.7.2.3 SUPPORT SCHEME(S)

Norway uses one, technology neutral, support scheme for all types of renewable energy. The system of tradable renewable certificates is based on the Electricity Certificate Act.<sup>667</sup> The interesting feature about this Electricity Certificate Market is that it is a common market together with Sweden, based on an international treaty. This international agreement between the two governments describes the common market for (green) electricity certificates.<sup>668</sup> It is implemented in the two jurisdictions with separate Acts: the Norwegian Electricity Certificate Act (*Elsertifikatloven*) and the Swedish Electricity Certificate Act (*Lag (2003:113) om elcertificat*). In the text below, the system is explained with reference to the Norwegian Act (hereinafter 'the Act'). Together, Sweden and Norway form a joint support scheme, as described in the Renewable Energy Directive.<sup>669</sup>

In practice, the system works as follows. The certificate proves that 1 MWh of electricity was produced according to the Act. Certificates are issued for electricity produced by accredited production devices.<sup>670</sup> Once issued, the elcertificates can be traded.<sup>671</sup> There is a registry, in which every transaction is registered, including the trading price.<sup>672</sup> It is the responsibility of the seller to register the trade to the buyers account.<sup>673</sup> The demand for elcertificates is formed by parties that have a quota obligation: parties that supply electricity to the end-consumer, that consume self-produced electricity or that purchases electricity for own consumption on the Nordic power exchange.<sup>674</sup> The quota should be congruent with the yearly consumption of that party, multiplied by the quota ration specified in the Act.<sup>675</sup> The quota-obliged party can charge the end-consumer with the costs of the quota. However, they cannot charge the consumer with costs for energy to cover grid losses.<sup>676</sup>

The system, being technology neutral, also applies to wind energy.<sup>677</sup> It also applies offshore, as the Act defines the geographical scope as including the continental shelf.<sup>678</sup> The system also has a defined temporal scope, until 2035.<sup>679</sup>

<sup>667</sup> Electricity Certificate Act 2011 (Lov om elsertifikater, *Elsertifikatloven*), LOV-2011-06-24-39. The unofficial English translation can be found here: <http://www.statnett.no/Global/Dokumenter/Kraftsystemet/Elsertifikater/English%20unofficial%20translation%20of%20Norwegian%20elcertificate%20act.pdf>.

<sup>668</sup> [https://www.regjeringen.no/globalassets/upload/oed/pdf\\_filer\\_2/elsertifikater/agreement\\_on\\_a\\_common\\_market\\_for\\_electricity\\_certificates.pdf](https://www.regjeringen.no/globalassets/upload/oed/pdf_filer_2/elsertifikater/agreement_on_a_common_market_for_electricity_certificates.pdf) (hereinafter 'the Agreement')

<sup>669</sup> Renewable Energy Directive, art. 11.

<sup>670</sup> Act on elcertificates, section 8, section 10.

<sup>671</sup> *Ibid.*, chapter 3.

<sup>672</sup> *Ibid.*, section 12.

<sup>673</sup> *Ibid.*, section 12, second paragraph

<sup>674</sup> *Ibid.*, section 16.

<sup>675</sup> *Ibid.*, section 17 and 18.

<sup>676</sup> *Ibid.*, section 18.

<sup>677</sup> *Ibid.*, section 7(b).

<sup>678</sup> *Ibid.*, section 2.

<sup>679</sup> *Ibid.*, section 4. See also the Agreement, art. 2(2), art. 3(2).



### 5.7.3 OFFSHORE GRID CONSTRUCTION

#### 5.7.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

Norway is active in planning and constructing interconnectors with other European countries. An interconnector to the Netherlands has already been constructed,<sup>680</sup> and licenses have been awarded for interconnectors to Germany and to the UK.<sup>681</sup> Norway currently does not have any OWFs that need to be connected. Therefore, the legislation concerning offshore wind energy is not developed further in terms of grid planning and clustering of windfarms is not developed in detail. The Offshore Wind Energy Act does not mention whether the TSO, Statnett, should connect the offshore windfarms. Therefore, it has to be decided later on whether OWF developers would be responsible for the cable bringing the electricity onshore where it can be connected to the onshore grid. This does not facilitate a coordinated offshore grid planning nor does it facilitate the clustering of windfarms.

The Norwegian electricity transmission grid encompasses all cables used for the transport of electricity of 132 kV and above.<sup>682</sup> However, as the Norwegian Energy Act is not applicable to the sea territory,<sup>683</sup> the provisions on the transmission grid do not apply to subsea electricity interconnectors. It seems that the only legislation applicable to offshore electricity grids is the construction license requirement, combined with the license for export of electricity, both described in chapter 5.7.2.2. In practice, subsea interconnectors are developed based on 50-50 joint ownership with the other connected TSO.<sup>684</sup> Whereas offshore gas pipelines are developed based on bilateral treaties, this is not the case for electricity interconnectors.<sup>685</sup>

#### 5.7.3.2 CLUSTERING OF WINDFARMS

Currently, there are no concrete developments of OWF construction. Therefore, there is also no development on the field of clustering of OWFs. Moreover, the geographical distribution of potential OWF areas along the Norwegian coast would be a limitation for clustering.<sup>686</sup>

### 5.7.4 DECOMMISSIONING

At the end of the concession date, installations in the Norwegian sea have to be removed.<sup>687</sup> Timely before this date, a decommissioning plan needs to be drafted for the relevant Ministry.<sup>688</sup> However, if the Ministry decides to prolong the concession, this requirement can be cancelled.<sup>689</sup> Moreover, the Ministry can prescribe certain

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<sup>680</sup> NorNed: <http://www.tennet.eu/our-grid/international-connections/norned/>.

<sup>681</sup> <https://www.regjeringen.no/en/aktuelt/License-granted-for-electricity-interconnectors-to-Germany-and-the-UK/id2008232/>

<sup>682</sup> Norwegian Energy Act, art. 1-5.

<sup>683</sup> Norwegian Energy Act, art. 1-1.

<sup>684</sup> Energy Law in Europe, 11.246.

<sup>685</sup> Ibid.

<sup>686</sup> See the picture in chapter 1.6.2.1.

<sup>687</sup> Offshore Renewable Energy Act, art. 6-1.

<sup>688</sup> Ibid.

<sup>689</sup> Ibid.

conditions to the decommissioning of electricity installations.<sup>690</sup> In practice, Norway has not yet developed OWFs. Therefore, there has been no need to elaborate regulations with regard to decommissioning.

#### 5.7.5 INTERIM CONCLUSION

Norway has an extensive supply of renewable energy due to the large production of hydro power and, in some degree, onshore wind power. This reduces the necessity to construct offshore wind energy. Moreover, mainly due to the increased costs for offshore wind, Norway does not yet have concrete ambitions to deploy large scale offshore wind energy in the foreseeable future. However, some pilot projects have been given licenses. While there are no concrete plans for OWFs, Norway has paradoxically developed a legal regime for offshore wind energy.

Another aspect that is especially interesting in the context of compatibility of support schemes is the fact that Norway and Sweden have a joint support scheme for renewable energy. Therefore, it is interesting to study the Norwegian legal regime with regard to support schemes. Furthermore, with the development of floating wind energy and increased interconnection, Norway can still play a role in an offshore meshed HVDC grid although it currently does not have any large scale OWF installed.

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<sup>690</sup> Ibid.



## 5.8 LEGAL FRAMEWORK OF SWEDEN

### 5.8.1 INTRODUCTION

Sweden has an ambitious renewable energy policy. A coalition of five major political parties signed an agreement in which the energy transition goals are concretised: in 2040, Sweden should have 100% renewable energy production and 2045, Sweden should have zero net CO<sub>2</sub> emissions.<sup>691</sup> At the moment, the 49% target for 2020 under the Renewable Energy Directive has already been surpassed.<sup>692</sup> With regard to offshore wind energy, Sweden's main potential lies in the Baltic Sea. However, due to cooperation possibilities with Denmark and Germany, it will still be treated in this report.

Although according to some estimates, Sweden may have an economic potential of offshore wind energy as large as 300 TWh,<sup>693</sup> only a few OWFs are developed.<sup>694</sup> This is mainly due to the fact that the Swedish support scheme is technology neutral, with no specific extra support for offshore wind.<sup>695</sup> Currently, Sweden has around 200 MW of installed capacity in offshore wind, divided over 86 turbines.<sup>696</sup>

The main acts that are relevant for offshore wind energy and grid infrastructure are the Electricity Act (*Ellagen*),<sup>697</sup> Environmental Act (*Miljöbalken*)<sup>698</sup> and, concerning the support scheme, the Electricity Certificate Act (*Lag om elcertificat*).<sup>699</sup> The Swedish EEZ is installed by means of the Act on the Swedish EEZ.<sup>700</sup> The regulatory authority for energy is shared between the Energy Markets Inspectorate (*Energimarknadsinspektionen*) and the Energy Agency (*Energimyndigheten*). The TSO is Svenska kraftnät.

<sup>691</sup> Framework agreement between the Swedish Social Democratic Party, the Moderate Party, the Swedish Green Party, the Centre Party and the Christian Democrats, 10.06.2016,

<http://www.government.se/49d8c1/contentassets/8239ed8e9517442580aac9bcb00197cc/ek-ok-eng.pdf>.

<sup>692</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0057&qid=1488449105433&from=EN>, p. 10.

<sup>693</sup> Sweco on request of Energimyndigheten, *Havsbaserad vindkraft – potential och kostnader*, 2017

<https://www.energimyndigheten.se/globalassets/fornybart/framjande-av-vindkraft/underlagsrapport-sweco---havsbaserad-vindkraft---potential-och-kostnader.pdf>, p. 31.

<sup>694</sup> Jacobssen, Karltop, Dolff, *towards a strategy for offshore wind power in Sweden*, in 'Systems Perspectives on Renewable Power, Chalmers 2014, p. 161.

<sup>695</sup> *Ibid.*, p. 164.

<sup>696</sup> WindEurope, *Offshore Wind - Key Trends and Statistics 2016*, p. 18 and 19. *Havsbaserad vindkraft – potential och kostnader*, p. 11.

<sup>697</sup> Electricity Act (*Ellagen*), 1997:857, [https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/ellag-1997857\\_sfs-1997-857](https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/ellag-1997857_sfs-1997-857).

<sup>698</sup> Environmental Act (*Miljöbalken*), 1998:808, [https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/miljobalk-1998808\\_sfs-1998-808](https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/miljobalk-1998808_sfs-1998-808).

<sup>699</sup> Act on Electricity Certificates (*Lag om elcertificat*), 2011:1200, [https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20111200-om-elcertifikat\\_sfs-2011-1200](https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-20111200-om-elcertifikat_sfs-2011-1200).

<sup>700</sup> Act on the Swedish EEZ (*Lag om Sveriges Ekonomiska Zon*) (1992:1140), [https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-19921140-om-sveriges-ekonomiska-zon\\_sfs-1992-1140](https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-19921140-om-sveriges-ekonomiska-zon_sfs-1992-1140).

## 5.8.2 OFFSHORE GRID PLANNING

### 5.8.2.1 MARITIME SPATIAL PLANNING

The legal basis for maritime spatial planning in Sweden is the Environmental Act.<sup>701</sup> The process of drafting a maritime spatial planning is further elaborated in a regulation.<sup>702</sup> Sweden has three maritime spatial planning regions, namely Skagerrak/Kattegat, the Baltic Sea and the Gulf of Bothnia.<sup>703</sup> They have to be decided upon by the government.<sup>704</sup> Therefore, the maritime spatial plans will have legal value as government decisions. In practice, the plans are prepared and formally proposed by the *Havs och Vatten Myndigheten* (the Sea and Water Authority),<sup>705</sup> but they are not yet approved.<sup>706</sup> The approval process of the plan is scheduled to last until 2019.<sup>707</sup> However, when adopted, the maritime spatial plan has a long-term time horizon, even until 2030-2050. Nevertheless, the maritime spatial plans have to be kept up to date at least every eight years.<sup>708</sup> The Maritime Spatial Plan requires an EIA to be made as well.<sup>709</sup> One interesting feature of the Swedish maritime spatial planning regulation is that it prescribes that the drafting process should also include cooperation and coordination with neighbouring EU states.<sup>710</sup>

Next to the planning of the generation facilities, there is also a network development plan, which is published by the Swedish TSO bi-annually, with a time horizon of 10 years.<sup>711</sup> This grid planning includes the onshore electricity grid development. As will be explained further below, in Sweden,



Figure 12: Location of Swedish OWFs. Source: Wikimedia commons.

<sup>701</sup> Environmental Act, kap. 4 para 10.

<sup>702</sup> Maritime Spatial Planning Ordinance (Havsplaneringsförordning) (2015:400), [https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/havsplaneringsforordning-2015400\\_sfs-2015-400](https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/havsplaneringsforordning-2015400_sfs-2015-400).

<sup>703</sup> Environmental Act, kap. 4 para 10, Havsplaneringsförordning, para 2.

<sup>704</sup> Ibid.

<sup>705</sup> Maritime Spatial Planning Ordinance, para 5.

<sup>706</sup> See the draft plan for the Western seas (Skagerrak/Kattegat), in Swedish:

<https://www.havochvatten.se/hav/samordning--fakta/havsplanering/havsplaner/utkast-till-havsplan-for-vasterhavet.html>

<sup>707</sup> <https://www.havochvatten.se/hav/samordning--fakta/havsplanering.html>

<sup>708</sup> Maritime Spatial Planning Ordinance, para 21.

<sup>709</sup> See for example the EIA for the draft maritime spatial plan of the Western Seas:

<https://www.havochvatten.se/hav/uppdrag--kontakt/publikationer/publikationer/2017-02-06-miljokonsekvensbeskrivning-havsplan-vasterhavet.html>.

<sup>710</sup> Maritime Spatial Planning Ordinance, para 11.

<sup>711</sup> The latest version was published in 2015:

[http://www.svk.se/contentassets/c7ff3f2bb5ed4d4a8d7d6d0599a5426a/network-development-plan-2016-2025\\_webb.pdf](http://www.svk.se/contentassets/c7ff3f2bb5ed4d4a8d7d6d0599a5426a/network-development-plan-2016-2025_webb.pdf).

OWF developers are responsible for the grid connection until onshore, but there might be a need for grid reinforcement. Therefore, the grid development plan is also useful for offshore grid development.

#### 5.8.2.2 LICENSING AND PERMITTING PROCEDURES

This subchapter treats licensing and permitting procedures of OWF construction and cable construction respectively. For offshore wind energy, the licensing and permitting process depends on the location: the process for OWFs in the territorial zone requires two different permits, whereas for offshore wind in the EEZ, only one permit is needed.<sup>712</sup> Next to the permits for construction work at sea, a construction permit is also needed for the part of the project that takes place on land, e.g. the landing of the export cable.<sup>713</sup> Concerning offshore wind energy in the territorial zone, the two permits that are needed are the permit for environmentally hazardous activities and the permit for water operations.<sup>714</sup> The permit for environmentally hazardous activities is required on the basis of the Environmental Act.<sup>715</sup> The permit for water operations is prescribed through the Water Act.<sup>716</sup> The two permit applications can be processed synchronously and the trials for both permits can be coordinated.<sup>717</sup> The application of both permits has to be addressed to the government.<sup>718</sup> For this permit, an EIA is also required.<sup>719</sup>

Concerning the environmental permit, the assessment has to be performed according to the same rules as for onshore wind energy. An objective assessment of sites has to be provided in order to select the best location from an environmental point of view.<sup>720</sup> This is called the localisation rule.<sup>721</sup> Moreover, according to the rules regarding resource management, certain areas may be designated as national interests for wind power production.<sup>722</sup> However, areas may also be designated for other national interests, and it is unclear what will happen if two different interests collide.<sup>723</sup> In any case, although the assessment criteria are the same for onshore as for offshore in the territorial waters, some authors expected that as there are less opposing interests at sea, the license may be easier to obtain for offshore wind energy compared to onshore wind energy.<sup>724</sup> However, this is speculative, given the limited amount of experience with offshore wind in Sweden.

The water operations permit is needed for each water project, including the construction, modification, repair or demolition of 'water works'.<sup>725</sup> Offshore wind energy installations are also water works. The assessment criterion for the water permit is in fact a cost- and benefits analysis. Activities may only take place when the benefits (both

<sup>712</sup> P. Söderholm, M. Pettersson, 'Offshore Wind Power Policy and Planning in Sweden', *Energy Policy* [2011] p. 523.

<sup>713</sup> Planning and Building Act (Plan och bygglagen, 2010:900), chapter 9 sec. 2.

<sup>714</sup> *Ibid.*, p. 523.

<sup>715</sup> Environmental Act, kap. 9 para 6.

<sup>716</sup> Water Act (Vattenlagen (1983:291)), kap. 4 para 1.

<sup>717</sup> Söderholm and Pettersson (2011), p. 523.

<sup>718</sup> Environmental Act, kap. 9, para 6.

<sup>719</sup> *Ibid.*, kap. 6 para 1.

<sup>720</sup> *Ibid.*

<sup>721</sup> *Ibid.*

<sup>722</sup> *Ibid.*

<sup>723</sup> *Ibid.*

<sup>724</sup> *Ibid.*

<sup>725</sup> Water Act, kap. 1 para 3.



public and private) exceed the costs and damages of the activity.<sup>726</sup> An example of this assessment can be seen in the court case by the Environmental Court of Appeal concerning Utgrunden OWF.<sup>727</sup> In this case, the main question was what should be included in the cost-benefit analysis. The Court (and the Government, who agreed to this opinion) judged that subsidies granted to the windfarm would be regarded as public benefits because they represent the implicit value of increasing the share of renewable energy.<sup>728</sup>

For OWFs located beyond the territorial zone, only one permit is required. This permit is required on the basis of the Act on the Swedish EEZ.<sup>729</sup> With this Act, several of the principles and criteria from the Environmental Code are also applied to activities beyond the Swedish territorial waters.<sup>730</sup> “This permit is awarded by the government or by the relevant authority.”<sup>731</sup> An EIA is also required for the permit application.<sup>732</sup>

Concerning offshore grid infrastructure, the regime is the following: according to the Act on the Continental Shelf, permission is needed for activities of exploration and exploitation of the continental shelf. This also includes laying cables and pipelines that are continued in Swedish territory.<sup>733</sup> The Act also declares the general consideration rules from the Environmental Code applicable to these activities.<sup>734</sup> The permission needed for these activities can be awarded by the government or by a delegated authority.<sup>735</sup> Moreover, an EIA is needed for this permit as well.<sup>736</sup>

Onshore, in order to construct or operate a high voltage electric line, a developer needs a concession.<sup>737</sup> The authority responsible for decisions on this topic is the Energy Markets Inspectorate.<sup>738</sup> The concession application should include the voltage needed to operate the grid, the environmental impact of it, proof that the grid development can be economically motivated and consequences for grid users.<sup>739</sup> It seems that these requirements are rather aimed at the national transmission and distribution grids than at cables used for the connection of offshore wind energy. As will be explained later, the connection of OWFs takes place onshore, meaning that the last part of the cable, after it lands on the shore but before it arrives at the connection point, might fulfil the conditions of the Electricity Act and require a concession as well.

<sup>726</sup> Water Act, kap. 3 para 4. Söderholm and Pettersson (2011), p. 253.

<sup>727</sup> Miljööverdomstolen, Case M 833-99 (Utgrunden)

<sup>728</sup> Söderholm and Pettersson (2011), p. 253.

<sup>729</sup> Act on the Swedish EEZ (Lag (1992:114) om Sveriges ekonomiska zon), para 5.

<sup>730</sup> *Ibid.*, para 2.

<sup>731</sup> *Ibid.*, para 5.

<sup>732</sup> *Ibid.*, para 6.

<sup>733</sup> Act on the Continental Shelf (1966:314), para 2b and 3.

<sup>734</sup> *Ibid.*, para 2a

<sup>735</sup> *Ibid.*, para 3.

<sup>736</sup> *Ibid.*, para 3a.

<sup>737</sup> Ellag, 1997:857, kap. 2 para 1.

<sup>738</sup> *Ibid.*, kap. 2 para 1a.

<sup>739</sup> *Ibid.*, kap. 2 para 2.

### 5.8.2.3 SUPPORT SCHEMES

As referred to in chapter 5.7, Norway and Sweden have a joint support scheme. The information provided there is thus also applicable to the Swedish situation. The Norwegian and Swedish Acts that regulate the joint support scheme are practically identical. Therefore, it will not be presented in detail again.

One interesting development with regard to RES support is the case of Aland Vindkraft.<sup>740</sup> Although the case is about wind energy on an island rather than at sea, the situation could be compared to the situation of offshore wind energy in some configurations. Aland is an island between Sweden and Finland. It is an autonomous region of Finland, but it is only connected to the Swedish electricity grid. In this case, the windfarm developer of a windfarm at Aland applied for support through the Swedish green certificate system. The Swedish NRA did not accept this, as it stated that only production installation located in Sweden can profit from the scheme.<sup>741</sup> The windfarm developer challenged this in Court, referring to the prohibition of quantitative restriction to the import of goods or measures having an equivalent effect.<sup>742</sup> The European Court of Justice ruled that this rule was indeed a measure having an equivalent effect to a quantitative restriction on the import of electricity,<sup>743</sup> but that this can be justified by the fact that the system has the goal of promoting the use of energy from renewable resources, and that it is up to the Member-States to decide to what extent they would like to open up their support scheme to developers from other States.<sup>744</sup>

This case shows that for now, opening of the national support schemes to developers in other EU Member-States is possible but remains at the discretion of the Member-State. This judgment could also be applied to situations in which OWFs are connected to other EU Member-States than the state in which' territory the OWF is located. This could happen for example when OWFs are tee-ed in to an interconnector, or when an OWF is connected to an OWF hub across the border instead of to the national transmission grid of the state it is located in. In such cases, the OWF developer might not want such a connection if this means it will not receive funding under a support scheme.

### 5.8.3 OFFSHORE GRID CONSTRUCTION

#### 5.8.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

In Sweden, the developer of the OWF is also responsible for the construction of the export cable.<sup>745</sup> The official connection point to the transmission grid is thus located onshore, contrary to the legal system in most other countries researched in this report. It is not mentioned explicitly in Swedish law that the connection cannot take

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<sup>740</sup> CJEU, C-573/12, *Alands Vindkraft AB v. Energimyndigheten*, ECLI:EU:C:2014:2037.

<sup>741</sup> *Ibid.*, art. 24.

<sup>742</sup> Electricity is deemed to be a good under European law. This prohibition is laid down in the Treaty on the Functioning of the European Union, art. 34.

<sup>743</sup> C-573/12, *Alands Vindkraft*, para 75.

<sup>744</sup> *Ibid.*, para 82 and 118.

<sup>745</sup> In deliverable 7.2, Sweden features as an example of one of the connection models. The economic considerations of this connection model are analysed further in that deliverable.

place offshore, but in practice, it is the case that the grid connection takes place onshore and that the developer bears the costs for the export cable.<sup>746</sup> Therefore, cables from an OWF to the shore can be classified as owned by the developers, and not as part of the transmission system.

Interconnectors between Sweden and other countries are jointly owned by the Swedish TSO and the other country's TSO, in which Svenska kraftnät should always have a decisive vote. However, there is also one exempt interconnector, Baltic Cable, which runs between Sweden and Germany and which is owned by Statkraft.<sup>747</sup> Except for the Baltic Cable, interconnectors are part of the Swedish transmission grid. The construction of Baltic Cable gave rise to the drafting of the current interconnector regime.

The combination of interconnection and export of offshore generated electricity seems only hypothetical, given the limited development of offshore wind energy in Sweden. However, in 2009, a joint pre-feasibility study was published by the TSOs of Sweden, Denmark and Germany concerning the linkage of offshore wind energy to the three countries concerned.<sup>748</sup> Eventually, Denmark and Germany went ahead with (a variation of) this plan, now called the Combined Grid Solution,<sup>749</sup> whereas for developments in the Swedish waters, there was no business case. Nevertheless, the tender for the Danish part of Kriegers Flak resulted in a record-low bid.<sup>750</sup> It is interesting to see that already in the pre-feasibility study, the challenge was addressed whether such combined grid infrastructure should be constructed by the developer of the OWF or by the TSO in the Swedish part.<sup>751</sup> However, since that time, the issue has not been discussed any further in Sweden. Thus, this issue is still undecided in the case of Swedish grid infrastructure.

### 5.8.3.2 CLUSTERING OF WINDFARMS

In Sweden, the conditions for clustering of OWFs are not favourable. This is caused by the system of developer-based planning and developer-based construction of the export cable, with a connection only taking place onshore. Another factor is the low amount of new offshore wind capacity. Additionally, if there are OWFs, they are still located close to the shore. In such a case, it is economically not necessary to cluster OWFs before bringing the electricity to shore.

### 5.8.4 DECOMMISSIONING

Globally, decommissioning of OWFs is a rare occurrence. However, Sweden was the first in the world to decommission an OWF. The OWF concerned was Yttre Stengrund, with a total capacity of 10 MW (5 turbines),

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<sup>746</sup> See for example Energimyndighet, *Havsbaserad Vindkraft – potential och kostnader*, p. 56.

<sup>747</sup> <http://www.balticcable.com/>.

<sup>748</sup> Energinet.dk, Svenska Kraftnät, Vattenfall Transmission, *An Analysis of Offshore Grid Connection at Kriegers Flak in the Baltic Sea*, May 2009, [http://www.svk.se/siteassets/om-oss/rapporter/090507\\_kriegers-flak-pre-feasibility-report-final-version.pdf](http://www.svk.se/siteassets/om-oss/rapporter/090507_kriegers-flak-pre-feasibility-report-final-version.pdf).

<sup>749</sup> See chapter 5.3.3.1.

<sup>750</sup> <https://corporate.vattenfall.com/press-and-media/press-releases/2016/vattenfall-wins-tender-to-build-the-largest-wind-farm-in-the-nordics/>.

<sup>751</sup> *An Analysis of Offshore Grid Connection at Kriegers Flak in the Baltic Sea*, p. 19.

which had been constructed in 2001.<sup>752</sup> This OWF was decommissioned at the initiative of the owner, as the maintenance works became too expensive compared to the electricity yield.

In Sweden, the permit that is needed for construction of an OWF can include requirements and conditions.<sup>753</sup> In this permit, the government can also impose conditions with regard to decommissioning. Moreover, the Environmental Act stipulates that validity of the permit is dependent on whether or financial securities are placed in order to recover the damage to the environment after removal.<sup>754</sup> These securities are accepted when they are sufficient for their purpose.<sup>755</sup> The authority tasked with awarding the permit is also in charge of the securities.<sup>756</sup> For offshore wind and offshore grid infrastructure, this will be Energimyndighet. In a report, Energimyndighet describes that these are higher for offshore wind than onshore wind, and that the height of the securities is dependent on various factors.<sup>757</sup> When the decommissioning is fully performed, the security will be released again.

### 5.8.5 INTERIM CONCLUSION

In Sweden, there is a large potential for offshore wind energy. However, most of this potential is currently not being developed. This has to do mostly with the subsidy scheme offering no particular incentive to a relatively more expensive option. However, this can change in the future, as the costs for offshore wind energy decrease substantially. However, an interesting feature of this support scheme is that it is shared with Norway as a joint support scheme.

Another possible explanation of the reluctance to develop offshore wind energy comes from the Swedish legislative framework regarding offshore electricity cables. In Sweden, the developer is responsible for the construction of the export cable, as the point of connection with the national transmission system takes place onshore. Therefore, the developer bears the risks of this cable. We can see that when interconnection and offshore wind are combined, this will be a legal barrier as it is not clear whether the TSO would construct the cable or whether the developer builds it. This became clear from the pre-feasibility study for Kriegers Flak.

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<sup>752</sup> <https://corporate.vattenfall.com/press-and-media/press-releases/2016/the-first-decommission-in-the-world-of-an-offshore-wind-farm-is-now-complete/>.

<sup>753</sup> Environmental Permit, see chapter 5.7.2.2.

<sup>754</sup> Miljöbalk, kap. 16(3).

<sup>755</sup> Ibid.

<sup>756</sup> Ibid.

<sup>757</sup> Energimyndigheten och Naturvårdsverket, *Vägledning om nedmontering av vindkraftverk på land och till havs* (in Swedish), 2016, <http://www.energimyndigheten.se/contentassets/aa1eef8944994ef5b9b1f7708c0d2656/vagledning-nedmontering-av-vindkraftverk-och-efterbehandling-remissversion-160421.pdf>, p. 11

## 5.9 LEGAL FRAMEWORK OF THE UNITED KINGDOM

### 5.9.1 INTRODUCTION

The United Kingdom has been an active player in offshore wind energy, with 5.1 GW installed so far and another 4.5 GW under construction.<sup>758</sup> Moreover, the UK is one of the earlier developers, with the first UK offshore windfarm being in place already since 2000.<sup>759</sup> In the Renewable Energy Directive, the share of renewable energy in gross final energy consumption in the UK is set to 15%.<sup>760</sup> There are no specific (offshore) wind energy targets: the market decides which types of RES will be developed on which scale.<sup>761</sup>

The legal system of the UK, being a common-law system, is fundamentally different from the legal systems of the other countries in this report. However, UK energy law is mostly based on acts of primary and secondary legislation.<sup>762</sup> Moreover, although the legal system is different, energy law is also to a large extent based on the provisions of EU energy law, which are also implemented in the UK. The most relevant UK acts are the Electricity Act 1989,<sup>763</sup> the Energy Act 2004<sup>764</sup> and the Energy Act 2013.<sup>765</sup> Moreover, for spatial planning, the Marine and Coastal Access Act 2009 and Planning Act 2008 are of crucial importance. For support schemes, the Renewables Obligation scheme<sup>766</sup> as well as the Contracts for Difference mechanism,<sup>767</sup> which is meant to gradually replace the former, are important.

Concerning grid planning and clustering, the UK has a distinct regime: onshore, the function of TSO is split into transmission operators (TO) and a system operator (SO).<sup>768</sup> There are several TOs, namely National Grid

<sup>758</sup> <https://www.thecrownestate.co.uk/energy-minerals-and-infrastructure/offshore-wind-energy/>

<sup>759</sup> Blyth Offshore (4 MW) was the first demo project.

<sup>760</sup> Renewable Energy Directive, annex 1.

<sup>761</sup> Müller 2016, p. 176.

<sup>762</sup> *Ibid.*, p. 177.

<sup>763</sup> Electricity Act 1989, <http://www.legislation.gov.uk/ukpga/1989/29/contents>.

<sup>764</sup> Energy Act 2004, [http://www.legislation.gov.uk/ukpga/2004/20/pdfs/ukpga\\_20040020\\_en.pdf](http://www.legislation.gov.uk/ukpga/2004/20/pdfs/ukpga_20040020_en.pdf).

<sup>765</sup> Energy Act 2013, <http://www.legislation.gov.uk/ukpga/2013/32/contents/enacted/data.htm>.

<sup>766</sup> This scheme is regulated by various Renewables Obligation Orders: Renewables Obligation Order 2009 (SI 2009/785), Renewables Obligation (Amendment) Order 2010 (SI 2010/829), Renewables Obligation (Amendment) Order 2011 (SI 2011/984), Renewables Obligation (Amendment) Order 2013 (SI 2013/768), Renewables Obligation (Amendment) Order 2014 (SI 2014/893), the Renewables Obligation Closure Order 2014 (SI 2014/2388) which contains provisions regarding the closure of the Renewable Obligation, the Renewables Obligation Closure (Amendment) Order 2015 (SI 2015/920) which deals with closure of RO for large solar photovoltaic installations and the Renewables Obligation Closure Etc. (Amendment) Order 2016 (SI 2016/457) which deals with closure of RO for smaller solar photovoltaic installations. This is also the main statutory instrument which revoked or consolidated previous Orders.

<sup>767</sup> This mechanism is regulated through various Regulations: The Electricity Market Reform (General) Regulations 2014 (SI 2014/2013), Contracts for Difference (Standard Terms) Regulations 2014 (SI 2014/2012)

Contracts for Difference (Allocation) Regulations 2014 (SI 2014/2011), Contracts for Difference (Definition of Eligible Generator) Regulations 2014 (SI 2014/2010), Contracts for Difference (Standard Terms) (Amendment) Regulations 2015 (SI 2015/1425), Contracts for Difference (Allocation) (Amendment) Regulations 2015 (SI 2015/981), Contracts for Difference (Miscellaneous Amendments) Regulations 2016 (SI 2016/784), Contracts for Difference (Allocation) (Amendment) Regulations 2016 (SI 2016/1053) and the Contracts for Difference (Standard Terms) (Amendment) Regulations 2017 (SI 2017/112) - in force 1 March 2017.

<sup>768</sup> Energy Law in Europe, p. 1101.

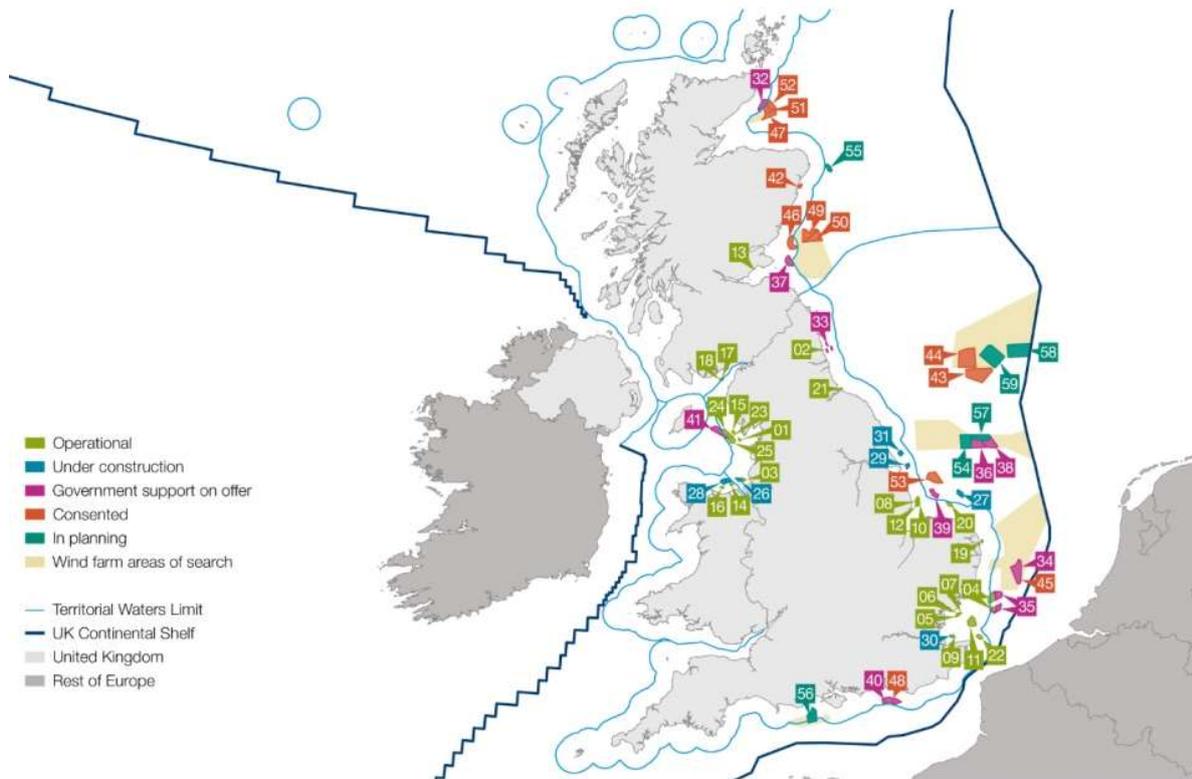


Figure 13: Offshore Wind Energy in the UK. Source: Crown Estate.

Electricity Transmission (NGET) for England and Wales, Scottish Power Transmission Limited for southern Scotland and Scottish Hydro Electric Transmission for northern Scotland and the Scottish islands groups. Northern Ireland has a separate TSO, SONI. National Grid Electricity Transmission also has an additional function, namely as SO of the National Electricity Transmission System. None of these companies is in charge of OWF export cables. Instead, this is done by separate actors, called Offshore Transmission System Operators (OFTOs). This will be elaborated further in chapter 5.9.3.1.

The latest large policy change in the electricity market came from the Electricity Market Reform, a process that was introduced in 2011.<sup>769</sup> The electricity market reform entails many legislative changes, implemented mostly with the Energy Act 2013. As the electricity market design is for a large part dependent on EU Directives and Regulations, there might be legislative changes in UK energy law as well as a result of Brexit.

<sup>769</sup> Department of Energy and Climate Change, 'Planning our electric future: a white paper for secure, affordable and low-carbon electricity', July 2011, [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48129/2176-emr-white-paper.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48129/2176-emr-white-paper.pdf).

## 5.9.2 OFFSHORE GRID PLANNING

### 5.9.2.1 MARITIME SPATIAL PLANNING

Marine planning was introduced in the UK with the Marine and Coastal Access Act (2009).<sup>770</sup> This Act created the Marine Management Organisation (MMO) which unites several functions related to marine management, such as fisheries, issuing of marine licenses to undertake works or activities, pollution and monitoring and enforcement of regulations. The Act also provides for marine planning. First, a marine policy statement is made by the public authorities concerned, in which they lay down their general policies for contributing to sustainable development in the UK marine area.<sup>771</sup>

As a next step, marine plans are made for the English, Scottish, Welsh and Northern Irish inshore and offshore areas.<sup>772</sup> Inshore area is to be interpreted as the territorial waters, whereas offshore area is the area beyond these waters.<sup>773</sup> As such, the seas around the UK are divided into different areas for which separate marine plans exist. These areas can even be subdivided into smaller plan areas.<sup>774</sup> Marine plans are drafted by the marine planning authority, which is the Secretary of State in England (who has delegated this function to the MMO), or by the Scottish or Welsh Ministers (the Scottish Ministers delegated the function to Marine Scotland).<sup>775, 776</sup> The plan states the relevant authority's policies with regard to sustainable development in the region.<sup>777</sup> Most plans are still in the process of being drafted, but some are already available.<sup>778</sup>

As maritime spatial planning is still a new development, the OWFs that are currently in the licensing or construction phase are sited according to wind development zones designated in the tender rounds that were organised so far by The Crown Estate. The Crown Estate is the owner of most of the territorial sea in the UK.<sup>779</sup> Beyond this zone, the UK has declared a Renewable Energy Zone,<sup>780</sup> comparable to an EEZ, in which the exclusive rights to exploit this zone for energy production belong to the Queen and are managed on her behalf by The Crown Estate.<sup>781</sup>

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<sup>770</sup> Marine and Coastal Access Act, <http://www.legislation.gov.uk/ukpga/2009/23/contents>.

<sup>771</sup> Marine and Coastal Access Act, art. 44(1). The marine policy statement can be found here: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69322/pb3654-marine-policy-statement-110316.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf)

<sup>772</sup> *Ibid.*, sec. 49(1).

<sup>773</sup> *Ibid.*, sec. 322(1).

<sup>774</sup> See for example, the England plan area is subdivided into 11 areas (including both inshore and offshore):

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/325688/marine\\_plan\\_areas.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/325688/marine_plan_areas.pdf)

<sup>775</sup> Marine and Coastal Access Act, sec. 50(2).

<sup>776</sup> <http://www.gov.scot/Topics/marine/seamanagement>.

<sup>777</sup> *Ibid.*, sec. 51(3)b.

<sup>778</sup> For example, the plan for the East shore (both inshore and offshore):

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/312496/east-plan.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/312496/east-plan.pdf)

<sup>779</sup> Crown Estate Act 1961.

<sup>780</sup> The Renewable Energy Zone was originally designated by Renewable Energy Zone (designation of area) order 2004, no. 2668. However, this order has been revoked by Exclusive Economic Zone Order 2013/3161 art.1(2) (March 31, 2014). Nevertheless, the Renewable Energy Zone is also described in the Energy Act 2004, art. 84. For Scotland, there is a separate Renewable Energy Zone Order, based on Energy Act 2004 art 84(5), which is not revoked and thus still applicable: Renewable Energy Zone (Designation of Area) (Scottish Ministers) Order 2005/3153.

<sup>781</sup> Energy Act 2004, sec. 84(1).

The Crown Estate organises licensing for OWFs through licensing rounds, in which applicants can apply for a lease of a certain area of the REZ.<sup>782</sup> So far, three licensing rounds have been organised.<sup>783</sup>

### 5.9.2.2 LICENSING AND PERMITTING PROCEDURES

This subchapter sets out licensing and permitting procedures of respectively OWF construction and cable construction, differentiating between connection of OWFs and interconnectors. Afterwards, a possible combination of these cables in the context of an offshore grid is elaborated.

Concerning the OWF permitting and licensing process, the first step is to obtain a lease. OWF sites are on lease by the Crown Estate.<sup>784, 785</sup> The leasing process consists of two steps. First, a 5-year lease is awarded for the process of obtaining all these consents and permits.<sup>786</sup> A final lease can only be granted after all the consents and permits are obtained.

The permitting process of OWFs is in general described in the Planning Act 2008,<sup>787</sup> but it depends on whether the OWF is located in England, Wales, Scotland or Northern Ireland which provisions apply.<sup>788</sup> Concerning English waters, “offshore generation stations”<sup>789</sup> of more than 100 MW capacity are subject to the Planning Act, whereas OWFs with a capacity below 100 MW require consent under the Marine and Coastal Access Act 2009 and the Electricity Act 1989.<sup>790</sup> In Wales, this is slightly different. The Planning Act 2008 is also applicable, but only to installations with a capacity of more than 350 MW.<sup>791</sup> Except for demonstration projects, almost all OWFs that are currently planned, consented or under construction have a capacity of more than 100/350 MW. Therefore, the information on permitting for OWFs will focus on OWFs of more than 100 MW.

In English and Welsh waters, OWFs above the threshold mentioned above fall under the Planning Act 2008 as they are deemed ‘Nationally Significant Infrastructure Projects’ (NSIPs).<sup>792</sup> They require ‘development consent’

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<sup>782</sup> <https://www.thecrownestate.co.uk/energy-minerals-and-infrastructure/offshore-wind-energy/>

<sup>783</sup> Not to be confused with the five tender rounds organised by Ofgem, which will be explained in more detail in chapter 5.9.3.1.

<sup>784</sup> Müller, p. 179.

<sup>785</sup> The Crown Estate devolved its Scottish assets and their revenues to the Scottish Ministers. It is not clear yet whether this has implications for OWF and offshore grid planning. For more information in general:

<http://www.crownstatescotland.com/>. For more information on maritime management:

<http://www.gov.scot/Topics/marine/seamanagement/TCE>.

<sup>786</sup> Müller, p. 179.

<sup>787</sup> Planning Act 2008, <http://www.legislation.gov.uk/ukpga/2008/29/contents>.

<sup>788</sup> Several provisions of the Planning Act only apply to England and Wales, for instance with regard to nationally significant infrastructure projects in the energy sector. Planning Act 2008, art. 240(1)b. However, also in the substantive provisions that are applicable to England and Wales, a distinction is made between English and Welsh waters.

<sup>789</sup> Defined in the Planning Act 2008 as a generating station that is (a) in waters in or adjacent to England or Wales up to the seaward limits of the territorial sea, or (b) in a Renewable Energy Zone, except any part of a Renewable Energy Zone in relation to which the Scottish Ministers have functions. Thus, it is applicable to both the territorial waters and the EEZ of England.

<sup>790</sup> Marine and Coastal Access Act, sec. 65 and 66. Electricity Act 1989, sec. 36 and 36a.

<sup>791</sup> Planning Act 2008, sec. 15(3B), Government of Wales Act 2006, sec. 158(1).

<sup>792</sup> Planning Act 2008, sec. 14, 15(3) and 15(4).

(termed Development Consent Order) which replaces many other consent procedures.<sup>793</sup> In this way, the permitting process for large projects is streamlined. The Planning Act provided for the Infrastructure Planning Commission to be the relevant authority for planning and permitting. However, with the Localism Act 2011, this Commission was abolished.<sup>794</sup> Instead, this power was placed at the Secretary of State, who can give a direction about the handling of applications.<sup>795</sup> Currently, the Planning Inspectorate is the relevant authority for processing applications for development consent.<sup>796</sup> A Development Consent Order can encompass the authority to construct and operate an OWF, any offshore or onshore electricity cables connecting it to the national grid and marine licence(s).

Next to this development consent, a marine licence is necessary for constructing an OWF as the activities associated with constructing an OWF are mentioned in the list of licensable activities under the Marine and Coastal Access Act (for example, constructing works, depositing objects or substances and dredging).<sup>797</sup> The appropriate licensing authority is the Secretary of State, or in the case of Northern Ireland, Scotland or Wales the relevant Northern Irish, Scottish or Welsh Ministers.<sup>798</sup> Such applications must be published either by the authority or by the project developer.<sup>799</sup> When judging the merit of the applications, the Secretary of State must take into account the need to protect the environment, human health and the need to limit interference with other legitimate usages of the sea.<sup>800</sup>

With regard to offshore cables for the transport of electricity from an OWF to the onshore grid, the regime is the following. The transmission of offshore generated electricity is the responsibility of a separate entity, the offshore TSO (OFTO).<sup>801</sup> For this type of activity, an offshore transmission license is required.<sup>802</sup> Offshore transmission licenses are awarded through a competitive tender organised by Ofgem.<sup>803</sup> Next to the offshore transmission license, these cables also require a marine license to be constructed.<sup>804</sup> Moreover, the Crown Estate may require another agreement for lease for the cables, if the cables are not part of the OWF lease.<sup>805</sup> Interestingly, in practice, these cables are often constructed by the OWF developer and then transferred to an OFTO in order to keep transmission and generation separate under the unbundling requirements.<sup>806</sup> The OFTO will then hold the offshore transmission licence.

<sup>793</sup> *Ibid.*, sec. 31 and 32.

<sup>794</sup> Localism Act 2011, sec. 128.

<sup>795</sup> Localism Act 2011, sec. 129.

<sup>796</sup> <https://infrastructure.planninginspectorate.gov.uk/application-process/planning-inspectorate-role/>.

<sup>797</sup> Marine and Coastal Access Act, sec. 66.

<sup>798</sup> Marine and Coastal Access Act, sec. 113.

<sup>799</sup> Marine and Coastal Access Act, sec. 68.

<sup>800</sup> *Ibid.*, sec. 69(1).

<sup>801</sup> This system will be elaborated further in chapter 5.9.3.1.

<sup>802</sup> Electricity Act 1989, sec. 6C(5) and (6).

<sup>803</sup> Electricity Act 1989, sec. 6C and 6D describe this procedure. The allowed revenues of these cables are set by the winning bid of the tender procedure, for a 20-year period.

<sup>804</sup> Marine and Coastal Access Act, art. 66.

<sup>805</sup> [https://www.thecrownestate.co.uk/media/5518/guideline\\_for\\_leasing\\_of\\_export\\_cable\\_routes.pdf](https://www.thecrownestate.co.uk/media/5518/guideline_for_leasing_of_export_cable_routes.pdf), p. 7.

<sup>806</sup> The unbundling requirements are laid down in Directive 2009/72/EC, art. 9 and further. See also chapter 4.2.1.

Regarding interconnector cables, the licensing and permitting regime differs with regard to the location of the cable. A distinction is made between the ‘inshore stretch’ and the ‘offshore stretch’.<sup>807</sup> The requirements of the Marine and Coastal Access Act 2009 relating to a Marine License are not applicable to the ‘offshore stretch’ of exempt submarine cables.<sup>808</sup> ‘Exempt’ in this context means a cable that is *not* used for the exploration or exploitation of natural resources or the operation of artificial islands or installations under the jurisdiction of the United Kingdom. This exemption thus relates to interconnectors and not to OFTO-cables. With regard to the ‘inshore stretch’ of exempt cables, a Marine License is needed, but the relevant authority must grant the license for any application.<sup>809</sup> However, with regard to both parts of the cable, the authority can impose conditions, related for example to safety or environmental considerations.<sup>810</sup>

Interconnector cables, although they are to a large extent located in the seabed and transmit electricity, do not require an offshore transmission license under the Electricity Act 1989. Instead, they require a separate ‘interconnection licence’ under the same Act.<sup>811</sup> As these licenses give right to different activities, it is very important for the further regulatory treatment of the cables whether they obtain an offshore or an onshore licence.<sup>812</sup>

When, in the development of a meshed offshore grid, the function of transmission of offshore generated electricity is mixed with the function of interconnection, the question arises which licensing regime applies. It seems that such a grid would not meet the definition of ‘exempt’ cable under the Marine and Coastal Access Act, meaning that a marine license is required. Moreover, it seems that such hybrid grid infrastructure would require an offshore transmission license, as it would have the purpose of transmitting electricity generated at sea.<sup>813</sup> However, this will probably depend on the cable configuration and usage. Nevertheless, it should still be clarified by the relevant authorities which licences will be needed for such infrastructure. Also in literature, it is argued that the current categories may no longer be appropriate for a future meshed offshore electricity grid.<sup>814</sup>

In this context, Ofgem launched a project on ‘Integrated Transmission Planning and Regulation’ (ITPR). One of the conclusions of this project was that an enhanced role of the SO with regard to system planning would help to ensure better coordination across different parts of the network (onshore – offshore – interconnection).<sup>815</sup> In the same project, the concept of Multiple Purpose Projects (MPPs) is also investigated.<sup>816</sup> MPPs are network components that fulfil multiple functions, as is made clear in an earlier document of the same project.<sup>817</sup> Such

<sup>807</sup> Marine and Coastal Access Act 2009, sec. 81(4). The ‘inshore stretch’ is the part of the cable that is located in the territorial waters. The ‘offshore stretch’ is the part beyond the territorial waters.

<sup>808</sup> Marine and Coastal Access Act 2009, sec. 81(1).

<sup>809</sup> *Ibid.*, sec. 81(2)a.

<sup>810</sup> *Ibid.*, sec. 81(3), see also <https://www.gov.uk/guidance/marine-licensing-cables>.

<sup>811</sup> Electricity Act 1989, sec. 6(1)e.

<sup>812</sup> Energy Law in Europe, p. 1100-1101.

<sup>813</sup> Electricity Act 1989, sec. 6C(5) and (6).

<sup>814</sup> Energy Law in Europe, p. 1101.

<sup>815</sup> Ofgem, Integrated Transmission Planning and Regulation (ITPR) project: Final Conclusions, 17 March 2015, p. 4, <https://www.ofgem.gov.uk/ofgem-publications/93913/itprfinalconclusionsimpactassessmentpublicationfinal-pdf>.

<sup>816</sup> *Ibid.*, p. 28.

<sup>817</sup> <https://www.ofgem.gov.uk/ofgem-publications/52728/itpremergingthinkingconsultation.pdf>, p. 6.

MPPs are in fact the same concept as ‘hybrid’ or combined assets mentioned more often in this PROMOTioN report. In the project, Ofgem concludes that investment in such MPPs should be enabled and that an integrated approach is better than investment in separate pieces of infrastructure.<sup>818</sup> Moreover, in the final conclusions report, it is stated that Ofgem strives for continuity in the regulatory treatment of these projects, creating certainty for investors.<sup>819</sup>

### 5.9.2.3 SUPPORT SCHEME(S)

The UK is currently in a transition from Renewable Obligation Certificates (ROCs) to Contracts for Difference (CfD). The OWFs currently in operation all receive support via the ROC system, but new OWFs will have to follow the CfD system, which allows for a long-term revenue stabilisation. Now that the transitional phase has ended, ROCs are not open for new capacity. However, the systems will run in parallel for the coming years as existing installations still profit from the ROC system. Therefore, both systems will be elaborated below.

ROCs are tradable certificates awarded per MWh produced from an eligible installation. They are bought by electricity suppliers, who have the obligation to present these ROCs for a certain percentage of the electricity they supply. The percentage increases every year, which increases demand for the certificates. As such, a market price for these certificates exists. The territorial scope of the ROC system is UK-wide, although there are different Renewables Obligation Orders for Scotland and Northern Ireland.<sup>820</sup>

As mentioned above, the ROC system will be gradually phased out during the coming years. From March 31<sup>st</sup> 2017, new capacity could no longer profit from this scheme.<sup>821</sup> However, it will still run until 2037 for capacity that was already accredited before this date.<sup>822</sup> There is an exception to the deadline of March 31<sup>st</sup> 2017 for offshore wind: when OWF operators have not yet registered all phases of their RO-accredited capacity before that deadline, they can still obtain ROCs even if some of these phases are not yet commissioned.<sup>823, 824</sup>

The new system, introduced with the Energy Act 2013 following the Energy Market Reform, concerns Contracts for Difference (CfDs).<sup>825</sup> CfDs are contracts under private law in which electricity producers are refunded for the difference between an estimate of the market price and an estimate of the long-term price needed to bring forward

<sup>818</sup> Ofgem ITPR project final conclusions, p. 28.

<sup>819</sup> Ibid.

<sup>820</sup> Renewables Obligation Order 2015 (England and Wales), [http://www.legislation.gov.uk/ukdsi/2015/9780111138359/pdfs/ukdsi\\_9780111138359\\_en.pdf](http://www.legislation.gov.uk/ukdsi/2015/9780111138359/pdfs/ukdsi_9780111138359_en.pdf), Renewables Obligation (Scotland) Order 2009, <http://www.legislation.gov.uk/ssi/2009/140/contents/made>, Renewables Obligation Order (Northern Ireland) 2009, <http://www.legislation.gov.uk/nisr/2009/154/article/34/made>.

<sup>821</sup> Department of Energy and Climate Change, RO Transition Consultation Document, 17 July 2013

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/223489/ROtransitionconsultation17July2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/223489/ROtransitionconsultation17July2013.pdf), p. 8. See also: Ofgem, Final guidance on the transition period and closure of the RO, 16 Oct. 2014. [https://www.ofgem.gov.uk/sites/default/files/docs/2014/10/final\\_ro\\_guidance\\_on\\_the\\_transition\\_period\\_and\\_closure\\_of\\_the\\_ro\\_16oct14.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2014/10/final_ro_guidance_on_the_transition_period_and_closure_of_the_ro_16oct14.pdf).

<sup>822</sup> Ibid.

<sup>823</sup> Ibid.

<sup>824</sup> Renewable Obligation Closure Order 2014 (SI 2014/2388), art. 3 and 9-11.

<sup>825</sup> Energy Act 2013, part 2 chapter 2.



investment in a given technology (the strike price). The counterparty in the contract is the ‘Low Carbon Contracts Company’ (LCCC), a private limited company wholly owned by the Secretary of State for Business, Energy and Industrial Strategy.<sup>826</sup>

The conditions for CfDs can be found in the Contracts for Difference (Allocation) Regulations 2014.<sup>827</sup> They are offered in the form of allocation rounds, by the Secretary of State.<sup>828</sup> This is done on the basis of allocation frameworks, which are also established by the Secretary of State.<sup>829</sup> Next to this, a budget notice has to be published, which specifies at least the total budget and the administrative strike price applicable to applications.<sup>830</sup> The strike price differs per category of technology, and is corrected for inflation (Consumer Price Index).<sup>831</sup> The territorial scope of the CfDs is limited to Great Britain, so this regulation does not apply to Northern Ireland.<sup>832</sup> The end date of the CfD is mentioned in the contract itself, allowing for 15 years of support.

There is a specific article in the Regulations concerning offshore generating stations.<sup>833</sup> It stipulates a supplementary requirement for generating stations that are wholly located in ‘offshore waters’, which encompasses both the territorial waters and the EEZ.<sup>834</sup> The extra requirement is that “the applicant must demonstrate that a lease or an agreement for lease has been granted by the Crown Estate in respect of the location of the relevant CfD unit.”<sup>835</sup> With this requirement, the government ensures that CfDs are awarded to OWFs that have already obtained the necessary consents to build, thus increasing the chance that the OWF will actually be constructed and will profit from the CfD. All awarded CfDs can be found in a register maintained by the LCCC.<sup>836</sup> For offshore wind energy, the metering point to determine the amount of electricity produced under the CfD system is at the substation.<sup>837</sup> Therefore, transmission losses on the OFTO-cable will not affect the amount of support that an OWF developer receives for the electricity its OWF produces.

### 5.9.3 OFFSHORE GRID CONSTRUCTION

#### 5.9.3.1 LEGAL CLASSIFICATION OF DIFFERENT CABLES

The United Kingdom has a very specific system of connection of OWFs, namely via Offshore Transmission System Operators (OFTOs). Under this regime, all cables connecting windfarms to the shore are classified as offshore transmission, and they require an ‘Offshore Transmission Licence’.<sup>838</sup> A tender process decides which

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<sup>826</sup> <https://lowcarboncontracts.uk/who-we-are>

<sup>827</sup> <http://www.legislation.gov.uk/ukdsi/2014/978011116777/contents>

<sup>828</sup> Contracts for Difference (Allocation) Regulations 2014, art. 4

<sup>829</sup> *Ibid.*, art. 6, see also art. 30.

<sup>830</sup> *Ibid.*, art. 11.

<sup>831</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/263937/Final\\_Document\\_-\\_Investing\\_in\\_renewable\\_technologies\\_-\\_CfD\\_contract\\_terms\\_and\\_strike\\_prices\\_UPDATED\\_6\\_DEC.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263937/Final_Document_-_Investing_in_renewable_technologies_-_CfD_contract_terms_and_strike_prices_UPDATED_6_DEC.pdf), p. 7.

<sup>832</sup> *Ibid.*, art. 1(2) [http://www.legislation.gov.uk/ukdsi/2014/2011/pdfs/ukdsi\\_20142011\\_en.pdf](http://www.legislation.gov.uk/ukdsi/2014/2011/pdfs/ukdsi_20142011_en.pdf)

<sup>833</sup> *Ibid.*, art. 27.

<sup>834</sup> *Ibid.*, art. 2(1).

<sup>835</sup> *Ibid.*, art. 27(2).

<sup>836</sup> <https://lowcarboncontracts.uk/cfds>

<sup>837</sup> <https://www.emrsettlement.co.uk/documents/2015/10/g8-contracts-difference-metering-3.pdf>, p. 19/20.

<sup>838</sup> Electricity Act 1989, Sec. 6C-6D.

party gets the Offshore Transmission Licence for a particular connection.<sup>839</sup> This tender process is independent of the Crown Estate rounds for OWF development zones.<sup>840</sup> Instead, when OWF developers finish with the construction of their OWF (which often includes construction of the export cable), they contact Ofgem. Ofgem then organises a tender round which includes one or multiple OWFs.<sup>841</sup> The winner of that tender owns and operates the cables (offshore and onshore) and substations (offshore and onshore) connecting the windfarm to the shore, and receives a regulated rate of return.<sup>842</sup> This party is called ‘Offshore Transmission System Operator’ (OFTO) of that particular cable. The height of the tariffs for that cable are decided by the bid that this OFTO has posted in the tender.<sup>843</sup>

It is important to note that the Third Energy Package is also applicable to OFTOs, which means that the unbundling requirements have to be fulfilled.<sup>844</sup> So, although the construction of the cable can be done by the windfarm developer, it is sold to other investors as soon as it is in operation.<sup>845</sup> Under the transitional regime, the cable was always constructed by the operator and then transferred to the OFTO, whereas under the ‘enduring regime’ that is in place now, it is the choice of the developer, whether to build the cable by himself (generator built) or to let it be built by the OFTO (OFTO built).<sup>846</sup> It is interesting to see that although the unbundling requirements apply, the third party access rules that also spring from EU energy law do not apply to these cables.<sup>847</sup> This is because these are dedicated transmission lines that do not serve to extend the transmission system offshore but rather to connect specific OWFs.

National Grid, in its role of SO, has the ultimate responsibility for coordinating the British electricity transmission system including both onshore and offshore infrastructure. In this capacity, it will interact with an OFTO in respect of outages as well as planned and unplanned maintenance works. Moreover, it is supposed to connect all cables once they land on the shore, as they have the duty to connect all generators to the grid.<sup>848</sup> Furthermore, it also has to coordinate the connection between the offshore cable and the onshore grid and care for the general stability of the grid.<sup>849</sup> Thus, the OFTO interacts with the grid operator (either on transmission or distribution level) to which it is connected and with the system operator National Grid. The network code ‘System Operator-Transmission Owner Code’ (STC) defines these relations and interactions.<sup>850</sup>

<sup>839</sup> Müller 2016, p. 183

<sup>840</sup> Crown Estate has so far launched three rounds for OWF development zones, whereas Ofgem is currently in the fifth round.

<sup>841</sup> See: <https://www.ofgem.gov.uk/electricity/transmission-networks/offshore-transmission/offshore-transmission-tenders>. Round 4 consisted of only one OWF, whereas round 5 included five OWFs.

<sup>842</sup> *Ibid.*, p. 184.

<sup>843</sup> *Ibid.*, p. 185. Ofgem: Offshore Transmission OFTO Revenue Report, December 2013, p. 3.

<sup>844</sup> *Ibid.*, p. 184. Directive 2009/72/EC, art. 9. See also chapter 4.2.1.

<sup>845</sup> *Ibid.*, p. 186.

<sup>846</sup> *Ibid.*, p. 186

<sup>847</sup> Energy Law in Europe, p. 1107.

<sup>848</sup> Müller (2016), p. 188. A ‘Bilateral Connection Agreement’ is required. In this document, it is described how the different codes (Grid Code, Connection Use of System Code and Balancing and Settlement Code) apply to the connection. <http://www2.nationalgrid.com/UK/Services/Electricity-connections/New-connection/New-BCA-Agreement/>.

<sup>849</sup> Müller 2016, p. 184, Sec. 6C-6H Electricity Act 1989.

<sup>850</sup> <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/System-Operator-Transmission-Owner-Code/>. The STC Procedures set out the roles, responsibilities, obligations and rights of each party in further detail. National Grid is the Code Administrator for the STC and maintains the Code.

Still, the OFTO is responsible for downtime of the cable, which will be punished with a reduction of the income the OFTO receives. On the other hand, the OFTO will be rewarded with extra income if it manages to keep the cable in operation for more days than the threshold.<sup>851</sup> This incentive has resulted in high cable availability over the last years.<sup>852</sup>

The idea behind the OFTO approach is to encourage new entrants to enter the industry, to encourage innovation and to lower the costs of OWF connection. Every Ofgem tender round, there are new chances for entry. Moreover, assets can also be sold on a secondary market.<sup>853</sup> Some impact reports concluded that there have indeed been significant savings compared to counterfactual scenarios in which the costs are compared to that of a scenario in which the UK would have a generator-owned or TSO-owned system regarding the cables to the shore, even if one includes the higher transaction costs necessary to make the bids.<sup>854</sup>

### 5.9.3.2 CLUSTERING OF WINDFARMS

In the United Kingdom, all OWFs constructed so far have been connected with radial connections.<sup>855</sup> This can be linked to the OFTO system which presents several difficulties.<sup>856</sup> When it comes to coordination and clustering of OWFs, the OFTO system is more difficult than a TSO-model, as there are more actors involved and as the OWFs may also choose to construct the cable by itself and only sell it to an OFTO afterwards.<sup>857</sup> Another reason is that neither OWF developers nor OFTOs are incentivised to create connection hubs instead of radial connections.<sup>858</sup> This could possibly be mitigated by the government by tendering OWF sites close to each other and stipulating as one of the tender conditions that the OWFs should be connected in a hub, and then set out another tender for an OFTO to operate the cables to the hub and from the hub to the shore. However, this would require a regulatory change compared to the current regime in which OWF developers build their own grid connection and then sell it. Nevertheless, it is logically not possible to have a hub-based system in which every OWF developer constructs its own export cable to the shore. It could still be possible though for OWFs to construct the part of the grid connection to an offshore converter station and to have an OFTO to operate. Although there are various legal barriers to a hub-based connection approach, the possibility is being considered increasingly, especially with the longer distances to shore in current allocation rounds.<sup>859</sup>

<sup>851</sup> Ofgem, Guidance on the offshore transmission owner licence for Tender Round 5, 13 March 2017, [https://www.ofgem.gov.uk/system/files/docs/2017/03/licence\\_guidance\\_-\\_tr5\\_group\\_2.pdf](https://www.ofgem.gov.uk/system/files/docs/2017/03/licence_guidance_-_tr5_group_2.pdf), p. 25 and further.

<sup>852</sup> KPMG, Offshore Transmission: An Investor Perspective, Update Report 2014, p. 18, [https://www.ofgem.gov.uk/sites/default/files/docs/2014/02/offshore\\_transmission\\_-\\_an\\_investor\\_perspective\\_-\\_update\\_report\\_1.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2014/02/offshore_transmission_-_an_investor_perspective_-_update_report_1.pdf).

<sup>853</sup> Ibid., p. 37 and further.

<sup>854</sup> Ofgem and CEPA: Evaluation of OFTO Tender round 2 and 3 Benefits, March 2016, p. 43

<sup>855</sup> National Grid and The Crown Estate, 'Offshore Transmission Network Feasibility Study', 2011, <https://www.thecrownestate.co.uk/media/5506/km-in-gt-grid-092011-offshore-transmission-network-feasibility-study.pdf>

<sup>856</sup> Müller 2016, p. 245.

<sup>857</sup> See chapter 5.9.3.1.

<sup>858</sup> Müller 2016, p. 245.

<sup>859</sup> Müller 2016, p. 245-246.



Regarding the construction of hybrid assets, i.e. OWF export cables combined with interconnection, the situation becomes even more difficult. This is because the onshore TOs are prohibited from holding an interconnector licence.<sup>860</sup> Instead, for instance, National Grid plc. has formed a daughter company (National Grid Interconnectors Limited) for the interconnector between the UK and France.<sup>861</sup> Moreover, it has formed a 50-50 joint venture, BritNed development Limited, for the interconnector with the Netherlands, together with the Dutch TSO TenneT.<sup>862</sup> Interconnector owners are treated as separate TSOs under UK law.<sup>863</sup> This also has consequences with regard to finance, as interconnectors normally receive their returns as a regulated asset. However, several interconnectors with the UK, such as BritNed and Eleclink, operate under the exemption of art. 17 of Regulation 714/2009,<sup>864</sup> and obtain finance as a ‘merchant’ interconnector.<sup>865</sup>

The United Kingdom introduced a new regulatory regime for the income of (non-exempted) interconnectors, the cap-and-floor regime. With this system, revenue over an interconnector will be between the cap and the floor. Revenues above the cap flow back to National Grid in its role of SO, and ultimately back to consumers. However, when revenues are below the floor, National Grid as SO will increase the revenue to the floor level. This system creates a stable base income for investors while also limiting excessive income. The first project using this regime is NEMO, an interconnector between Belgium and the UK, which is scheduled to become operational in 2019.<sup>866</sup> However, there is a lot of interest for this regulatory regime and many more regulated interconnector projects are in the pipeline.<sup>867</sup>

#### 5.9.4 DECOMMISSIONING

The Energy Act 2004 introduces a scheme for the decommissioning of offshore installations.<sup>868</sup> This refers to OWFs as well as electricity cables.<sup>869</sup> The standard for decommissioning in the UK is rather flexible: the relevant object could either be wholly or partly removed, in which case there should be a provision “about restoring the location to the condition that it was in prior to the construction of the object”, or left in position in which case there must be a provision about monitoring and maintenance of the object in question.<sup>870</sup>

<sup>860</sup> Electricity Act 1989, sec. 6(2A), Energy Act 2004, sec. 145(6), Müller (2016), p. 192.

<sup>861</sup> <http://www2.nationalgrid.com/About-us/European-business-development/Interconnectors/france/>

<sup>862</sup> <http://www2.nationalgrid.com/About-us/European-business-development/Interconnectors/Netherlands/>

<sup>863</sup> Müller 2016, p. 192.

<sup>864</sup> Regulation (EC) 714/2009 of the European Parliament and the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) 1228/2003, art. 17. See for example: [https://ec.europa.eu/energy/sites/ener/files/documents/2014\\_eleclink\\_decision\\_en.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/2014_eleclink_decision_en.pdf).

<sup>865</sup> <https://www.ofgem.gov.uk/electricity/transmission-networks/electricity-interconnectors>.

<sup>866</sup> <http://www.nemo-link.com/the-project/overview/>.

<sup>867</sup> <https://www.ofgem.gov.uk/electricity/transmission-networks/electricity-interconnectors>.

<sup>868</sup> Energy Act 2004, sec. 105-114.

<sup>869</sup> Energy Act 2004, sec. 105(10).

<sup>870</sup> Energy Act 2004, sec. 105(8)(d) and (e)



The Secretary of State may require the project developer to submit a 'decommissioning programme'.<sup>871</sup> If this is in Scottish territorial waters or in the Scottish REZ, the Scottish ministers also need to be consulted.<sup>872</sup> The decommissioning programme sets out which measures have to be taken in the decommissioning of the project, contains an estimate of expenditures related to the decommissioning measures and a time schedule for when these measures will have to be taken.<sup>873</sup> Moreover, if the object in question will be wholly or partially removed, it must include provision about restoring the location to the condition that it was in prior to the construction.<sup>874</sup> On the other hand, if the object will be left in position or will not be wholly removed, it must include provision about monitoring and maintenance of the object.<sup>875</sup>

The Secretary of State can approve or reject the decommissioning plan. When the decommissioning plan is rejected, or when the project developer failed to hand in a decommissioning plan within the deadline posed by the Secretary of State, the latter may themselves prepare the decommissioning plan.<sup>876</sup> The Secretary of State can also recover the expenditures for this under the same article.<sup>877</sup> Moreover, this entity can also require the project developer to provide them with documents and information necessary to draft a decommissioning plan.<sup>878</sup>

If the project developer defaults in decommissioning the OWF or cable, the Secretary of State may take remedial action.<sup>879</sup> Failure to comply with the deadlines of the decommissioning constitutes an offence.<sup>880</sup> The Secretary of State may also make regulations about decommissioning.<sup>881</sup>

The question arises who is liable for the decommissioned project, the project developer or the government? The Department of Energy and Climate Change published an Industry's Guide which also treats this question.<sup>882</sup> There, it is stated that the government expects that the owner of the installation remains the owner of its residues after decommissioning, and thus retains liability.<sup>883</sup> However, an exception could be made when the project developer intends to fully remove the installation whereas the government decides to keep the project in place for ecological reasons.<sup>884</sup> In principle, fully decommissioned projects should not cause any problems. However, if problems do arise, the government expects to require the owners to take action.<sup>885</sup> Moreover, any claims for compensation by third parties would not be regulated by the government but be subject to general law.<sup>886</sup>

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<sup>871</sup> Energy Act 2004, sec. 105(2).

<sup>872</sup> Energy Act 2004, sec. 105(5).

<sup>873</sup> Energy Act 2004, sec. 105(8).

<sup>874</sup> *Ibid.*

<sup>875</sup> *Ibid.*

<sup>876</sup> Energy Act 2004, sec. 107(1).

<sup>877</sup> *Ibid.*, sec. 107(9) and (10).

<sup>878</sup> *Ibid.*, sec. 112A(4) jo. sec. 107(1).

<sup>879</sup> *Ibid.*, sec. 110.

<sup>880</sup> *Ibid.*, sec. 110(3).

<sup>881</sup> *Ibid.*, sec. 111.

<sup>882</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/80786/orei\\_guide.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/80786/orei_guide.pdf).

<sup>883</sup> *Ibid.*, p. 34.

<sup>884</sup> *Ibid.*

<sup>885</sup> *Ibid.*

<sup>886</sup> *Ibid.*

Concerning the financing of the decommissioning, the government does not prescribe which amount of financial security the responsible party should provide.<sup>887</sup> However, it refers to the 'polluter pays' principle, under which the party who is responsible for the installation should take its responsibility and pay for decommissioning.<sup>888</sup> In the Industry Guidance document, the government produces examples of which financial securities would be deemed acceptable and which would be deemed unacceptable.<sup>889</sup>

When the decommissioning starts, another marine license is necessary for the removal of constructions in the sea or at the sea bed.<sup>890</sup> This license has to be given by the Secretary of State as well.<sup>891</sup>

### 5.9.5 INTERIM CONCLUSION

The UK has been an active player in the offshore wind sector, with a large installed capacity and already more than 15 years of experience. Concerning spatial planning of OWFs, a comprehensive system of maritime spatial planning has been in place since 2009. The territorial seas and EEZs of England, Northern Ireland, Scotland and Wales have been subdivided into planning areas, and a spatial plan will be drafted for each area. However, the location of OWFs so far was dependent on the Crown Estate's designation of offshore wind zones, in which leases for specific areas could be obtained. The consenting of OWF is also well set out with the Planning Act 2008 establishing a robust consenting framework.

The support scheme regime of the UK changed significantly with the introduction of the Electricity Market Reform. This resulted in two systems being applicable alongside each other at the moment. The Renewable Obligation Certificate system provides for tradable certificates that have to be bought by electricity supply companies for a certain, yearly increasing, percentage of the electricity they supply. However, since the legislative reform, a new system is put into place for new installations. Developers apply for a Contract for Difference, which remunerates the difference between the electricity price and an administrative strike price that differs per category of RES. For offshore wind, applicants have to have the lease from the Crown Estate before applying.

Concerning offshore grid construction, the UK has a rather distinct system compared to the other States that are covered in this report. Separate entities are created for the connection of OWFs to the onshore transmission system. These entities, OFTOs, are responsible for the operation of the offshore cable and related offshore transmission assets such as substations. The construction of these assets lies either with an OWF developer or with an OFTO. Moreover, under the electricity interconnector regime, it is also stipulated that an operator of a transmission system cannot in addition obtain an interconnector license. Therefore, separate legal entities need to be created by a TO to own and operate interconnectors. The UK legal regime with regard to offshore grid

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<sup>887</sup> Ibid., p. 30.

<sup>888</sup> Ibid., p. 30.

<sup>889</sup> Ibid., p. 31-33.

<sup>890</sup> Marine and Coastal Access Act, sec. 66(1)(8).

<sup>891</sup> See chapter 5.8.2.2. for more information about marine licenses.

construction still poses several legal barriers with regard to the clustering of OWFs and the combination of OWF export cables and interconnector cables.



## 6 ANALYSIS AND COMPARISON

### 6.1 INTRODUCTION

In this chapter, the information from the previous chapter will be compared and analysed. The goal is to map which factors in the national legislative regulatory approach could contribute to the construction of offshore wind energy and a meshed electricity grid, and which factors would hold back such developments and form possible legal barriers, either in combination with other countries' legal systems or on their own. The chapter is organised according to the same subchapters as the country-specific accounts. This chapter gives a textual comparison and analysis of the eight countries' differences in legal frameworks. For a quick overview, see the tables with topic-specific comparison in Annex 12.2.

### 6.2 MARITIME SPATIAL PLANNING

With regard to maritime spatial planning, several factors can be distinguished. The factors will be elaborated in detail below.

#### **Is there maritime spatial planning at all?**

It has to be noted that the countries investigated in this document all have some provisions in place on maritime spatial planning. However, whether this has already resulted in concrete spatial plans differs per country. This is dependent on how long ago the policy to create maritime spatial plans was adopted, on how many actors are involved in the process and on whether there are any other delaying factors (such as litigation about the plan). Since the entry into force of the Maritime Spatial Planning Directive, EU Member States are obliged to install a Maritime Spatial Planning authority that will draft maritime spatial plans. However, the first maritime spatial plans will officially only have to be adopted from 2021 onwards. Nevertheless, several countries already developed maritime spatial plans before.<sup>892</sup> Norway, as a non-EU Member State, does not have the obligation to adopt a maritime spatial plan. However, they have a strategic assessment of possible OWF areas.

#### **Does the spatial planning involve only offshore wind or does it involve other interests as well? (i.e. fishing, shipping, tourism)**

According to the Maritime Spatial Planning Directive, Member States have to take into account relevant uses and interaction. The Directive suggests a broad range of interests in the sea that States can take into account in their Maritime Spatial Plans.<sup>893</sup> Whereas before, some countries had separate spatial plans for different interests,<sup>894</sup> the Maritime Spatial Planning Directive will lead to more integrated approaches. This should lead to more

<sup>892</sup> Belgium (2014), Germany (2009), Netherlands (2016). The other countries investigated in the report are in the process of drafting a maritime spatial plan, or have a spatial plan for some regions but not for other regions.

<sup>893</sup> Maritime Spatial Planning Directive, art. 8.

<sup>894</sup> M.A.K. Muir, Social Acceptance and the Development of a North Sea Offshore Grid, *Renewable Energy Law and Policy Review*, 143 2013, p. 144.



sustainable development, good utilisation of the sea space for different users and managing of conflicts between different users of the sea space.<sup>895</sup>

### **What is the duration for spatial planning? Is it renewed/improved regularly or not?**

In some cases, a spatial plan is made for indeterminate time, without any mention of when the plan should be revised.<sup>896</sup> In other cases, a review period is mentioned in the law.<sup>897</sup> In the Maritime Spatial Planning Directive, the time after which a maritime spatial plan should be revised is set at maximum 10 years.<sup>898</sup> A plan with a longer time horizon gives interested parties more certainty with regard to future developments, but limits the leeway governments have to change the plan due to new insights or developments.

### **Is there one spatial plan, developed centrally, or do regions have different spatial plans?**

Some States have introduced one spatial plan for the entire maritime area, while others have subdivided their plans according to different regions. Belgium and the Netherlands cover their entire maritime space in one spatial plan. Germany, Sweden and France have spatial plans for different seas: Germany for the North Sea and the Baltic Sea, Sweden for Skagerrak, Bothnic Gulf and the Baltic Sea and France for the Mediterranean Sea, the Atlantic Sea and the Channel. The United Kingdom even has 11 different areas for which spatial plans will be drafted. This potentially reduces the coherence of the maritime spatial planning. However, when the (regional) plans are all drafted by the same entity, coherence can still be ensured. This is the case in France.

### **Amount of participation of other actors**

When there is coordination between different entities and participation in the drafting process of the maritime spatial planning by for example local governments, industry, environmental protection organisations and citizens, this may increase acceptance of the plan. This can also speed up implementation of next phases, for example, because there is less appetite for litigation regarding decisions to officially dedicate a specific area to for example offshore wind energy or electricity cables.

### **Adopted in the form of a policy document, a law, a royal decree**

The legal status of a spatial plan is dependent on the form it is adopted in. A policy document does not have a fixed legal status. Therefore, it provides less legal certainty than a spatial plan that is officially adopted per royal decree or law. However, with such spatial plans, the procedure to change the plan in the case of progressive insight or technological developments is more difficult again.

The form of the maritime spatial plan differs per country, since the legal systems differ. However, a clear tendency towards binding maritime spatial plans adopted by decree or other delegated form of decision-making can be

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<sup>895</sup> Maritime Spatial Planning Directive, preambulatory clause 19.

<sup>896</sup> This is the case in the United Kingdom and in Norway.

<sup>897</sup> Belgium (6 years), Denmark (10 years), France (6 years), Germany (8 years), Netherlands (5 years), Sweden (8 years).

<sup>898</sup> Maritime Spatial Planning Directive, art. 6(3).

observed.<sup>899</sup> Moreover, in several countries, the binding character can be seen from the provision that no spatial planning decisions can go against the maritime spatial plan.<sup>900</sup>

### Amount of coordination between neighbouring countries

Some usages of the sea space go beyond national limitations or interfere with other activities across the sea border, especially when there is a scarcity of space. Therefore, it is advisable for countries to communicate with each other about maritime spatial plans they have.<sup>901</sup> This is also required by the Maritime Spatial Planning Directive.<sup>902</sup> In a later stage, namely the EIA for specific plans, there is also an obligation for countries to notify and consult each other beforehand when activities are likely to have a transboundary adverse impact on the environment.<sup>903, 904</sup> It is interesting to see that Sweden specifically includes this obligation in national legislation as well.<sup>905</sup>

### Conclusion

It is important that States have some sort of spatial planning, so that they can coordinate with each other and signal synergies in spatial planning early on. There are several characteristics of spatial planning that differ per Member-State. With the implementation of the Maritime Spatial Planning Directive, the different national laws will become more aligned, although there can still be significant differences in national law. However, these do not form legal barriers for the construction of OWFs and eventually an offshore grid.

When it comes to facilitating an offshore meshed electricity grid, coordination between the spatial planning authorities. This is already covered in the Maritime Spatial Planning Directive, although not yet implemented in every country.

## 6.3 LICENSING AND PERMITTING PROCEDURES

The licensing and permitting procedures differ considerably across the observed countries. They will not be compared in detail here. However, it can be observed that the development of an offshore grid benefits from streamlined procedures, in which licencing procedures are carefully prepared.<sup>906</sup> Moreover, in some countries,

<sup>899</sup> Belgium: Royal decree, France: decree, Germany: delegated regulation, Netherlands: decision.

<sup>900</sup> Denmark and the UK mention this explicitly.

<sup>901</sup> This is also concluded in SeaEnergy, Offshore Renewable Energy and Maritime Spatial Planning, 2011, p. 15.

[http://www.seaenergy2020.eu/wp-content/uploads/2011/11/111020\\_Seaenergy2020\\_Deliverable3.2\\_Final.pdf](http://www.seaenergy2020.eu/wp-content/uploads/2011/11/111020_Seaenergy2020_Deliverable3.2_Final.pdf)

<sup>902</sup> Ibid., art. 11.

<sup>903</sup> Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), signed by all states covered in this report, as well as by the EU:

[https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII-4&chapter=27&lang=en](https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en).

<sup>904</sup> This is adopted in the EIA Directive, Directive 2011/92/EU, art. 7.

<sup>905</sup> See chapter 5.8.2.1.

<sup>906</sup> This is the case for example in Denmark and in the Netherlands. See for example Danish Energy Agency, Danish Experiences from Offshore Wind Development, updated 2015, p. 24.

[https://ens.dk/sites/ens.dk/files/Globalcooperation/offshore\\_wind\\_development.pdf](https://ens.dk/sites/ens.dk/files/Globalcooperation/offshore_wind_development.pdf)

there is one entity responsible for the entire licensing and permitting process,<sup>907</sup> whereas in others, there are several different entities involved. A ‘one-stop-shop’ approach with one entity responsible for the entire process seems to bear fruits with regard to the streamlining of procedures as well.<sup>908</sup> Furthermore, when there is a coupling between the award of permits and licenses and the award of support to the OWF, there is more certainty that when a license or concession is awarded, the OWF will actually be built. Especially in the context of an offshore grid in which anticipatory investments are made in order to connect future OWFs, it is necessary to have sufficient certainty in this regard. Therefore, coupling of the concession or license award with a support scheme is advisable.<sup>909</sup>

Legal barriers for an offshore grid in the context of licensing and permitting procedures could start to exist when a cross-border project encounters a multitude of different permit requirements that are not streamlined in terms of time and procedure. For example, when there are long delays in the decisions to award licenses for an OWF that should form part of a hub-to-hub construction, the entire project including the cross-border grid connection may face delays. A question for further research is, how the process of planning and permitting can be streamlined to mitigate this regulatory risk, especially with regard to cross-border projects. From a developer’s point of view, one practical method to decrease the risk is to decrease the time between the planning stage, the permit and license application and the financial close of the project. This decreases the risk that there are legislative changes in the meantime. However, in practice, this time is dependent on many factors and cannot always be influenced. Moreover, the governments’ and civil society’s point of view should also be taken into account. Therefore, this is a subject for further research in the context of PROMOTiON.

## 6.4 SUPPORT SCHEMES

Support schemes vary enormously across the observed countries. Main categories are tradable certificates and feed-in premiums or tariffs. For the latter category, the height of the premium or tendency could be fixed or based on a competitive procedure (e.g. tender). A tendency towards the latter can be observed. It is important to note that although support schemes seen in isolation do not necessarily pose legal barriers to the development of an offshore grid in the North Sea, the combination of different support schemes and provisions on the basis of which offshore generated electricity has to be connected to the onshore grid of the country in which it is located in order to receive support are problematic.<sup>910</sup> When analysed in more detail, the support schemes differ on the following elements:

### Form of the remuneration

<sup>907</sup> This is the case in Denmark, Germany and the Netherlands. It is also in principle the case in Norway and Sweden, but there, the offshore wind energy sector is not developed very much in practice.

<sup>908</sup> IEA, *Offshore Renewable Energy: Accelerating the deployment of wind, tidal and wave technologies*, Routledge 2012, p. 157.

<sup>909</sup> This happens currently in Denmark, Germany and the Netherlands.

<sup>910</sup> NorthSeaGrid (2015), p. 81. PwC, Tractebel, Ecofys, *Study on Regulatory Matters* (2016), p. 71-72.



This can be for example a feed-in premium<sup>911</sup> or a system of tradable renewable energy certificates, such as in Norway or in the UK (ROC). Feed-in tariffs still exist for some older projects, such as in Belgium for projects with a concession before July 2007, but they are no longer available for new projects in the investigated countries. A subdivision in feed-in premiums/tariffs is whether the base price per MWh was established through a competitive bidding process or whether this is based on a fixed sum.<sup>912</sup> In general, the tendency is towards more competitive methods to establish the price. Although there is a risk of collusion or underbidding with certain tender designs,<sup>913</sup> determining the price of the premium on the basis of a tender seems to be successful in bringing down the costs of the support scheme.<sup>914</sup>

### Duration

The running time of the support scheme differs per country. It is mostly 15 or 20 years. Schemes based on renewable energy certificates that are bought in the market may run for as long as the support scheme is running, i.e. until 2035 in Norway and Sweden.<sup>915</sup>

### Usage of cooperation mechanisms (Renewable Energy Directive)

Most countries in this report have a national support scheme with no specific reference to the cooperation mechanisms of the Renewable Energy Directive. However, Norway is in a joint support scheme with Sweden. An option between no cooperation mechanism and a full joint support scheme is a national support scheme that is partially open for projects from abroad, such as the German Renewable Energy Act from 2017 onwards.<sup>916</sup> Another option is a specific cross-border tender that is introduced through an Act dedicated to that specific tender, such as in Denmark for the joint solar PV tender with Germany. These countries will make use of statistical transfers under the Renewable Energy Directive as well, in order to settle the differences in installed capacity and funding.<sup>917</sup>

### Preparation

In the case of tenders, some countries already prepare extensive information on the tendered area, relating for example to oceanographic data and wind, wave and current conditions. This reduces possible information asymmetries between different tender parties, contributing to a level playing field, and reduces uncertainties for bidders.<sup>918</sup> In some countries, like Denmark and the Netherlands, an EIA is also already drafted in advance. This contributes to the same goal as publication of the relevant data. Moreover, it reduces the time necessary to bring

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<sup>911</sup> Feed-in premiums supplement the market price when it is lower than a certain threshold. The exact configuration and price rules of feed-in premium support schemes differ per country.

<sup>912</sup> The latter will no longer be compatible with EU State Aid law

<sup>913</sup> AURES Report 2.2, Overview of Design Elements for RES-E Auctions, October 2015, p. 13, p. 25 footnote 4.

[http://auresproject.eu/files/media/documents/design\\_elements\\_october2015.pdf](http://auresproject.eu/files/media/documents/design_elements_october2015.pdf).

<sup>914</sup> B. Vree, N. Verkaik, TKI Wind Op Zee, *Offshore Wind Cost Reduction Progress Assessment*, 2017 (version 3), [https://topsectorenergie.nl/sites/default/files/uploads/Wind%20op%20Zee/20170220\\_Rap\\_TKI\\_Offshore\\_Wind\\_Cost\\_reduction.pdf](https://topsectorenergie.nl/sites/default/files/uploads/Wind%20op%20Zee/20170220_Rap_TKI_Offshore_Wind_Cost_reduction.pdf).

<sup>915</sup> With the possibility of prolongation.

<sup>916</sup> Renewable Energy Act 2017, para 5 jo. 88a.

<sup>917</sup> Agreement between Germany and Denmark, art. 2(3), English version: [https://ens.dk/sites/ens.dk/files/Udbud\\_aktuelle/cooperation\\_agreement\\_dk\\_and\\_de\\_eng\\_version.pdf](https://ens.dk/sites/ens.dk/files/Udbud_aktuelle/cooperation_agreement_dk_and_de_eng_version.pdf)

<sup>918</sup> Danish Energy Agency, Danish Experiences from Offshore Wind Development, updated 2015, p. 24.

the project to the construction phase after the tender. Similarly, some countries already provide the permits that are necessary in order to start construction and operation to the successful tenderer. These permits are already prepared in advance, reducing the chance of delays due to legal problems with the permits, such as litigation. This also significantly reduces the time before construction can start.<sup>919</sup> Additionally, it seems that this preparation and coupling of the tender with permitting procedures brings down the tender price.<sup>920</sup>

#### Details laid down in what kind of document?

In some countries, the details of the support scheme, such as the price per MWh, are fixed in an act or royal decree, such as in Belgium. In other countries, this is done with official decisions per tender, containing the tender conditions and maximum price. It is also possible to lay down the details in a contract under private law, such as in the United Kingdom. Which document is used is dependent on the design of the support scheme and whether details need to be adapted often, such as in the case of tenders, or not, such as in the case of a support scheme with a fixed price.

#### Conclusion

Across the investigated countries, a variety of support schemes can be found. They differ in form, duration, preparation and in what kind of document the details are laid down. Legal barriers do not exist specifically in these factors, but rather in the existence of support schemes that are limited to the national territory and EEZ of one country, in which one of the conditions is that the support scheme is applicable to electricity fed in the grid of the country in which the OWF is located. The mitigation of this legal barrier will be the subject to further analysis in the context of the PROMOTioN research programme.

## 6.5 LEGAL CLASSIFICATION OF DIFFERENT CABLES

The legal classification of different cables is part of the subchapter 'offshore grid construction'. This is because, regarding the construction of a meshed HVDC offshore grid in the North Sea, it is highly relevant to know how certain cables and other grid components are classified under national law, i.e. as part of the OWF installation, as part of the onshore grid or as part of a separate type of transmission infrastructure, i.e. an offshore transmission grid. These differences in classification lead to differences in practice, for example with regard to the financing of such grid infrastructure.<sup>921</sup> Moreover, it also leads to differences with regard to which actor is responsible for the construction and operation of that grid infrastructure, i.e. a TSO, the OWF developer or a third, external party. This, in turn, may have consequences for the possibilities of grid planning and clustering.

When a meshed offshore HVDC grid is constructed, or already when 'hybrid' infrastructure that combines interconnection with the connection of OWFs is utilised, there may also be a challenge regarding the legal

<sup>919</sup> Ibid.

<sup>920</sup> B. Vree, N. Verkaik, TKI Wind Op Zee, *Offshore Wind Cost Reduction Progress Assessment*, 2017 (version 3), [https://topsectorenergie.nl/sites/default/files/uploads/Wind%20op%20Zee/20170220\\_Rap\\_TKI\\_Offshore\\_Wind\\_Cost\\_reduction.pdf](https://topsectorenergie.nl/sites/default/files/uploads/Wind%20op%20Zee/20170220_Rap_TKI_Offshore_Wind_Cost_reduction.pdf), p. 9.

<sup>921</sup> The different classifications are analysed further in Deliverable 7.2 with regard to who bears the connection costs. The financing structures are elaborated in Deliverable 7.3.

classification of this hybrid grid infrastructure. This depends on whether the functions of interconnection and connection of OWFs are normally performed by the same entity or by different entities with conflicting interests. This conflict of interests renders the latter option potentially more problematic than the former. The following is an example to illustrate this: an OWF needs to be connected to the onshore grid. However, there is potential for interconnection with another coastal state nearby. If in that case, the OWF owner is also responsible for the cable, it will aim for the connection to the onshore grid with the least costs and least risk. Interconnection is not primarily in its interest. In such a case, the developer might aim for a cable capacity that is sufficient to export the electricity from the OWF to the onshore grid, but not necessarily any more than that, and might refrain from utilising complicated HVDC switchgear that is necessary to establish a combined, 'hybrid' connection that can be used both for interconnection and for OWF connection.

These conflicting interests could be reconciled by a regulatory intervention, i.e. action from the state to ensure that an OWF developer is compensated for extra costs. However, it is difficult to balance the interests and to offer the right amount of compensation in order to mitigate the extra costs and the risks involved.<sup>922</sup> Another option is for the state involved to oblige the OWF developer to construct the export cable in such a way that hybrid infrastructure is facilitated. However, it is questionable whether developers would be willing to develop the OWF when such demands are placed. Moreover, one potential risk that will remain even after regulatory intervention is the interface management between the grid component managed by the OWF developer, the part managed by the interconnector owner and the onshore TSO.<sup>923</sup>

The other option, where there is no differentiation between OWF connection cables and other grid components, including interconnectors, leads to less problems. There may still be issues such as whether rules on interconnectors, related for example to congestion management and congestion rents, are applicable to the hybrid structure as well or not. However, the conflict of interests does not exist if the same entity is responsible for both functions. Moreover, the interface risk is much less.

Concluding, the consequences of the legal classification of different grid components are visible in their regulatory treatment (i.e. who can operate the cable, how is the cable financed). When considering hybrid infrastructure, the options of legal classification can have significantly differing outcomes. When several different entities are involved, there might be a conflict of interests and an interface risk. The former can be mitigated by regulatory intervention, but the interface risk may persist. When the infrastructure is all owned and operated by the same entity, there will be less of these problems. However, even with this option, there might still be issues related to legal classification of different cables, such as which rules relating to congestion management are applicable to such hybrid infrastructure. This can be addressed in future research.

<sup>922</sup> Compensation for risks is a topic also treated in Deliverables 7.2 and 7.3.

<sup>923</sup> For a concrete discussion of interface risks (in the Netherlands):

[https://www.tennet.eu/fileadmin/user\\_upload/Our\\_Grid/Offshore\\_Netherlands/Report\\_NL-O\\_Interface\\_Workshop\\_22\\_June\\_2016.pdf](https://www.tennet.eu/fileadmin/user_upload/Our_Grid/Offshore_Netherlands/Report_NL-O_Interface_Workshop_22_June_2016.pdf).



## 6.6 CLUSTERING OF WINDFARMS

Clustering of OWFs can be seen as the first step towards hybrid infrastructure that combines offshore wind connection with interconnection. However, the possibility and success of clustering depends on several elements, namely, the geographical location of the OWFs that need to be connected, timing of the different parts of the hub and most important, the location of the grid connection point (i.e. onshore or offshore), which determines who is responsible for the cable from the OWF to shore. The same elements that influence the success of clustering could also be useful when investigating the possibility of a meshed offshore grid.

### Responsibility to connect and connection point

In general, the TSO is required to connect parties that request to be connected to the grid. However, the question is whether this connection takes place onshore or offshore, and who is responsible to construct and operate the cable from the converter station of the OWF to the shore. This differs per country. In several countries, such as Germany, Denmark and the Netherlands, the onshore TSO is made responsible for the connection of OWFs until the converter station. In this way, there is one centralised actor responsible for grid planning and connection, which facilitates clustering and hybrid projects.

However, there are also exceptions: in the United Kingdom, every OWF is connected by a different OFTO, which causes a multitude of different actors operating offshore cables. This makes coordinated grid planning and clustering of OWFs more difficult. However, this could perhaps be solved by writing out tenders for different OWFs in one cluster, and tendering the converter station and export cable from the cluster to the shore instead of tendering different cables. In Norway and Sweden, the grid connection takes place onshore, and the project developer is responsible for constructing the cable to the shore. In such systems, there is no centralised grid planning with regard to the connection of offshore windfarms. Nevertheless, in Norway, the geographical spread of possible OWF locations already makes clear that a hub approach is not advantageous in that country. Belgium is currently in a transition from the system with onshore connection points to an integrated approach with an offshore connection point. France places the responsibility for the converter station on the OWF developer, but leaves the responsibility for the cable from the converter station to the shore to the TSO.

### Geographical location

A hub-based approach seems to deliver economic benefits only from a certain distance to shore onwards, a maximum distance to each other and only from a certain capacity onwards.<sup>924</sup> Moreover, it matters whether the OWFs are in line with each other, such as in the Belgian EEZ. This should be taken into account in maritime spatial planning. It should be noted well, that there is no point in clustering of windfarms if this is more costly than direct (radial) connections.<sup>925</sup> Whether OWFs are located close to each other or not, is partially a political decision, but also dependent on the geography of the country. Therefore, in Norway and France, with an extensive coastline with deep waters, possible OWF locations are spread out much more than in Germany (German Bight) or Belgium, with a limited amount of sea space.

<sup>924</sup> OffshoreGrid Final Report, p. 42.

<sup>925</sup> NorthSeaGrid Final Report, p. 98.



### Timing

The issue of timing is only relevant when there is a different party responsible for the offshore converter station (and the cable from this station to the shore) and for the windfarm itself. When this is the same entity, timing problems can be solved internally. Thus, regarding OWFs that are connected offshore, the delivery date of the OWFs (and their connections) should not be planned to be delivered too far from one another. If there is a significant time gap between delivery of the different parts of a cluster, the assets are (at least temporarily) not used to their full extent. Moreover, there is a risk of stranded costs.<sup>926</sup> This can be seen as a waste of resources. There is also another aspect of timing: when OWFs are planned well in advance, the party responsible to connect them to the grid still has time to look into possibilities for clustering and even into whether a cluster could be part of a hybrid (OWF-interconnector) asset.

### Conclusion

With regard to grid connection, there are again several options. The three possibilities are either the developer connects to the onshore grid, and is responsible for the export cable, or there is a separate entity between the OWF and the onshore grid (OFTOs in the UK), or the TSO provides the connection until the converter station. The latter option is most favourable with regard to clustering of offshore windfarms. Other factors that significantly affect the possibility of clustering OWFs are the geographical location, and thus spatial planning, and the timing of delivery of the different OWFs to be connected.

## 6.7 DECOMMISSIONING

Although offshore wind energy is a relatively young sector and decommissioning only takes place on a small scale now, it is an important topic on the long term. It has to be noticed that there are differences between decommissioning of OWFs and decommissioning of cables in the seabed. First of all, they may have a different lifetime: whereas OWFs normally have an economic life of between 20 and 30 years, modern subsea electricity cables can have a much longer lifetime.<sup>927</sup> In the context of the development of an offshore HVDC grid, this is an important difference: what will happen when an OWF is decommissioned halfway through the lifetime of the connecting cable? Will a new OWF be constructed at the same place or will the cable also have to be removed even though it is still economically and technically sound?

Secondly, they have a different impact on the space use, and thus the reasons for decommissioning or for the decision not to decommission are different. OWFs and grid equipment such as converter stations are decommissioned because they can form a hazard for other users of the sea, such as navigation or tourism, and because they take up space that could perhaps be used otherwise. At the same time, cables that are buried form

<sup>926</sup> OffshoreGrid Final Report, p. 41.

<sup>927</sup> The lifetime of OWFs mentioned here is based on the duration of the licenses in various countries. The first decommissioned OWFs in Sweden and Denmark had a lifetime of respectively 16 and 25 years. The lifetime of subsea cables used to be around 30 years, but with progressing technology, submarine HVDC cables could have a lifetime of 40 years or even longer: <http://www.pub.nf.ca/applications/IslandInterconnectedSystem/files/rfi/DD-NLH-067.pdf>.



much less of a disturbance to other sea users. However, leaving cables in the seabed after the end of their economic life could lead to a ‘spaghetti scenario’ in which it is difficult to lay new cables due to the existing abandoned cables.<sup>928</sup> However, from an environmental impact perspective, it could also be the case that leaving the cable buried in the seabed causes less negative environmental impact than digging up the cable and disturbing the seabed.<sup>929</sup> Thirdly, it is possible that different rules of international law apply, meaning that the requirement for removal of OWFs is much stronger than the requirement of removal of cables.

It is interesting to note that in general, the OWF decommissioning regimes are similar, or sometimes even copied, from offshore oil and gas installation decommissioning requirements. An analysis of oil and gas decommissioning requirements goes beyond the scope of the current deliverable, but it has to be noted that in further work of WP7.1, solutions and guidelines from the oil and gas installations decommissioning industry can be taken into account as possible solutions for OWF and cable decommissioning as well.

When analysed in more detail, the decommissioning system of the different countries differs on the following issues:

### **Standard of decommissioning**

The basic assumption for what is exactly is the standard for decommissioning varies per country. There are two main varieties. In some countries, such as Denmark, France and Sweden, the area has to be fully restored in its original state. In other countries, such as the Netherlands and Norway, the basic requirement is full removal of the OWF including cables. These are already two different scenarios which might require a different approach. However, in practice, measures will be similar. Moreover, in some countries, there is a reference to international standards or norms for decommissioning,<sup>930</sup> whereas in other countries, such a reference is not made, or at least not explicitly. It has to be noted that phrases such as ‘full restoration in original state’ or ‘full removal’ are difficult to interpret when OWFs, cables and other installations are in place for several decades. Therefore, a question for further research is how to interpret these standards in light of OWFs or an offshore electricity grid.

### **Decommissioning regulated by law or by conditions in the license**

In the UK, decommissioning is regulated in considerable detail by the Energy Act 2004. In most other countries, there is a mention of decommissioning in an official act, but it is regulated in more detail by the license conditions. An advantage of regulating decommissioning mainly by official act is that the same system applies to all OWFs and is known in advance. However, as decommissioning of OWFs and offshore grids is still a very young and developing activity, fixing the system by law can be dangerous as it does not allow for sufficient flexibility with

<sup>928</sup> ‘Spaghetti scenario’ as a term for a large amount of subsea cables has been coined already in 2013 and possibly already before. See for example: [http://www.elia.be/~media/files/Elia/PressReleases/2013/EN/20131112\\_BOG-permits\\_ENG.pdf](http://www.elia.be/~media/files/Elia/PressReleases/2013/EN/20131112_BOG-permits_ENG.pdf).

<sup>929</sup> NIRAS, Subsea Cable Interactions with the Marine Environment, December 2015, p. 22.

<sup>930</sup> This is the case for example in Germany where ‘generally accepted international norms about decommissioning’ are the minimum standard. This could refer to the IMO guidelines (see chapter 2.2.5) or possibly to the current state practice that may develop into norms of customary international law.

regard to developments in technology and advancing ideas about what the standard of decommissioning should be.

### **Discretionary powers of the Minister or authority involved**

The amount of discretion that the Minister or the responsible authority has with regard to the extent, timescale and planned steps of decommissioning varies considerably between different countries. For example, in Belgium, if technology advances, state of the art techniques can be used.<sup>931</sup> The advantage of this is will result in a high standard of environmental protection. However, it does not allow for flexibility regarding the re-use of parts of the installations, such as leaving in place the foundations and replacing the turbines. In other countries, the installations only have to be decommissioned as far as other interests require so, to be determined by the Minister or authority responsible for decommissioning.

### **Financial guarantees for decommissioning**

In every country, there are certain requirements concerning the financial guarantees for decommissioning. However, the stringency of these requirements differs significantly: whereas for example France mentions a specific number, EUR 50.000 per MW, and Denmark and the Netherlands specify in the tender conditions the amount of DKK that has to be provided in a bank guarantee, the United Kingdom only has the requirement that the authorities have to be informed of the (financial) plans of the developer, which then has to be approved by the regulatory authority. The latter system leaves less guarantee for the authorities to enforce that the money set aside in a fund is sufficient for the decommissioning costs.

### **Questions that still need to be answered**

Even though many countries already have provisions for decommissioning, there are still several uncertainties. For example, when the lifetime of the grid connection is much longer than the OWF it connects, can the grid connection be re-used? This is especially relevant for the development of an offshore HVDC grid in which many windfarms will be made. The same question holds for the different components of a wind turbine: if the foundation is still sufficiently strong although the project officially needs to be decommissioned, can that part be re-used by the same or a different developer? Moreover, it has to be specified further how the standards of decommissioning have to be interpreted, especially when full recovery of the area concerned in its original state is required. Additionally, for the development of an offshore grid, it is very relevant to know what standards there are under international law with regard to the removal of cables after the end of their lifetime.

Another question relates to the development of artificial reef, which is documented to grow on OWF turbine foundations and other underwater parts: when the (ecological) value of the reef is high but the project developer does not want to bear the responsibility of maintaining the underwater structures, can these structures and the responsibility to maintain them be transferred to another party, such as the state? Finally, there are rules and standards for the decommissioning (or abandonment) of offshore oil and gas structures. Should such standards

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<sup>931</sup> Royal decree of 30-12-2000 concerning domain concessions, art. 24.

also be developed for the offshore renewables sector? These questions still need to be answered in order to develop a fitting legal framework for decommissioning

## 6.8 INTERIM CONCLUSION

The analysis and comparison of the country-specific legal frameworks show that there are significant differences. The legal frameworks as such (mostly) do not pose legal barriers to the development of an offshore grid. However, in combination with each other, legal barriers may exist in the incompatibilities between different legal and regulatory frameworks. Moreover, sometimes the legal frameworks are fit for purpose now, but need to be amended if a large-scale HVDC network is rolled out. The specific legal barriers and open questions per topic will be listed in chapter 9, key take-aways for further research, as they will form the foundation for further work in WP7.



## 7 OFFSHORE GRID OPERATION

### 7.1 INTRODUCTION

The operation of a grid encompasses many different issues, such as grid safety, access rules, balancing responsibility, rules on dispatch and capacity allocation and congestion management. For the currently existing grids, these issues are mostly regulated on a national level through national grid codes. However, an in-depth description of the different national grid codes goes beyond the scope of this report. There are three reasons for this. First, these grid codes are very detailed and more technical than legal. Secondly, the current network codes are expected to change substantially over the course over the coming few years, with the implementation of EU network codes. Thirdly, the main focus of this research project is an HVDC offshore electricity grid, whereas most national grid codes are designed specifically for the currently existing AC-grid.

Instead, offshore grid operation will be treated in this report along the lines of possible legal barriers in the future operation of a cross-border HVDC grid in which both transmission of offshore generated electricity and the trade and transport of electricity between countries are addressed. This chapter will first elaborate on what is regulated in the European grid codes, what is left to decide for the national TSOs and how this can create legal barriers. Then, the fundamental question of applicability of the grid codes to cross-border connections is addressed, as well as the possibility of convergence or harmonisation. Following this, institutional aspects are treated. Lastly, concrete issues with regard to the operation of an offshore HVDC grid will be explored.

### 7.2 EUROPEAN NETWORK CODES

The currently existing national grid codes are supplemented with grid codes at European level.<sup>932</sup> They are currently being developed in the context of the Regulation on the cross-border exchange of electricity.<sup>933</sup> The aim of these European network codes is to stimulate harmonisation of grid operation and electricity market rules and through this, to facilitate cross-border trade in electricity. Several of these network codes are very relevant for an offshore HVDC grid in the North Sea: the Network Code on Requirements for Grid Connection applicable to all generators,<sup>934</sup> the Network Code on HVDC Grid connection,<sup>935</sup> the Network Code on Capacity Allocation and Congestion Management,<sup>936</sup> the Network Code on Forward Capacity Allocation<sup>937</sup> and the Network Code on

<sup>932</sup> For a description of the contents of the network codes relevant to an offshore grid, see chapter 4.5.

<sup>933</sup> Regulation (EC) 714/2009, art. 6.

<sup>934</sup> Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators, OJ L112/1 (Network Code on Requirements for Grid Connection).

<sup>935</sup> Commission Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules, L 241/1 .

<sup>936</sup> Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management, OJ L 197/24.

<sup>937</sup> Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation, OJ L-259/42.



Electricity Balancing.<sup>938</sup> Currently, the first four of these Network Codes have entered into force, whereas the Network Code on Electricity Balancing still needs to be validated by the European Parliament and Council.<sup>939</sup> These network codes were already described in chapter 4.5.

Although some concrete requirements are fixed in the Network Codes already, the Network Codes normally describe principles and frameworks within which TSOs should propose rules,<sup>940</sup> develop algorithms and communicate with each other. Several issues have deliberately been left open for the national TSOs to fill in. These are called the “non-exhaustive requirements”.<sup>941</sup> These requirements have to be filled in by the TSOs in the implementation of the European network codes into the national network codes during the coming years.<sup>942</sup> Some of these requirements are mandatory for TSOs to fill in, whereas others can be left if they are not relevant.<sup>943</sup>

Even though the European Network Codes have all been developed in recent years, several issues which are relevant for future developments are not yet addressed. This could form a legal barrier to developments towards an offshore grid. In practice, for example, it is unclear how balancing rules will be applied when an OWF is connected to multiple countries.<sup>944</sup> Another example is that countries may have different technical requirements for grid connection, which can be burdensome for OWF developers.<sup>945</sup> This might have a negative influence with regard to technological standardisation. Moreover, it can create difficulties if an OWF is connected to two countries’ offshore electricity grid. These are examples of issues that could appear already in the development of the first ‘stepping stones’ towards an offshore grid.

### 7.3 APPLICABILITY OF NETWORK CODES TO CROSS-BORDER CONNECTIONS

The first problem in this respect is the question which of the national grid codes is applicable. Especially when an OWF is connected to the grid of another country rather than to the grid of the country in which it is situated. This could occur for instance if the COBRA cable is used to connect OWFs in the German EEZ. This could also happen when an OWF is connected to a converter station in a different country, such as depicted in the image (in this case, the red lines indicate the maritime boundaries between the three different countries).

<sup>938</sup> Latest draft: [https://ec.europa.eu/energy/sites/ener/files/documents/informal\\_service\\_level\\_ebgl\\_24-01-2017.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/informal_service_level_ebgl_24-01-2017.pdf)

<sup>939</sup> <https://www.entsoe.eu/major-projects/network-code-development/updates-milestones/Pages/default.aspx>

<sup>940</sup> See for example HVDC Network Code, art. 5(4).

<sup>941</sup> ENTSO-E has published a guidance document for national implementation of the network codes with parameters for non-exhaustive requirements: ENTSO-E, 16 November 2016,

[https://www.entsoe.eu/Documents/Network%20codes%20documents/NC%20RfG/161116\\_IGD\\_General%20guidance%20on%20parameters\\_for%20publication.pdf?Web=1](https://www.entsoe.eu/Documents/Network%20codes%20documents/NC%20RfG/161116_IGD_General%20guidance%20on%20parameters_for%20publication.pdf?Web=1).

<sup>942</sup> Where the TSO has to set rules, this often has to be done within two years after entry into force of the Network Code. The Network Codes themselves are Regulations, which means that from their entry into force, they are binding and directly applicable in the Member-States.

<sup>943</sup> See the guidance above for an overview of which requirements are (non)-mandatory.

<sup>944</sup> PwC, Tractebel, Ecofys, Study on regulatory matters concerning the development of the North Sea offshore energy potential, January 2016, p. 66.

<sup>945</sup> *Ibid.*, p. 68.



On distribution grid level, it is already the case that some households and companies in the border area of a country are connected to the grid of the neighbouring country,<sup>946</sup> but this is mainly due to historical developments. In the greenfield situation of new offshore transmission grid connections which yet have to be built, the situation is different. Nevertheless, it could be argued both that the grid code of the country in whose EEZ the OWF is located should apply and that the grid code that applies to the grid in general should apply. However, when the grid codes vary from each other, it is impossible to apply both grid codes at the same time.

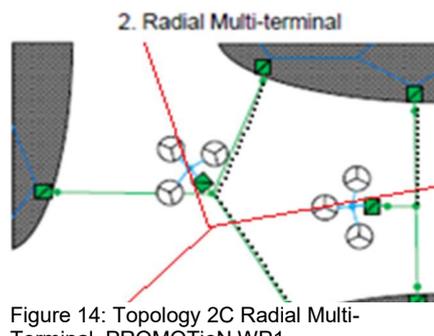


Figure 14: Topology 2C Radial Multi-Terminal, PROMOTiON WP1.

## 7.4 CONVERGENCE AND HARMONISATION

This issue brings up a fundamental question: why do these requirements vary from each other? When the requirements do not differ, the question which grid code applies, becomes less important. The requirements come from the national grid operation, which has developed differently in each country. The European grid codes aim to harmonise several aspects of grid operation, in order to facilitate cross-border trade. However, it seems that they do not aim to facilitate cross-border connections. Moreover, many specific dispositions, the non-exhaustive requirements, still have to be elaborated by the TSOs. This still leaves room for convergence of the requirements in the national codes. When the coastal states keep the possibility of cross-border connections in an offshore grid in mind when they fill in the non-exhaustive requirements, this could prevent legal barriers to come up during the next stepping stones towards an offshore grid.<sup>947</sup>

It is important to keep in mind that it is not necessary to fully harmonise these codes. This is not necessary and could raise problems with regard to the principles of proportionality and subsidiarity.<sup>948</sup> Instead, the main focus should be convergence or harmonisation of the requirements that are relevant for an offshore HVDC grid in as far as necessary to facilitate cross-border connections and grid infrastructure. Another reason for convergence is that this allows for industry standardisation, for example with regard to OWF developers or even turbine manufacturers. Currently, there are different requirements for generators in each country, also regarding offshore generators. However, if there is more convergence, standardisation of equipment is facilitated. This may also bring down costs.

<sup>946</sup> This happens for example with connections in the Netherlands on the Belgian grid:

<http://www.omroepbrabant.nl/?news/2198901083/Grensstreek+in+de+kou+bij+stroomuitval+Belgi%C3%AB+Honderden+Brabanders+op+Belgisch+stroomnet.aspx>

<sup>947</sup> Evidently, national network codes can still be amended when an offshore grid comes within reach. However, instead of amending the codes after legal barriers start to exist, a proactive approach would be more beneficial for the development of an offshore grid. In fact, an amendment procedure is also foreseen for the European Network Codes, Regulation (EC) 714/2009, art. 7.

<sup>948</sup> The principle of subsidiarity entails that the EU shall only act in so far as the objectives cannot be reached at Member-State level. The principle of proportionality entails that the content and form of EU action shall not exceed what is necessary to reach the objectives of the Treaties. Treaty on European Union, art. 5(3) and (4).

## 7.5 INSTITUTIONAL ASPECTS

With regard to the institutional structure, the implementation of the European grid codes in the national grid operation codes is mostly the task of the TSOs of the respective countries. Normally, (national) network codes are officially adopted by the NRAs. However, the implementation is also monitored at European level. This is first and foremost a task of ENTSO-E.<sup>949</sup> However, ENTSO-E will report on this activity to ACER again.<sup>950</sup> Moreover, in general ACER monitors the performance of ENTSO-E regarding the monitoring of the implementation of the Network Codes as well.<sup>951</sup>

In the monitoring of the implementation, the NRAs, ENTSO-E and indirectly ACER could stimulate TSOs to implement the Network Codes in such a way that an offshore HVDC grid is facilitated and that barriers are taken away.

## 7.6 CONCRETE ISSUES IN OFFSHORE GRID OPERATION

It seems that in concrete terms, there are several issues that could be streamlined in order to facilitate offshore grid development, both based on the network codes and other possible issues. It is important to get stakeholder input on this issue. Therefore, this section will be expanded with stakeholders' feedback in due time.

Balancing:

- The current balancing system is based on balancing areas. The European grid code for balancing steers in the direction of increased balancing areas, i.e. regional. However, should the offshore grid also follow this regulatory development or not?
- EU network codes are independent of the market model (i.e. active or passive balancing by the TSO, balancing obligations for solar PV and wind energy). If the North Sea is to be developed as one balancing area, how can these differences be dealt with?

Dispatch, priority dispatch of renewables and re-dispatch:

- The countries investigated in this report have a market model for dispatch of the generation facilities, based on dispatch according to the lowest price. However, under the Renewable Energy Directive, priority dispatch is prescribed for renewable electricity generation.<sup>952</sup> Nevertheless, this may be changed with the legislative proposals of the Clean Energy for all Europeans package. How will this influence offshore grid operation in a grid that primarily connects OWFs?

Interconnectors:

<sup>949</sup> Regulation (EC) 714/2009, art. 8(8).

<sup>950</sup> *Ibid.*, art. 8(8).

<sup>951</sup> *Ibid.*, art. 9(1).

<sup>952</sup> Directive 2009/28/EC, art. 16(2)c.



- Currently, there are some specific rules for interconnectors, such as the exemption regime under Regulation 714/2009<sup>953</sup> and limitations on how income from congestion management can be used. To what extent will these rules also be applicable to hub-to-hub cables?

## 7.7 INTERIM CONCLUSION

For cross-border electricity grids, it is important that the rules on the networks, the network codes, are compatible. For this purpose, the EU Network Codes have been developed. They regulate several aspects, some of which are also relevant for the future offshore HVDC electricity grid. The contents of the network codes are already discussed in chapter 4.5.

The European network codes exist alongside national network codes, which differ on various points. Therefore, an important first question for connections in a cross-border context is which national network code applies, especially where a generator is linked to a different grid than the national grid of the country it is located in. This issue can be solved on a case-by-case basis but when the situation exists more often, it can be advisable to draft a standard solution that can be utilised each time there is such a cross-border situation. This will be addressed in future work of WP7.1.

It becomes clear that the root cause for this problem is the fact that there are national differences between the grid codes. This is logical, given the different historical development and grid characteristics in each country. However, it should be investigated to what extent these national differences hamper the development of a meshed offshore grid. The European network codes strive for harmonisation on some aspects, whereas for other aspects, the non-exhaustive requirements, this is left to the TSOs to decide. A question to be answered in future WP7.1 work is therefore, to what extent can convergence of implementation of European grid codes prevent problems with regard to the applicability of these codes to cross-border connections? A last relevant aspect regarding offshore grid operation is the institutional aspect: ENTSO-E, the NRAs and ACER have the role of coordinator of the network code drafting and implementation process. They could make use of this role to stimulate TSOs to implement the network codes in such a way that an offshore meshed HVDC grid is facilitated. However, this requires an active attitude during the coming months and years, as the network code implementation process takes place within a limited period of time after entry into force of the documents.

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<sup>953</sup> Regulation (EC) 714/2009, art. 17.



## 8 CONCLUSION

The present deliverable elaborates the legal framework for offshore wind and grid development on international, European and national level. It is shown that often, the legal framework needs to be adapted in order to facilitate the development of a meshed offshore electricity grid. This is because offshore wind and offshore grid connections have developed strongly in the past few years while the legal framework lags behind. It becomes clear that while solutions have been sought in order to facilitate offshore wind, hybrid solutions that combine interconnection with offshore wind connection are often not yet supported by legal frameworks.

Concerning international law, the legal framework is mainly based on UNCLOS, the convention on the law of the sea. This convention differentiates between different functions of grid components: when an installation, structure or cable is used for the production of energy or other economic exploitation of the EEZ, it falls under the functional jurisdiction of the coastal state. When a cable is not linked to such an activity, jurisdiction of the coastal state is limited: only related to safety, environmental impact and cable delineation. However, it is problematic under international law when these functions are combined, for example in a hybrid asset or in a meshed HVDC grid. This issue can be solved by drafting bilateral treaties between bordering states, by drafting a multilateral treaty focusing specifically on this issue or by amending existing treaties. Which option is best for the purpose of facilitating the development of a meshed offshore HVDC grid will be treated in future work of WP7.1.

On the level of European law, it is shown that the applicability of EU law at sea follows jurisdiction of national states under international law. Nevertheless, competence also depends on whether states have given the EU competence to regulate over a certain issue in the EU founding treaties. There are sufficient competences for the EU to regulate an offshore electricity grid, with competences for both trans-European networks and energy in general. Another issue discussed here is the applicability of EU law in non-EU states, such as Norway in the EEA and the UK after Brexit. This has to be taken into account when drafting a legal framework for a meshed offshore electricity grid in the Northern Seas. Concerning substantive EU law, the main issue is that the concept of hybrid assets is not yet reflected in current EU law, which creates legal uncertainty and holds back development of such assets.

With regard to national law, several issues relating to offshore grid planning and construction are researched. It can be observed that there are many differences between the different national legal regimes. The choice for a certain legal framework can significantly affect whether offshore wind energy and offshore grid development are stimulated or restrained. Therefore, the legal frameworks are analysed and compared to see which different options there are and how they influence offshore wind and grid development. Some legal issues also arise not from one legal framework but from the combination between two legal frameworks in a cross-border context. Moreover, the issue of offshore grid operation is treated separately, along the lines of the EU network codes. The legal issues discovered in this deliverable will serve as a basis for future work in the context of WP7.1. An overview of this future work is given in the next chapter, Key take-aways for further research.



## 9 KEY TAKE-AWAYS FOR FURTHER RESEARCH

### International Law

- There are several options for clarifying the issue of jurisdiction for offshore cables that fall within the scope of PROMOTioN, namely drafting several bi- or trilateral treaties, drafting one multilateral treaty or amending existing treaties (such as the maritime delimitation treaties between different states that border each other). These options need to be researched further to see which of these options is most appropriate as a legal foundation for a meshed offshore grid in the Northern Seas.
- The most important content of such treaties concerns the division of competences to regulate over offshore cables between countries (for the avoidance of concurrent jurisdiction). However, other topics, for example related to governance, could also be included in such instruments. Nevertheless, they could also be included in other instruments (such as EU legislative instruments). Which other topics should be included in international treaties, as opposed to other levels of legislation?

### Competences under European Law

- There is sufficient legal basis for the EU to regulate a meshed offshore electricity grid. However, the principles of proportionality and subsidiarity have to be taken into account. To what extent is drafting EU-legislation specifically dedicated to the meshed offshore electricity grid in line with the principles of proportionality and subsidiarity?
- The EEA States transpose the majority of EU law (related to the internal market) in the EEA-Agreement. However, as this requires an investigation and Joint Committee Decision, there is a time lag between adoption by the EU and incorporation in the EEA Agreement. An example is the third energy package, which entered into force in the EU in 2011 (publication in the OJ in 2009) and which is still under consideration in the EEA. Is this time lag problematic in the field of legislating the meshed offshore grid? And if so, in what ways can this problem be mitigated?

### Substantive EU Law

- How will the upcoming legislative changes influence the legal regime of offshore electricity cables?
- Can/will a hub-to-hub cable be classified as an interconnector or as another cable, and what are the regulatory consequences of this difference? This could be investigated in combination with a case study of the Combined Grid Solution (Kriegers Flak), in which an OWF hub in Germany will be connected to an OWF hub in Denmark. Here, a link can be made to other research projects researching the status of hub-to-hub cables.



- Is it possible for a cable to have a combined function of interconnector and hub-to-shore (export) cable, in light of priority access under the renewable energy directive and the obligations of the network codes (capacity allocation: FCA, CACM and balancing)? This question is also relevant for WP7.2.
- The TEN-E Regulation provides for a PCI-list. Projects on this list should go through the permitting process on a fast track. However, in practice, it seems to last longer than the two years envisaged by the TEN-E Regulation. As the PCI-list is revised bi-annually, this could mean that projects could lose their PCI-status. What are the legal consequences of loss of the PCI-status? How can developers keep legal certainty over their PCI-status after a PCI-revision?
- The application of the legal framework to the offshore grid is to a large extent dependent on how Member States, NRAs and TSOs make use of it. However, when different countries interpret provisions differently, this may cause additional legal barriers. Which barriers exist in the national legal systems of the coastal states? This will be the subject of the next deliverable, due April 2017.

National Law:

- Licensing and permitting procedures: the issue is that licensing and permitting procedures vary considerably and usually have long processing times, especially in cross-border context. This also creates a risk for the project, making it more expensive.<sup>954</sup> How can the licensing and permitting process be streamlined as much as possible? Can this be solved in the context of the Maritime Strategy Framework Directive combined with the TEN-E directive with requirements for the total length of the planning and permitting procedure, or is additional action needed?
- Support schemes: the current issue is that most support schemes are limited to the territory and EEZ of one country and require connection with the onshore grid of the country providing the support. This hampers the development of hybrid solutions, as the point of the hybrid connection is that the electricity can flow to either country connected to it. In that way, OWFs connected to such infrastructure would not qualify for support. How can this problem be mitigated? On the other side, recent tender results show a significant decline of support needed to develop OWFs in the Netherlands, Denmark and notably Germany (with OWP West and Borkum Riffgrund II for EUR 0,00 per MWh). To what extent will the issue of support schemes hamper the development of an offshore HVDC grid in the long run?
- Legal Classification of hybrid assets: the current issue is that there is legal uncertainty with regard to legal classification of hybrid assets. For example, one question is whether a hub-to-hub cable is classified as an interconnector or as another cable under EU law. This has consequences for the financial and regulatory treatment of the cable. This could possibly be investigated in combination with a case study of the Combined Grid Solution (Kriegers Flak), in which an OWF hub in Germany will be connected to

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<sup>954</sup> This is also discussed in PROMOTioN WP7.3



an OWF hub in Denmark. Also, other research projects researching the regulatory status of hub-to-hub cables can be taken into account here. Another question is whether it is possible for a cable to have a combined function of interconnector and hub-to-shore (export) cable, in light of priority access under the renewable energy directive and the obligations of the network codes (capacity allocation: FCA, CACM and balancing). Should EU energy law be changed in order to facilitate hybrid connections, for example by creating a separate category of 'hybrid' assets or by changing the current differentiation between interconnectors and other cables?

- Offshore grid operation: the current issue is that with cross-border assets, especially when an OWF is connected to another grid than the national grid of the country in whose EEZ the OWF is located (such as a tee-in to an interconnector), it is not clear which network codes apply. This is problematic since the network codes differ per country. Even with the European network codes, there is different national implementation of the non-exhaustive requirements. Therefore, two questions to be answered are:
  - o Which grid codes are applicable to cross-border connections in which there is no link to the onshore grid of the country in which the asset is located (i.e. tee-in)?
  - o To what extent can convergence of implementation of European grid codes prevent problems with regard to the applicability of these codes to cross-border connections?
  
- Decommissioning: although it will take several decades before the OWFs that are currently built will be decommissioned, it is relevant to see what issues can be addressed now already. For example, questions arise regarding how to deal with varying lifetimes of assets, i.e. HVDC cables which can outlive OWFs twice. Should this be taken into account in maritime spatial planning beforehand? How to interpret standards such as 'full restoration of the area in its original state' over the course of several decades? Should international standards be developed for the decommissioning of OWFs, for example in the context of MARPOL or OSPAR?

## 10 LIST OF ABBREVIATIONS

AC	Alternating Current
ACER	Agency for the Cooperation of Energy Regulators
BNetzA	BundesNetzAgentur, regulatory authority (DE)
BSH	Bundesamt für Schifffahrt und Hydrographie (Institute for Shipping and Hydrography, DE)
CACM	Capacity allocation and congestion management
CAPEX	Capital Expenditures
CBA	Cost-benefit analysis
CBCA	Cross-border cost allocation
CEF	Connecting Europe Facility
CfD	Contract for Difference (UK)
CJEU	Court of Justice of the European Union
CRE	Commission de Régulation de l'Énergie (FR)
CREG	Commission de Régulation de l'Électricité et du Gaz (BE)
DC	Direct Current
DEA	Danish Energy Authority
DERA	Danish Energy Regulatory Authority
DSO	Distribution System Operator
EEA	European Economic Area
EEG	Renewable Energy Act (DE)
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ENTSO-E	European Network for Electricity TSOs
EnWG	Energy Industry Act (DE)
FAB	France Alderney Britain project
HVDC	High Voltage Direct Current
ISO	Independent System Operator
ITC	Inter TSO Compensation
ITO	Independent Transmission Operator
JCD	Joint Committee Decision
LCCC	Low Carbon Contracts Company (UK)
LCOE	Levelised cost of electricity
MMO	Marine Management Organisation (UK)
NEMO	Nominated Electricity Market Operator
NRA	National Regulatory Agency
NREAP	National Renewable Energy Action Plan
NSIP	Nationally Significant Infrastructure Project (UK)
NVE	Water and Energy Directorate (NO)



Ofgem	Office of Gas and Electricity Markets
OFTO	Offshore Transmission System Operator
OPEX	Operating Expenditures
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OWF	Offshore Wind Farm
PCI	Project of Common Interest
RED	Renewable Energy Directive
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency
RES	Renewable Energy Sources
RTE	Réseau de transmission de l'électricité
ROCs	Regional Operational Centres
ROC	Renewable Obligation Certificate (UK)
SEA	Strategic Environmental Assessment
SO	System Operator (UK)
TEN-E	Regulation on Guidelines for Trans-European Energy Infrastructure
TFEU	Treaty on the Functioning of the European Union
TO	Transmission Operator (UK)
TPA	Third Party Access
TSO	Transmission System Operator
TYNDP	Ten Year Network Development Plan
UNCLOS	United Nations Convention on the Law of the Sea
WindSeeG	Offshore Wind Energy Act (DE)

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## 12 ANNEXES

### 12.1 EU LAW APPLICABLE TO THE EEA (NORWAY)

Incorporated in the EEA Agreement and in force:

- Directive 2001/42/EC (*SEA Directive*)
- Directive 2009/28/EC (*Renewable Energy Directive*)
- Directive 2011/92/EU (*EIA Directive*)
- Regulation (EU) 1316/2013 (*CEF Regulation*)
- Directive 2014/52/EU (*amendment EIA Directive*)

Still in force in the EEA, no longer in force in the EU:

- Directive 2003/54/EC (*E-Directive, second energy package*)
- Regulation (EC) 1228/2003 (*E-Regulation, second energy package*)

Adopted 'with relevance to the EEA' but considered by the EEA countries as not relevant:

- Directive 2008/56/EC (*Marine Strategy Framework Directive*)
- Council Regulation (EU, EURATOM) 617/2010 (*Notification of energy investment projects*)

Draft JCD under consideration, not adopted yet:

- Directive 2009/72/EC (*E-Directive*) – instead, Directive 2003/54/EC is applicable
- Regulation (EC) 713/2009 (*ACER Directive*)
- Regulation (EC) 714/2009 (*E-Regulation*) – instead, Regulation 1228/2003 is applicable
- Commission Regulation 838/2010 (*Inter-TSO Compensation Mechanism*)

Under scrutiny by EFTA for incorporation in the EEA Agreement:

- Regulation (EU) No 1227/2011 (*REMIT*)
- Regulation (EU) 347/2013 (*TEN-E Regulation*)
- Commission Regulation (EU) 2015/1222 (*CACM Network Code*)
- Commission Regulation (EU) 2016/631 (*Network Code Requirements for Grid Connection*)
- Commission Regulation (EU) 2016/1447 (*HVDC Network Code*)

EU Act does not have 'EEA relevance' according to the act itself:

- Council Directive 92/43/EEC (*Habitats Directive*)
- Directive 2009/147/EC (*Birds Directive*)
- Directive 2014/89/EU (*Maritime Spatial Planning Directive*)
- Commission Delegated Regulation (EU) 2016/89 (*PCI-List amendment*)



## 12.2 TOPIC-BASED OVERVIEW TABLES

### 12.2.1 MARITIME SPATIAL PLANNING

	Current/past practice	Interests taken into account	Renewal time	Legal status
Belgium	Masterplan (2003), Maritime Plan (2014)	Offshore energy, fishing, nature conservation, navigation	6 years	Maritime Plan 2014: binding by Royal Decree
Denmark	Long history of centralised OWF planning, no maritime plan yet under new act	Offshore energy, navigation, fishing, mineral resources extraction, environmental protection	10 years + amendment procedure	Binding: spatial planning decisions cannot go against it
France	New under Environmental Code (since 2010), no full maritime plan yet	Offshore energy, navigation, fishing, nature conservation, climate change resilience	6 years	Binding: drafted by regional authorities, adopted as decree
Germany	EEZ: MSP since 2009, territorial zone: up to Bundesländer. Bundesfachplan-Offshore (BFO): specifically for offshore grid planning	Wind energy, navigation, mineral resources extraction, cables and pipelines, maritime research, fishing, nature conservation.	8 years	Rechtsverordnung (delegated legislation), Vorrangsgebiete
Netherlands	Via Water Act (2009). Before: open door concessions regime	Maritime ecosystem, RES, resources extraction (also sand), cables and pipelines, navigation	5 years (2016-2021)	Water Decision: Binding
Norway	Strategic assessment of offshore wind energy locations (2012)	Wind energy	Once	Non-binding
Sweden	Based on Environmental Act: three MSP regions, plans prepared by Water Authority, but not yet approved (scheduled 2019)	Business policy goals, social goals and environmental goals. Good environmental status, sustainable use of resources and coexistence of activities	Scope 2030-2050, Update procedure at least every 8 years	Binding as government decisions
United Kingdom	Marine Coastal Access Act (2009): regional division of maritime plans. Not all plans are drafted yet.	Open to the regional authorities to decide	"may be amended from time to time"	Binding: any authorisation decision should be taken in accordance with Maritime Plan

### 12.2.2 LICENSING AND PERMITTING

	Which permits and licenses?	Authority	Preparation	Coupling license+ support scheme
Belgium	Domain Concession, Cable construction permit, environmental permit	Federal minister, CREG prepares domain concession	Possible to obtain domain concession before environmental permit. However, concession will be suspended until environmental permit is obtained.	No
Denmark	Concession; pre-investigation license; construction license;	Danish Energy Agency is one stop shop	With the tender procedure, a lot of preparation is done by DEA. Pre-investigation license and construction can	Open door: No, Tender

	exploitation of wind power license; for all generators: license to produce electricity		be obtained directly after winning the concession. Pre-investigation can start even before the term for appeal finishes, at risk of concessionaire. Moreover, DEA asks TSO to perform preliminary investigations. Permit for exploitation of wind power can only be obtained after construction work has started, but no later than 2 months prior to grid connection of the first turbines.	Procedure: Yes
France	Territorial waters: concession for the use of public space and environmental permit; EEZ: authorisation (followed by consultation); For all generation: authorisation for exploitation of installation for production of electricity	Maritime Prefect. Authorisation for exploitation of installation for production: CRE.	Developer is responsible for preparation of all licenses, no preparation by the authorities.	No
Germany	Zuschlag (location), planning approval	BSH	Preliminary investigations in planned OWF areas are performed by BSH.	Yes
Netherlands	Wind Farm Zone Decision, Tender: Wind License	Officially the Minister of Economic Affairs, in practice RVO is the one stop shop	Before the tender procedure takes place, the Wind Farm Zone Decision is already prepared and published. This decision already includes an EIA as well. Additionally, preliminary investigations in the area are already performed. Therefore, many things are already prepared for the developer.	Yes
Norway	Concession to construct, own and operate OWF or subsea cable	Officially the Minister of Petroleum and Energy, in practice Water Resources and Energy Directorate	Developer is responsible for all preparation, no preparation by the authorities.	No
Sweden	Territorial waters: Permit for environmentally hazardous activities (including EIA) and Water Operations permit. EEZ: Permit for activities in the EEZ (including EIA).	Swedish government	Developer is responsible for all preparation, no preparation by authorities.	No
United Kingdom	Crown Estate Lease, Development Consent (more than 100 MW), Marine License	Crown Estate for the lease, Secretary of State (or relevant minister) for Development Consent and Marine License	Crown Estate has a proactive approach to developing offshore wind. It organises leasing rounds and monitors the process of planning and consenting afterwards. Moreover, it prepares certain investigations and identifies new offshore wind areas. EIA is prepared by OWF developer.	No

## 12.2.3 SUPPORT SCHEMES

	Form	Duration	Coop. mechs.	Establishment of the level of support, preparation
Belgium	Flexible minimum price: $LCOE_{ref} \times (1 - \text{correction factor}) + \text{value of GoOx}(1 - \text{grid loss factor}) + \text{separate scheme for construction of cables}$	19/20 years	No	Price based on formula. No preparation.
Denmark	Feed-in premium	20 years. Full-load hours: 10 TWh	Yes – (onshore solar PV)	Competitive tender, competition on subsidy height. Preparation: preliminary investigation data are available for tenderers.
France	Feed-in tariff (floating) or competitive dialogue with obligation to buy	20 years	No	Competitive tender dialogue, no preparation
Germany	Feed-in premium	20 years	Yes – (onshore solar PV)	Competitive tender, competition on subsidy height. Preparation: preliminary investigation data are available for tenderers.
Netherlands	Feed-in premium	15 years	No	Competitive tender, competition on subsidy height. Tender is coupled with permit award procedure. Preparation: seabed survey, area data and EIA are available for tenderers.
Norway	Tradable Certificates system	Until 2035	Yes – with Sweden	Market-based certificates, no preparation.
Sweden	Tradable Certificates system	Until 2035	Yes – with Norway	Market-based certificates, no preparation.
United Kingdom	Tradable Certificates system + Feed-in premium (CfD)	Tradable Certificates: phased out until 2037. CfDs: 15 years	No	CfDs: pre-determined strike price per technology per year. No preparation.

## 12.2.4 LEGAL CLASSIFICATION OF DIFFERENT CABLES

	Status quo responsibilities and grid connection
Belgium	Cables from OWF to shore are part of OWF construction, grid connection onshore. TSO can own interconnectors. New system: TSO builds offshore connection point and grid towards this point.
Denmark	Cables from OWF to shore are part of the Danish grid, TSO owns both these and interconnectors. Favourable regime for hybrid connections.
France	Cables from OWF (after converter station) to shore are part of the French grid, TSO owns both these and interconnectors. Favourable regime for hybrid connections.
Germany	Cables from OWF to shore are part of the German grid, TSOs own both these and interconnectors. Favourable regime for hybrid connections.
Netherlands	Cables from OWF to shore are part of the Dutch grid at sea, TSO owns both these and interconnectors (except BritNed). Favourable regime for hybrid connections.

Norway	TSO owns interconnectors, cables from OWF to shore are developer-owned and not part of the grid.
Sweden	TSO owns interconnectors, cables from OWF to shore are developer-owned and not part of the grid.
United Kingdom	Cables from OWF to shore are owned by OFTOs, onshore grid by TOs, interconnectors by subsidiaries of TO. Unfavourable regime for hybrid connections.

## 12.2.5 CLUSTERING OF WINDFARMS

	Geographical opportunity	Status quo clustering	Grid connection point
Belgium	Favourable	No clustering yet, future clustering in modular offshore grid	At offshore converter station
Denmark	Not favourable	Currently, OWFs are not planned close to each other. However, theoretically possible. Hub-to-hub development with Germany at Kriegers Flak.	At offshore converter station
France	Not favourable	No clustering due to geographical distance, but possible in the future. Potential difficulty: the converter station is still owned by the OWF developer. When multiple OWFs are clustered to one converter station, it will have to be shared.	After offshore converter station
Germany	Favourable	Much experience with clustering, active stimulation due to the grid development plans.	At offshore converter station
Netherlands	Favourable	Clustering is planned in new legal regime (2016), Borssele is the first in which OWFs are built in clusters.	At offshore converter station
Norway	Not favourable	With the grid connection onshore and the geographical distance between possible OWF locations, clustering is unlikely to happen.	Onshore
Sweden	Neutral	With the grid connection onshore and the geographical distance between possible OWF locations, clustering is unlikely to happen.	Onshore
United Kingdom	Favourable	Clustering is difficult with the OFTO regime, as every OWF constructs its own cable and then transfers to an OFTO. Possible mitigation if clustering is planned in advance (by Crown Estate), cables are constructed together and Ofgem writes out one OFTO tender for the cluster connection instead of separate cables.	OFTO connection at offshore converter station

## 12.2.6 DECOMMISSIONING

	Standard for decommissioning	Regulatory document(s)	Discretionary powers	Financial guarantees
Belgium	Removal of the installation, securing the area concerned and protection of the marine environment	Royal Decree + Domain Concession	Other measures than foreseen could be used when they have at least equivalent result, Minister decides over this	Depends on domain concession proposal
Denmark	Removal of the installation, restoration of the area in its original state	Construction Permit	Developer has to decommission to the extent specified in the construction permit, little discretionary powers	A security deposited at the Danish Energy Agency until final decommissioning
France	Restoration of the area in its original state	Tender criteria, concession conditions	Two years before the end of exploitation, project developer performs study on optimisation of decommissioning, the	EUR 50.000 per MW, guarantee at financial institution or Caisse des Dépôts et Consignations

			maritime prefect is the authority who can ask this	
Germany	Decommissioning as far as maritime environment, shipping, mining and defence requires this	Offshore Wind Act	Large discretionary powers: BSH decides to what extent decommissioning needs to take place and to what extent financial guarantees are necessary.	BSH can order that guarantees need to be in place when approving the planning permit
Netherlands	OWF and cables have to be removed when not in use anymore	Water Decision	Minister can decide that some parts may be left behind under specific circumstances.	Not specified
Norway	Removal of the installation	Offshore Energy Act	The Ministry for Petroleum and Energy can prescribe conditions to decommissioning	Not specified
Sweden	Recovery and remedy of environmental damage.	Environmental Act	The Ministry can impose requirements and conditions for the construction permit, one of which relates to decommissioning.	Validity of the permit dependent on financial guarantees. Height: accepted when sufficient for their purpose.
United Kingdom	Flexible: object could be left in place or removed. Provisions needed either for restoration in previous state, or maintenance of objects left in place.	Energy Act 2004	Developer has large discretionary powers with regard to decommissioning (see standard for decommissioning), Secretary of State approves or rejects the plan, and may take remedial action if developer defaults.	Not specified, but polluter pays principle