GREEN PLATFORM OCEAN GRID

Project period: 2022-2024
Duration: 36 months

D1.6 - Report on regulatory barriers

Catherine Banet and Silke Goldberg, *Mapping of regulatory barriers to hybrid offshore wind projects from Norway to Europe*

Final version: 05 February 2024

Organization name of lead participant for this deliverable:
University of Oslo

Grant Agreement No 328750
Ocean Grid is a Green Platform project financed in part by The Research Council of Norway.

Dissemination Level		
PU	Public	X
CO	Confidential , only for members of the consortium	

Deliverable details	
Deliverable number	D1.6
Deliverable title	Regulatory barriers
Delivery date	First delivery: 24.02.2023. Final version after project hearing: 05.02.2024.
Subproject	SP1.3
SP1.3 lead	Øyvind Ottersen, Å Energi
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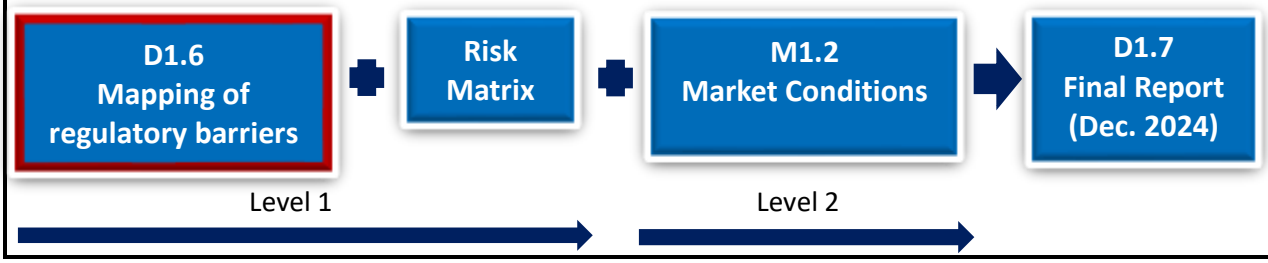
Keywords
offshore wind, offshore grid, hybrid projects, radial, multipurpose interconnector, EU law, EEA law, unbundling, capacity allocation, 70% rule, metering, balancing, Norway, European Union, United Kingdom

Abstract
This Report is a formal deliverable in the Green Platform project Ocean Grid (Deliverable D1.6). The subproject (SP) 1.3 is dedicated to the study of regulatory conditions to enable the vision supported by the Ocean Grid, that is the development of profitable offshore energy infrastructure and reduce risks and costs through knowledge-based analyses. The specific objective of SP1.3 is to contribute to the development of a Norwegian regulatory model for offshore wind and grid development with hybrids by 2030 and in the period beyond. SP1.3 is structured in two levels. The present Report D1.6 and the Risk Matrix cover Level 1 that is dedicated to the mapping of regulatory barriers and major systemic risks when delivering offshore wind projects and a meshed grid with hybrids. Level 2 is dedicated to the analysis of market conditions for developing these projects (Report M1.2). The findings of the D1.6 and M1.2 Reports and the Risk Matrix will feed into a Final Report (D1.7). This D1.6 Report is updated as of January 2024.



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This report is written by legal academics and researchers at the University of Oslo. Project partners have provided input to the document, notably in the form of background notes and comments. The authors remain the sole responsible for the content of the analysis and the conclusions drawn. The conclusions do not necessarily reflect the views of the project partners.

Citation
This report should be cited as follows: Catherine Banet and Silke Goldberg, *Mapping of regulatory barriers to hybrid offshore wind projects from Norway to Europe*, Green Platform Ocean Grid, Deliverable D1.6, February 2024.

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Summary

The present report is written as part of Level 1 of the SP1.3 work in the Ocean Grid project and is dedicated to the legal definition and jurisdiction over multipurpose interconnectors/hybrid assets from Norway to European Union (EU) countries and the United Kingdom (UK). The report provides a first mapping of the applicable legislative and regulatory landscape, but also the legal challenges and barriers faced by hybrid projects to be developed from the Norwegian continental shelf to EU countries and the UK. It summarises some preliminary findings and lays the grounds for the next milestone in SP1.3, which is the Report on market conditions (Milestone M1.2).

While the legal framework governing the development of cross-border cables (interconnectors) has been in place for several decades, the one applicable to new types of infrastructures and assets, such as hybrids and energy islands/energy hubs, is at present unclear. This is notably due to the national approach that coastal states have so far followed for the development of offshore wind projects. This is also due to the more complex set up of offshore wind assets, combining several components serving several purposes and crossing maritime borders. Developing new types of offshore wind assets that include cross-border and multidirectional trade elements requires legal clarification and legislative developments.

A hybrid offshore wind project refers to a situation where there is offshore energy production from windfarms connected to the interconnector(s) between different bidding areas. Hybrids can be seen as an intermediary step towards a more meshed grid in the North Sea where offshore hybrid projects are connected to each other, in a coordinated manner. Several hybrid projects have been approved in Europe and several ones are planned.

A first question addressed in this report is the one of the applicable jurisdiction over hybrid offshore wind projects.

Building offshore wind power systems with hybrid assets will represent of form of cross-border power system integration. According to the International Energy Agency (IEA), the three main drivers in the integration of power systems across jurisdictions are: (i) economics, with the reduction of investment and operating costs of the related power systems (economies of scale); (ii) security, with an increase diversity in terms of both supply and demand; and (iii) environmental, with the challenges created by the integration of increasing shares of renewable energy sources and the benefits of optimising the use of sea areas.

The IEA identifies three main modes of cross-border integration: bilateral, multilateral, and unified. In all three integration modes, the first question to be addressed by the participating countries is the one of the applicable jurisdiction over the cross-border energy infrastructure.

Jurisdiction is the expression of sovereignty and derives from the sovereign rights states have over their territory. A main aspect of jurisdiction is the ability for a State to regulate through law. Within the frame of Ocean Grid, the question is to determine the extent of a state's jurisdiction over the assets covered by the hybrid project. In other words, which jurisdiction will apply to assets located offshore, and combining the different functions of power generation and interconnection? A

preliminary finding is that the applicable jurisdiction to hybrid offshore wind projects will depend on the asset configuration, and to which extent they will be covered by territorial or functional jurisdiction, or whether they fall outside by lacking a link to wind production activity on the Exclusive Economic Zone (EEZ) and will be subject to an alternative regime yet to be defined. A similar question applies to energy islands/energy hubs, in the context of a meshed grid in the North Sea.

In the case where the application of functional jurisdiction is doubtable – due to the lack of connection to the wind power generation on a country's EEZ- , the States involved in the hybrid project will need to clarify the question of applicable jurisdiction, i.e. the right to regulate over the different parts of the offshore assets.

In the absence of clear answer under UNCLOS to the question of the applicable jurisdiction over assets in a hybrid project, there are different ways of clarifying the issue. The clarification can be made: by court, through the interpretation of regional treaties, such as in the case of the EU (see Section II.2 below); through the adoption of a new bilateral or multilateral agreements (framework agreement or project-specific); or through amendment to maritime delimitation treaties. In all circumstances, a legally binding solution is advised, in order to provide legal certainty to all parties and foster investments. Without clarification or agreement on a common approach about the applicable jurisdiction over the different parts of a cross-border hybrid project, there is a risk of suboptimal, cost-ineffective situation where the coastal states may favour the construction of additional projects on their own EEZ, instead of pooling them together under a hybrid project.

As hybrid projects might be seen as an intermediary step towards a meshed grid in the North Sea, early agreement on the applicable jurisdiction over the different parts of the hybrid project will have consequences for its further development. Notably, it might influence the decision of certain states whether or not to connect to these existing infrastructures. If such early agreements on applicable jurisdiction over the infrastructures restrict the further development of a meshed grid, this should be carefully taken into account from the very start. A balancing of interests between coastal states and project developers will need to be performed, based on a *forward-looking, anticipatory approach*.

Building hybrid projects from the Norwegian continental shelf to EU countries and the UK requires an assessment of the application legislation in the North Sea. This requires assessing the legal regime for the different assets included in the project across all these jurisdictions.

In the EU, it has been clarified by case law that EU law also applies outside territorial waters if the coastal state has jurisdiction there (full sovereignty or sovereign rights), under the limit of international law (notably the right of innocent passage). This means that EU countries will have to legislate in accordance with the EU legal framework in all sea areas held by the relevant state jurisdiction.

The EEA Agreement's geographical scope is limited to Norwegian territory, including territorial waters. The part of the hybrid project that constitutes an interconnection will be regulated according to the Energy Act. It will be classified both as a transmission network and as foreign

interconnection, with the consequence that the starting point will be the Norwegian Transmission System Operator (TSO) Statnett, or company in which Statnett has a decisive influence, which must own and operate this in accordance with applicable regulations, unless exemption is provided.

Electricity production at sea from offshore wind outside territorial waters will fall outside the geographical scope of both the Energy Act and the EEA Agreement. In principle, this gives more freedom of action for concerned actors. However, it is not a given that everything that takes place outside territorial waters will be unaffected by EEA law. It is also more consistent with the objective of the EEA Agreement to align offshore market rules for energy production and transmission with EU legislation, when developing hybrids to EU countries. This calls for upfront agreements between the relevant countries, and a decision on the Norwegian side to apply energy market legislation offshore.

The increasing backlog at EEA level is an element of concern when developing hybrid projects. Temporary solutions could be found, but long-term solutions must be ensured to ensure investment certainty. There is also a risk of adopting national solutions than will be in contradiction with EU regulation once incorporated into the EEA Agreement.

The second question addressed in the report is to assess to which extent the currently applicable substantive law in Norway, the EU, and the UK, enables the building and operation of hybrid offshore wind projects.

At EU level, a first finding is that hybrid projects can be developed under currently applicable EU legislation. However, further clarification and additional rules will be needed to provide actors with the sufficient visibility to make investments.

In Norway, the definitions for exchange connections in national regulations are insufficient when applied to connections serving hybrid projects. Firstly, the regulations presume that the connection is cross-border, but the onshore portion of a hybrid connection from the offshore wind farm to the domestic market may not necessarily cross any national borders if the wind farm is located within Norway's borders. Secondly, the regulations do not account for the fact that a single connection can serve as a cross-border exchange between national power systems while being connected to an offshore production facility, both within and outside the Norwegian EEZ.

The existing regulations for interconnectors are designed for connections where production takes place at the endpoints and not on the connection itself, as is the case with hybrids. It is also assumed that the connections are cross-national, which may not necessarily apply to the parts of the hybrid connection that extend from the offshore wind farm to the domestic market. In principle, it can be considered that existing regulations could still be applied to hybrids, despite the definitions not being fully compatible.

How the regulations on the electricity market affect hybrid projects will depend on how hybrids are integrated into the power market and which market model is applied. The impact of existing regulations depends on the regulatory treatment of the asset. For windfarms connected to a hybrid project, the situation is clearly more challenging compared to radially connected windfarms, that

are ensured a guaranteed capacity for bringing their electricity ashore. Therefore, the legal consequences of such application should be further analysed. The design of bidding zones will be significant in this context. These questions will be further studied as part of Level 2 of the SP1.3 work, in the Milestone Report M1.2 on Market Conditions.

EU legislation will play an important role on the regime for hybrid offshore wind projects from Norway, particularly on the following points:

- planning (marine areas, energy grid infrastructures);
- permitting of generation and infrastructure (including rules on strategic impact assessment / environmental impact assessment, auctioning, permit-process timing, etc.);
- market design, including grid regulation;
- financing mechanisms.

Under EU law, the legal definition of hybrid projects / multipurpose interconnectors is still subject to interpretation, with some few recent references in secondary legislation. Further legal certainty is urgently needed.

The following EU requirements have been identified as particularly influential for the regulatory regime for hybrid projects:

- application of the regime for project of common interest (PCI) or project of mutual interest (MPI) under the TEN-E Regulation, including for planning and permitting;
- unbundling rules;
- capacity allocation, including the so-called 70% rule;
- grid connection;
- metering;
- balancing.

The rules on cost benefit and cost allocation between countries for hybrid projects are still unclear and clarification is urgently needed here as well, either by law / agreements, or through soft law guidelines. Such clarifications are expected to come at EU level, as announced in the October 2023 Wind Power Package adopted by the European Commission, but could also emerge from collaboration between states at sea basin level through established fora (such as the North Seas Energy Cooperation).

Abbreviations

AC	Alternating Current
ACER	Agency for the Cooperation of Energy Regulators
BEIS	Department for Energy, Business and Industrial Strategy
BSP	Balancing Service Providers
CACM	Capacity Allocation and Congestion Management
CBCA	Cost-benefit and cost-allocation
CBCS	Cost-benefit and cost-sharing
CfD	Contract for Difference
CS	Continental Shelf
DC	Direct Current
EA	Electricity Act 1989
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EFTA	European Free Trade Area
ESA	EFTA Surveillance Authority
EU	European Union
FOU	Full Ownership Unbundling
GB	Great Britain
IEA	International Energy Agency
ISO	Independent System Operator
ITO	Independent Transmission Operator
JCD	Joint Committee Decision
MPI	Multipurpose interconnector
MW	Megawatt
NCS	Norwegian Continental Shelf
NEMO	Nominated Electricity Market Operator
NRA	National Regulatory Authority
NSI	Non-Standard Interconnector
OFTO	Offshore Transmission Owner
OHA	Offshore Hybrid Asset
ORE	Offshore Renewable Energy
PCI	Project of Common Interest
RED	Renewable Energy Directive
TCMs	Terms, Conditions and Methodologies
TEN-E	Trans-European Network for Energy
TEU	Treaty on the European Union
TFEU	Treaty on the Functioning of the European Union
TPA	Third Party Access
TSO	Transmission System Operator
TYNP	Ten-Year Network Development Plan
UK	United Kingdom
UNCLOS	United Nations Convention on the Law of the Sea

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I - Introduction

The overall objective of the Ocean Grid project is to enable the development of profitable offshore energy infrastructure and reduce risks and costs through knowledge-based analyses. The subproject (SP) 1.3 is dedicated to the study of regulatory conditions to enable this vision. The specific objective of SP1.3 is to contribute to the development of a Norwegian regulatory model for offshore wind and grid development with hybrids by 2030 and in the period beyond. Hybrid offshore wind project refers to a situation where there is offshore energy production from windfarms connected to the interconnector(s) between different bidding areas. Hybrids can be seen as an intermediary step towards a more meshed grid in the North Sea where these projects are connected to each other, in a coordinated manner.

Within that context, the work in SP1.3 focuses on the assessment of the currently applicable regulatory and legal framework for hybrid projects, the identification of regulatory barriers, and the development of recommendations for improved regulatory conditions. The end result in SP1.3 is meant to reflect technical and market developments studied in other subprojects of the Ocean Grid Green Platform, as part of a holistic approach.

The work undertaken in SP1.3 is structured around two levels:

- Level 1: legal definition and jurisdiction over multipurpose interconnectors/hybrid projects from Norway to European Union (EU) countries and the United Kingdom (UK).
- Level 2: legal requirements in terms of market design alternatives and cost and revenue sharing models.

The present report is written as part of Level 1. It provides a first mapping of the applicable legislative and regulatory landscape, but also the legal challenges and barriers faced by hybrid projects to be developed from the Norwegian continental shelf to EU countries and the UK[1]. It summarises some preliminary findings and lays the grounds for the next milestone in SP1.3, which is the Report on Market Conditions (Milestone M1.2).

[1] The United Kingdom comprises Scotland, England and Wales and Northern Ireland. In turn, Scotland, England, and Wales constitute Great Britain (GB). When used as an adjective, "UK" or "British" are used as synonyms in this Report. In relation to electricity, energy is a policy area that has been devolved to the administrations of Northern Ireland and, to a lesser extent the administration of Scotland, in relation to planning and the administration of the Renewables Obligation, a support mechanism for renewable energy pursuant to the Renewables Obligation Order 2009 as amended by the Renewables Obligation (Amendment) Order 2014. In relation to the seabed, the Crown Estate deals with seabed matters in England and Wales whereas the Crown Estate Scotland is in charge of the seabed on the Scottish coast within the UK Exclusive Economic Zone (EEZ).
The electricity market in Northern Ireland is integrated with the electricity sector of the Republic of Ireland to *constitute* the Single Electricity Market ("iSEM", created in 2007 by (a) The Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 (Statutory Instrument 917 2007, N.I.7) in the UK, and (b) Electricity Regulation (Amendment) (Single Electricity Market) Act 2007 (Statutory Instrument No.5 of 2007) in Ireland on the basis of the 2006 Memorandum of Understanding between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of Ireland in relation to the Single Electricity Market Arrangements. For this reason, when referring to the electricity sector in the UK it is important to distinguish between the iSEM and the electricity sector in GB.

The methodology applied in the report is primarily the one of legal dogmatic research, based on top-desk analysis of the legislation and policy documents. Some policy considerations are also drawn. Norway being a part to the European Economic Area (EEA) Agreement, the regulation of renewable energy generation projects and energy infrastructures is an area highly influenced by EU legislation. Therefore, an important part of the work in SP1.3 relates to the identification and analysis of relevant EU legislation, and the assessment of the manner the Norwegian regulation could evolve taking into account the EEA legal framework.

Several legislative and policy initiatives put forward by the European Commission (EC) will directly impact the future development of hybrid offshore wind projects from Norway. In addition, the prospects of developing hybrids assets over the border to the UK requires assessing the applicable bilateral agreements applying between Norway and the UK. Agreements made between EU countries and the UK might be of relevance for projects from Norway, as they may serve as a blueprint, although the legal framework would be different, due to the application of the EEA Agreement. Finally, international law requirements under notably the United Nations Convention on the Law of the Sea (UNCLOS) will be referred to.

This report starts by discussing the question of jurisdiction applicable to cross-border energy infrastructures - like hybrid projects - from Norway to EU countries and the UK (Section II). It continues by reiterating the applicable principles under the EEA Agreement for the application of EU legislation in the context of offshore energy projects (Section III). The next section is dedicated to the identification of the key requirements and barriers in existing EU laws and regulations with reference to hybrid projects (Section IV). The report ends with a summary of the preliminary findings (Section V).

II – Applicable jurisdiction to cross-border infrastructures from Norway to the EU and the UK

Building offshore wind power systems with hybrid configurations will represent of form of cross-border power system integration. According to the International Energy Agency (IEA), the three main drivers in the integration of power systems across jurisdictions are: (i) economics, with the reduction of investment and operating costs of the related power systems (economies of scale); (ii) security, with an increase diversity in terms of both supply and demand; and (iii) environmental, with the challenges created by the integration of increasing shares of renewable energy sources and the benefits of optimising the use of sea areas.[2] The IEA identifies three main modes of cross-border integration: bilateral, multilateral and unified.[3] In all three integration modes, the first question to be addressed by the participating countries is the one of the applicable jurisdiction over the cross-border energy infrastructure.

This section raises the question of applicable jurisdiction to cross-border infrastructures for offshore wind between Norway and EU countries, and between Norway and the UK. The question of applicable jurisdiction is important to clarify to several respects: the laying of the submarine cables, the conduct of environmental impact assessment, the extent of jurisdiction – and applicable national laws – over the different types of infrastructure and assets covered by the Ocean Grid project (e.g. offshore wind farm, interconnector cables, assets connected to the hybrid project, energy islands or energy hubs).

While the legal framework governing the development of cross-border cables (interconnectors) has been in place for several decades, the one applicable to new types of infrastructures and assets, such as hybrids and energy islands/energy hubs, is unclear. This is notably due to the national approach that coastal states have so far followed for the development of offshore wind projects. This is also due to the more complex set up of offshore wind assets, combining several components serving several purposes and crossing maritime borders. Developing new types of offshore wind assets including cross-border and multidirectional trade elements requires legal clarification.

1. State's sovereignty and applicable jurisdiction over cross-border energy infrastructures under public international law

1.1 Reminder of UNCLOS principles on the delimitation of jurisdiction for coastal states

The UN Convention on the Law of the Sea (UNCLOS) lays down principles for the delimitation of jurisdiction at sea following a zonal approach.[4] Pursuant to Article 2 of UNCLOS, coastal states enjoy full sovereignty over internal waters and the territorial seas (up to 12 nautical miles from the baseline). This means that within territorial waters, the national legislation will apply to notably the concession process for building offshore cables. In the Exclusive Economic Zone (EEZ) and on the

[2] International Energy Agency, Integrating Power Systems across Borders, June 2019, pp.8-9.
[3] Ibid, pp.6-7.
[4] For a general overview, see: Erik Molenaar, 'Port and Coastal States', in Rothwell, Oude Elferink, Scott and Stephens (eds.), *The Oxford Handbook of the Law of the Sea* (Oxford University Press), 2015, pp.294-299.

Continental Shelf (CS) (up to 200nm with a possibility of extension in the case of the CS), coastal states do not have full sovereignty, but have sovereign rights in relation to specific activities.[5] Beyond the EEZ lay the High Seas and the Area, which are not relevant for the North Sea.

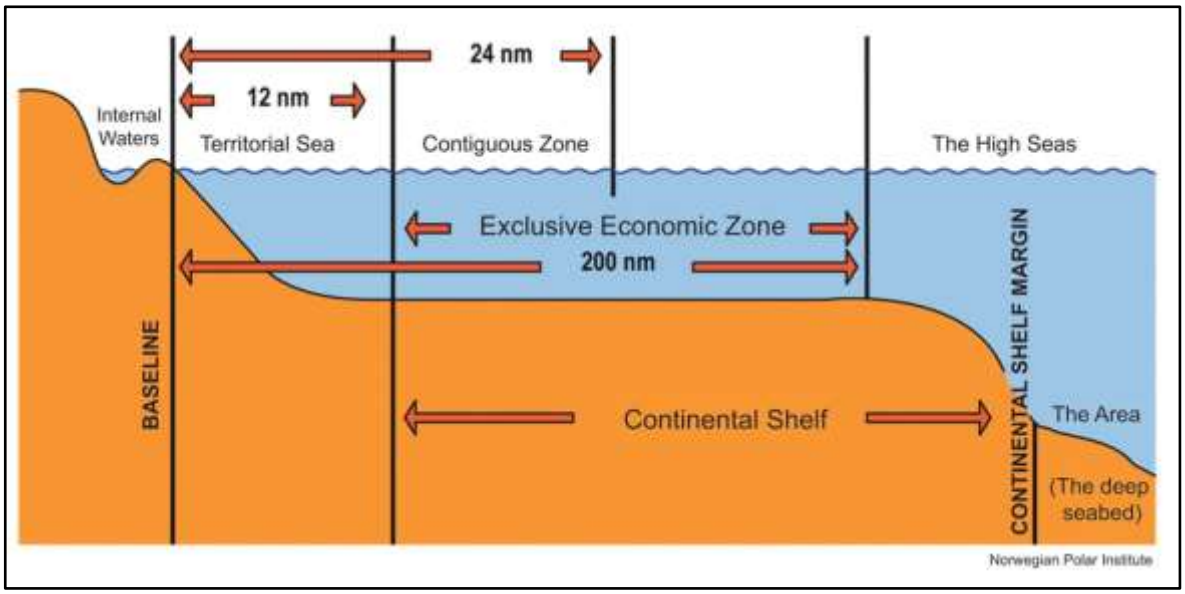

Figure 1: Illustration showing the maritime jurisdictional areas of coastal states under UNCLOS. Source: Norwegian Polar Institute.

Within the EEZ, coastal states have sovereign rights regarding their natural resources and with regard to "*other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds*".[6] This limited jurisdiction follows a so-called functional approach, since related to specific economic activities.[7] This is with "*due regard to the rights and duties of other States*" and with respect to other provisions of UNCLOS.[8] States benefit from a qualified freedom to lay submarine cables and pipelines on their continental shelf.[9] This means that they have the right to lay cables and pipelines on another country's continental shelf, provided that the route is approved by the coastal state. Approval is granted on condition that ongoing and planned utilisation of the natural resources is taken into account, as well as the necessary care for existing installations and the risk of pollution. It may not interfere with the coastal state's use of its continental shelf. The coastal state may pose conditions for cables and pipelines entering its territory or territorial sea. The landing of pipelines and crossing within the territorial sea requires consent from the coastal state. Such consent can be granted for example through a bilateral treaty.

These treaty requirements under UNCLOS will be of particular interest for both the laying of interconnectors from generation facility offshore and energy islands/hubs, and for the crossing of the territory of a third country by an interconnector connected to a hybrid. It can already be noted

[5] UNCLOS, Art. 56. Pursuant to Article 77 UNCLOS, coastal states only have certain sovereign rights over the continental shelf.
[6] UNCLOS, Art. 56.1(a).
[7] See below, Section 1.2.
[8] UNCLOS, Art. 56.1(b).
[9] UNCLOS, Art. 79.

that a part of the hybrid project will be qualified as an interconnector having access to land, and the application of the coastal state jurisdiction will be presumed as soon as the cable enters the territorial waters, unless agreed otherwise.

In the case of the Ocean Grid project, all involved countries around the North Sea have ratified UNCLOS and have claimed an EEZ, as illustrated by Figure 2 below. The North Sea countries share the same geographical continental shelf, and the delineation of their EEZ is based on bilateral treaties signed between the different coastal states.

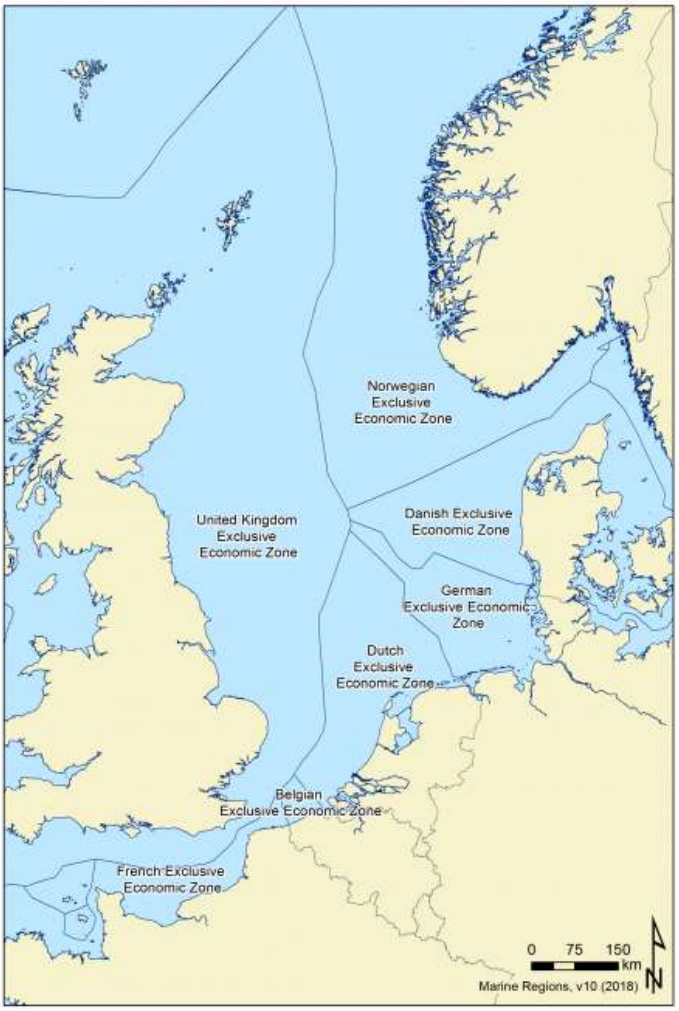

Figure 2: Exclusive Economic Zones in the North Sea (version 10, 2018).
Author: Nathalie De Hauwere (published as creative commons for non-commercial purposes).
Source: https://www.marineregions.org/maps.php?album=3747&pic=129395

As illustrated by Figures 3 and 4 below, the area identified as the most relevant one for developing the first hybrid projects are located in Sørvest F, in the Norwegian EEZ. Sørvest F is an extension of Sørlige Nordsjø II and is suitable for bottom-fixed offshore wind. The Norwegian Transmission System Operator (TSO) Statnett has previously recommended Kvinesdal as the connection point for the radial to Sørlige Nordsjø II that will be built in the Phase 1 (1500 MW). For future offshore wind

farms in Sørvest F, Statnett recommends building hybrid connections.[10] Statnett is also of the opinion that, for sea areas far from the Norwegian shore and close to other countries' sea areas, hybrid connections should always be considered, as they will connect the offshore wind farms to Norway and as the same time to one or more other countries or other offshore wind farms.[11]

In line with this recommendation, the Norwegian government has requested Statnett to start assessing possible hybrid connections fra Sørvest F. Statnett will investigate and develop several alternative hybrid projects in order to identify the best solutions, and to be able to realise two hybrid connections by 2040.[12] As part of this work, Statnett has strengthened its cooperation with other TSOs around the North Sea by entering five study agreements with Elia (Belgium), TenneT (the Netherlands, Germany), Amprion (Germany), Energinet (Denmark) and National Grid Venture (GB). Finally, through its assessment work, Statnett aims to build a portfolio of alternative choices for future political decisions on offshore wind developments.[13]

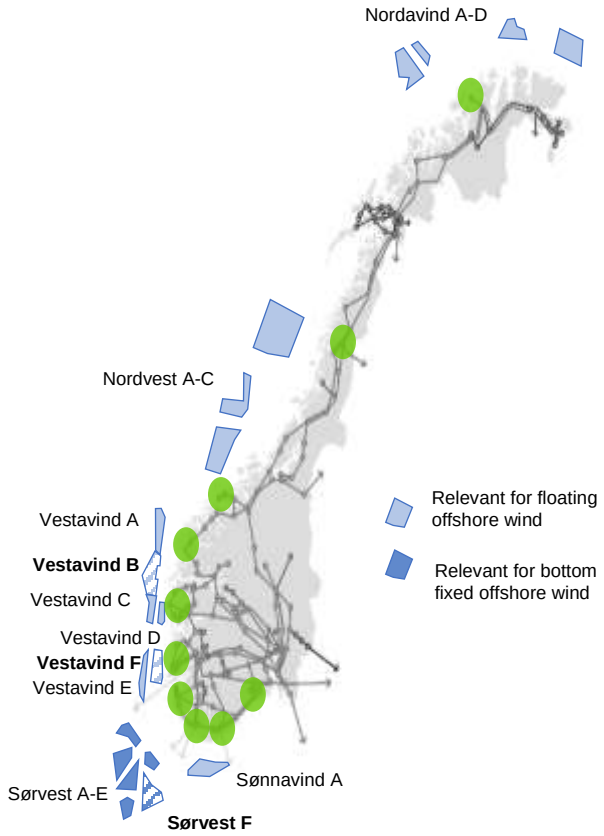

Figure 3: Assessment of offshore wind areas.
Source: Statnett, Temarapport: Utvikling av nett til havs, November 2023, p.57 (figur 35). Available at: https://www.statnett.no/globalassets/havvind/temarapport---utvikling-av-nett-til-havs-2023.pdf

[10] Statnett, Temarapport: Utvikling av nett til havs, November 2023, p.57. Available at: https://www.statnett.no/globalassets/havvind/temarapport---utvikling-av-nett-til-havs-2023.pdf
[11] Ibid, p.57.
[12] Ibid, p.3.
[13] Ibid, p.20.

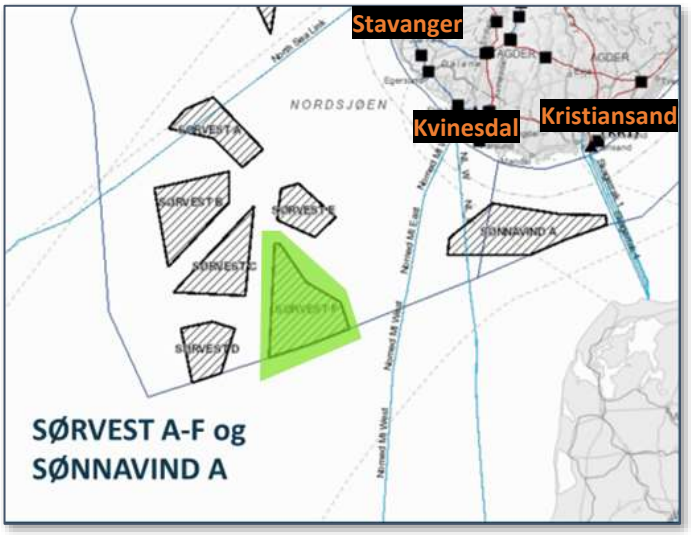

Figure 4: Recommendation for the award announcement in 2025
with a hybrid connection from Sørvest F to Sørlandet.
Source: Statnett, Temarapport: Utvikling av nett til havs, November 2023, p.58 (figur 36). Available at:
https://www.statnett.no/globalassets/havvind/temarapport---utvikling-av-nett-til-havs-2023.pdf

In addition to UNCLOS requirements, the applicability of the Convention on Environmental Impact Assessment in a Transboundary Context (ESPOO Convention) and other regional instruments (e.g. the Convention for the Protection of the Marine Environment of the North-East Atlantic, OSPAR) will need to be assessed on a case-by-case basis.

In the very probable case where the new cable crosses an existing cable, a crossing agreement must be entered into, and so for each crossing point. This is often based on standard agreements.[14]

1.2 Application of UNCLOS principles on jurisdiction to hybrid projects

Jurisdiction is the expression of sovereignty and derives from the sovereign rights states have over their territory. Jurisdiction is therefore concerned with the reach of a state's law. A main aspect of jurisdiction is the capacity of a State under international law to adopt, apply and enforce a rule of law. A State has an absolute right to adopt, apply and enforce rules of law within its own territory (full and absolute sovereignty within its territorial sea). In the case at study within Ocean Grid, the question is to determine the extent of a state's jurisdiction (and therefore applicability of national/EU law) over offshore energy infrastructures such hybrid projects that combine the different functions of power generation and interconnection.

When considering the question of the applicable jurisdiction, a main distinction is to be made between *territorial* and *functional* jurisdiction. In internal and territorial seas, a state's jurisdiction

[14] Lars Olav Askheim, Commercial Arrangements and Liability for Crossing Pipelines, Power Cables and Telecom Cables (Connectors) on the Seabed, in C. Banet (ed.) *The Law of the Seabed* (BRILL, 2020), Chapter 23, pp.553-571.

is territorial. The State has power over persons and property on the basis of their location within the defined boundaries. In the EEZ and on the CS, a state's jurisdiction is functional, meaning that the state's power of over persons and property is limited to the specific activities or issues in the various maritime zones mentioned in UNCLOS.

In the case of hybrid projects, the application of jurisdiction will depend on the asset configuration and cable function, and to which extent the latter ones will be covered by territorial or functional jurisdiction, or whether they fall outside by lacking a link to such activity on the EEZ and will be subject to an alternative regime to be defined.[15]

For example, when an installation or an asset is utilised in relation to the economic exploitation of the EEZ for wind power generation (e.g. the offshore wind farm or a converter station connected to an offshore wind park), the coastal State will have sovereign rights and functional jurisdiction will apply. The same applies to activities in relation to artificial islands, installations, and structures.[16] However, when the assets combine different functions that do not relate to wind power generation or other mentioned economic activity on the EEZ, the applicable jurisdiction is unclear. Further, in the case of a wind farm park or a hub connecting windfarms located within the EEZ of several States, there will be a need for clarification of the application jurisdiction, as the involved coastal States may raise concurrent claims over the cross-boundary infrastructures (e.g. cables between the wind farms).

The main conclusion is that the extent to which the coastal State's jurisdiction applies will depend on the configuration of the asset, either as part of the functional jurisdiction applicable on the EEZ in relation to wind power generation (Art. 56(1)(1)) or in relation to an asset to be qualified as "artificial islands, installations and structures" (Art. 56(1)(b)(i)). In the case of hybrid projects that combine both wind power generation and interconnection, the question of applicable jurisdiction on the different parts of the asset remains unclear.

In the case where the application of functional jurisdiction is doubtable – due to e.g. the lack of connection to the wind power generation on a country's EEZ -, the States involved in the hybrid project will need to clarify the question of applicable jurisdiction, i.e. the right to regulate over the different parts of the hybrids.

In the absence of clear answer under UNCLOS to the question of the applicable jurisdiction over hybrid projects, there are different ways of clarifying the issue. The clarification can be made: by court, through the interpretation of regional treaties, such as in the case of the EU (see Section II.2 below); through the adoption of a new bilateral or multilateral agreement (framework agreement or project-specific); through amendment to maritime delimitation treaties. In all circumstances, a legally binding solution is strongly advised, in order to provide legal certainty to all parties and foster investments. Without clarification or agreement on a common approach about the applicable jurisdiction over the different parts of a cross-border hybrid project, there

[15] For a similar discussion, see: PROMOTiON, Legal framework and legal barriers to an offshore HVDC electricity grid in the North Sea, WP7.1 Deliverable 1, pp.4 and 8-9.

[16] For a similar discussion, see H.K. Müller, A Legal Framework for a Transnational Offshore Grid in the North Seas (Intersentia, 2016), p.36.

is a risk of suboptimal, cost-ineffective situation where the coastal states may favour the construction of additional projects on their own EEZ, instead of pooling them together under a joint hybrid project.

As hybrid projects might be seen as an intermediary step towards a meshed grid in the North Sea, early agreement on the applicable jurisdiction over the different parts of the project will have consequences for its further development. Notably, it might influence the decision of certain states to connect themselves to these existing infrastructures or not. If such early agreements on applicable jurisdiction over the infrastructures restrict the further development of a meshed grid, this should be carefully taken into account from the very start. A balancing of interests between coastal states and project developers will need to be performed, based on a *forward-looking, anticipatory approach*.

Finally, in addition to the application of public international law rules (including UNCLOS), private international law rules might also be relevant, notably in terms of taxation and property rights, in case of conflicts between individuals and private entities across countries.[17]

2. Extent of jurisdiction of EU law offshore - EU competence in respect to offshore activities

Within the internal EU legal order, one central question for the development of offshore wind activities is the extent of EU competence on the offshore activities conducted by Member States on the territories under their jurisdiction.

According to Article 52 of the Treaty on the European Union (TEU), the EU Treaties apply to the Member States, the territorial scope of application of the Treaties being further detailed in Article 355 TFEU. Because of the general wording of the latter provision that is more attached to specific territories of Member States than on a detailed, material definition, the Court of Justice of the EU (CJEU) had to interpret these provisions and the definition of "territories" in the context of EU law, as well as the applicability of EU law outside the territories of the Member States.

It is established through case law of the CJEU that EU law applies where Member States have sovereign powers. In Salemink,[18] the CJEU held that:

> (35) Since a Member State has sovereignty over the continental shelf adjacent to it – albeit functional and limited sovereignty (see, to that effect, Case C-111/05 *Aktiebolaget* NN [2007] ECR I-2697, paragraph 59) – work carried out on fixed or floating installations positioned on the continental shelf, in the context of the prospecting and/or exploitation of natural resources, is to be regarded as work carried out in the territory of that State for the purposes of applying EU law (see, to that effect, Case C-37/00 *Weber* [2002] ECR I-2013,

[17] Jaap J. A. Waverijn, Navigating Legal Barriers to Mortgaging Energy Installations at Sea – the Case of the North Sea and the Netherlands', in C. Banet (ed.) The Law of the Seabed: Access, Uses and Protection of Seabed Resources (BRILL, 2020), Chapter 21, pp.509-510, 515-522.
[18] Case C-347/10, *Salemink*, ECLI:EU:C:2012:17, paras 35 and 36.

> paragraph 36, and Case C-6/04 *Commission v United Kingdom* [2005] ECR I-9017, paragraph 117).
>
> (36) A Member State which takes advantage of the economic rights to prospect and/or exploit natural resources on that part of the continental shelf which is adjacent to it cannot avoid the application of the EU law provisions designed to ensure the freedom of movement of persons working on such installations.

The Salemink case relates to the application of EU law in relation to the free movement of persons, but the same applies to other freedoms and other fields of EU law. The recognition of national sovereignty and sovereign rights for an EU Member State will entail application of EU law.[19]

The applicability of EU law to the territories of the Member States is explicit from the wording of the Treaties. If the activity does not fall under the exercise of sovereignty or sovereign rights of the EU Member State, EU law will not be applicable.[20] The applicability of EU law to issues relating to geographical areas outside the territories of the Member States has to be decided on the basis of the Member States' jurisdiction over the area and the issue at stake (with possible functional extension), together with the interpretation of the relevant EU legal act. The competence is not absolute as it can be limited by international law, and notably the freedom of navigation.[21] To sum up, the applicability of EU law follows the exercise of jurisdiction of the EU Member State (through its full sovereignty and sovereign rights), with the constraints imposed by international law.

3. Review of relevant offshore interconnectors agreement from Norway

A hybrid offshore wind project will combine offshore energy generation from wind farms and the transmission of that energy functionally through an interconnector cable. It is therefore relevant to review existing practice as to interconnector agreement from Norway. It is notable that UNCLOS does not use the term "interconnector" but refers to "cables and pipelines".

The coastal state will have full jurisdiction over the cable laid down in its territorial sea. Beyond the territorial water, the coastal state will only have qualified rights over the interconnector that, in the case of a point-to-point interconnection, is not related to the economic exploration or exploitation of resources in the EEZ. In addition, the laying, construction and operation of cables fall under the freedom to lay cables under UNCLOS, with the consequence that other states can lay cables crossing the EEZ of the coastal state.[22] The coastal state will need to approve the delineation of the cable and may impose conditions related to safety and environmental protection.

[19] Case C-6/04 *Commission v United Kingdom* [2005] ECR I-9017, paragraph 117. The case relates to the application of the Habitats Directive beyond the territorial zone of the UK (EU Member State at that time).
[20] Case C-111/05 *Aktiebolaget* NN [2007] ECR I-2697, paragraph 59. The case relates to the application of the VAT Directive to the building of submarine fibre-optic cables between Sweden and other EU Member States.
[21] Case C-286/90 *Anklagemyndigheden v Peter Michael Poulsen and Diva Navigation Corp.* [1992] ECR i-6019, paras.24-25.
[22] UNCLOS, Art. 79, and Section 1.1 above.

As a standard approach, and unless agreed otherwise by treaty, the coastal state has full jurisdiction over the cable in its territorial sea and has qualified rights related to safety and environmental matters over the cable until the border to the EEZ of the neighbouring country. The same applies to the cable within the neighbouring country's EEZ and territorial sea. A different solution can be approved by Treaty by the two coastal states connected by the interconnector.

As a matter of comparison, the 2005 Framework Agreement between the Government of the UK of the GB and Northern Ireland and Norway concerning cross-boundary petroleum cooperation provides that "*all installations on the continental shelf appertaining to the United Kingdom shall be under the jurisdiction of the United Kingdom and all Installations on the continental shelf appertaining to the Kingdom of Norway shall be under the jurisdiction of the Kingdom of Norway*."[23]

One could also draw the comparison with older oil and gas pipeline agreements from the Norwegian continental shelf. Although the main rule of shift of jurisdiction at the limit between national continental shelves prevailed, there are some few examples of extended national jurisdiction over the exporting infrastructure to the receiving state. The fact that the pipeline was solely meant to be unidirectional had an influence on the manner to agree upon applicable jurisdiction over the infrastructure. Such approach found justification in the "balance of interests" approach, where a state, after the balancing of interests at hand, might be entitled to apply legislative extra-territorial jurisdiction over the concerned infrastructure.[24] A major difference between the projects these pipeline agreements cover and the envisaged hybrid projects in Ocean Grid, is that the pipeline agreements covered mostly unidirectional transport of petroleum from a sending state (Norway) to a receiving state (e.g. UK).[25] In the case of interconnectors and hybrids, the electricity can be sent in both directions, with equal interest for the involved coastal states in terms of jurisdiction over the infrastructures.

The following table only reviews marine offshore electricity interconnectors from Norway.

Interconnector	Year entry into Function	Connecting country
Skagerrak 1	1976/1977	Denmark
Skagerrak 2	1976/1977	Denmark
Skagerrak 3	1993	Denmark
Skagerrak 4	2015	Denmark
Nordned	2008	The Netherlands
Nordlink https://www.statnett.no/en/our-projects/interconnectors/nordlink/	2021	Germany
North Sea Link https://www.statnett.no/en/our-projects/interconnectors/north-sea-link/	2021	United Kingdom
NorthConnect application: rejected	-	United Kingdom

[23] Article 1.3(2) on Jurisdiction, https://www.regjeringen.no/globalassets/upload/kilde/oed/prm/2005/0142/ddd/pdfv/242757-traktat_no_storbrit_e_april_05.pdf

[24] M. M. Roggenkamp, Petroleum Pipelines in the North Sea: Questions of Jurisdiction and Practical Solutions, Journal of Energy and Natural Resources Law, 1998, p.98.

[25] For a discussion of this issue, see PROMOTioN, Legal framework and legal barriers to an offshore HVDC electricity grid in the North Sea, WP7.1 Deliverable 1, p.12.

4. Review of relevant bilateral agreements with the UK

The Agreement between the United Kingdom of Great Britain and Northern Ireland and the Kingdom of Norway on Cross-Border Trade in Electricity and Cooperation on Electricity Interconnection, dated 16 September 2021, is the most relevant one after that the UK left the EU.

- The purpose of the Agreement is to facilitate efficient cross-border electricity trade between the Parties, the operation and development of electricity interconnection between them and their cooperation in this area (Art. 1).
- Article 4 deals with the efficient use of electricity interconnectors, focusing on North Sea Link.
- Article 5 covers further areas of cooperation.

In addition, trade relations between Norway and the UK will be covered by the Free Trade Agreement between Iceland, the Principality of Liechtenstein, the Kingdom of Norway and the 5 United Kingdom of Great Britain and Northern Ireland signed in London on 8 July 2021. The Agreement applies to the land territory, internal waters, territorial sea, the exclusive economic zone, and the continental shelf of a Party, in accordance with international law (Art. 1.2(1)). Under the provision on trade and climate change (Art. 13.22), the Parties commit themselves to cooperate on issues of mutual interest, including:

> (c) trade and investment in renewable energy technologies and energy efficient goods and services;
> (d) the cost-effective deployment of renewable energy, including offshore energy and in particular offshore wind generation in the North Sea;
> (e) the development of decarbonisation technologies, such as for hydrogen, including markets for hydrogen and the development and promotion of carbon capture, utilisation, and storage, including but not limited to the North Sea.

III – Scope of application of the EEA Agreement in relation to hybrid offshore wind projects

This section presents the principles applying to the geographic and material scope of application of the EEA Agreement, the EU Treaties and relevant EU energy market legislation for hybrid projects and so-called multipurpose interconnectors (MPI). It helps understanding the manner EU legislation, through the EEA Agreement, might apply to the development of hybrid offshore wind projects on the Norwegian continental shelf.

1. The incorporation process into the EEA Agreement and assessment of EEA relevance of EU legislation

The EEA Agreement foresees the inclusion of EU legislation in all policy areas related to the internal market. It covers the four freedoms, i.e. the free movement of goods, services, persons, and capital. It covers competition and state aid rules as well. Some horizontal policies are also included, such as company law, environmental protection, social policy, consumer protection, statistics.

In order to become EEA law binding on EEA states, EU secondary legislation must be incorporated into the EEA Agreement, more precisely into one of the Annexes or Protocols to the EEA Agreement. This is formally done by the adoption of a Joint Committee Decisions (JCDs).

Two fundamental principles govern the EEA Agreement. First, the principle of **homogeneity** addresses the relationship between the EEA Parties.[26] As a consequence, the EEA Agreement is of **dynamic** character, subject to continuous update to incorporate new EU legislation "as closely as possible to the adoption".[27] Second, the principle of **reciprocity** requires that operators located within the EEA shall have the same rights under the two pillars.

After the adoption of an EU act, the EFTA experts in the EEA EFTA States analyse whether the act is "EEA relevant" and, if so, whether any adaptations are required in the JCD for incorporation into the EEA Agreement and whether there are likely to be any constitutional requirements.

The "EEA relevance" test for incorporating new EU legislative acts relies on an assessment of both the material scope of application and the geographical scope of application of the act.

In terms of **material scope of application**, EU legislation related to the internal market will normally fall under the scope of application of the EEA Agreement.[28] Most of the legislation on energy and the promotion of renewable energy sources is already incorporated into the EEA Agreement, to a few exceptions (a notable example is the Energy Efficiency Directive). EU acts dealing with the management of natural resources and the security of energy supply will fall outside the scope of application of the EEA Agreement.[29]

[26] EEA Agreement, Art. 1.
[27] EEA Agreement, Art. 102.
[28] EEA Agreement, Art. 102.
[29] St.prp. nr. 100 (1991-92) om samtykke til ratifikasjon av EØS-avtalen, punkt 4.10.4. EØS-avtalen ikke innebærer at det legges opp til en felles energipolitikk.

Against this background, Norway has previously considered it inappropriate to incorporate the Gas Supply Security Directive (2004/67/EC) and the Oil Supply Security Directive (2006/67/EC). However, the case might be different if the act, according to its content, may intervene in the functioning of the internal market. The Electricity Supply Security Directive (Directive 2005/89/EC)[30] is an example of this. The Directive was incorporated into the EEA Agreement due to its clear impact on the internal market.

The assessment of a legal act's connection to the EEA Agreement material scope of application is performed in the light of the Agreement's overall provisions and objectives. It includes in particular the following factors:

- Whether the legal act thematically falls within the areas referred to in the main part of the EEA Agreement, Protocols and Annexes.
- Whether the provisions of the act may affect the free movement and free competition across national borders, and whether market participants are imposed obligations that have economic consequences.
- The purpose of the act, i.e. whether the purpose applies to areas that are important for the completion of the internal market, or whether the purpose is cooperation beyond this.
- Whether the legal act is an amendment, follow-up or addition to acts that have already been incorporated into the EEA Agreement;
- The assumptions made by the Storting (Norwegian Parliament) when agreeing on Norway's accession to the EEA Agreement in 1993, as set out in St.prp. No. 100 (1991-92).
- The legal basis of the EU act.

The **geographical scope of application** of the EEA Agreement is defined in its Article 126. It provides that the EEA Agreement applies to the territory of the Kingdom of Norway, but not to Svalbard. Nevertheless, it is still left to interpretation and opens for varying practices.[31] The official position of Norway is that the term "territory" is to be understood in accordance with established practice in international law, which means the EEA Agreement applies to Norwegian land territory, internal waters and territorial waters, but not to the EEZ, the continental shelf or the high seas.[32] As a matter of example, the Norwegian government considered that the Marine Strategy Framework Directive (2008/56/EC)[33] and the Offshore Safety Directive (2013/30/EU) were not deemed to be EEA relevant.[34] On the contrary, the Hydrocarbons Licensing Directive (94/22/EC) or the Directive on the geological storage of CO_2 (CCS Directive) (2009/31/EC) have been incorporated into the EEA Agreement.

[30] Directive 2005/89/EC of the European Parliament and of the Council of 18 January 2006 concerning measures to safeguard security of electricity supply and infrastructure investment.
[31] EØS-rett, Haukeland, Fredriksen and Mathisen, Fagbokforlaget, 4. utgave, 2022.
[32] Meld. St. 5 (2012-2013) EØS-avtalen og Norges øvrige avtaler med EU, p.41. For the international law part, see above, Section II.1.1.
[33] The Marine Strategy Framework Directive (2008/56/EC) requires EU Member States to draw up marine strategies (management plans) to achieve good environmental status in their marine areas. The Norwegian government is of the opinion that the Directive covers some geographic areas which fall outside the geographical scope of the EEA Agreement.
[34] For an overview of the Norwegian positions concerning these legal acts, see Ibid: Meld. St. 5 (2012-2013).

One can also note the discussions around the definition of "territory" and the functional approach followed by the CJEU.[35] Here, an interesting question is whether EU law and EEA law are to be interpreted equally with regard to the question of geographical scope.

The EU is of the opinion that the scope delimitation of the EEA Agreement must be done according to the same criteria as EU law. That is, the delimitation in sea areas follows the states' jurisdiction as this is delimited according to international law. Norway's view is that the word "territories" in the EEA Agreement, Article 126(1), entails a delimitation of the scope of the agreement to areas outside Norwegian territorial waters.[36] EFTA Surveillance Authority (ESA) has argued that the geographical scope of application of the EEA Agreement should be interpreted according to the same principles than under EU law.[37] This means that the EEA relevance of an EU legal should be defined in a functional manner and in the light of the object and purpose of the EEA Agreement. It is here interesting to note that the same argument was used by the Norwegian authorities for incorporated the Hydrocarbons Licensing Directive.[38] To date, the question has not been clarified by the EFTA Court.

This does not prevent Norway to decide, in exceptional circumstances, to accept the incorporation into the EEA Agreement of an EU legislative act which applies to the continental shelf or the EEZ, while stating that the main principle remains.[39] A strong factual or economic connection between the parts of a specific activity that takes place within and outside the territory may indicate that Norway in a given situation chooses to incorporate into the EEA Agreement legal acts with a scope that includes the EEZ or the continental shelf. In such cases, it has been a clear precondition on the Norwegian side that extended geographical application of certain legal acts does not change the general understanding of the geographical scope of the EEA Agreement.

An alternative solution to the incorporation of the EU legal act in the main part of the EEA Agreement, is to include it in Protocol 31. In other cases, Norway may, on a national basis, choose to have similar rules outside the territory as those laid down by an EEA act within the territory, but without incorporating the act into the EEA Agreement at all.[40]

The question of geographical scope of the EEA-Agreement is of importance when assessing the EEA relevance of secondary legislation for offshore activities, such as offshore wind generation and offshore wind grid. It is central to the further development of the regulatory regime offshore, such as market design legislation, EU financial support mechanisms or state aid rules.

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[35] See above Section II.2.

[36] Kari Anne Haugli Trosdahl, MarIus 511: EØS-avtalens geografiske virkeområde, 2019.

[37] Reasoned Opinion of 24 September 1999 concerning the application of Council Regulation (EEC) 1408/71 in the EEZ (doc. no 99–6990-D), and Reasoned Opinion of 2 April 2004 concerning the application of Council Regulation (EEC) No 1612/68 (case no. 2229).

[38] Reasoned Opinion of 24 September 1999 concerning the application of Council Regulation (EEC) 1408/71 in the EEZ (doc. no 99–6990-D), p.4.

[39] See Report to the Storting (White Paper), The EEA Agreement and Norway's other agreements with the EU (Meld. St. 5 (2012–2013)), p.13

[40] NOU 2012:02 Utenfor og Innenfor; Meld. St. 5 (2012–2013) "EØS-avtalen og Norges øvrige avtaler med EU", Section 5.3.1.

The assessment of the EEA relevance is based on objective and legal criteria. However, the criteria set out in the EEA Agreement are not precise. The assessment of EEA relevance is thus to a certain extent discretionary. If the regulations are found to be EEA-relevant, it must then be clarified whether the EU act, based to its content, can be incorporated into the EEA Agreement as it is, or whether there is a need for adaptations. Such an assessment will naturally be based on expert, political and institutional considerations.

If the act is only partially EEA-relevant, the parts of the act that are not EEA-relevant are removed by an adaptation text in the EEA Committee Decision. Only the EEA-relevant parts will be incorporated into the EEA Agreement.

2. Varying practice brings uncertainty, also for hybrid projects

It follows from above that the appreciation of the geographical scope of application of EU acts for the purpose of their incorporation into the EEA Agreement varies. The positions of the different parties (Norway, the EC and ESA) differ, and the practice for incorporation varies from one legal act to another one.

As another matter of example, the former TEN-E Regulation on trans-European energy infrastructure has not been incorporated into the EEA Agreement, while the TEN-T Regulation is. The process of evaluation of the EEA relevance of the 2022 TEN-E Regulation[41] for its possible incorporation into the Agreement was still ongoing at the time of the finalisation of this report (December 2023). The TEN-E Regulation has relevant provisions for hybrid projects concerning permitting, offshore network development plans per sea basins and access to financing.

Other pieces of legislation such as the 2022 Guidelines on State aid for climate, environmental protection, and energy (CEEAG) or the Temporary Crisis Framework for State Aid (TCTF)[42], both of relevance for offshore renewable energy projects, are adopted in identical terms by ESA and have already been applied for the purpose of approving state aid to offshore wind projects.[43]

Varying practice and a case-by-case approach brings uncertainty for the development of hybrids. Legal certainty will need to be provided urgently as hybrid offshore wind projects could already be part of the 2025 award announcement.[44]

[41] Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure.
[42] Temporary Crisis Framework for State Aid measures to support the economy following the aggression against Ukraine by Russia, Communication from the Commission on the Temporary Crisis and Transition Framework for State aid measures to support the economy following the aggression against Ukraine by Russia (OJ C 101, 17.3.2023, p. 3). The Temporary Crisis and Transition Framework replaces the Temporary Crisis Framework adopted on 28 October 2022 and applies to all measures notified as of 9 March 2023 as well as to measure notified prior to that date.
[43] ESA, Decision No 194/23/COL, Phase I of Sørlige Nordsjø II, 19 December 2023; ESA Decision No 108/23/COL, Investment aid scheme for floating offshore wind projects, 15 August 2023.
[44] Statnett, Temarapport: Utvikling av nett til havs, November 2023, p.57. See above Section II.1.1.

Hybrid projects combine the two elements of offshore wind interconnection between at least two countries and offshore electricity generation. The interconnection part from the Norwegian continental shelf, even if going through the offshore wind farm, will be qualified as an interconnector in the sense of the Electricity Regulation.[45] Norway will be required to apply the regime for interconnectors, based on the 2009 version of the Electricity Regulation, since the 2019 version of the Electricity Directive part to the Clean Energy Package has not yet been incorporated. The electricity generation part of the hybrid project on the Norwegian continental shelf will most probably take place on the EEZ beyond the limit of the territorial waters. Based on the interpretation of the geographical scope of application of the EEA Agreement that the Norwegian authorities follow, EU legislation will not be automatically considered as EEA relevant for this part of the hybrid asset.[46] If not incorporated into the main part of the EEA Agreement, EEA States might include the relevant EU legislation as part of Protocol 31 or choose to follow the EU legal regime directly in national legislation without being legally bound by it, but the purpose of regulatory alignment.

On this particular matter, the Norwegian Energy Regulatory Authority (RME-NVE) has expressed the view that it would "*present great challenges to operate with completely different rules for market-integrated operations on land on the one hand, and for activity outside the territorial waters on the other side, as long as the power systems at sea and on countries are physically connected*." They believe that there is a strong material and economic connection between the offshore wind activities that take place within and outside the scope of application of the EEA Agreement. Therefore, RME-NVE is of the opinion that the construction and operation of offshore electricity grid with hybrids "shall" follow the rules and principles of the relevant energy market legislation. Until the incorporation of the Clean Energy Package, such alignment will be based on the Third Energy Package, as concerns interconnection to the EU.[47]

For projects connecting Norway to the UK, the relevant framework is the 2021 Agreement between the UK and Northern Ireland and the Kingdom of Norway on Cross-Border Trade in Electricity and Cooperation on Electricity Interconnection.[48]

3. Relevant EU legislation for offshore electricity grid development with hybrids

The table below provides an overview of the most relevant EU legislation for the development of offshore electricity grid with hybrid assets, organised by thematic areas and focusing on market regulation. The status of the incorporation into the EEA Agreement is indicated in the right column. Certain legal acts could fall under several categories but are only mentioned once.

[45] See below Section IV.1.2.
[46] See above Section III.1. For a similar conclusion, see: RME-NVE, Regulering av nett til havs –Del II Hybridprosjekter, Report No 1/2023, p.12.
[47] RME-NVE, Regulering av nett til havs –Del II Hybridprosjekter, Report No 1/2023, p.13.
[48] See above Section II.4.

EU secondary legislation	EEA relevance
Spatial maritime planning	
Maritime spatial planning Directive - Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning	Not EEA relevant, but will indirectly impact Norway through the implementation of the directive in EU neighbouring countries
Permitting and grid planning	
Strategic Environmental Assessment (SEA) Directive - 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	Incorporated into the EEA Agreement, Annex XX.I.
Environmental Impact Assessment (EIA) Directive - 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, as amended by: Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014	Incorporated into the EEA Agreement, Annex XX 1a.
Governance Regulation - Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council	EEA-relevance will need to be assessed, but certain parts fall clearly outside the scope of the EEA Agreement. Other might have an impact on the internal energy market.
Renewable Energy Directive (REDII) - Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (REDII)	EEA-relevance still under assessment. Previous directive already incorporated.
Renewable Energy Directive (REDIII) - Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652	EEA-relevance assessment not started. The previous directive (REDII) is not yet incorporated into the EEA Agreement. To be noted that REDIII is not marked as "EEA relevant", without obvious grounds. This has no impact of the assessment process.
Trans-European Energy Networks for Electricity (TEN-E) Regulation - Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy	EEA-relevance under assessment. Previous TEN-E Regulation not incorporated, but TEN-T is incorporated.

infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013	
Electricity Market design	
2019 Electricity Directive - Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (recast)	EEA-relevance under assessment. Previous directive already incorporated.
2019 Electricity Regulation - Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast)	EEA-relevance under assessment. Previous regulation already incorporated.
Network Codes, Guidelines, Terms, Conditions and Methodologies **<u>Network Codes:</u>** • Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (RfG). • 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 (HVDC). • Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration (ER). • Demand Connection Code 2016/1388 could also be relevant if/when e.g. hydrogen production is established offshore (DCC). **<u>Guidelines:</u>** • Guideline on capacity allocation and congestion management (CACM) - Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management. • Guideline on forward capacity allocation - Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation. • Guideline on electricity transmission system operation - Commission Regulation (EU)	

2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation. • Guideline on electricity balancing - Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing. **Terms, Conditions and Methodologies (TCMs):** The Network Codes and, in particular, the Guidelines require the development of a large number of Terms, Conditions and Methodologies (TCMs). Proposals for these are prepared by cooperating TSOs and sometimes also NEMOs (Nominated Electricity Market Operators) and submitted for approval to the competent regulatory authorities. The number of such documents is significant: • Guideline on capacity allocation and congestion management: 21 • Guideline on forward capacity allocation: 12 • Guideline on electricity transmission system operation: 16 • Guideline on electricity balancing: 23	
ACER Regulation - Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators (recast)	Under assessment. The previous ACER Regulation (713/2009) was deemed EEA relevant and is incorporated in Annex IV to the EEA Agreement with a series of adaptations (Decision of the EEA Joint Committee No 93/2017 of 5 May 2017 amending Annex IV (Energy) to the EEA Agreement [2019/205]). ESA and ACER signed in September 2020 a Memorandum of Understanding on cooperation, information exchange and consultation.
REMIT Regulation - Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (Currently under review as part of the Electricity Market Design Reform).	Not yet incorporated. Norwegian authorities are of the opinion that the provisions of the Regulation on sanctions are not EEA relevant. In practice, many Norwegian companies will be subject to REMIT as they trade energy products in EU countries. In addition, Norwegian authorities have adopted national rules on insider trading (*Forskrift om nettregulering og energimarkedet* (NEM) Chapter 5).

Financing	
Public Procurement Directive - Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement	Incorporated into the EEA Agreement, Annex XVI.
Inter-transmission system operator compensation mechanism (ITC mechanism) - Commission Regulation (EU) No 838/2010 of 23 September 2010 on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging	Incorporated into Annex IV to the EEA Agreement, point 40, by Decision No 7/2011 (OJ L 171, 30.6.2011, p. 1 and EEA Supplement No 37, 30.6.2011, p. 1), e.i.f. 2.4.2011 and subsequently replaced by Decision No 297/2021 (OJ L [to be published] and EEA Supplement No [to be published]), e.i.f. 30.10.2021.
Block exemption regulation (GBER), revised in 2023	Already adopted by ESA.
Targeted amendment to the General Block Exemption Regulation (GBER) to allow further support for the green and digital transitions.	The GBER will have to be incorporated into the EEA legal order before the EEA EFTA States can apply it.
2022 State aid guidelines for climate, environmental protection and energy (CEEAG)	Already adopted by ESA. Relevance for Ocean Grid: - Higher threshold for notifying state aids (de minimis Regulation and GBER); - New criteria for assessing notified measures. - Impacts on national support measures.
New Temporary Crisis and Transition Framework (TCTF) allowing states to provide support to sectors that are key to the transition to a net-zero economy. The TCTF has been amended at several occasion to notably prolong its application and increase the ceilings. TCTF website of the European Commission: https://competition-policy.ec.europa.eu/state-aid/temporary-crisis-and-transition-framework_en	EFTA Surveillance Authority applies in full the TCTF from the date of adoption by the EC.

4. Relevant EC policy documents for the development of hybrid projects

The table below provides an overview of the most central policy documents adopted by the European Commission since 2020 and that will impact the development of hybrid offshore wind projects. The documents are organised by chronological order. The main points relevant for hybrid assets development are indicated in the right column.

Date	Act/Document	Impact on hybrids and Ocean Grid vision
19 Nov. 2020	Guidance on electricity market arrangements: A future-proof market design for offshore renewable hybrid projects SWD/2020/273 final	The Commission clarifies the regulatory framework, in particular on offshore bidding zones for hybrid projects, in the market guidance staff working document accompanying the Offshore Renewable Energy (ORE) strategy.

		Relevant for scenarios in SP 1.2 - recommends offshore bidding zones.
1 Feb. 2023	Communication from the European Commission, A Green Deal Industrial Plan for the Net-Zero Age Press release: https://ec.europa.eu/commission/presscorner/detail/en/ip_23_510 Communication COM(2023) 63 final	- Adaptation of State aid rules - Temporary Crisis and Transition Framework (TCTF)
14 March 2023	EC adopts proposal for electricity market design reform Reform of the EU electricity market design (europa.eu)	- Two-way Contacts-for-Difference (CfD) to become the new norm for supporting renewables investments; - Supports growth of corporate PPAs. Combination CfD and PPA allowed; - Electricity producers keep the right to sell their electricity on the market; - Hybrid offshore wind projects: allows for Transmission Access Guarantees (TAG). It will help de-risk investments in hybrid offshore wind farms.
16 March 2023	Proposal for a regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (Net Zero Industry Act) Proposal for a Regulation, COM(2023) 161, Annexes, SWD(2023) 68.	- Improving investment certainty; - Lowering administrative burden for developing net-zero manufacturing projects. "Offshore renewable technologies" and "grid technologies" included; - Facilitating access to markets (support through public demand public procurement procedures and auctions, support private demand by consumers).
24 Oct. 2023	European Wind Power Action Plan, COM(2023) 669 final	- Announced guidelines on cost benefit and cost sharing; - Speed-up of permitting procedures.
28 Nov. 2023	EU Action Plan for Grids, COM(2023) 757 final	- Commission to propose guiding principles identifying conditions under which anticipatory investments in grid projects should be granted: - Tariff methodology reflecting balance of interests between the need for anticipatory investments and consumer protection; - Commission to issue guidance on cross-border cost sharing for offshore projects; - Calls upon a rapid agreement on the Electricity Market Design reform with provisions recognising the importance of "anticipatory investments", a transmission access guarantee (TAG) for offshore renewables and accounting for both CAPEX and OPEX in network tariffs.

A main conclusion from the above table is that important legislative and regulatory initiatives are under way at EU level for the purpose of facilitating the development of hybrid offshore wind projects. The initiatives announced by the European Commission will result in changes of existing EU legislation and the adoption of new EU legislation. A slow incorporation process of new relevant EU legislation into the EEA Agreement will result in additional barriers to the development of hybrid projects if not anticipated and addressed rapidly (see Section III.5 below). Other initiatives announced by the European Commission will take the form of soft law documents (e.g. guidelines). However, Norwegian actors and authorities should follow closely the elaboration process for these documents and try to be involved in their shaping as they might result in new legislative requirements at a later stage. In the meantime, Norwegian authorities might choose to follow the EC guidelines for the purpose of developing hybrid projects with EU Member States, and so ensure an early regulatory alignment.

5. Increasing concerns about the "EEA backlog"

There is an increasing backlog in the incorporation process of EU legislation into the EEA Agreement. In particular, the incorporation of the Clean Energy Package from 2018/2019 is still pending. Some of the legislative acts of the package have already been or will be soon amended by revisions as part of the Fit for 55 Package, the electricity market design reform and the RepowerEU Plan. Such is the case of the Renewable Energy Directive, the Electricity Directive, and the Electricity Regulation.

The EEA backlog creates uncertainty for actors as to the criteria to apply when developing offshore wind projects. Where hybrid projects will be developed, the lack of legislative alignment will de facto confront actors to a lack of level playing field across countries that will need to be addressed in one way of the other, e.g.: national approach, bilateral agreement, or guidelines.

IV – Requirements and barriers in existing EU laws and regulations with reference to hybrid offshore wind projects

The present section assesses which requirements defined in EU legislation will or may apply to hybrid projects. Both existing and proposed legislation is reviewed. Conclusions are drawn in terms of barriers to the development of hybrid projects from Norway. The analysis aims to:

1. Assess the legal qualification of hybrid projects (previously referred to as Multipurpose interconnector (MPI) in the UK) that are used for the dual purpose of wind power generation and power exchange between countries (market-to-market interconnection);
2. Review the status of existing projects;
3. Identify EU requirements that will have the most impact on cross-border infrastructure development with hybrids;
4. Identify EU processes that will have the most impact on cost and revenue sharing models for hybrids in EU/EEA (this section serves as background for Level 2 of SP1.3 work).

1. Legal qualification of hybrid offshore wind projects

Along the research, it became apparent that there is not yet a standardised legal definition for hybrid projects in EU legislation, but multiple references are made to the concept in policy documents. The Norwegian legislation does not provide either a legal definition for hybrid projects. The most established concept in existing regulatory framework is the one of multipurpose interconnector in the UK (MPI).

1.1 The various configurations for offshore wind assets and infrastructures: towards hybrid projects and meshed grids

1.1.1 About terminology: distinction between offshore radial, hybrid connections, hybrid assets and hybrid projects

There are two different ways for offshore electricity grid connections to be developed: *radial connections* and *hybrid connections*.[49]

Radial connections

A radial connection refers to a cable link between an offshore wind park and a specific point in the onshore power grid. This radial network solution is exclusively utilised for grid connection during offshore wind generation, meaning it serves no function in the absence of wind. It links an offshore wind project to a substation on the onshore power grid. This is the classical and hitherto predominant way of connecting offshore wind projects.

[49] For a more detailed technical discussion of hybrid connections, see Øystein Hestad, "Hybrid cables explained", Sintef blog, 27 April 2022, available at: https://blog.sintef.com/sintefenergy/hybrid-cables-explained/ .

It is also possible to connect offshore wind projects to offshore demand installations.[50] This solution is used primarily for the purpose of electrifying oil and gas platforms, with the objective of reducing emissions for power generation (traditionally by fossil fuel turbines) on the petroleum installations. These wind projects operate either in a completely isolated system, together with the relevant oil and gas platforms and/or have a connection to the mainland. The cables from the offshore wind farms can also be interconnected to other platforms around if the generation capacity is sufficient.

Hybrid connections

A hybrid connection links an offshore wind project to either two onshore regions or an onshore region and a further offshore wind project or substation. These connections integrate the grid connection of the offshore wind park with the regional networks and facilitate power exchange between the regions.

Hybrids can also become interconnectors when no electricity is generated by the relevant offshore wind project. The resulting available spare capacity in the cable will be made available as a normal interconnector.

Hybrid assets and hybrid projects

The use of the term "hybrid" is not consistent throughout the legislation and policy documents, where reference is made to for example "hybrids", "hybrid project", "hybrid integrated project", "hybrid asset", "hybrid cable", "hybrid connection", "hybrid interconnector", with the underlying challenge of defining a precise legal regime for the related infrastructures, such as unbundling and costs allocation model. To which extent generation is or not part of the hybrid project according to unbundling rules is a fundamental starting point. For the purpose of this report, the term **"hybrid offshore wind project"** is favoured.

GB authorities have previously used the concept of **multi-purpose interconnector (MPI)**, as the frame concept. As part of the further development of the regulatory framework for the concerned assets, Ofgem has proposed a revised terminology, based on different categories of projects: MPIs and **non-standard interconnectors (NSI)**, that are together referred as **"offshore hybrid asset" (OHA)**.[51] GB authorities have decided to use the term "hybrid" in order to align with EU terminology.

ENTSO-E opposes the use of the term "hybrid asset". The argument is that an asset is either transmission or generation, and that combining the two functions challenges the EU unbundling principle. Further, ENTSO-E argues that hybrid assets are not needed onshore and should not be needed offshore either. Hybrid projects develop generation and transmission together, which is

[50] E.g., the following oil and gas installations on the Norwegian continental shelf are electrified with cables to shore: Troll A, Gjøa, Martin Linge, Johan Sverdrup The Gullfaks and Snørre fields are electrified with wind power from the Hywind Tampen offshore floating wind park (fore more information about Hywind Tampen, see: https://www.equinor.com/energy/hywind-tampen).

[51] Ofgem, Consultation on the Regulatory Framework for Offshore Hybrid Assets: Multi-purpose Interconnectors and Non-Standard Interconnectors, June 2023.

appropriate. However, the resulting assets are not hybrid, but rather either transmission or generation.[52] ENTSO-E viewpoint is illustrated by Figure 5 below.

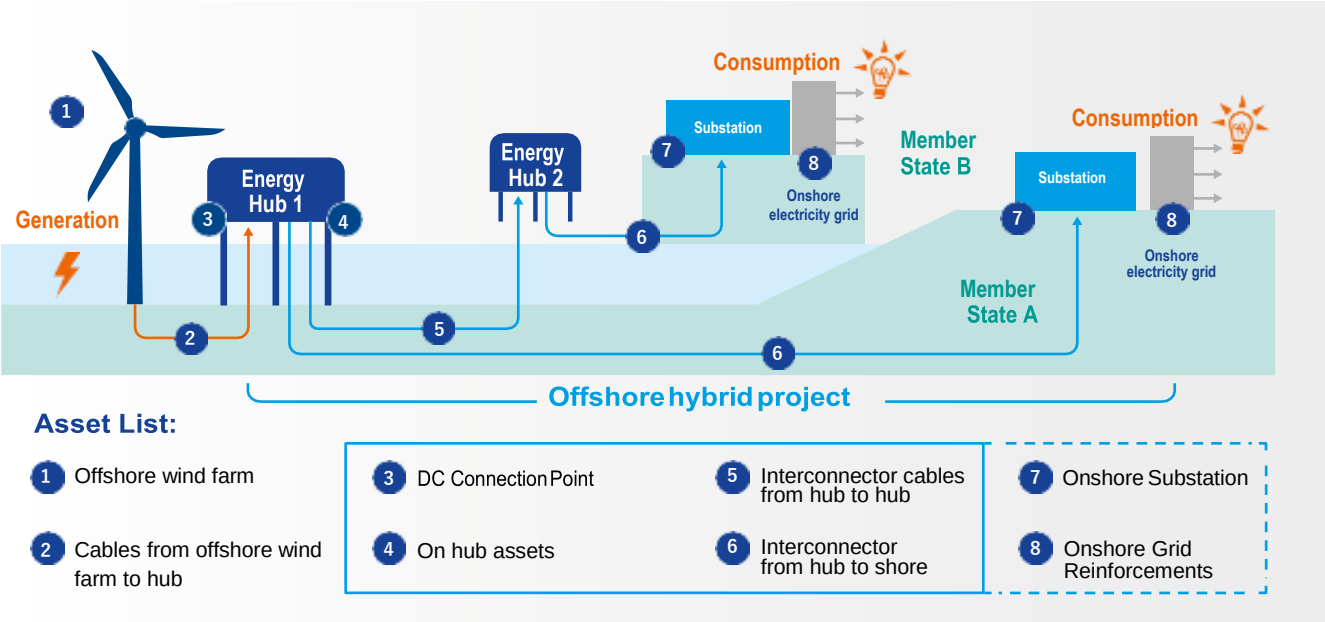


Figure 5: Offshore Hybrid Project: distinction between transmission and generation assets.
Source: ENTSO-E Position on Offshore Development, Assessment of Roles and Responsibilities for Future Offshore Systems, November 2022, p.7.

The discussion about terminology is important as it reveals the uncertainty about the correct classification for the different segments in hybrid projects under current legislation. Legal clarity on that point will support the development of hybrid projects, and foster investments. This is important for new hybrid projects, but also in the view of connecting new assets to existing hybrid projects in the future. In several jurisdictions, it is unclear whether the currently applicable legislation allows for cable systems with hybrid functionality.[53] This calls for at least a common understanding and practice around classification of hybrid projects, and at best harmonisation of legal definitions across jurisdiction around the same sea basin.

SP1.3 will further reflect on the terminology to be used in Level 2 of its work, notably in relation to the application of market design rules and cost/benefit allocation models.

[52] ENTSO-E Position on Offshore Development, Assessment of Roles and Responsibilities for Future Offshore Systems, November 2022.
[53] European Commission, Directorate-General for Energy, Kern, S., Zorn, T., Weichenhain, U. et al. (Roland Berger), *Hybrid projects – How to reduce costs and space of offshore development – North Seas offshore energy clusters study*, Publications Office, 2019, pp.27-29. https://data.europa.eu/doi/10.2833/416539

1.1.2 The various configurations for offshore wind assets and infrastructures: from radial to hybrid projects and towards meshed grids

The idea of pooling together power generation in parallel to developing interconnections between North Sea countries is not novel. Already in 2012, the North Seas Grid Study advanced possible design for a meshed offshore grid in the region, as illustrated by Figure 6 below.

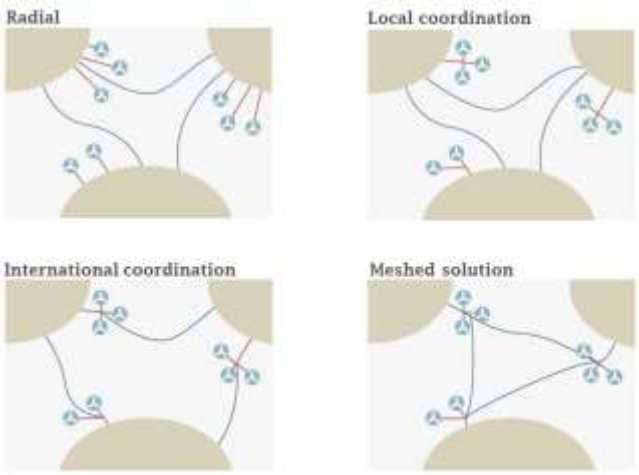


Figure 6: Assumed general pattern of the Offshore Grid Development.
Source: The North Seas Countries' Offshore Grid Initiative - Initial Findings, Final Report Working Group 1 – Grid Configuration, November 2012, p.8.

Since then, the vision for offshore wind in EU basins and for energy system integration has further evolved, with both higher targets and more complex designs.

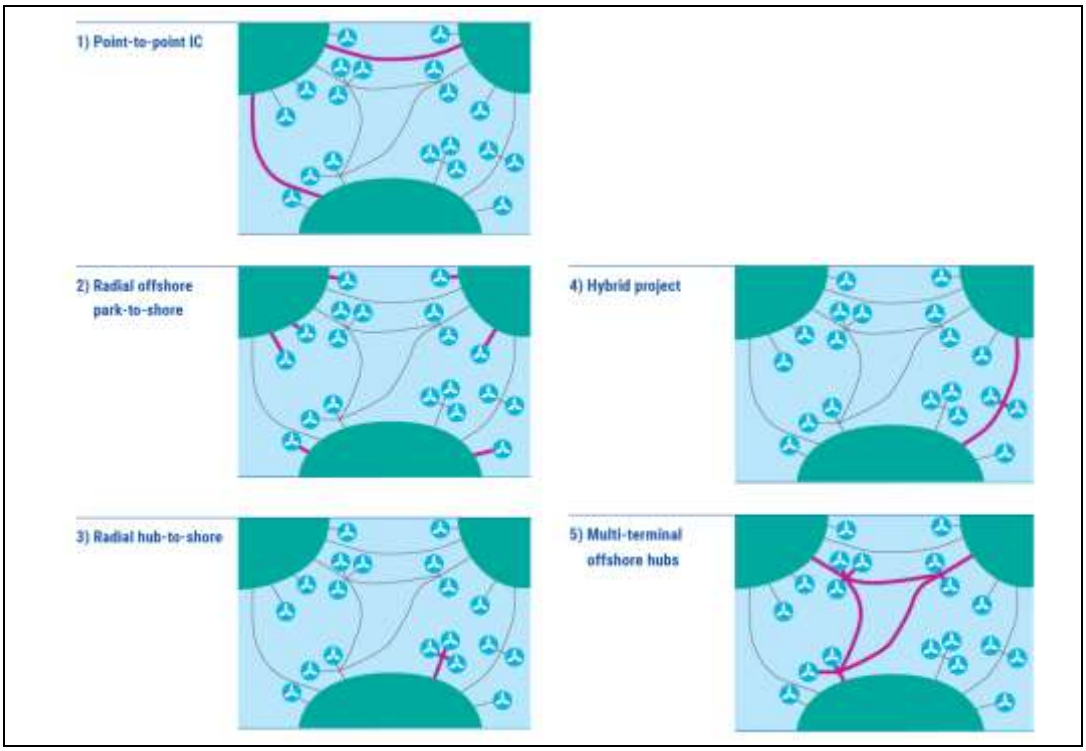


Figure 7: Various offshore design concepts with 1) – 3) being single purpose and 4), 5) being multi-purpose (connecting offshore renewable energy sources and connecting markets).
Source: ENTSO-E Position on Offshore Development, Interoperability, January 2021, p.7.

In its Offshore Renewable Energy Strategy (ORE Strategy) from November 2020, the European Commission calls for an objective of 300 GW of offshore wind and 40 GW of ocean energy across all the Union's sea basins by 2050.[54] To achieve these objectives, the Commission deems it necessary for Member States to work together across borders at sea-basin level. Furthermore, the Commission, as other Member States, and stakeholders, believe that Member States should consider a more long-term vision with hybrid projects and/or, at a later stage, a more meshed grid. By allowing electricity to flow in different directions, this will ultimately maximise socio-economic welfare, optimise infrastructure expenditure and enable a more sustainable usage of the sea.[55] This vision is also reflected in the TEN-E Regulation (EU) 2022/869.[56]

To complete the picture of possible future offshore grid, five main configurations have been identified: (1) point-to-point interconnector, (2) radial offshore park-to-shore; (3) radial hub-to-shore; (4) hybrid project; and (5) multi-terminal offshore hubs.[57]

This list of different configurations for offshore assets and offshore grids, argues in favour of a **progressive approach** with gradual adjustment to the legislative framework and harmonisation when necessary.[58] This is also reflected in the statement of the European Commission in its ORE Strategy that ***"hybrid projects will form an intermediate step between smaller-scale national projects and a fully meshed, offshore energy system and grid"***.[59] It follows that the interoperability of the different national offshore systems will need to be facilitated along the way,[60] notably through harmonised definitions, harmonised market rules, guidance on cost allocation and standardisation.[61]

Hybrid projects are therefore an essential first step towards the eventual construction of more complex "meshed" grid structures, which could allow clusters of offshore wind farms to be connected to offshore hubs that connect to each other and then to various onshore terminals across national jurisdictions.

1.2 Positioning of hybrid projects within the regulatory framework

The following sections provide a preliminary assessment of the regulatory framework applicable to hybrid projects in Norwegian (1.2.1), EU (1.2.2) and UK (1.2.3) law.

[54] Communication from the European Commission, an EU Strategy to harness the potential of offshore renewable energy for a climate neutral future, COM(2020)741 final, 19.11.2020.
[55] Proposal for a Directive amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, COM(2021) 557 final, 14 July 2023
[56] TEN-E Regulation, Recital (22) and Art. 14(2).
[57] ENTSO-E Position on Offshore Development – Market and Regulatory Issues, 15 October 2020, p.8.
[58] For a series of recommendations on regulatory approach to scaling up offshore wind in the EU, see: Banet C., and Willems B., Scaling up Offshore Wind Energy in Europe, CERRE Report, October 2023.
[59] ORE Strategy, p.12.
[60] Ibid.
[61] ENTSO-E Position on Offshore Development, Assessment of Roles and Responsibilities for Future Offshore Systems, Nov. 2022, p.31.

1.2.1 Norwegian law and regulations

The definition of "interconnections"[62] in Section 4-2 of the Energy Act[63] primarily applies to cross-border exchange connections, as mentioned in Proposition 160 L (2020-2021).[64] It refers to connections that link the Norwegian power system to another country's power system or connect the Norwegian power system to production or consumption facilities outside the Norwegian continental shelf. The Ministry of Energy, in Proposition 160 L (2020-2021), considers hybrid connections that require a construction permit under Section 3-1 of the Energy Act and involve power exchange with another country as interconnections, requiring a permit under Section 4-2 of the Energy Act. However, this definition does not account for situations where the onshore portion of a hybrid connection, from the offshore wind farm to the domestic market, does not necessarily cross any national borders. It also fails to consider that a hybrid connection combines onshore transmission of offshore wind production with power exchange.

Section 8-1 of the Offshore Renewable Energy Act[65] governs permits for the "export and import of electrical energy." According to Proposition No. 107 (2008-2009),[66] this provision applies when offshore wind farms in Norway are connected to another country or when offshore wind farms in another country are linked to grid facilities in the Norwegian offshore area. Still, it is not directly applicable in cases where offshore wind production and exchange at sea are combined, as is the case with hybrid connections.

Furthermore, according to Section 1, paragraph 3 of the Offshore Renewable Energy Act Regulation, interconnectors with a permit under Section 4-2 of the Energy Act are exempt from requiring a permit under Section 8-1 of the Offshore Renewable Energy Act. Initially, permits could only be granted to Statnett as the system operator.[67] A 2021 amendment[68] allows permits for interconnections to be granted to entities other than the system operator when the connection is linked to facilities for production or consumption of electrical energy at sea and crosses the border between Norway's continental shelf and another state's shelf. This exception, however, assumes that the connection crosses a national border, which is not the case for the onshore portion of the hybrid connection to Norway.

In summary, the definitions for interconnections in Norwegian legislation are insufficient when applied to hybrid connections. Firstly, the legislation presumes that the connection is cross-border, but the onshore portion of a hybrid connection from the offshore wind farm to the domestic market may not necessarily cross any national borders if the wind farm is located within Norway's borders. Secondly, the legislation does not account for the fact that a single connection can serve as a cross-

[62] In Norwegian "utenlandsforbindelse". Expressed in a direct translation "cross-border connection".
[63] Act of 26. June 1990 No. 50 relating to the generation, conversion, transmission, trading, distribution and use of energy etc.
[64] Proposition 160 L (2020-2021) Proposal to the Storting (draft law proposal) Amendments to the Energy Act (concession for cross-border connections), p.13.
[65] Act of 04. June 2010 No. 21 relating to renewable energy production at seas.
[66] Proposition No. 107 (2008–2009) to the Storting. Concerning an Act on Offshore Renewable Energy Production (the Offshore Renewable Energy Act), page 84.
[67] Energy Act Section 4-2, first paragraph, second sentence.
[68] Prop. 160 L (2020–2021) p. 15.

border exchange between national power systems while being connected to an offshore production facility, both within and outside the Norwegian continental shelf.

1.2.2 EU law

Both the third and fourth energy packages have adopted identical legal definitions of "interconnector" in the respective directives and regulations. In the Norwegian version of the legal acts, this has been translated as "overføringsforbindelse" (transmission connection). A linguistic and practical understanding of the wording suggests that it refers to connections between both countries and bidding zones.

According to Article 2(39) of the 2019 Electricity Directive,[69] exchange connections are defined as "equipment used to link electricity systems". The phrase "link electricity networks" is broad and encompasses both cross-border and cross-zonal connections. The term "equipment" can also include various technical components such as cables, transformers, and power generation facilities. Therefore, hybrid connections with their dual functionality of offshore wind power transmission and power exchange can be considered within the scope of the legal definition.

Article 2(1) of the 2009 and 2019 Electricity Regulation, defines interconnector as "*a transmission line which crosses or spans a border between Member States and which connects the national transmission systems of the Member States*". Thus, only connections across national borders are included.[70] For hybrid connections, this means that only the part of the cable crossing the EEZ boundaries is covered by the definition.

1.2.3 UK law

To the extent that such hybrid connections cross an international border, they are referred to as hybrid interconnectors or multipurpose interconnectors (MPIs).

MPIs can optimise the allocation of renewable electricity to demand centres and are considered as essential for the planned development of a meshed offshore grid connecting numerous European neighbouring countries, in particular in the North Sea region.

Whilst in the UK it has been assumed that MPIs will be direct current (DC) connection, this does not need to be the case. In the case of Krieger's Flak, the German and Danish electricity system operate on slightly different phases. Therefore, one converter transforms the alternating current (AC) from the Nordic interconnected system to DC. The other converter transforms this direct current back to alternating current - only now adapted to the Continental Europe Synchronous Area.[71]

The deployment potential of hybrid interconnectors has increased significantly in recent years, with a number of projects at preconstruction stage development in Europe. However, deployment of

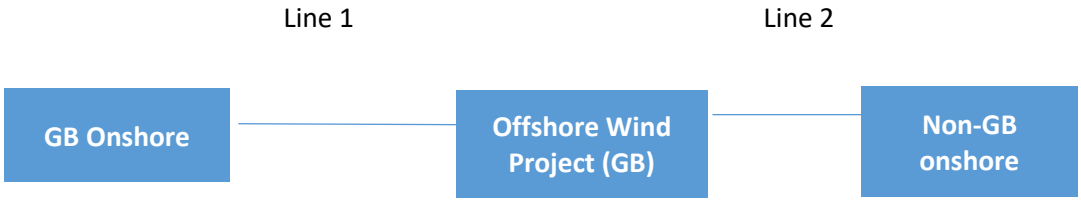
[69] See Article 2(13) of the 2019 Electricity Directive with an equivalent definition, applicable in Norway and the EEA.
[70] While the wording specifically addresses national borders, bidding zones are effectively encompassed in practice.
[71] Kriegers Flak: Combined Grid Solution, Energinet/ 50Hetz, available at: https://www.50hertz.com/en/Grid/Griddevelopement/Concludedprojects/CombinedGridSolution.

hybrid interconnectors is arguably not adequately provided for by existing national and EU legislative and regulatory framework.[72]

At EU level, there is no specific legal or regulatory framework addressing the development of hybrid assets or MPIs. There is equally no standard definition, but MPIs or "hybrid" project are used to refer to a combination of generation and interconnection: the ORE Strategy mentions hybrid projects and refers to a 2019 study in which they are defined as: "transnational, coordinated offshore energy generation projects. Typically, hybrid projects combine generation and transmission assets across maritime boundaries."[73]

Ofgem's open letter of 12 August 2020 to launch its interconnector policy review simply describes multiple-purpose interconnectors as: "*projects which could link interconnectors with offshore renewable generation, and might form part of a potential North Seas grid*."[74] To compare with, the fourth Electricity Regulation (EU) 2019/943 refers to: "*Offshore electricity infrastructure with dual functionality (so-called 'offshore hybrid assets') combining transport of offshore wind energy to shore and interconnectors*".[75]

Hereafter follows an example of an MPI between onshore GB and another jurisdiction:



In the above example, Line 1 would be an Offshore Electricity Transmission (OFTO) for GB regulatory purposes, line 2 could be classified as a cross-border interconnector. Line 1, the offshore wind park Line 2 taken together then constitute the MPI.

> The regulatory classification of Line 1 as an OFTO is important for the overall functioning of the relevant offshore hybrid asset, as OFTOs are the only type of offshore transmission assets defined in GB law.
>
> The concept of OFTOs was created with a view to create competition for the construction and operation of offshore cables connecting wind farms in order to accelerate the connection process and render the same more efficient. The implication is that the OFTO is purpose build in order to connect the relevant wind farm, it is not built with a view to creating a wider offshore grid. The OFTO process is governed by the Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015. The ownership and operation of an OFTO is subject

[72] Electricity Interconnection Policy Consultation June 2022, Irish Government.
[73] European Commission, Directorate-General for Energy, Kern, S., Zorn, T., Weichenhain, U. et al. (Roland Berger), *Hybrid projects – How to reduce costs and space of offshore development – North Seas offshore energy clusters study*, Publications Office, 2019, https://data.europa.eu/doi/10.2833/416539
[74] Ofgem, Open letter: Notification to interested stakeholders of our interconnector policy review, 12 August 2020. Available at: Open letter: Notification to interested stakeholders of our interconnector policy review (ofgem.gov.uk)
[75] Electricity Regulation (EU) 2019/943, Recital (66).

to a specific offshore transmission licence which may only be granted on the basis of the 2015 Regulations.

In this context, and "offshore transmission licence" is defined as a transmission licence authorising anything that forms part of a transmission system to be used for purposes connected with offshore transmission.

In turn, "transmission system" means a system which (a) consists (wholly or mainly) of high voltage lines and electrical plant; and (b) is used for conveying electricity from a generating station to a substation, from one generating station to another or from one substation to another; and "offshore transmission" means the transmission within an area of offshore waters of electricity generated by a generating station in such an area (s6C(5) EA 1989). Transmission has been defined as "transmission by means of a transmission system" (s4(4) EA 1989).

OFTOs can be constructed by the relevant offshore wind developer (generator-build) or by a third-party transmission operator (OFTO build). To date, only the "developer build" model of the OFTO tender regime has been used.

1.3 The implications of the definitions for interconnectors

The definitions of interconnections in existing regulations do not fully apply to connections included in a hybrid project. This is a natural consequence of the legal rules aiming to regulate traditional interconnectors, where production occurs at the endpoints of the connection, as opposed to on the connection itself as in hybrids.

Both Norwegian legal sources, EEA law, and EU law indicate that the regulations were not designed with hybrids in mind. Hybrid connections were first legally recognized in the recital 66 of the Fourth Electricity Regulation, where they are referred to as "[o]ffshore electricity infrastructure with dual functionality (so-called 'offshore hybrid assets') combining transport of offshore wind energy to shore and interconnectors". However, the legal provisions in the Fourth Electricity Regulation do not fully account for the characteristics of hybrid connections. This was included relatively late in the legislative process and did not have operational effect.

Nevertheless, one year later in 2020, in its ORE Strategy, the European Commission recognised the key role of hybrid grid solutions in the development of large-scale renewable production at sea, which hailed a "new approach" and noted that:

- "In order to step up offshore renewable energy deployment in a cost efficient and sustainable way, a more rational grid planning and the development of a meshed grid is key."
- "A share of the future offshore grid will ideally be built around hybrid projects, in cases where they can reduce costs and use of maritime space."
- "Hybrid projects will form an intermediate step between smaller-scale national projects and a fully meshed, offshore energy system and grid."[76]

[76] ORE Strategy, COM(2020) 741 final p. 12.

1.4 Summary and preliminary conclusion

The existing regulations for interconnectors are designed for connections where production takes place at the endpoints and not on the connection itself, as is the case with hybrids. It is also assumed that the connections are cross-national, which may not necessarily apply to the parts of the hybrid connection that extend from the offshore wind farm to the domestic market (eg, the GB OFTO line). In principle, it can be considered that existing regulations could still be applied to hybrids, despite the definitions not being fully compatible. The current legal definitions do not reflect all functionalities of hybrid projects.

How the regulations on the electricity market affect hybrid connections will depend on how hybrids are integrated into the power market and which market model is applied. The existing regulations' impact depends on the regulatory treatment of the asset. For windfarms connected to a hybrid project, the situation is clearly more challenging compared to radially connected windfarms that are ensured a guaranteed capacity for bringing their electricity ashore. Therefore, the legal consequences of such application should be further analysed. The design of bidding zones will be significant in this context.

2. Status of hybrid projects in Europe

In its 2019 study for the European Commission, the Roland Berger consortium identified out of ten hybrid projects, five ones with significant benefits in the North Sea, as reproduced in figure 8 below.

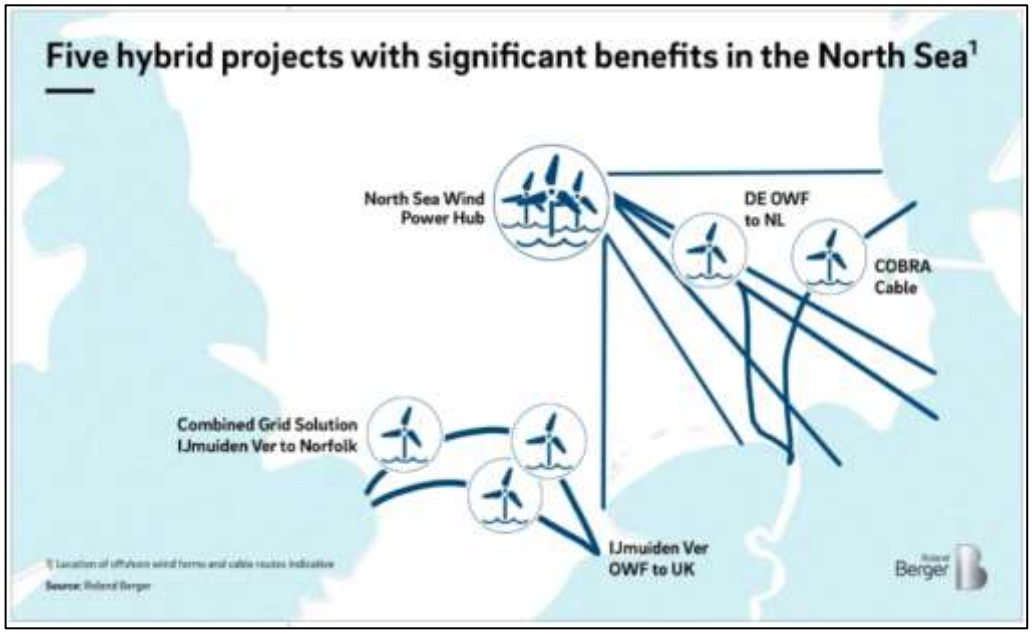


Figure 8: Five hybrid projects with significant benefits in the North Sea.
Source: European Commission, Directorate-General for Energy, Kern, S., Zorn, T., Weichenhain, U. et al. (Roland Berger), Hybrid projects – How to reduce costs and space of offshore development – North Seas offshore energy clusters study, Publications Office, 2019

In the draft TYNDP2022 project portfolio (dated January 2022), six offshore hybrid projects were indicated as included. The corresponding table is reproduced below.

Project TYNDP ID	Project name	Project promoters	Status*	Commissioning year foreseen by the project promoter(s)	Existing or new project
121	Nautilus: multi-purpose interconnector Belgium – UK	Elia, National Grid	2	2029	was in TYNDP 2020
260	Project 260 – Multi-purpose HVDC interconnection between Great Britain and The Netherlands	National Grid, TenneT-NL	1	2030	was in TYNDP 2020
335	Project 335 – North Sea Wind Power Hub	Energinet.dk, TenneT-NL, TenneT-DE	1	2035	was in TYNDP 2020
1088	Offshore Wind Park in Latvia and Estonia – ELWIND	AS Augstsprieguma tikls (AST) and AS ELERING	1	2030	new in TYNDP 2022
1092	Triton Link: Offshore Hybrid HVDC Interconnector Belgium – Denmark	Energinet and Elia Transmission Belgium	1	2030	new in TYNDP 2022
1106	Bornholm Energy Island (BEI)	Energinet, 50Hertz	1	2030	new in TYNDP 2022

Figure 9: List of offshore hybrid projects included in the draft TYNDP22 project portfolio (January 2022). Source: https://tyndp.entsoe.eu/explore/about-the-tyndp-project-portfolio

With the announcements made by the Norwegian government as to the possible inclusion of hybrid projects in the 2025 award for offshore wind, there are currently up to 10 offshore hybrid projects in discussion in the North Sea and the Baltic Sea. There are under varying status, one being operational (Kriegers Flak), for several ones there are signed cooperation, while the remaining projects are under discussion.

	Hybrid Project Name	Countries	Status
1.	Kriegers Flak	Denmark-Germany	operational
2.	ELWIND	Latvia-Estonia	cooperation signed
3.	Lion Link (previously Eurolink)	The Netherlands-UK	cooperation signed
4.	Bornholm Energy Island	Denmark-Germany	cooperation signed
5.	North Sea Energy Island	Denmark-Germany-the Netherlands	under discussion
6.	North Sea Wind Power Hub	Denmark-Germany-the Netherlands	cooperation signed
7.	Nautilus	Belgium-UK	under discussion
8.	Triton Link	Belgium-Denmark	cooperation signed
9.	Baltic WindConnector	Estonia-Germany	under discussion
10.	Sørlige Nordsjø II	From the Norwegian continental shelf	Under discussion. Not yet decided.

Figure 10: List of currently known hybrid projects in the North Sea.
Source: Authors' own compilation of information.

See also separate table in **Annex I** to this report for further details about the most advanced of these offshore hybrid projects in the North Sea.

3. EU requirements with the most impact on cross-border infrastructure development with hybrids

There is no legal regime in EU legislation dedicated to hybrid projects yet, and an underlying question for the rest of the Ocean Grid project is to know whether there is a need for a dedicated regime for hybrids, or whether current legislation applicable onshore is sufficient to let the offshore hybrid projects develop, possibly with minor adjustments.

To answer this question, it is necessary to assess to which extent existing regime for interconnector (3.1) and the unbundling rules (3.2) will impact the development of hybrid projects while waiting for a more harmonised regime among North Sea countries. Following on the adoption of the ORE Strategy and the revision of a series of legal acts under the Fit-for-55 Package, there are a few starting points in EU legislation to regulate hybrids, but they are still deemed insufficient to provide sufficient legal certainty (3.3). Additional provisions are foreseen as part of the Electricity Market Design Reform, [77] but, as they are still under negotiations at the time of writing this report, their analysis will be included at a later stage in SP1.3 work.

3.1 Application of the interconnector regime

In the absence of a specific MPI regime, it is useful to consider the EU regime applicable to classical 'point -to- point' interconnectors.

To start with, it is useful to recall that the completion of the internal energy market is a priority policy area for the European Commission as outlined in Article 194(1) TFEU. Electricity interconnectors are a key part of the completion of the internal energy market, contributing to security of supply, cross-border trade, and the development of renewable energy generation.

Reflecting the importance of electricity interconnectors, the European Council has set targets to achieve 10% electricity interconnection by 2020 and 15% by 2030.[78] In 2016, an electricity interconnector expert group (the Commission Expert Group) was established to provide the Commission with technical advice on reaching these targets. As described in the Third Commission Expert Group Report,[79] "the European Union relies on its interconnected grid to reach the ambitious renewables target set for 2030 and deliver affordable, secure and sustainable energy to all

[77] Proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) 2019/943 and (EU) 2019/942 as well as Directives (EU) 2018/2001 and (EU) 2019/944 to improve the Union's electricity market design, COM(2023) 148 final, 14.03.2023.

[78] As mentioned in: Outcome of the October 2014 European Council: https://ec.europa.eu/clima/sites/clima/files/strategies/2030/docs/2030_euco_conclusions_en.pdf; and (ii) the Communication from the Commission to the European Parliament and the Council on European Energy Security Strategy, COM(2014)0330 final, dated 28.5.2014.

[79] Public engagement and acceptance in the planning and implementation of European electricity interconnectors - Third report of the Commission Expert Group on electricity interconnection targets (June 2019) (the "Third Report of the Expert Group"), p. 8. Available at: https://op.europa.eu/en/publication-detail/-/publication/b62207a9-97bc-11e9-9369-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search.

Europeans". Insufficient interconnection levels may result in renewable generation being curtailed.[80]

At a regulatory level, interconnectors fall within the remit of the European Union Agency for the Cooperation of Energy Regulators (ACER). Another central body in relation to interconnection in Europe is the European Network of Transmission System Operators for Electricity (ENTSO-E), which (among other things):

- develops and implements standards, network codes, platforms, and tools to ensure secure system and market operation as well as integration of renewable energy; and
- coordinates the planning and development of infrastructures at the European level (Ten-Year Network Development Plans, TYNDPs).

The TYNDP is the European electricity infrastructure development plan (prepared by ENTSO-E). It links, supports, and complements national grid development plans. The TYNDP provides a wide European vision of the future power system and investigates how power links and storage can be used to make the energy transition happen in a cost-effective and secure way.

At the heart of the TYNDP lays a definition of scenarios indicating how the European power system might look in the future. ENTSO-E and its gas counterpart ENTSO-G have developed the scenarios together with a wide range of stakeholders. Each scenario's impacts on energy markets and networks are analysed with the help of tailored modelling tools.

In its current form, Regulation (EU) 2022/869 (TEN-E Regulation) allows that projects between an EU Member State and the UK (as a country that is not a Member State or a European Economic Area country) may still meet the criteria to be a project of common interest (PCI) if it "is located on the territory of one Member State, either inland or offshore, including islands, and has a significant cross-border impact".[81]

For electricity transmission projects, a significant cross-border impact means that the project increases the grid transfer capacity between that Member State and other Member States by at least 500MW.[82]

Alternatively, a project may meet the criteria by "decreas[ing] energy isolation of non-interconnected systems in one or more Member States and increas[ing] the cross- border grid transfer capacity at the border between two Member States by at least 200 MW."[83]

While PCIs may exist between Member States and non-Member States, it is not clear how certain provisions of the 2022 TEN-E Regulation would be applied in relation to such projects. For example:

[80] Electricity interconnections with neighbouring countries - Second report of the Commission Expert Group on electricity interconnection targets (June 2019) – at page 9. Available at https://op.europa.eu/en/publication-detail/-/publication/785f224b-93cd-11e9-9369-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search

[81] Regulation (EU) 2022/869, Article 4(1)(c)(ii).

[82] Ibid, Annex IV at para 1(a).

[83] Ibid.

- in accordance with Article 16 of the 2022 TEN-E Regulation, a PCI may submit an investment and cross-border cost allocation request. However, in the case of an interconnector PCI between a Member State and a non-Member State it is not clear how such an application would be decided with the National Regulatory Authority (NRA) of the non-Member State (who would not be bound by the TEN-E Regulation);
- Article 16(1) of the 2022 TEN-E Regulation suggests that efficiently incurred investment costs not recovered from congestion rents will be paid for through network user tariffs in those Member States, which appears to suggest Member States could subsidise costs for a non-Member State; and
- the non-Member State would not be subject to the jurisdiction of ACER who is to decide on any such investment request where the NRAs are unable to reach agreement (or on referral).

It is worth noting that the 2022 TEN-E Regulation also introduces a new category for projects of "mutual" interest (PMI) which may exist on the territory of at least one Member State and one third country (such as the UK) if they:

- increase the grid transfer capacity with other Member States; and
- contribute significantly to sustainability and either market integration or security of supply. In addition the project, to be considered to provide a significant cross-border impact the project should bring significant benefits, either directly or indirectly (via interconnection with a third country).

3.2 Application of the unbundling rules

Under both the European unbundling regime (set out in Article 43 of Directive (EU) 2019/944) and the UK unbundling regime (set out in the Electricity Act 1989), the general rule is that a TSO is not allowed to own any generation or supply interest or be in a corporate group which owns the same. This will necessarily have an impact on the ownership arrangements of any MPI or hybrid project. Therefore, it is essential to understand the intended project structure of an MPI/hybrid project to be able to identify how unbundling obligations may be addressed or whether particular exemptions from unbundling obligations may be required to address the unique features of a project.

At the heart of the unbundling regime in both the GB and the EU is the prohibition on TSOs discriminating in favour of generator or supplier companies within their own group, thereby distorting competition in electricity markets.

In relation to MPIs/hybrids, unless they were part of a vertically integrated undertaking on 3 September 2009, the stricter full ownership unbundling (FOU) provisions of Article 43 of the 2019 Electricity Directive will apply, as the less invasive unbundling regimes (Independent System Operator (ISO) and Independent Transmission Operators (ITO)) are only available to transmission entities which belonged to a vertically integrated undertaking on that date. Given that most MPIs will be relatively recent creations, it is therefore likely that the FOU regime will apply.

The EU unbundling requirements were transposed into GB law by the Electricity and Gas (Internal Markets) Regulations and are set out in section 10 of the Electricity Act 1989 (the "Electricity Act" or the "GB Unbundling Legislation"). Section 10D of the Electricity Act sets out the certification regime for TSOs, and section 10F sets out the circumstances in which the relevant unbundling tests (the "Unbundling Tests")[84] are considered to have been passed by an applicant for certification. The GB Unbundling Legislation affords a certain discretion to Ofgem to certify applicants where some of the relevant tests are not technically considered passed.[85]

Whilst the UK Electricity Act applies to companies in GB only, substantively, the same tests apply to transmission system owner and operator companies in the EU pursuant to the 2019 Electricity Directive[86] and the relevant national implementing legislation in EU Member States. For the purpose of the EU unbundling legislation, interconnectors are considered to be transmission systems. It follows therefore that interconnectors between GB and an EU Member State need to comply with the unbundling regime in both the GB and the EU. It is not clear whether or not Ofgem would take into account any EU generation or supply interests as part of the GB Unbundling Test. However, given this uncertainty, we consider it prudent to assume that all the relevant assets will be taken into consideration.

In contrast to the discretion afforded to Ofgem under the GB Unbundling Legislation, the EU unbundling legislation does not formally bestow discretion on the Member States' National Regulatory Authorities (NRAs) or the European Commission. Instead, the certification decisions taken by the EU NRAs and the European Commission since 2009 reflect an emerging regulatory practice which is also supported by informal EU Commission working papers.

Following Brexit, it is not certain whether existing UK transmission owner or operator entities certified by Ofgem as complying with the Unbundling Tests will be recognised as such in the EU. Consequently, it would be prudent to expect that for MPIs connecting to both the UK and the EU, two certifications are required – one in the UK and one in the EU.

To the extent that certification in the EU is required, this too will need to be in place shortly prior to the commercial operation date. In practice, other interconnectors have commenced this process at the point that their relevant construction period had commenced (i.e. post final investment decision and financial close) and the ownership structure of the relevant project was unlikely to change further. This is acknowledged regulatory practice:

In a recent certification case (i.e. the OFTO for Beatrice wind farm), Ofgem specifically stated in relation to some supply interests in the holder of the OFTO licence for Beatrice "[s]ince none of these producers or suppliers will be in place at the time TC Beatrice is expected to be certified, Ofgem did not take them into account for the current assessment." This certification took place prior to Brexit and as such required the consent of the EU Commission. As this particular point was

[84] Section 10G of the EA 1989.
[85] Section 10F ss. (9A) of the EA 1989 inserted (15.1.2015) by *The Electricity and Gas (Ownership Unbundling) Regulations 2014* (S.I. 2014/3333), regs. 1(1), 3(3) (with reg. 4).
[86] Directive EU 2019/944, Article 43.

not negatively commented by the same, the implied regulatory practice in relation to the unbundling of interconnectors can be assumed to apply to EU interconnectors as well.

In relation to the governance structure of OFTOs (and by analogy, other TSOs), the relevant party's or parties' voting rights in relation to any generation assets will be critical. This was demonstrated by the certification decision in relation to West of Duddon Sands Transmission plc[87], the OFTO for the offshore transmission cable between the West of Duddon Sands wind project and the onshore grid, the European Commission considered governance structure of Macquarie Corporate Holdings Pty Limited as the 50% shareholder of West of Duddon Sands Transmission plc. As Macquarie also owns a number of generation assets, it was asked by the European Commission to re-examine its voting rights to ensure that these were limited only to "matters that are necessary for Macquarie to maintain the necessary minimum level of oversight over its financial asset".

Whilst the European Commission has no role in Ofgem's consideration of the Unbundling Tests, it is reasonable to assume, on the basis of several conversations with relevant Ofgem personnel, that Ofgem will continue to follow the regulatory practice in relation to unbundling decisions established in the EU since the introduction of the ownership unbundling regime in 2009.

Given the above unbundling practice, it is safe to assume that the same would also apply to MPIs and hybrid projects. Careful structuring of any MPI and hybrid projects will therefore be required, in particular where there are consortium structures involving sponsors of the relevant offshore wind projects.

3.3 Starting points in EU legislation to regulate hybrid assets

Although policy documents such as the ORE Strategy refer increasingly to hybrid projects, there are few references to the latter ones in the current EU legislation. Hybrids are referred to in the Recitals of the Electricity Regulation, as '*offshore electricity infrastructure with dual functionality (so-called 'offshore hybrid assets') combining transport of offshore wind energy to shore and interconnectors*'.[88]

There is no dedicated regime for hybrids in the current EU legislation, but some few provisions and requirements provide useful starting points:

- Recital 66 of Electricity Regulation 2019/943 supports – at least in theory - the facilitation of hybrid projects. It is there provided (although it is only a Recital) that offshore hybrid assets "should also be eligible for exemption such as under the rules applicable to new direct current interconnectors" (see Art. 63 of the Electricity Regulation (EU) 2019/943)). Further, and "when necessary, the regulatory framework should duly consider the specific situation

[87] C(2015) 1614, Commission Opinion of 9.3.2015 pursuant to Article 3(1) of Regulation (EC) No 714/2009 and Article 10(6) of Directive 2009/72/EC - Great Britain - Certification of WoDS Transmission Limited, 2015, available at: https://ec.europa.eu/energy/sites/ener/files/documents/2015_107_uk_en.pdf

[88] Electricity Regulation 2019/943, Recital (66).

of those assets to overcome barriers to the realisation of societally cost-efficient offshore hybrid assets".

- The TEN-E Regulation includes "hybrid projects" in the list of subjects to be assessed in the high-level strategic integrated offshore network development plans to be developed and published as part of the Union-wide TYNP by 24 January 2024.[89]
- Article 15 of the TEN-E Regulation foresees the development by the Commission by 24 June 2024 (with the involvement of Member States, relevant TSOs, ACER and the NRAs), of a guidance document for a specific cost-benefit and cost-sharing (CBCS) for the deployment of the sea-basin integrated offshore network development plans. By 24 June 2025, ENTSO-E shall present the results of the application of the CBCA/CBCS to the priority offshore corridors (Article 16).

As mentioned in introduction, additional legislative provisions are foreseen as part of the EU Electricity Market Design Reform, but, as they were still under negotiations at the time of writing this report, their analysis will be included at a later stage in SP1.3 work.

4. EU requirements with the most impact on cost and revenue sharing models for hybrids

Four main sets of EU requirements are deemed to have a particular impact on the cost and revenue sharing models for hybrid projects. These are:

1. Capacity allocation, including the 70% rule
2. Grid connection
3. Metering requirements
4. Balancing requirements

4.1 Capacity Allocation

4.1.1 The 70% rule

Both UK Regulation 2019/943 and EU Regulation 2019/943 include requirements to maximise the interconnector capacity available to the market. This is intended to prevent authorities from restricting interconnector capacity to solve congestion on domestic networks. This is potentially an issue for hybrid projects where it may be desirable for the offshore wind generation to have priority access to the interconnector capacity to ensure it is able to export electricity generated. If no such priority access was possible, the offshore wind generator would need to compete for capacity on the interconnector with other users.

Specifically, Article 16(4) of the Electricity Regulation sets out that "[t]he maximum level of capacity of the interconnections and the transmission networks affected by cross-border capacity shall be made available to market participants complying with the safety standards of secure network operation."

Article 16(8) of the Electricity Regulations further specifies:

[89] TEN-E Regulation, Art. 14(2).

"*8. Transmission system operators shall not limit the volume of interconnection capacity to be made available to market participants as a means of solving congestion inside their own bidding zone or as a means of managing flows resulting from transactions internal to bidding zones. Without prejudice to the application of the derogations under paragraphs 3 and 9 of this Article and to the application of Article 15(2), this paragraph shall be considered to be complied with where the following minimum levels of available capacity for cross-zonal trade are reached:*

(a) for borders using a coordinated net transmission capacity approach, the minimum capacity shall be 70 % of the transmission capacity respecting operational security limits after deduction of contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009;
(b) for borders using a flow-based approach, the minimum capacity shall be a margin set in the capacity calculation process as available for flows induced by cross-zonal exchange. The margin shall be 70 % of the capacity respecting operational security limits of internal and cross-zonal critical network elements, taking into account contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.
The total amount of 30 % can be used for the reliability margins, loop flows and internal flows on each critical network element."

Article 16(9) of the Electricity Regulation provides a limited scope for a derogation:

"*9. At the request of the transmission system operators in a capacity calculation region, the relevant regulatory authorities may grant a derogation from paragraph 8 on foreseeable grounds where necessary for maintaining operational security. Such derogations, which shall not relate to the curtailment of capacities already allocated pursuant to paragraph 2, shall be granted for no more than one-year at a time, or, provided that the extent of the derogation decreases significantly after the first year, up to a maximum of two years. The extent of such derogations shall be strictly limited to what is necessary to maintain operational security and they shall avoid discrimination between internal and cross-zonal exchanges."*

Derogations may also be granted under Article 64 of the Electricity Regulation (at the request of Member States) for small isolated systems and small connected systems:
"1. Member States may apply for derogations from the relevant provisions of Articles 3 and 6, Article 7(1), Article 8(1) and (4), Articles 9, 10 and 11, Articles 14 to 17, Articles 19 to 27, Articles 35 to 47, and Article 51 provided that:
(a) the Member State can demonstrate that there are substantial problems for the operation of small isolated systems and small connected systems;
(b) outermost regions within the meaning of Article 349 TFEU cannot be interconnected with the Union's energy market for evident physical reasons."

Article 2 of the Electricity Directive provides further that:

- *"small isolated system' means any system that had consumption of less than 3 000 GWh in the year 1996, where less than 5 % of annual consumption is obtained through interconnection with other systems;*"
- "*small connected system' means any system that had consumption of less than 3 000 GWh in the year 1996, where more than 5 % of annual consumption is obtained through interconnection with other systems*"[.]

4.1.2 Implications of minimum capacity requirements

Article 16(4) and the more specific 70% target set out in Article 16(8) of the Electricity Regulation require that interconnection capacity be made available to the market.

Interconnection in this context is not defined and it is likely correct to interpret it broadly (e.g. to include transmission networks affected by the cross-border capacity) as there are references to cross-border capacity without defining the nature of the connections and without defining whether the borders are intra-EU or could be with non-Member States.

It is also worth noting that "transmission systems operators" for the purpose of Article 16(8) of the Electricity Regulation would include undertakings which merely operate a cross-border interconnector (this follows the decision of the Court of Justice in the Baltic Cable case[90]) and would therefore include the operator of any MPI/hybrid.

In this case, the Court of Justice held that when a company merely operates a single cross-border interconnector, the relevant company is a TSO. Therefore, to the extent that companies operate single MPIs, they would need to be classified as TSOs, with, in the absence of specific rules for MPIs, all the relevant consequences regarding TPA, the 70% rule as well as membership and voting rights in ENTSO-E. This is supported by the decision of the European Commission in Kriegers Flak (see below) where it was clearly contemplated that the 70% rule applied specifically to the Kriegers Flak system.

However, national legislation will need to be taken into consideration in this context in particular where MPIs connect to third countries (e.g., the UK). For instance following recent Dutch legislation[91] regarding the status of transmission lines between the Netherlands and the UK which explicitly does not classify such lines as TSOs but rather as “operators” (*beheerders*), there may be an argument that MPIs might not qualify as a TSO for Dutch law purposes and thereby not come within the scope of the 70% rule. However, in the wider EU context, this interpretation is likely to be tenuous and the better interpretation is likely that the 70% rule will apply to all MPIs.

[90] Court of Justice of the EU, Case C-454/18, *Baltic Cable AB v. Energimarknadsinspektionen*, para. 51

[91] Besluit van 14 maart 2019, houdende regels met betrekking tot de werking en exploitatie van een landsgrensoverschrijdend net dat de grens met het Verenigd Koninkrijk overschrijdt en de beheerder van dat net in verband met de terugtrekking van het Verenigd Koninkrijk uit de Europese Unie (Besluit grensoverschrijdend net Nederland – Verenigd Koninkrijk na Brexit), Art. 18.

The intention of Article 16(8) of the Electricity Regulation is to prevent Member States from limiting interconnector flows in order to solve national congestion issues. However, while it may not have been the primary intention, the provisions apply more widely to transmission system operators.

However, in ACER's 2020 report monitoring the margin available for cross-zonal trade,[92] ACER considers the target on a border basis rather than as an assessment of each individual interconnector (e.g. in relation to the border between GB and the Single Electricity Market of Ireland, flows on both the Moyle and East-West interconnectors were aggregated). If this approach was applied to MPIs in jurisdictions with existing interconnectors, available capacity on the border would also take into account available capacity on such interconnectors.

4.1.3 Conflict of interest between 70% rule compliance and route to market access for wind projects

Wind farm operators have an interest in priority access to the transmission connections as these connections constitute their (only) route to market. In turn, this would have the effect of reducing the cross-border capacity available. This is an issue as such priority access would be in direct contravention of the requirement to make cross-border capacity available to the market (and in particular in contravention of the 70% target if that could not be met while maintaining the priority access).[93]

Where an MPI acts as the transmission asset for offshore generation, the question arises as to how the MPI is to deal with the connection needs of its generation capacity where this interferes with the 70% capacity requirement for interconnectors. For example, depending on the relative capacity of the interconnector compared to the generation capacity of the offshore wind farm, it might not be possible for the wind farm to get access to sufficient capacity to ensure the route to market of all electricity generated. The wind farm would then need to compete in capacity auctions with other interconnector users to reserve capacity.

The principal method of solving this "70% rule" restriction for an offshore bidding zone, could be through a derogation pursuant to Article 64 EU Regulation 2019/943. This was the approach adopted in the Kriegers' Flak MPI project. However, such an application for derogation would need to be made by the government of the relevant EU Member State to the European Commission, demonstrating that the 70% rule caused substantial issues for the operation of the system.

Kriegers' Flak was also unique in that it was a first of a kind project and was in development (and in the full knowledge of the European Commission) before the 70% rule was introduced in legislation

[92] ACER, Report on the result of monitoring the margin available for cross-zonal electricity trade in the EU in the first semester of 2020, 18 December 2020, available at: https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/MACZT%20report%20-%20S1%202020.pdf

[93] It has been suggested that the 70% target might not apply on a bidding zone basis (ie rather than an individual project basis). However, given the breadth of the obligations on TSOs and the approach taken by the Commission in the recent Kriegers Flak decision, it appears that the 70% rule is also to be applied to specific systems. This is to be balanced by the fact that offshore wind projects most probably will be placed in offshore bidding zones (see Level 2 of the SP1.3 work).

(although there were existing legislative requirements to maximise the capacity available to the market). Achieving such a derogation may also be challenging for these reasons.

Within EU, allocation of interconnector flows between bidding zones is covered by existing legislation, in particular Regulation 2019/943 and the recent Electricity Market Design Reform. When it comes to exchange with UK, it will need to be carefully considered in discussions with the NRAs how interconnector capacity is to be allocated between the relevant jurisdictions (e.g. GB and Norway) and flows from the offshore wind project to shore in the relevant jurisdictions.

4.2. Grid Connection

Grid connection arrangements will need to be considered in detail as part of structuring a hybrid project. For example, there is no precedent for a generation or demand user connecting to an interconnector and it is not clear what the contractual connection arrangements would be. There would need to be an arrangement for access to the interconnector itself between the generator and the interconnector operator. However, the generator would likely as a minimum need to accede to the relevant framework arrangements for trading and industry codes (e.g., the Connection and Use of System Code (CUSC) as well as the Balancing and Settlement Code (BSC) in GB) to ensure compliance with standard operational requirements.

Connection arrangements would also need to be considered by the wind farm in connection with a potential application for a contract for difference (CfD) in GB – one of the eligibility criteria for a CfD is that the project holds a grid connection agreement.

The offshore generation asset will also need to have appropriate access arrangements to secure sufficient interconnector capacity to export the electricity generated (or will need to compete with other users in capacity auctions).

4.3 Metering

Metering arrangements should also be considered at an early stage to ensure it is possible to differentiate between offshore wind generation (particularly important in the case of a project which receives subsidies based on the volume of power generated) and cross-border flows on the interconnector which are not attributable to the relevant wind project.

Metering will also need to be arranged appropriately to identify electricity generation from the wind farm for the purpose of the CfD.

4.4 Balancing

Article 5 of Regulation (EU) 943/2019 provides that all market participants must be financially responsible for the imbalances they cause in the system. The responsibility of system balance lays with the relevant regional or national TSOs as further detailed in Commission Regulation (EU) 2017/2195 (Electricity Balancing Regulation).

Articles 18, 30 and 32 of the Electricity Balancing Regulation provide that the pricing methods for both standard and specific products for balancing energy should create positive incentives for market participants in keeping their own balance or helping to restore the system balance in their imbalance price area, thereby reducing system imbalances and costs to society.

The relevant pricing methodologies need to be economically efficient in relation to the use of demand response and other balancing resources, subject to operational security limits.

As noted above, it is expected that the majority of the hybrid assets will be DC connections. This will facilitate balancing arrangements due to the fact that there is no frequency in a direct current network that requires maintenance.[94] However, the power balance of hybrid connections will need to be ensured.

In the current legal framework, balance responsibility is defined and enforced by the "connecting TSO(s)", which defines terms and conditions for balancing service providers (BSPs) and balance responsible parties (BRPs) for providing services and for balancing responsibility. Therefore, each OWF needs to fall under clear terms and conditions for BSPs and BRPs established by the connecting TSO(s).

Offshore wind projects are intermittent sources of electricity and as such always face significant power imbalances which need to be addressed by trading in the market. In relation to hybrid assets, a particular challenge is the closing of balance positions outside the relevant national markets, chiefly due to the fact that currently cross-border intraday trading is no longer possible in the last hour before gate-closure. In such a case, these imbalances need to be resolved via balancing in the onshore grid, done by TSOs in the balancing market (such as future EU platforms for exchanges of balancing energy).

For hybrid assets which cover the territory of two or more EU Member States, EEA states and/or third countries, the set-up of the relevant balancing arrangements is therefore complex and will require further thought and consultation with the relevant industry stakeholders.

5. Evolving regime for Offshore Hybrid Assets in the UK

In 2023, Ofgem, the GB NRA, has consulted on the regulatory framework and market arrangements for Offshore Hybrid Assets (OHA), considering licensing, cost sharing, ownership, network charging and support schemes.[95] Under the proposed approach, the definition of MPIs is extended, a new category of projects called Non-Standard Interconnectors (NSIs) is created. MPIs and NSIs are referred to together as OHA.

[94] ACER and CEER, Reflection on the EU Strategy to Harness the Potential of Offshore Renewable Energy for a Climate Neutral Future, 11 April 2022.

[95] Ofgem conducted two consultations in parallel: (i) Consultation on the Regulatory Framework for Offshore Hybrid Assets: Multi-Purpose Interconnectors and Non-Standard Interconnector, published 2 June 2023; (ii) Market Arrangements for Multi-Purpose Interconnectors, published 2 June 2023.

The regime review process started in 2021 with the Ofgem's Interconnector Policy Review. In 2022, Ofgem launched the Multi-Purpose Interconnector Pilot scheme (MPI Pilot scheme), to create a regulatory framework that would enable the development of novel MPI projects and contribute to national offshore wind and interconnection targets. The Nautilus and Lion Link projects are the two projects that passed the eligibility check, moving towards the Initial Project Assessment. This section retraces the process of revision of the MPI regime now covered by the concept of OHA.

In its Decision of 13 December 2021, Ofgem stated that "[a]n MPI is a project that combines cross-border interconnection with another purpose, such as the transmission of offshore generation. MPIs could play an important role in enabling the development of offshore renewables to meet our decarbonisation policy ambition and targets." In its 2022 Pilot Framework Guidance, Ofgem understands MPIs to "at the minimum be a project that combines cross-border interconnection with the transmission of offshore generation."[96]

Ofgem has consulted on MPIs as part of workstream 4 (multi-purpose interconnectors) of its Interconnector Policy Review and addressed some views in its 13 December 2021 Decision (Ofgem Cap & Floor Decision).[97]

Prior to this, in July 2020, the Offshore Transmission Network Review (OTNR) was launched by Energy Minister Kwasi Kwarteng.[98] The OTNR addresses issues pertaining to asset classification and market arrangements. BEIS and Ofgem joint response of 18 December 2020 notes stakeholder suggestions to:

- define the treatment of MPIs in the connections process, grid code & licensing and network charging; and
- explore novel MPI incentive mechanisms and future proofing these against EU-exit negotiations as well as addressing EU cross-border trading rules.

In September 2021 the Department for Energy, Business, and Industrial Strategy (BEIS) published a consultation on proposals for an Enduring Regime for offshore transmission and Multi-Purpose Interconnectors.[99]

This was followed by the Offshore Transmission Network Review – Multi-Purpose Interconnectors: Minded-to Decision on interim framework in April 2022[100] and the Multi-Purpose Interconnectors

[96] Ofgem, Guidance "Multi-purpose Interconnectors Pilot Regulatory Framework" (October 2022), p. 10 – available at: Multi-purpose Interconnectors Pilot Regulatory Framework | Ofgem.
[97] Ofgem, "Interconnector Policy Review: Decision", 13 December 2021, available at: Interconnector Policy Review - Decision | Ofgem.
[98] BEIS, website of the "Offshore Transmission Network Review", available at: Offshore transmission network review - GOV.UK (www.gov.uk).
[99] BEIS, "Offshore Transmission Network Review: Enduring Regime and Multi-Purpose Interconnectors" (September 2021), available here.
[100] Ofgem, Consultation "Offshore Transmission Network Review - Multi-Purpose Interconnectors: Minded-to Decision on interim framework" (April 2022), available here.

Pilot Regulatory Framework published in July 2022 and revised in October 2022.[101] In parallel, Ofgem ran a pilot cap and floor regulatory framework for MPIs alongside their third application window for point-to-point interconnectors.

The MPI pilot application period was open from 1 September to 31 October 2022, and attracted applications from four potential projects. Ofgem has confirmed that they will be progressing all four projects to the pilot selection phase. Applicants that are successful in the pilot selection phase will then proceed to the next assessment phase.

As part of this assessment phase, Ofgem will aim to test their policy assumptions and facilitate an MPI pilot regulatory framework for these early MPI projects by aiming to work collaboratively with developers and other regulators to put in place the building blocks that will enable the near-term implementation of these projects. As mentioned above, Ofgem consulted on the MPI regime in June 2023.

The final outcomes of the consultation and review process will be reflected in the next step of SP1.3 work in the Ocean Grid Project.

As Ofgem is developing the GB MPI and OHA framework, it is important to note that collaboration with the UK remains, even after Brexit, important in the context of the EU's increasing focus on its meshed offshore energy systems, of which the North Sea will be a crucial part:

- UK projects accounted for nearly half of all new offshore wind capacity installed in Europe in 2019, including the world's largest offshore wind farm (Hornsea One). On the demand side, the UK's highly ambitious decarbonisation targets make it a significant and growing market for renewable energy; and
- as per the 2020 strategy: "the interoperability of the various national offshore systems is necessary… To achieve a significant scale-up of offshore renewable energy, the development and planning for an offshore grid needs to go beyond national borders and cover the whole sea basin."

The Trade and Cooperation Agreement explicitly provides for this cooperation as Title VIII (Energy) determines that parties will cooperate on:

1. establishing a specific forum for the development of renewable energy in the region and the development of an offshore grid;
2. hybrid and joint projects;
3. sharing of information on new technologies and best practices on rules, regulations, and technical standards; and
4. development of multipurpose interconnectors.

[101] Ofgem, Guidance "Multi-purpose Interconnectors Pilot Regulatory Framework" (October 2022), available here.

V – Preliminary findings and take-aways for next steps in SP1.3 work

Hybrid offshore wind projects can be developed under currently EU legislation, however, further clarification and additional rules will be needed to provide actors with the sufficient visibility to make investments.

The definitions for exchange connections in Norwegian regulations are insufficient when applied to hybrid projects. Firstly, the regulations presume that the connection is cross-border, but the onshore portion of a hybrid connection from the offshore wind farm to the domestic market may not necessarily cross any national borders if the wind farm is located within Norway's borders. Secondly, the regulations do not account for the fact that a single connection can serve as a cross-border exchange between national power systems while being connected to an offshore production facility, both within and outside the Norwegian shelf.

The existing regulations for interconnectors are designed for connections where production takes place at the endpoints and not on the connection itself, as is the case with hybrids. It is also assumed that the connections are cross-national, which may not necessarily apply to the parts of the hybrid connection that extend from the offshore wind farm to the domestic market. In principle, it can be considered that existing regulations could still be applied to hybrids, despite the definitions not being fully compatible.

How the regulations on the electricity market affect hybrid projects will depend on how hybrids are integrated into the power market and which market model is applied. The existing regulations impact depends on the regulatory treatment of the asset. For windfarms connected to a hybrid project, the situation is clearly more challenging compared to radially connected windfarms, that are ensured a guaranteed capacity for bringing their electricity ashore. Therefore, the legal consequences of such application should be further analysed. The design of bidding zones will be significant in this context.

The EEA Agreement's geographical scope is limited to Norwegian territory, including territorial waters. In the EU, it has been clarified that EU law also applies outside territorial waters if the coastal state has jurisdiction there. This means that EU countries will have to legislative in accordance with the EU legal framework in all sea areas held by the relevant state jurisdiction.

Under Norwegian law, the part of the hybrid project that constitutes an interconnection will be regulated according to the Energy Act. It will be classified both as a transmission network and as foreign interconnection, with the consequence that the starting point will be Statnett, or company in which Statnett has a decisive influence, which must own and operate this in accordance with applicable regulations, unless exemption is provided.

Power production at sea from offshore wind outside territorial waters will fall outside the geographical area the scope of both the Energy Act and the EEA Agreement. In principle, this gives more freedom of action for such actors. However, it is not a given that everything that takes place outside territorial waters will be unaffected by EEA law. It is also more consistent with the objective of the EEA Agreement to align offshore market rules for energy production and transmission with

EU legislation, when developing hybrids to EU countries. This calls for upfront agreements between the relevant countries, and a decision on the Norwegian side to apply energy market legislation offshore.

EU legislation will play an important role on the regime for hybrid offshore wind projects from Norway, particularly on the following points:

- planning (marine areas, energy grid infrastructures);
- permitting of generation and infrastructure (including rules on strategic impact assessment / environmental impact assessment, auctioning, permit-process timing, etc.);
- market design, including grid regulation;
- financing mechanisms.

Under EU law, the legal definition of hybrid projects / multipurpose interconnectors is still subject to interpretation, with some few recent references in secondary legislation. Further legal certainty is urgently needed.

The following EU requirements have been identified as particularly influential for the regulatory regime for hybrid projects:

- application of the regime for project of common interest (PCI) or project of mutual interest (MPI) under the TEN-E Regulation, including for planning and permitting;
- unbundling rules;
- capacity allocation, including the so-called 70% rule;
- grid connection;
- metering;
- balancing.

The increasing backlog at EEA level is an element of concern when developing hybrid offshore wind projects. Temporary solutions could be found, but long-term solutions must be ensured to promote legal certainty for all stakeholders involved, including project developers, investors, grid operators and NRAs. There is also a risk of adopting national solutions than will be in contradiction with EU regulation once incorporated into the EEA Agreement.

The rules on cost benefit and cost allocation between countries for hybrid projects are still unclear and clarification is urgently needed here as well, either by law / agreements, or through soft law guidelines. Such clarifications are expected to come at EU level, as announced in the October 2023 Wind Power Package adopted by the European Commission, but could also emerge from collaboration between states at sea basin level through established fora (such as the North Seas Energy Cooperation).

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Annex 1 – Table of Currently known MPIs

Overview of existing (operational and in development) Multi-Purpose Interconnectors

Project (Parties)	Sponsors	Location	Status	Regulatory Framework
Kriegers Flak - Combined Grid Solution (Denmark and Germany)	**50hertz** (German Transmission System Operator) and **Energinet** (Danish Transmission System Operator)	Kriegers Flak as a geographic area refers to a reef **in the Baltic Sea** spanning the economic zones of Denmark, Germany, and Sweden The Kriegers Flak Interconnector connects the **Danish region of Zealand with the German state of Mecklenburg-Western Pomerania**.	The Project has been **in operation since 15 December 2020**.	The EU Commission has **exempted** the Kriegers Flak Combined Grid Solution project **from the current regulation which stipulates that at least 70 per cent of the interconnector capacity between European countries must be made available** for cross-border electricity trading.
Triton Link (Belgium and Denmark)	**Elia** (Belgium's Transmission System Operator) and **Energinet** (Denmark's Transmission System Operator)	Triton Link will **connect two artificial energy islands** in the **northern and southern parts of the North Sea**. The Belgian energy island, called the Princess Elisabeth Island (page 10), will be located **almost 45 km off the Belgian coast** and will serve as the link between the offshore wind farms in the second offshore wind zone	The Triton Link project is currently **under development**. **The construction of the island is due to start in 2024 and the island should be completed in mid-2026.** From then on, the construction of the electrical	The tender process for the island is still being prepared, as is the development of the environmental impact assessment, the preparation of the permitting procedure and the application for a concession of public space. https://www.oedigital.com/news/499883-belgium-s-elia-presents-plans-for-world-s-first-artificial-energy-island (most recent article)

Project (Parties)	Sponsors	Location	Status	Regulatory Framework
		and its onshore high-voltage grid.	infrastructure on the energy island will start. **The construction of Triton Link will take approximately four years and is due to be completed around 2030**.	
Nautilus Interconnector (UK and Belgium)	**National Grid Ventures** and **Elia** (Belgian National Transmission System Operator)	Last year, NGV ran a non-statutory consultation for Nautilus, which proposed a connection at **Friston (in Suffolk, in proximity to the coast near Sizewell)**. NGV holds a connection **agreement on the Isle of Grain in Kent** as part of its development portfolio and it's currently investigating if this could be **a potential location for Nautilus**. Until this is confirmed to be technically feasible, Nautilus will be included as part of its coordination work in **East Suffolk**. • Nautilus Map	The Nautilus Project is currently **under development**. The **application** is expected to **be submitted to the Planning Inspectorate on Q2 of 2023**. After receipt of the application, there will be **28 days for the Planning Inspectorate to review** the application and **decide whether or not to accept it** for examination.	The **European Commission** has recognised the future second interconnector between Belgium and the UK (Nautilus) **as a Project of Common Interest (PCI)**, highlighting its importance within the wider European context. Nautilus has been classified as **a Nationally Significant Infrastructure Project (NSIP)** in East Suffolk UK. As part of the NSIP process, the project has a live page on the Planning Inspectorate's website. The Secretary of State for Business, Energy and Industrial Strategy (BEIS) has exercised powers under section 35 of the Planning Act 2008 to direct that the Nautilus project be treated as development for which development consent is required and the NSIP regime is applicable. NGV will as a result be required **to submit an application for a Development Consent Order (DCO)**. A final decision whether to grant consent will be made by the Secretary of State for BEIS. • Decision letter to National Grid regarding Nautilus

Project (Parties)	Sponsors	Location	Status	Regulatory Framework
		• Project location A **further update** on the Nautilus proposals will be provided **in 2023** once the necessary feasibility studies confirm the Isle of Grain could accommodate Nautilus.	If the application is accepted, the Inspectorate will confirm the timescale within which people can register to become an Interested Party by making a Relevant Representation.	• https://www.eastsuffolk.gov.uk/planning/national-infrastructure-and-energy-projects/nautilus-multi-purpose-interconnector/ The **DCO regime** requires a robust Environmental Impact Assessment and pre-application consultation process prior to any application being submitted. The DCO consent process will provide a single, unified consenting process with clear and fixed timescales.
Lion Link (previously called **EuroLink** (UK and Netherlands)	**National Grid Ventures** and **TenneT** (Dutch Transmission System Operator)	At the **proposed Friston substation in East Suffolk (awaiting confirmation)**.	The EuroLink project is currently **under development**. NGV are holding a non-statutory public consultation. The consultation started on 24 October and is running for eight weeks **until Sunday 18 December 2022**. The consultation seeks to explore potential **opportunities to coordinate NGV's Eurolink and Nautilus projects**	Following the receipt of **a Section 35 Direction**, EuroLink is being treated as a **Nationally Significant Infrastructure Project (NSIP)** in the UK. NGV will as a result be **required to apply for development consent** where the final decision whether to give permission will be made by the relevant Secretary of State through the granting of a **Development Consent Order (DCO)**. • Eurolink: request to the Secretary of State for section 35 direction • Direction by the Secretary of State under section 35 relating to the Eurolink multipurpose interconnector

Project (Parties)	Sponsors	Location	Status	Regulatory Framework
			and National Grid Electricity Transmission NGET's Sea Link project. Coordination could range from **co-location of infrastructure** from different projects on the same site, to **coordinating construction activities** to reduce potential impacts on local communities and the environment.	
Bornholm Energy Island (Germany and Denmark)	**50Hertz** (German TSO) and **Energinet** (Danish TSO)	The Interconnector is due to run across 200 kilometres from the Danish Island of Zealand in the east, via Bornholm, to the coast of Mecklenburg-Western Pomerania in the south-west. A joint energy hub with converters and substations for the distribution of electricity to Germany and/or Denmark	The Bornholm Energy Island project is currently **under development**. It is expected that the tender framework for the offshore wind build-out related to the Bornholm Energy Island will be	

Project (Parties)	Sponsors	Location	Status	Regulatory Framework
		is due to be built on Bornholm itself.	completed by the end of 2022. The Project is expected to be completed by 2031. • EIB Business Case (page 47 Time schedule)	

Annex 2 – Relevant Norwegian legislation

The Energy Act (the Energy Act), act no. 50 of 29 June 1990, entered into force on 1 January 1991.

- N.B.: The various EU rules under the Third Energy Package and the guidelines adopted pursuant to it such as the CACM guidelines, are implemented into Norwegian law pursuant to the Norwegian Energy Act. In contrast to the Offshore Renewable Energy Act and the Petroleum Act, the Norwegian Energy Act applies only the Norwegian territory and not in territorial waters (§1-1, Energy Act). As a consequence, their geographical applicability is correspondingly limited geographically. This geographical delimitation represent a point for consideration when considering the applicability of EU legislation offshore.

The Offshore Renewable Energy Act, act no. 21 of 4 June 2010 entered into force 1 July 2010.

The Petroleum Act, act no 72 of 29 November 1996, entered into force 1 July 1997.

The Regulation on System Responsibility of 17 May 2002.

- RSR includes a range of topics that directly or indirectly also will affect operation of an offshore grid, such as congestion management, bidding zone configuration, capacity allocation, bidding, production scheduling, reserves etc. Topics overlap to a large degree with European Network Codes and Guidelines, especially those already included in Norwegian law (European regulations although containing even more detail than RSR with guidelines).
- The goal of RSR is to ensure an efficient power market, continuous balance between production and demand and a satisfactory quality of supply.

National guideline for functional requirements in the power system of 1 July 2020.

- The guideline on functional requirements is an annex to the guidelines according to paragraph 28 a) of the RSR for the execution of system responsibility under RSR paragraph 14 (Determination and following up of functional requirements to power system installations). These guidelines are prepared by the TSO and approved by the National Regulatory Authority.

Regulation on economic and technical reporting, revenue cap for grid companies and tariffs of 11 March 1999, including change of 4 December 2019.

- This Regulation consists of five parts
    1) General rules
    2) Economic and technical reporting
    3) Removed
    4) Revenues from grid activities
    5) Final Provisions
- Part 4 is relevant for offshore grids, especially paragraph 11 about the annual revenue cap for the TSO. Relevant parts of other articles that regulate the revenues of grid companies also pertain to the TSO.
- Chapter 14 (paragraphs 14-1 to 14-3) describes the practical construction of tariffs for power withdrawal from the grid, which can become relevant if demand is established offshore. Chapter 15 describes the construction of tariffs for injection, specifically paragraph 15-1 about the energy term and paragraph 15-2 about the fixed part. This is highly relevant for offshore generation but may need to be harmonized with other countries. Also highly relevant is Chapter 16 about connection fees.

Annex 3 – Relevant Norwegian policy documents

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- Statnetts vurderinger knyttet til regulering av nett til havs, October 2022

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Annex 4 – The Nordic System Operation Agreement

The purpose of the Nordic System Operation Agreement (SOA)[102] is to agree between Nordic TSOs on the principles for system operation in the interconnected Nordic power system. The objective of the Nordic SOA is:

a) to meet the requirements of the European Network Codes that will constitute binding rules in the form of EU Regulations

b) to create a legal framework for agreeing on specific operational issues relevant for the Nordic TSOs that are not regulated directly through the Network Codes.

c) to ensure that the Nordic interconnected system is operated on a satisfactory level of reliability and quality.

The Agreement states the following regarding the order of merit (Article 10): In the event of any discrepancy between the contents of the Network Codes, the main body of the Agreement, the detailed annexes and other documents, the order of merit shall be as follows:

1. The European Union legislation
2. The main Agreement
3. The Annexes
4. Operational Instructions

There are seven Annexes on the following topics:

- Load-Frequency control and reserve
- Electricity balancing
- Operational planning
- Operational security
- Emergency and restoration
- Capacity calculation and congestion management
- Forward capacity allocation

All these annexes may have an impact on an offshore grid.

[102] The text of the Agreement and its Annexes can be found on https://eepublicdownloads.entsoe.eu/clean-documents/SOC%20documents/Nordic/Nordic%20SOA_Main%20Agreement.pdf