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Integrated Baltic Offshore
Wind Electricity Grid Development

Offshore wind in the Baltic Sea

German policy and regulatory frameworks on energy transmission and generation

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Offshore wind in the Baltic Sea

German policy and regulatory frameworks on energy transmission and generation

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List of abbreviations

AC	Alternating current
DC	Direct current
BEE	German Renewable Energy Federation
BfN	Federal Agency for Nature Conservation
BFO	Federal offshore grid plan
BGB	German Civil Code
BImSchG	Federal Emissions Control Act
BImSchV	Federal Emissions Control Regulation
BMU	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BMWi	Federal Ministry of Economic Affairs and Energy
BMVI	Federal Ministry of Transport and Digital Infrastructure
BRH	Federal Audit Office
BSH	Federal Maritime and Hydrographic Agency
BSR	Baltic Sea Region
BNetzA	Federal Network Agency
EEG	Renewable Energy Sources Act
EEZ	Exclusive economic zone
EIA	Environmental impact assessment
EnWG	Energy Industry Act
FEP	Land development plan
FIT	Feed-in tariff
HV	High voltage
HVDC	High-voltage direct current
KraftNAV	Regulation on the Network Connection of Power Plants
LEP	State spatial development plan
NRA	National regulatory authority
O-NEP	Offshore network development plan
OWE	Offshore wind energy
OWE-SRK	Offshore wind energy security framework
OWF	Offshore wind farm
PV	Photovoltaic
RES	Renewable energy source
RES-E	Electricity from renewable energy sources
SEA	Strategic environmental assessment
TSO	Transmission system operator
UBA	Federal Environment Agency
VwGO	Administrative Court Regulation
VwVfG	Administrative Procedure Act
WindSeeG	Offshore Wind Energy Act

Executive Summary

In recent years, Germany has established short- and long-term targets for electricity production as part of its ambitious energy transition (*Energiewende*). Current German legislation on renewable energies calls for continued growth in the share of renewable energy in electricity consumption. In the context of this transition, support has grown for the expansion of offshore wind energy (OWE) as a supply source with minimal negative environmental impacts. This report provides a comprehensive overview of the policy and regulatory frameworks governing the growth of OWE transmission and generation in Germany, specifically as they affect the expansion of the OWE industry into the Baltic Sea Region (BSR). The overview addresses distinct elements of German OWE development in detail, with individual sections on relevant provisions of international and national legislation; the role of diverse actors and stakeholders; transmission (including grid planning, implementation, and operation); and generation (including capacity planning, authorisation, construction, and operation).

1. Introduction

This report has been written as part of the research of the Interreg Baltic InteGrid project, funded by the Interreg Baltic Sea Region Programme, where the project's Group of Activity 3.1 "Policy and Regulation" studied the policy and regulatory frameworks of the Member States related to offshore wind generation and transmission. It focuses of the German political and legal framework related to offshore wind power generation and transmission in the territorial waters and exclusive economic zone of the German Baltic coast as of 2018. The contents of this report are reflected in the Group of Activity's deliverables on policy and regulation research "*Establishing an offshore meshed grid – Policy and regulatory aspects and barriers in the Baltic Sea Region*" (July 2018) and "*Economic considerations on the regulatory framework for offshore wind and offshore meshed grid investments*" (October 2018).[1]

The report provides an overview of the relevant aspects of German energy law, which also comprises the transposition of relevant provisions of EU law, and focuses on the applicable framework following the entry into force of the 2017 Offshore Wind Energy Act. Of particular interest for the scope of the project were spatial and maritime spatial planning procedures at federal and regional level, authorisation procedures for grid and generation projects, environmental assessments, the conditions for connecting offshore wind farms (OWF) to the transmission grid, grid operation rules including network stability mechanisms and the remuneration of electricity from renewable energy sources (RES-E).

2. Political strategies and targets

2.1 Energy mix and renewables in general

Due to its important industry and high population, Germany has extensive energy needs. Its main energy source has traditionally been coal, supplemented by nuclear and green energy. Following the Fukushima catastrophe in 2011, Germany opted to phase out nuclear energy by 2022 ("*Atomausstieg*"). As a result, the development of alternative energy sources is vital. Germany has launched an ambitious energy transition that has gained international attention: the ***Energiewende***.

In 2014, Germany issued a **National Renewable Energy Action Plan** in accordance with Art. 4 of the RES-Directive.[2] The plan sets a 2020 renewable energy target of 19.6% for Germany's gross final energy consumption. The share of renewable energy shall vary depending on the respective sectors, with 38.6% in the electricity sector, 15.5% in the heating/cooling sector, and 13.2% in the transport sector.[3] Since then, Germany has set additional, longer-term targets for electricity production. Under German legislation on renewable energies, the share of renewable energy in electricity consumption should continue to grow, reaching 40–45% by 2025, 55–60% by 2035, and at least 80% by 2050.[4]

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[1] These reports are available on the Baltic InteGrid website at: http://baltic-integrid.eu/index.php/download.html.

[2] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 5.6.2009, p. 16–62.

[3] BMWi (2014), *Nationaler Aktionsplan für erneuerbare Energie gemäß der Richtlinie 2009/28/EG zur Förderung der Nutzung von Energie aus erneuerbaren Quellen*, p. 2, available at https://www.erneuerbare-energien.de/EE/Redaktion/DE/Downloads/Broschuere/nationaler_aktionsplan.html (accessed 27 November 2018).

[4] Sec. 1 par. 2 EEG.

Following the 2017 elections, the elected parties CDU, CSU, and SPD entered a coalition agreement ("*Koalitionsvertrag*") that increased a target of 65% renewable energy in the German electricity mix by 2030.[5] An extra capacity tendering for offshore wind is also mentioned.[6]

As of 2017, renewable energies accounted for 36.2% of Germany's electricity production, but only 12.9% in the heating sector and 5.2% in transport (figure 1).[7]

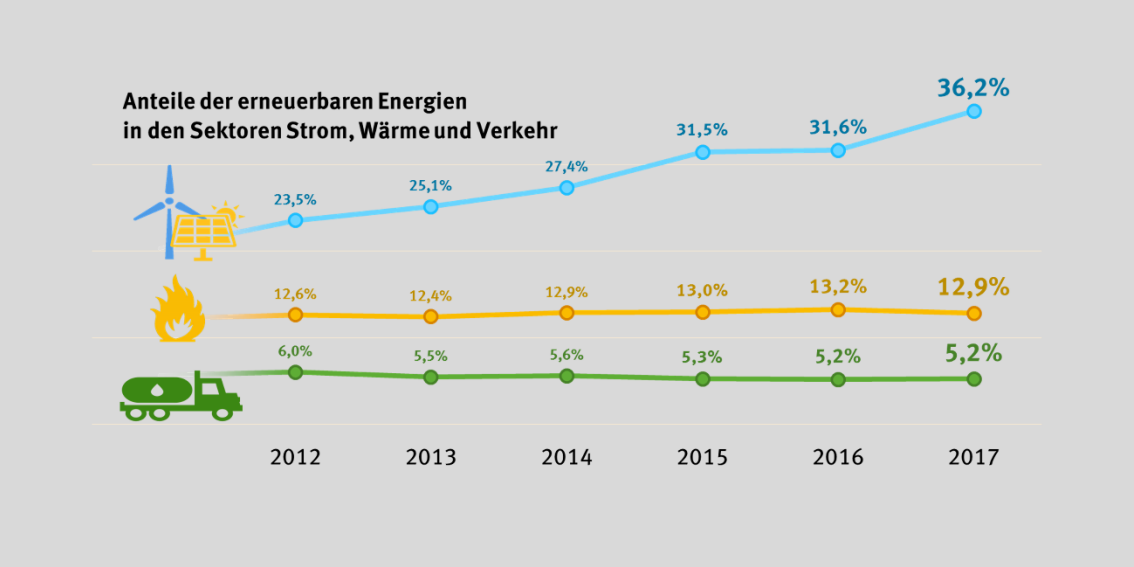

Figure 1. RES in electricity, heating, and transport sectors, 2012-2017.
Source: Umweltbundesamt | AGEE-Stat (Icons von Freepik/flaticon.com und Sabathius/openclipart.org) (2018)

In 2017, renewable energy production accounted for a capacity of 218.3 TWh, of which **106.6 TWh was derived from (onshore and offshore) wind**. OWE production amounted to 17.9 TWh, which represented 2.7% of the German gross electricity production.[8]

2.2 Offshore wind energy policy in Germany

Specific OWE targets have been concretised by the German legislature. The Offshore Wind Energy Act (WindSeeG),[9] passed in 2017, envisages an offshore wind installed capacity of 15 GW by 2030,[10] of which 3.3 GW will be installed in the Baltic Sea.[11]

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[5] Coalition agreement between the CDU, CSU and SPD for the 19th legislation period, p. 14, available at: https://www.bundesregierung.de/resource/blob/975226/847984/5b8bc23590d4cb2892b31c987ad672b7/2018-03-14-koalitionsvertrag-data.pdf?download=1 (accessed 27 October 2018).

[6] Ibid, p. 71.

[7] UBA, "Erneuerbare Energien in Zahlen", 16 March 2018, https://www.umweltbundesamt.de/themen/klima-energie/erneuerbare-energien/erneuerbare-energien-in-zahlen (accessed 19 July 2018).

[8] AG Energiebilanzen e.V. (2018), *Stromerzeugung nach Energieträgern 1990 – 2017*, available at https://ag-energiebilanzen.de/index.php?article_id=29&fileName=20171221_brd_stromerzeugung1990-2017.pdf (accessed 27 October 2018).

[9] Offshore Wind Energy Act of 13 October 2016 (BGBl. I p. 2258, 2310), last modified 20 July 2017 (BGBl. I p. 2808).

[10] Sec. 1 par. 2 (1) WindSeeG.

[11] BNetzA (2018), *Bedarfsermittlung 2017-2030 – Bestätigung Offshore-Netzentwicklungsplan*, p. 19, available at https://www.netzentwicklungsplan.de/sites/default/files/paragraphs-files/O-NEP_2030_2017_Bestaetigung.pdf (accessed 27 October 2018).

With the enactment of the WindSeeG in 2017, the Federal Government provided an overall legal framework for OWE in Germany. The new Act was issued with the specific aim to increase the installed capacity, setting statutory targets for the future development of the OWE in the country. The expansion of OWE is perceived as an optimal solution to support climate and environmental protection. In order to attain the targeted 15 GW until 2030, the Act sets an intermediary target of 7,700 MW until 2020.[12]

The achievement of such goals is to be ensured by a steady and cost-efficient development of the installations, supported by a coordinated enhancement of grid connections and a more cost-effective coordination between the processes of site and regional planning and approval procedures. Cost efficiency will be further guaranteed by a yearly tendering process by the national regulatory authority (BNetzA), which will set the level of remuneration of the power produced.[13]

2.3 Status of offshore wind energy in Germany

Germany, thanks to its 5,355 MW of installed capacity[14] at the end of 2017, is currently the second largest developer country for OWE in Europe[15]. A total of 1,169 connected turbines are spread across 23 farms which are displaced over the maritime areas of North Sea and Baltic Sea.[16]

The Baltic Sea accommodates three fully commissioned OWFs providing 692 MW of installed capacity by virtue of 172 connected turbines. The Baltic 1 is the only farm currently operating in territorial waters as the Baltic 2 and the Wikinger parks have been located in the EEZ. The new OWF Arkona, which is currently under construction, will join the other two farms in the EEZ and will contribute over the coming years with 385 MW and 60 turbines[17] to the overall offshore wind generation. Furthermore, three new projects have been authorised in the Baltic Sea and will be developed in the coming years: Wikinger Süd (10 MW, based in the Cluster 1 in the EEZ), Baltic Eagle (476 MW located in the Cluster 2 in the EEZ) and Arcadis Ost 1 (247.25 MW in the territorial waters of Mecklenburg-Western Pomerania, in the Westlich Arkonasee cluster). The Gennaker project (865.2 MW, in the territorial waters of Mecklenburg-Western Pomerania) is currently being permitted.[18]

[12] Sec. 8 par. 2 WindSeeG.

[13] For details about the tender procedure, see below under 6.2.1.1 Tendering pursuant to WindSeeG.

[14] Wind Europe (2018), *Offshore Wind in Europe; Key trends and statistics 2017*, https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2017.pdf (accessed 27 October 2018).

[15] The leading country for OWE generation is the United Kingdom with 6.835 MW installed capacity.

[16] Deutsche Windguard (2018), *Status des Offshore-Windenergieausbaus in Deutschland*, p. 1, available at https://www.windguard.de/veroeffentlichungen.html?file=files/cto_layout/img/unternehmen/veroeffentlichungen/2018/Status%20des%20Offshore%20Windenergieausbaus%20in%20Deutschland%2C%201.%20Halbjahr%202018.pdf (accessed 27 October 2018).

[17] equinor, "Statoil enters German offshore wind market through € 1.2 billion project with E.ON", last modified 28 June 2016, https://www.equinor.com/en/news/german-offshore-wind-market-eon.html (accessed 27 November 2018).

[18] 4C Offshore, "Global Offshore Renewable Map", https://www.4coffshore.com/offshorewind/ (accessed 27 November 2018).

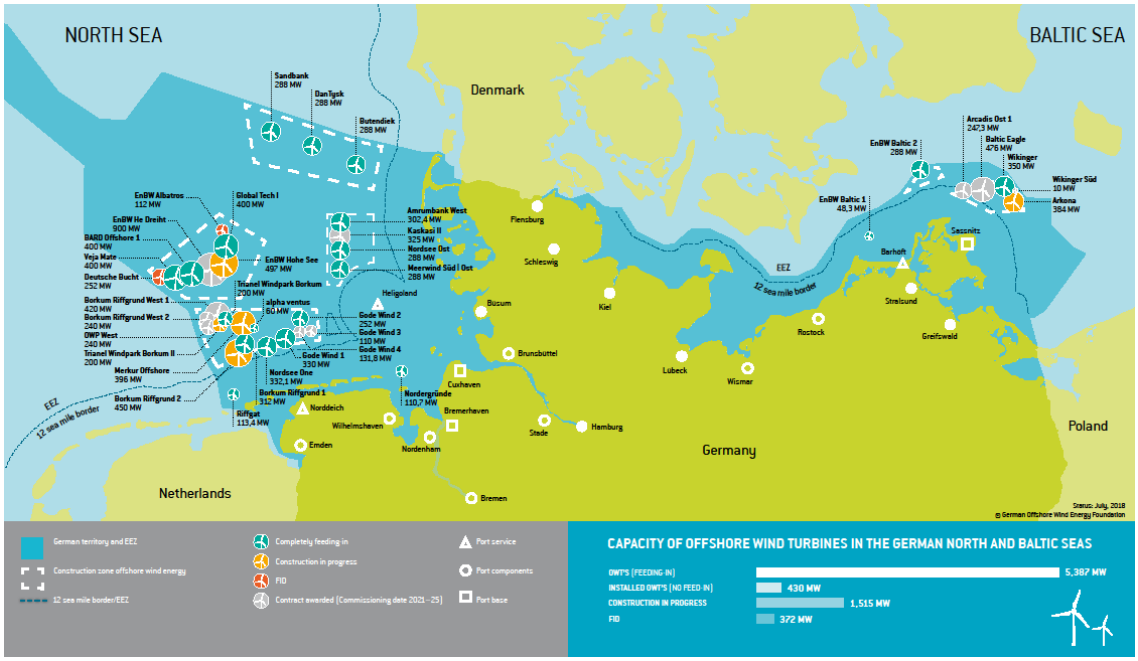

Figure 2. Overview of offshore wind capacity in German waters.
Source: Stiftung OFFSHORE-WINDENERGIE (2018)

The denominations, capacity and year of coming into service of OWF in German waters are listed in the following (table 1):

	Capacity (MW)	Commissioning year
Baltic Sea		
Wikinger	350	2017
Baltic 2	288	2015
Baltic 1	48	2011
North Sea		
Nordsee One	332	2017
Nordergründe	111	2017
Veja Mate	402	2017
Sandbank	288	2017
Gode Wind 2	252	2016
Gode Wind 1	330	2016
Amrumbank West a	302	2015
Riffgrund 1	312	2015
Butendiek	288	2015
Trianel Windpark Borkum	200	2015
Nordsee Ost	295	2015
Dan Tysk	288	2015
Global Tech 1	400	2015
Meerwind Süd / Ost	288	2014

Riffgat	113	2014
Bard Offshore 1	400	2013
Alpha Ventus	60	2010
Breitling	2.5	2006
Offshore Project Ems-Emden	4.5	2004

Table 1. Installed OWE capacity in German waters as of 2018.
Source: Offshore-Windindustrie.de (2018) / 4C Offshore

The following (table 2) shows projects under construction in the North and Baltic Sea as of 2018:

	Capacity (MW)	**Status**
Baltic Sea		
Arkona	385	Partial generation/ under construction
North Sea		
Merkur Offshore	396	Partial generation/ under construction
Hohe See	497	Under construction
OWP Albatros	112	Under construction
Borkum Riffgrund 2	450	Partial generation/ under construction
Trianel windpark Borkum II	200	Under construction
Deutsche Bucht	252	Under construction

Table 2. Planned projects in German waters as of 2018.
Source: Offshore-Windindustrie.de (2018) / 4C Offshore[19]

3. Stakeholders

In Germany, the growth of the OWE industry in recent years has been the result of the actions and interactions of an extensive array of actors and stakeholders, including federal ministries and agencies, *Länder* and municipal authorities, TSOs, manufacturers and suppliers, associations, and NGOs. The increased distribution of OWE contributes to the local economy around ports and is intended to create local jobs in the field of OWE operation and service. This market is expected to grow in the coming years as OWE becomes more important.

Furthermore, the coastal offshore wind industry is also linked to other regions and therefore also has a national economic impact. OWE manufacturers based in the northern states are linked directly to supplier industries in states such as North Rhine-Westphalia and Baden-Württemberg. Industrial research regarding wind energy is conducted in research institutions and companies all over Germany.[20]

OWE supporters are usually those actors that benefit from OWE promotion through investments and business opportunities (OWE-related industries, North German states). These

[19] Offshore-Windindustrie, "Windparks in Deutschland", https://www.offshore-windindustrie.de/windparks/deutschland (accessed 27 October 2018).
[20] Offshore-Windindustrie, "Wirtschaft", http://www.offshore-windindustrie.de/wirtschaft (accessed 27 October 2018).

actors argue that OWE is a crucial element to guarantee supply security and insist that implementation costs will decrease in the course of OWE proliferation. The recent introduction of a tender mechanism for new OWE projects is considered a strategy to limit OWE-related costs.

3.1 Ministries

The **Federal Ministry of Economic Affairs and Energy** (*Bundesministerium für Wirtschaft und Energie* – BMWi) assumes lead responsibility for developing offshore wind energy and establishing the grid connection. The BMWi's favourable attitude toward OWE makes it a strategic partner in defining Germany's energy and climate protection policy. The BMWi has observed an increasing market concentration in OWF project development and operation. It has also noted that, at present, planning and developing OWF is a very time-consuming process.[21] Because of the slow expansion of onshore HV electricity grid infrastructure, it has scaled back offshore targets. Expansion of Baltic Sea OWE is preferable due to the bottleneck in grid infrastructure in Western Germany. The BMWi faces pressure from the Federal Audit Office (*Bundesrechnungshof* – BRH) to prevent a rise in energy costs related to OWF due – not least – to the RES surcharge ("*EEG-Umlage*")[22], the primary financing tool for renewable energies.[23] As a result, it supports research intended to lower the costs associated with OWF.[24]

The **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety** (*Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit* – BMU) conducts research on the environmental impact of OWE. While its view on OWF is generally positive, it is also interested in protecting maritime animals such as porpoises and birds. As a result, the BMU funds projects intended to reduce the impact of OWFs on the environment during construction (e.g., noise protection)[25] and operation (e.g., avoiding bird strikes). The BMU also released a position paper in 2009 appealing for more areas banning wind farms to protect maritime habitats.[26]

The **Federal Ministry of Transport and Digital Infrastructure** (*Bundesministerium für Verkehr und digitale Infrastruktur* – BMVI) considers OWF vital to a successful energy transition. The Ministry has authority over offshore installations regulations (*Seeanlagenrecht*) and spatial planning. It also emphasises that developing and operating OWFs requires regulations to ensure the feasibility and safety of maritime traffic and raw materials extraction;

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[21] Offshore-Windindustrie, "Wirtschaft", http://www.offshore-windindustrie.de/wirtschaft (accessed 27 October 2018).

[22] The mechanism of the EEG surcharge is explained below in part 6.4.2."RES Remuneration".

[23] Andreas Mihm, "Bundesrechnungshof kritisiert undurchsichtige Energiewende", Frankurter Allgemeine, 12 January 2017, http://www.faz.net/aktuell/wirtschaft/energiepolitik/ruege-fuer-sigmar-gabriel-14621838.html (accessed 27 October 2018).

[24] Federal Gazette, BMWi, *Bekanntmachung Forschungsförderung im 6. Energieforschungsprogramm "Forschung für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung"*, 8 December 2014, p. 2, available at https://www.bmwi.de/Redaktion/DE/Downloads/B/bekanntmachung-forschungsfoerderung-im-6-energieforschungsprogramm.pdf?__blob=publicationFile&v=3 (accessed 27 October 2018).

[25] BMU, "Offshore-Windenergie: natur- und umweltverträglicher Ausbau ist möglich", 30 October 2013, http://www.bmub.bund.de/pressemitteilung/offshore-windenergie-natur-und-umweltvertraeglicher-ausbau-ist-moeglich/ (accessed 27 October 2018).

[26] BMU (2009), *Positionspapier des Geschäftsbereichs des Bundesumweltministeriums zur kumulativen Bewertung des Seetaucherhabitatverlusts durch Offshore-Windparks in der deutschen AWZ der Nord- und Ostsee als Grundlage für eine Übereinkunft des BfN mit dem BSH*, available at http://www.bmub.bund.de/fileadmin/Daten_BMU/Download_PDF/Artenschutz/seetaucher_positionspapier_bf.pdf (accessed 27 October 2018).

defense and environmental protection must also be considered. In 2014, it issued the "Offshore Wind Energy Security Framework" (OWE-SRK) addressing these issues.[27]

3.2 Agencies and public authorities

The **Federal Network Agency** (*Bundesnetzagentur* – BNetzA) is a subordinate authority of the BMWi and the German national regulatory authority (NRA). Among other tasks, it oversees grid planning and OWF connection to the grid, including the necessary public consultations. The BNetzA fulfils the roles delegated to NRAs by the EU network codes. For example, it approves proposals of the TSOs concerning the generation and load data provision methodology, the regional design for long-term transmission rights and the nomination rules for electricity exchange schedules between bidding zones pursuant to the EU **FCA** network code.[28] As required by Art. 4 of the **CACM** network code[29], the BNetzA, with the participation of the German TSOs, nominated several operators as NEMOs in 2016, for example EPEX Spot, Nord Pool and EXAA.[30] The BNetzA further identified power-generating modules to be classified as an emerging technology pursuant to the requirements of the **RfG** network code[31] in a decision of 28 July 2017[32], and implemented the requirements of art. 78 **HVDC**[33] with a decision of 16 June 2017.[34]

The **Federal Maritime and Hydrographic Agency** (*Bundesamt für Seeschifffahrt und Hydrographie* – BSH) is a subordinate authority of BMVI. Before the 2017 reform and coming into force of the WindSeeG, it was responsible for the approval of OWFs and their connections, for monitoring their operation and for spatial planning in the EEZ. With the new WindSeeG, the responsibilities of the BSH include the planning potential sites for OWF development in the EEZ.[35]

The **Federal Agency for Nature Conservation** (*Bundesamt für Naturschutz* – BfN) is subordinated to the BMU. It is responsible for maritime nature conservation and provides technical and scientific advice on all aspects of nature and landscape conservation as well as on international cooperation. It also takes part in maritime spatial planning in the EEZ with the

[27] BMWi, *Offshore-Windenergie*, available at http://www.bmvi.de/SharedDocs/DE/Artikel/WS/offshore-windenergie.html (accessed 27 October 2018).

[28] Art. 4 of the Regulation 2016/1719 of the European Commission establishing a guideline on forward capacity allocation, OJ L 259, 27.9.2016, p. 42–68.

[29] Regulation 2015/1222 of the European Commission establishing the guidelines on capacity allocation and congestion management, OJ L 197, 25.7.2015, p. 24–72.

[30] BNetzA, Decision number BK6-15-044-N2 of 11 June 2016, available at https://www.bundesnetzagentur.de/DE/Service-Funktionen/Beschlusskammern/1BK-Geschaeftszeichen-Datenbank/BK6-GZ/2015/2015_0001bis0999/BK6-15-044-N1_und_N2/BK6-15-044-N2_Beschluss_vom_11_01_2016.pdf?__blob=publicationFile&v=1.

[31] Regulation 2016/631 of European Commission establishing a network code on requirements for grid connection of generators, OJ L 112, 27.4.2016, p. 1–68.

[32] BNetzA, Decision number BK6-16-139 of 28 July 2017.

[33] Regulation 2016/1447 of European Commission establishing a network code on requirement for grid connection of high voltage direct current systems and direct current-connected power park modules, OJ L 241, 8.9.2016, p. 1–65.

[34] BNetzA, *Kriterien für die Gewährung von Freistellungen von. Netzanschlussbedingungen für Stromerzeuger of 10 February 2017*, available at https://www.bundesnetzagentur.de/DE/Service-Funktionen/Beschlusskammern/1BK-Geschaeftszeichen-Datenbank/BK6-GZ/2016/2016_0001bis0999/BK6-16-259/BK6-16-259_Verwaltungsvorschrift.pdf?__blob=publicationFile&v=2 (accessed 27 October 2018).

[35] Sec. 6 WindSeeG.

BSH.[36]

The **Federal Environment Agency** (*Umweltbundesamt* – UBA), an authority subordinate to the BMU, provides guidelines for the performing of environmental assessments.[37]

3.3 Regional level

3.3.1 Energy policy of the Länder

Since Germany is a federal state, the states (*Länder*) develop their own energy policy. For example, the states of **Lower Saxony** and **Mecklenburg-Western Pomerania** demand faster grid expansion to improve the transmission of (O)WE from the North to the South of Germany.[38] Because the construction of offshore wind projects is currently tedious, these *Länder* advocate a stronger role for the Federal Government in grid planning and development.

In May 2016, **Mecklenburg-Western Pomerania** enacted a revised **spatial development plans** ("*Landesentwicklungspläne*" – LEP). which limits the total maritime area available for OWF within the 12-mile zone to 185 km^2.[39] The LEP considers economic interests as well as the need for nature conservation. With only one North Sea port (Brunsbüttel) able to accommodate OWE projects, **Schleswig-Holstein** is focusing on the production of onshore wind energy. The state government has emphasised the fact that onshore wind energy is the cheapest renewable energy. Schleswig-Holstein has not initiated a planning approval procedure (*Planfeststellungsverfahren*) for any offshore grid connection other than the Nordlink Interconnector.

3.3.2 Regional and local governments

The German territorial seas fall under the jurisdiction of the *Länder*. As a result, the energy ministries of the Länder will be competent for tasks such as spatial and maritime planning.

Municipalities are rarely involved in OWE issues, unless they are involved in the planning process for grid projects that run through their area or have OWE-related industries or ports used in the construction or maintenance of OWE operations (e.g., the cities of Bremen/Bremerhaven, Hamburg, Cuxhaven, Rostock, Brunsbüttel and Kiel). Municipalities can be.

3.3.3 Local administrative authorities

Länder authorities are responsible for the approval procedures for offshore infrastructure in their territorial waters. Within this territory, the competences of the authorities are similar to those of the BSH. The relevant regulations include federal laws and local regulations

[36] Sec. 6 par. 7 WindSeeG.

[37] UBA, "Umweltprüfungen", 17 April 2018, https://www.umweltbundesamt.de/themen/nachhaltigkeit-strategien-internationales/umweltpruefungen#textpart-3 (accessed 27 November 2018).

[38] Ministerium für Energie, Infrastruktur und Landesentwicklung (2014), "Pegel: NEP-Entwurf ist deutliches Signal", https://www.regierung-mv.de/Landesregierung/em/Aktuell/?id=86119&processor=processor.sa.pressemitteilung (accessed 27 October 2018).

[39] IWR, "Mecklenburg-Vorpommern: 185 Quadratkilometer Fläche für Offshore-Windenergie", 27 May 2016, http://www.iwr.de/news.php?id=31341 (accessed 27 October 2018).

(e.g., those referring to spatial planning, building requirements and nature protection).

For example, in **Lower Saxony**, the State Trade Supervisory Office Oldenburg (*Staatliches Gewerbeaufsichtsamt Oldenburg* – GAA Ol) is competent for the authorisation of the wind farms Nordergründe and Riffgat. In **Schleswig-Holstein**, the authorisation for the offshore wind project GEOFReE was given by the State Agency for the Environment (*Staatliches Umweltamt* – StUA) in Kiel.

A local differentiation for the competence of local administrative authorities may also be encountered. For example in **Mecklenburg-Western Pomerania**, there are in total four State Agencies for Agriculture and the Environment (*Staatliche Ämter für Landwirtschaft und Umwelt* – StALU) which are part of the *Länder* Ministry for Agriculture and Environment. The Western Pomeranian StALU was competent for authorising the OWF Baltic 1 and Arcadis Ost 1.

3.4 Network operators (TSOs)

In Germany, four different TSOs are responsible for operating and maintaining a stable, reliable and efficient power supply network, for the construction, maintenance and operation of the relevant infrastructure, and for the connection of OWFs. The framework for long-term (offshore) grid planning is laid out in the Federal Offshore Grid Plan and the Offshore Network Development Plan, and from 2026 in the Land Development Plan. The TSOs responsible for coastal areas around the Baltic Sea are TenneT and 50Hertz.

50Hertz Transmission, headquartered in Berlin, operates the high-voltage grid in Eastern Germany and Hamburg. Formerly owned by Vattenfall, 50Hertz was acquired by Elia System Operator, a Belgian TSO, and Industry Funds Management (Australia) in 2010.[40] 50Hertz manages the onshore grid connection of all current German Baltic Sea OWFs and planned projects. 50Hertz is a partner in Kontek, a 600 MW HVDC Interconnector connecting the German and Danish grids.[41] Planned for 2026 is the Hansa Power Bridge, an HVDC connection between Germany and Sweden of ca. 700 MW.[42] Furthermore, 50Hertz has spoken for the development of OWF in the Baltic Sea, as it welcomed tenders for OWFs pursuant to the new WindSeeG and argued in favour of a balanced regional distribution of OWE between the North and Baltic seas.[43] It also recommended that, beginning in 2025, tenders should be introduced for OWE-projects in the territorial sea zone in order to ensure the steady expansion of OWE in the BSR.

TenneT TSO GmbH operated the grid in the German North Sea costal area. It belongs to Tennet, a limited liability company (BV) owned by the Dutch government and the national TSO of the Netherlands. TenneT is the partial owner of several interconnectors such as the Baltic Cable which connects the German and the Swedish grids.[44] TenneT is also

[40] 50Hertz, "Unternehmensstruktur", https://www.50hertz.com/de/Unternehmen/Struktur (accessed 27 October 2018).

[41] ABB, "Kontek", https://new.abb.com/systems/hvdc/references/kontek (accessed 27 October 2018).

[42] 50Hertz, "Hansa PowerBridge", https://www.50hertz.com/en/Grid-Extension/Offshore-projects/Projects/Hansa-PowerBridge (accessed 27 October 2018).

[43] 50Hertz, "50Hertz fordert Verstetigung des Offshore-Ausbaus in der Ostsee", 29 April 2016, https://www.50hertz.com/de/News/Detail/id/1204/50hertz-fordert-verstetigung-des-offshore-ausbaus-in-der-ostsee (accessed 27 October 2018).

[44] Tennet, https://www.tennet.eu/fileadmin/user_upload/Company/Publications/Gridmaps/ENG/Gridmap_Germany_ENG.pdf (accessed 27 October 2018).

participating in new grid projects such as the NORD.LINK, a bi-pole, high voltage, HVDC interconnector with a capacity of 1.4 GW connecting the German and Norwegian grids from 2020.[45] The company manages the grid connection of all current German North Sea OWFs and planned projects.[46] In 2016, TenneT also proposed the creation of an artificial island in the Dutch North Sea. The island would serve as a permanent maintenance station and central grid hub for OWFs and their connection to surrounding countries.[47]

3.5 Associations

The **Stiftung OFFSHORE-WINDENERGIE (SOW)** is a political foundation that is a joint initiative of the BMU, coastal states, and representatives of the OWE industry (e.g., energy suppliers and insurance and engineering companies). SOW supports the expansion of wind energy and successfully advocated a policy introducing an energy consumption surcharge to cover OWE-related risks (*Offshore-Haftungsumlage*). It has criticised the 2017 revision of the Renewable Energy Act for reducing the targets for OWE plant construction to 500 MW annually after 2020. SOW has stated that this policy will limit OWE cost-saving potential and hurt the German offshore industry.[48]

The Working Group on Offshore Wind Energy (Arbeitsgemeinschaft Offshore-Windenergie e.V.) evaluates current developments and analyses their future impact, such as the consequences for the expansion of OWE, the German economy and nature conservation.[49] Its members include DONG Energy, EnBW, E.ON, Iberdrola, RWE and Vattenfall.

The **Bundesverband WindEnergie e.V.** is a German energy industry association with over 20,000 members. The association demands reliable and long-term framework conditions for investments.[50]

The **Bundesverband Erneuerbare Energien e.V.** is the umbrella organisation for 30,000 member companies representing renewable energy associations and suppliers. It supports OWE and has criticised the revised Renewable Energy Act for reducing OWE construction targets and for negatively affecting small- and medium-sized renewable energy companies.[51]

The umbrella organisation for all big German industry associations, the **Bundesverband der Deutschen Industrie e.V.**, has not asserted an explicit position for or against OWE, but it has generally supported the German energy system transition (*Energiewende*). The BDI

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[45] TenneT, "NordLink", https://tennet.eu/our-grid/international-connections/nordlink/ (accessed 27 October 2018).

[46] Namely Alpha ventus, BorWin 1-3, DolWin 1-3, HelWin 1-2, Nordergründe, Riffgat and SylWin 1.

[47] TenneT, "North Sea Wind Power Hub", https://www.tennet.eu/our-key-tasks/innovations/north-sea-wind-power-hub/ (accessed 27 October 2018).

[48] Stiftung Offshore Windenergie, "EEG NOVELLE GEFÄHRDET WERTSCHÖPFUNG UND BESCHÄFTIGUNG IN DER OFFSHORE-WINDBRANCHE", https://www.offshore-stiftung.de/eeg-novelle-gef%c3%a4hrdet-wertsch%c3%b6pfung-und-besch%c3%a4ftigung-der-offshore-windbranche (accessed 14 August 2018).

[49] Bundesverband der Windparkbetreiber Offshore e.V., "Unsere Ziele; Gemeinsam für den Ausbau der Offshore-Windenergie", https://www.agow.eu/ziele.html (accessed 27 October 2018).

[50] Bundesverband WindEnergie, "Offshore: Windenergiegewinnung auf See", https://www.wind-energie.de/themen/offshore (accessed 27 November 2018).

[51] Bundesverband Erneuerbare Energie e.V. (2016), *Bilanz zum EEG 2017; Deutliche Drosselung der Energiewende, leichte Verbesserungen im Detail*, 19 August 2017, available at http://www.bee-ev.de/fileadmin/Publikationen/Positionspapiere_Stellungnahmen/20160819_BEE-Kurzbewertung_EEG_2017_web.pdf (accessed 27 October 2018).

sees business opportunities for German companies, especially in the field of engineering and technology, but fears rising energy costs as a consequence of RE promotion. It has demanded limitations on RE-related surcharges or exceptions for industries relying heavily on electric energy. This position is supported by major trade unions representing employers (BDA) and heavy industries (IG BCE, IG Metall).[52]

The **Network Technology/Network Operations Forum** (*Forum Netztechnik/Netzbetrieb im VDE*) is a working group within the **Association of Electrical Engineering, Electronics and Information Technology** (*Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.*) that addresses technical and policy-related issues related to grid development. It develops technical instructions for the safe and reliable operation of transmission and distribution networks, including for the grid connection of OWE.

The **Verband Deutscher Maschinen- und Anlagenbau e.V./Fachverband Power Systems** is an association of the German engineering industry with over 3,100 member companies. It advocates instituting a four-year transition period for the tendering process and has argued that, in order to provide security in the planning process and legal certainty for established projects, the tender design should allow for reasonable compensation in the event that building permits for OWE plants are withdrawn. It supports implementing the Offshore Network Development Plan as early as possible, with amendments to Renewable Energy Act legislation as needed. The Power Systems Association, an industry network within the VDMA representing energy technology manufacturers, fears that low expansion targets will weaken Germany's offshore industry and reduce cost-saving effects.[53] The VDMA calls for reliable OWE expansion targets and rejects the coupling of onshore and offshore expansion targets.[54]

The **Wirtschaftsverband Windkraft e.V.**, founded in 1996, is an association of 100 member companies aiming to foster a positive legal and economic climate for wind energy.

3.6 Environmental organisations

The **Bund für Umwelt und Naturschutz Deutschland e.V.** is an independent NGO promoting climate and environmental protection and the German branch of Friends of the Earth. Although it recognises OWE as a necessary component of the German energy supply, it works to prevent OWE projects from jeopardising environmental protection. The BUND has called for measures to reduce noise (e.g., ending pile driving of foundations) and improve security in navigation (e.g., better radar surveillance, improved buoyage for busy shipping routes, and guaranteed emergency towing capacity). It advocates the continuation of research on the long-term effects of OWE. In particular, the BUND supports research on the impact of OWE on birds' migratory patterns, as the findings from this research are vital to a determination of the OWE downtimes that best preserve these patterns. The BUND opposes further expansion of areas for OWE, in particular so that nature reserves can remain

[52] Bundesverband der Deutschen Industrie e.V., "Steigende Stromkosten: Herausforderung für die Industrie", http://bdi.eu/artikel/news/steigende-stromkosten-herausforderung-fuer-die-industrie/ (accessed 27 October 2018).

[53] Verband Deutscher Maschinen- und Anlagenbau e.V., "Windindustriestandort gerät in schwere See", http://wind.vdma.org/article/-/articleview/14268637 (accessed 27 October 2018).

[54] Verband Deutscher Maschinen- und Anlagenbau e.V., "Wie erwartet sorgen Nachholeffekte für Rekord bei Offshore-Wind", http://wind.vdma.org/article/-/articleview/11601355 (accessed 27 October 2018).

untouched.[55]

Greenpeace, an international organisation promoting climate and environmental protection, has a large branch in Germany. It regards OWE as a necessary component of the German energy mix but opposes any threat to environmental protection as a result of OWE projects. Its positions on OWE are similar to those of the BUND. Greenpeace also advocates the construction of an integrated offshore grid for the North Sea in order to equalise regional differences in power generation.[56]

Like Greenpeace, the **World Wildlife Fund** (WWF) is an international organisation for environmental protection, especially wildlife conservation, and has a large branch in Germany. The WWF perceives OWE as a necessary component of the German energy supply but calls for the implementation of high environmental standards for OWE projects. Its specific demands include among other issues the protection of the integrity of conservation areas, the consideration of bird routes in OWF planning to reduce strikes, noise protection for maritime mammals, navigation security and minimised environmental impact of grid works. For example, WWF advocates specifically for the construction of no more than two cables through the Wadden Sea in the German North Sea.[57]

The perspective on OWE adopted by many environmental protection NGOs is largely shared by the **Naturschutzbund Deutschland**, a German NGO promoting environmental protection. The NABU advocates limiting the cumulative environmental effects of OWE projects and evaluating the overall scope of OWE. It once filed a lawsuit against an OWE project on environmental grounds.[58] With regard to new OWE projects, the Naturschutzbund Deutschland calls for new cable trays to be bundled and placed outside the Wadden Sea, with cables laid in ways that ensure the smallest impact and shortest construction time. It also demands the use of alternative methods in constructing foundations and the implementation of compulsory sound-minimising measures. Finally, it supports the advancement of research on OWE impacts in accordance with uniform standards.[59] The Naturschutzbund Deutschland demands that no new offshore wind projects will be developed in the German Baltic Sea.[60]

4. Legal and regulatory framework

The main relevant legal fields for offshore wind generation and transmission are energy and environmental law. These legal fields in Germany combines norms serving the

[55] Bund für Umwelt und Naturschutz Deutschland e.V., "Energiewende beschleunigen, nicht ausbremsen!", http://www.bund.net/themen_und_projekte/klima_und_energie/energiewende/erneuerbare_energien/windenergie/offshore_windenergie/ (accessed 27 October 2018).

[56] Norddeutscher Rundfunk, "Offshore Windparks; auch mal im Gegenwind", 29 October 2018, http://www.ndr.de/nachrichten/dossiers/windkraft/Die-deutschen-Offshore-Windkraftanlagen,offshore680.html (accessed 27 October 2018).

[57] WWF (2015), *Offshore-Windenergie; den Ausbau naurverträglich gestalten*, available at https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/WWF-Standpunkt-Windenergie-Offshore.pdf (accessed 27 October 2018).

[58] Naturschutzbund Deutschland, "Streit um Butendiek geht in die nächste Runde; Leidtragende sind Schweinswale, Pracht und Seetaucher", 22 September 2015, https://www.nabu.de/news/2015/09/19525.html (accessed 27 October 2018).

[59] Naturschutzbund Deutschland (2013), *Strom vom Meer ins Netz; Naturverträgliche Netzanbindung von Offshore-Windkraftanlagen*, available at https://www.nabu.de/imperia/md/content/nabude/energie/150416-nabu-leitfaden-offshore-netzanbindung.pdf (accessed 27 October 2018).

[60] Naturschutzbund Deutschland (2016*), Naturverträgliche Nutzung der Windenergie an Land und auf See*, available at https://www.nabu.de/imperia/md/content/nabude/energie/wind/170320__positionspapier_naturvertraegliche_nutzung_windenergie.pdf (accessed 27 October 2018).

implementation of international and EU law obligations, and legal framework of the country's own initiative. The following describes the main legal instruments relevant to German energy and environmental law and their relation to the international and EU legal framework.

4.1 Constitutional law

On constitutional level, the obligation of the German state to protect the environment appears in Art. 20a of the German Basic Law[61], which states that:

> "*Mindful also of its responsibility toward future generations, the state shall protect the natural foundations of life and animals by legislation and, in accordance with law and justice, by executive and judicial action, all within the framework of the constitutional order.*"

Addressees of this obligation are all three branches of power: the legislative, the executive and the judicative. This protection obligation can be understood as an expression of the **precaution principle**[62], as it requires from the state a proactive protection of environmental concerns.

4.2 Acts and Regulations

4.2.1 Federal law

4.2.1.1 Energy law

The main legal instrument for energy law in Germany, the **Energy Industry Act** (*Energiewirtschaftsgesetz* – EnWG)[63], defines – among many other elements – the rules for the grid connection and operation of power plants and serves as legal basis for many concretising energy law regulations.

The primary legal instrument for renewable energy law is the **Renewable Energy Act** (*Erneuerbare-Energien-Gesetz* – EEG)[64], which has been revised several times since its initial adoption in 2000. The Act plays a key role in the promotion of renewable energy, notably by providing subsidies and the priority dispatch of electricity from RES-E. The EEG also introduced regional target corridors for the further development of wind energy that limit construction of new wind energy plants in grid bottleneck areas such as Northern Germany.[65]

Lex specialis to the EEG, the WindSeeG entered into force in 2017 and aims to contribute to the development of OWE in the interests of climate and environment protection.[66] It sets the target to augment installed capacity of OWE to total 15 GW until 2030, starting 2021.[67] Numerous provisions of the Act refer to the RES Act. The WindSeeG sets rules for maritime

[61] German Basic Law, last modified 13 July 2017 (BGBl. I p. 2347).

[62] Landmann/Rohmer, Umweltrecht 83. EL Mai 2017, Rn. 62.

[63] Energy Industry Act of 7 July 2005 (BGBl. I p. 1970, 3621), last modified 20 July 2017 (BGBl. I p. 2808, 2018 I 472).

[64] Renewable Energy Act of 21 July 2014 (BGBl. I p. 1066), last modified 17 July 2017 (BGBl. I p. 2532).

[65] Sec. 36c EEG.

[66] Sec. 1 WindSeeG.

[67] Sec. 2 WindSeeG.

spatial planning (MSP) for the period 2026–2030 in the EEZ, for OWE capacity tendering[68] and for the conduction of permitting procedures for the grid and OWE, referring to the Administrative Procedure Act.[69] The WindSeeG replaces the **Marine Facilities Regulation** (*Seeanlagenverordnung* – SeeAnlV), which used to specify the permit procedure for marine facilities, including OWFs and grid connections.[70] Transitional provisions in the WindSeeG specify the respective scope of application of the two provisions.

4.2.1.2 Grid planning

The **Federal Requirements Plan Act** (*Bundesbedarfsplangesetz* – BBPlG)[71] implements the **Federal Requirements Plan**, which becomes legally binding and determines the demand for a transmission grid necessary to the power plants, listed in its Annex, which are necessary for the energy supply and for which an urgent need for transmission lines is assessed. The Federal Requirements Plan is drafted by the BNetzA on the basis of the TSOs' network development plans[72], then passed as an Act of Parliament.[73] A relevant connection listed in the Act is the **Kriegers Flak Combined Grid Solution**, connecting two OWFs: the Danish Kriegers Flak, which is yet to be built, and the German Baltic 2 OWF.

The **Grid Expansion Acceleration Act (NABEG)**[74] serves the purpose to hasten the development of interregional and international high-voltage transmission lines. It aims to achieve a legally certain, transparent, efficient and sustainable expansion of the transmission grid and provides, among other, regulation for the federal spatial planning of routes for the electricity grid. The Act applies in particular in the case of transmission links between OWF transformer substations and onshore grid connection points.

4.2.1.3 Grid operation rules

Germany's legal framework for grid operation is largely based on Regulations which find their legal basis in the EnWG, as well as on the EU network codes and their implementation.

The **Electricity Grid Access Regulation**[75] establishes rules for feed-in to, and consumption from, electricity grids.

The **Grid Incentive Regulation (ARegV)**[76] sets up ground rules for grid fees based on the current costs, the gradual separation of revenue and costs, efficiency guidelines, and the

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[68] Sec. 14 WindSeeG.

[69] Administrative Procedure Act of 23 January 2003 (BGBl. I p. 102), last modified by Article 11(2) of the Act of 18 July 2017 (BGBl. I p. 2745).

[70] Printed paper of the German Parliament (BT-Drucksache) 18/8860, p. 158.

[71] Federal Requirements Plan Act of 23 July 2013 (BGBl. I p. 2543; 2014 I p. 148, 271), last modified by Article 12 of the Act of 26 July 2016 (BGBl. I p. 1786).

[72] See below under 5.1.2 Offshore Network Development Plan.

[73] Sec. 12e par. 1 EnWG.

[74] Grid Expansion Acceleration Act of 28 July 2011 (BGBl. I p. 1690), last modified by Article 2(13) of the Act of 20 July 2017 (BGBl. I p. 2808).

[75] Electricity Grid Access Regulation of 25 July 2005 (BGBl. I p. 2243), last modified by Article 5 of the Act of 29 August 2016 (BGBl. I p. 2034).

[76] Grid Incentive Regulation of 29 October 2007 (BGBl. I p. 2529), last modified by Article 5 of the Act of 17 July 2017 (BGBl. I p. 2503).

calculation of legally defined costs.[77]

The **Grid Incentive Regulation**[78] predominantly describes the cost accounting rules and complements the ARegV. It determines the regulation of the electricity grid and specifies the principles and methods to develop the grid fees.[79]

The **Regulation on the Network Connection of Power Plants (KraftNAV)**[80] identifies the requirements that electricity generation facilities with a capacity of at least 100 MW must meet before they can be linked to electricity grids with a voltage of at least 110 kV.[81] In order to prevent a power shortage due to the nuclear power phase-out, electricity generation facilities must be connected to the grid as efficiently and equitably as possible.[82]

The **Protection of Transmission Networks Regulation**[83] specifies the security policies that operators must observe for critical infrastructure protection.

The **System Service Regulation**[84] aims to ensure the safety and stability of the electricity grids despite the fluctuating share of wind energy in the networks.[85]

The **Low Voltage Connection Regulation**[86] standardises the requirements for the network connection of low voltage lines.

4.2.1.4 Environmental law

The **Environmental Sustainability Assessment Act (UVPG)**[87] sets rules for the strategic environmental assessments (SEA) and environmental impact assessments (EIA).[88]

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[77] Hummeln in: Danner/Theobald, Energiepreisrecht B. Kommentar Einführung Anreizregulierungsverordnung Rn. 1, beck-online.

[78] Regulation on Grid Fees for Electricity of 25 July 2005 (BGBl. I p. 2225), last modified by Article 4 of the Act of 17 July 2017 (BGBl. I p. 2503).

[79] Danner/Theobald, Energiepreisrecht B. Kommentar B 2. Verordnung über die Entgelte für den Zugang zu Elektrizitätsversorgungsnetzen Stromnetzentgeltverordnung – StromNEV Einführung Rn. 1, beck-online.

[80] Regulation on the Network Connection of Power Plants of 26 June 2007 (BGBl. I p. 1187).

[81] BMWi (2017), *Overview of legislation governing Germany's energy supply system*, p.1, available at https://www.bmwi.de/Redaktion/EN/Publikationen/gesetzeskarte.pdf?__blob=publicationFile&v=9 (accessed 27 October 2018).

[82] 50Hertz, "Kraftwerks-Netzanschlussverordnung (KraftNAV)", https://www.50hertz.com/de/Anschluss-und-Zugang/Netzanschluss/Netzanschlussverfahren/KraftNAV (accessed 27 October 2016).

[83] Protection of Transmission Networks Regulation of 6 January 2012 (BGBl. I p. 69), last modified by Article 315 of the Regulation of 31 August 2015 (BGBl. I p. 1474).

[84] System Service Regulation of 3 July 2009 (BGBl. I p. 1734), last modified by Article 10 of the Act of 13 October 2016 (BGBl. I p. 2258).

[85] BMWi (2017), *Overview of legislation governing Germany's energy supply system*, p.1, available at https://www.bmwi.de/Redaktion/EN/Publikationen/gesetzeskarte.pdf?__blob=publicationFile&v=9 (accessed 27 October 2018).

[86] Low Voltage Connection Regulation of 1 November 2006 (BGBl. I p. 2477), last modified by Article 7 of the Act of 29 August 2016 (BGBl. I p. 2034).

[87] Environmental Sustainability Assessment Act of 24 February 2010 (BGBl. I p. 94), last modified by Article 2 of the Act of 8 September 2017 (BGBl. I p. 3370).

[88] For general English-speaking information about environmental assessments in Germany, see BMU, "General Information on Environ-mental Assessment EIA/SEA", http://www.bmu.de/en/topics/bildung-beteiligung/buergerbeteiligung/general-information/ (accessed 27 October 2018).

The **Federal Nature Conservation Act (BNatSchG)**[89] identifies legally binding regulations for nature and landscape conservation, including the preservation of animal habitats. Moreover, the possibility for environmental lawsuits through associations against project permits is provided by the **Act on Environmental Legal Remedies (UmwRG)** [90] and well as, in a subsidiary way, by sec. 64 BNatSchG.

The objective of the **Federal Emissions Control Act (BImSchG)**[91] is to protect the environment from harmful effects of emissions, such as damage to water, soil and air. Its provisions include licensing requirements for the operation of facilities and machines that may have hazardous environmental impacts. The Act is concretised by several Federal Emission Control Regulations, among which the 4th Federal Emissions Control Regulation (BIMSchV)[92] which provides for a list of all facilities requiring authorisation. Among them, OWFs with wind turbines higher than 50m are listed. Relevant is also the 26th Federal Emissions Control Regulation[93], which addresses the negative impacts of electric, magnetic, and electromagnetic fields on the environment. The Regulation was revised in 2015 to reflect current scientific standards.

4.2.1.5 Spatial and maritime spatial planning

The **Spatial Planning Act (ROG)**[94] sets the general principles and conditions of spatial planning. In conjunction with the **Spatial Planning Regulation (RoV)**[95], the Act states that the land use tolerability of the construction of overhead power lines with a nominal voltage of 110 kV and higher must be assessed by the competent regional administrative authority within a **regional planning procedure** (*Raumordnungsverfahren*).

At the federal level, the BMVI issues spatial plans for the German EEZ in form of regulations.[96] The Ministry issued in 2009 the **Regulation on spatial planning in the German EEZ in the Baltic Sea (AWZ Ostsee-ROV)**[97], which provides maritime spatial planning for this area.

4.2.2 Law of the *Länder*

Apart from the federal level, each *Land* has its own parliament with legislative powers and competences. They may therefore influence the proliferation of renewable energies through state-level regulations, including those on nature protection, spatial planning and building standards. The two *Länder* which have a coast on the Baltic Sea are **Schleswig-Holstein** and **Mecklenburg-Vorpommern**.

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[89] Federal Nature Conservation Act of 29 July 2009 (BGBl. I p. 2542), last modified by Article 1 of the Law of 15 September 2017 (BGBl. I p. 3434).

[90] Act on Environmental Legal Remedies of 23 August 2017 (BGBl. I p. 3290).

[91] Federal Emissions Control Act of 17 May 2013 (BGBl. I p. 1274), last modified by Article 3 of the Act of 18 July 2017 (BGBl. I p. 2771).

[92] Regulation on installations requiring a permit in the version of the publication of 31 May 2017 (BGBl. I S. 1440).

[93] Regulation on electromagnetic fields in the version of the publication of 14 August 2013 (BGBl. I S. 3266).

[94] Spatial Planning Act of 22 December 2008 (BGBl. I p. 2986), last modified by Article 2(15) of the Act of 20 July 2017 (BGBl. I p. 2808).

[95] Spatial Planning Regulation of 13 December 1990 (BGBl. I p. 2766), last modified by Article 5(35) of the Act of 24 February 2012 (BGBl. I p. 212).

[96] Sec. 17 par. 1 ROG.

[97] Regulation on spatial planning in the German EEZ in the Baltic Sea of 10 December 2009 (BGBl. I p. 3861).

4.3 International law

The following table 3 reviews the implementation in Germany of relevant international conventions.

Convention	**Implementation**
UNCLOS[98]	Germany implemented the Convention by adopting the Act implementing the Convention of the Law of the Sea 1982/1994.[99] It has furthermore implemented the concept of the EEZ by adopting legislation, such as the WindSeeG, that refer or apply exclusively to this zone.
Espoo Convention[100] ***Kyiv Protocol***[101]	These Conventions were implemented at EU level by the EIA and SEA Directives and in Germany by the passing of the UVPG, which sets rules for EIAs and SEAs.
Aarhus Convention[102]	The Convention was implemented through the adoption of the UmwRG as well as sec. 64 of the BNatSchG. Public participation requirements in SEAs and EIAs are implemented by the rules on public participation set in the UVPG.

Table 3. Implementation of relevant international conventions in Germany.
Source: IKEM (2018)

4.4 Transposition of EU legislation

Germany adapts national legislation to comply with the requirements set in EU Directives. The following table 4 sums up the transposition of the main relevant EU legislation into German law.

EU legal instrument	**Transposition into German law**
3rd energy package[103]	The provisions of the EU's 3rd Energy Package are mostly transposed through the above-mentioned national energy law norms, in particular the EnWG and the RES Act. In 2016, the EU issued a reasoned opinion to Germany to transpose

[98] United Nations Convention on the Law of the Sea, signed on 10 December 1982, entered into force on 16 November 1994.
[99] Implementing Act of the Convention on the Law of the Sea 1982/1994 of 6 June 1995 (BGBl. I p. 778), last modified by Article 550 of the Ordinance of 31 August 2015 (BGBl. I p. 1474).
[100] Convention on Environmental Impact Assessment in a Transboundary Context, signed in 1991, entered into force in 1997. The second amendment entered into force on 23 October 2017.
[101] Kyiv Protocol on Pollutant Release and Transfer Registers, entered into force on 8 October 2009.
[102] Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, adopted on 25 June 1998 in Aarhus (Århus).
[103] European Commission, "Market legislation", https://ec.europa.eu/energy/en/topics/markets-and-consumers/market-legislation (accessed 22 August 2018).

	the Electricity directive, which according to the EU Commission had not been fully implemented as regards provisions on unbundling, competences of the NRA and consumer protection.[104]
EIA Directive[105] ***SEA Directive***[106]	The Directives are transposed respectively by Chapters II and III of the UVPG setting rules for the performance of EIAs and SEAs.[107]
Public participation Directive[108]	The Directive is transposed by the UmwRG, which provides for an exception to the requirements of standing for legal remedies against administrative decisions.
MSP Directive[109]	Member States must establish MSPs with minimum requirements set by the Directive until March 2021 at the latest. Maritime spatial planning for the German EEZ and territorial seas is performed respectively at the federal and regional level pursuant to the ROG.

Table 4. Transposition of the EU legal framework into German law.

Source: IKEM (2018)

5. Transmission

The following provides elements on the regulatory framework relevant for the planning, construction and operation of the German transmission grids. These provisions are also relevant for interconnectors, as German law considers these to be part of the transmission grid.[110] Electricity interconnectors are legally defined as installations "*serving the connection of electricity grids*".[111]

[104] European Commission, April 2016: Internal energy market: Commission urges Germany to fully comply with the Third Energy Package, https://ec.europa.eu/energy/en/april-2016-internal-energy-market-commission-urges-germany-fully-comply-third-energy-package (accessed 27 October 2018).

[105] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, OJ L 26, 28.1.2012, p. 1–21.

[106] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the environmental impact assessment of certain plans and programmes on the environment, OJ L 197, 21 October 2001, p. 30–37.

[107] BMU, "General Information on Environmental Assessment EIA/SEA", http://www.bmu.de/en/topics/bildung-beteiligung/buergerbeteiligung/general-information/ (accessed 27 October 2018)

[108] Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC, OJ L 156, 25.6.2003, p. 17–25.

[109] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257, 28.8.2014, p. 135–145.

[110] Sec. 3 n° 32 EnWG.

[111] Sec. 3 n° 34 EnWG.

5.1 Grid planning

Grid operators have the task to ensure energy security, in particular through adapting the capacity of the electricity grid according to demand.[112] Adaptations of the grid infrastructure to new developments in the energy landscape, in particular grid expansion and enhancement, and connection of new power plants to the grid, require upstream grid planning at a more abstract level. The provisions of the EnWG identifies priorities and establishes requirements that, in turn, shape this general process of grid planning.

Due to Germany's federal structure, the grid planning process in Germany is quite complex (figure 4) and differentiates between the areas where grid developments are to be planned, namely in sovereign territory or in the EEZ. The main stakeholders involved in grid planning are the TSOs, the BNetzA and the BSH. Public participation is also ensured.

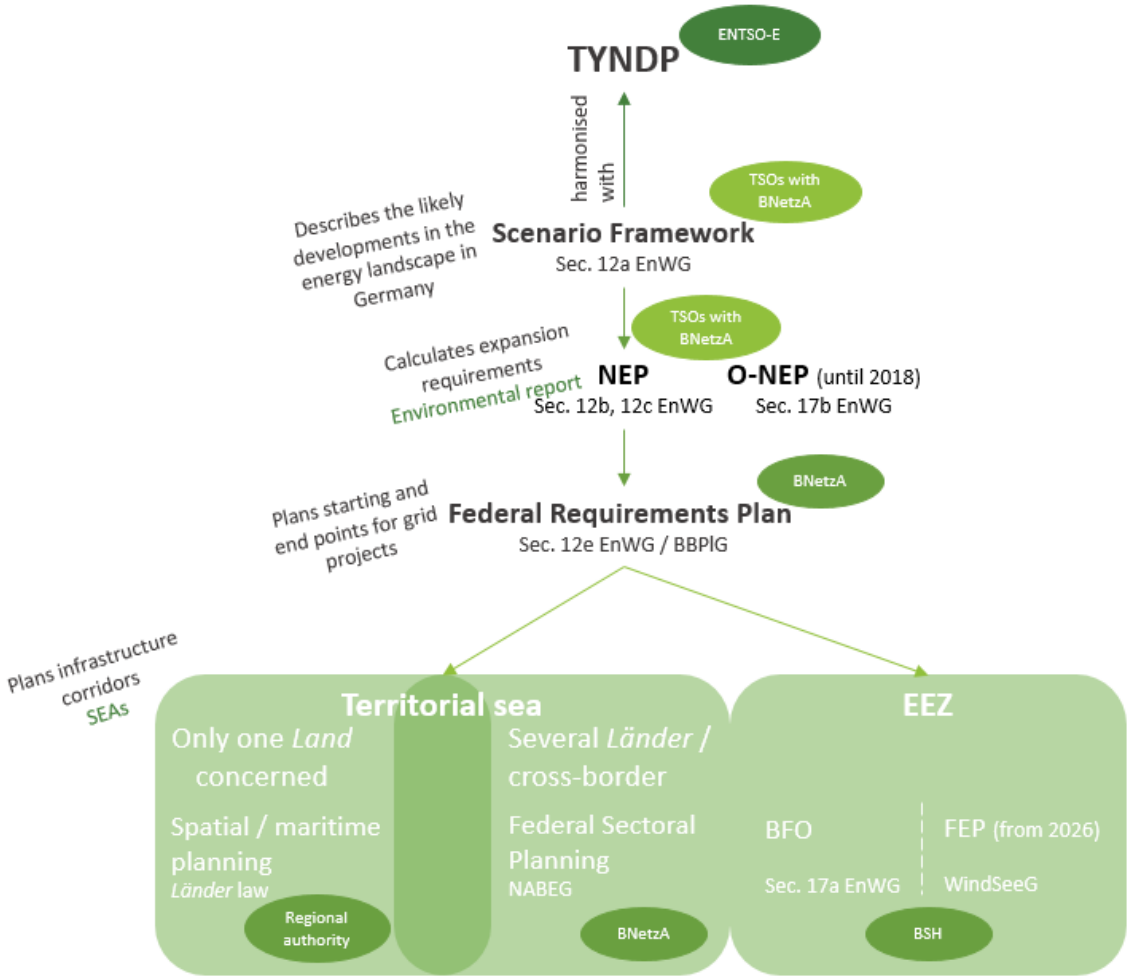

Figure 3. Regulatory framework for grid planning from 2026 in Germany.
Source: IKEM (2018), based on BNetzA[113]

[112] Sec. 12 par. 3 EnWG.

[113] BNetzA, "How it works: Grid expansion in five steps", https://www.netzausbau.de/EN/5steps/en.html (accessed 31 July 2018).

5.1.1 Scenario framework

The **Scenario framework** (*Szenariorahmen*) is a document issued every two years by the German TSOs and validated by the BNetzA.[114] It describes possible development scenarios for electricity generation, and provides rules for the connection of OWF in the North and Baltic Sea to the transmission grid. It serves as a basis for further grid planning. **Public participation** is ensured during the conception of the Scenario Framework, where the BNetzA gives the public, including actual and potential grid users, downstream network operators and public-interest bodies, the possibility to submit observations.[115]

5.1.2 Offshore Network Development Plan

The **Electricity Network Development Plan** (*Netzentwicklungsplan Strom* – NEP) and **Offshore Network Development Plan** (*Offshore-Netzentwicklungsplan* – O-NEP), based on the above-mentioned Scenario framework, are drafted by the four German TSOs and validated by the BNetzA.[116]

The O-NEP is meant as a common offshore network development plan for Germany's EEZ and coastal seas until – and comprising – the grid onshore contact point. It is drawn up on the basis of the NEP, the estimated future energy demand, the current location of grid connection points and the legal requirements of the EnWG. The TSOs submit the O-NEP draft to the BNetzA, which controls in cooperation with the BSH that the plan fulfils the requirements set by the EnWG.[117] They publish a first draft on their websites and give the public the possibility to express remarks, including actual and potential grid users, downstream network operators, public-interest bodies and the regulatory authorities of the *Länder*. The BNetzA can require from the TSOs that they modify their draft. At the end of the required public consultation, the BNetzA eventually confirms the O-NEP under "consideration" to the results of the public consultation. The decision of the BNetzA to confirm the O-NEP of the TSOs may not be legally challenged by the public according.[118]

For grid planning from 2026, the O-NEPs will partially be integrated into the NEPs and partly into the FEPs.[119] After 2018, the TSOs will thus not issue O-NEPs anymore. For the transition period after entry into force of the WindSeeG, the BNetzA may modify an already adopted O-NEP to take into account the results of the tendering procedure for OWE support.[120]

The current and last plan is the O-NEP 2030, which was presented by the four German TSOs and confirmed by the BNetzA at the end of the year 2017.[121] It is based on the Scenario Framework 2030 and provides a list of measures for optimisations and constructions in the transmission grid as well as in the connection points for OWF which as necessary in the eyes

[114] Sec. 12a EnWG.

[115] Sec. 12a, par. 2 (2) EnWG; BNetzA, "Wer kann mitreden?", http://www.netzausbau.de/mitreden/wer-kann-mitreden/de.html (accessed on 27 October 2018).

[116] Sec. 17b EnWG.

[117] Sec. 17b 17c par. 1 in conjunction with sec. 12c EnWG.

[118] Sec. 12c par. 4 (2) EnWG.

[119] Sec. 7 par. 2 WindSeeG.

[120] Sec. 17c par. 2 EnWG.

[121] BNetzA (2017), *Bedarfsermittlung 2017-2030 – Bestätigung Offshore-Netzentwicklungsplan*, available at https://www.netzentwicklungsplan.de/sites/default/files/paragraphs-files/O-NEP_2030_2017_Bestaetigung.pdf (accessed 27 October 2018).

of the TSOs for the achievement of the 2030 targets.[122] The BNetzA considers the construction of two extra connection points to accommodate offshore wind power produced in the Baltic Sea in addition to those of the O-NEP 2025.[123]

5.1.3 Federal Demand Plan

To concretise the needs identified in the above-mentioned NEP and O-NEP, the BNetzA drafts a Federal Requirements Plan ("*Bundesbedarfsplan*") which recognises concrete projects as "necessary" for grid expansion.[124] This plan sets **beginning and end points** for the necessary transmission sections.[125] It is then provided to the lawmaker, which enacts the BBPlG which Annex provides a list of concrete projects. The plan then becomes legally binding.

The list of projects set in the Annex may contain transmission lines between OWF transformer substations and onshore grid connection points.[126] The planning of interconnectors also falls under this scope; currently listed as necessary projects are the **Kriegers Flak Combined Grid Solution** connecting the Danish Kriegers Flak and the German Baltic 2 OWF, and the **NORD.LINK** connection between the *Land* of Schleswig-Holstein and Norway.[127]

5.1.4 Sectoral planning

Sectoral planning goes a step further than the above-mentioned planning stages; building on the set beginning and end points for grid development, concrete, up to 1,000m-wide corridors for the cables are now planned.[128]

5.1.4.1 In territorial seas (only one *Land* concerned)

Grid planning in sovereign territory encompasses the design of the grid onshore as well as within territorial seas. Due to the federal structure of the country, the planning in these areas falls within the competence of the *Länder*.[129] The planning of certain structures, for example of overhead electrical power lines with a voltage of 110 kV or more, necessitates a regional planning procedure involving public participation.[130]

5.1.4.2 In territorial seas (crossing several *Länder*)

The NABEG serves the purpose to hasten the development of interregional and international high-voltage transmission lines by means of **Federal Sectoral Planning**

[122] BNetzA, "Zieljahr 2030, Version 2019 (sechster Durchgang)", https://www.netzausbau.de/bedarfsermittlung/2030_2019/de.html (accessed 27 October 2018).
[123] Ibid.
[124] The legal basis for the Federal Requirements Plan is provided by sec. 12e EnWG.
[125] BNetzA, "Bundesfachplanung oder Raumordnungsverfahren?", https://www.netzausbau.de/5schritte/bundesfachplanung/de.html (accessed 14 August 2018).
[126] Sec. 2 par. 3 BBPlG; at the time of redaction, no OWF connection is listed in the Annex to the Act.
[127] N° 29 and 33 Annex to Sec. 1 par. 1 BBPlG.
[128] BNetzA, "Bundesfachplanung oder Raumordnungsverfahren?", https://www.netzausbau.de/5schritte/bundesfachplanung/de.html (accessed 14 August 2018).
[129] Sec. 13 ROG.
[130] Sec. 15 ROG in conjunction with sec. 1 n° 14 RoV.

("*Bundesfachplanung*"). It applies in particular in the case of transmission links between OWF transformer substations and onshore grid connection points in the territorial seas.[131]

5.1.4.3 In the EEZ

5.1.4.3.1 Until 2025: Federal Offshore Grid Plan

Every second year, the BSH issued a **Federal Offshore Grid Plan** (*Bundesfachplan Offshore* – BFO)[132], a maritime spatial plan laying the foundations for network planning and offshore grid connection for the German EEZ in the North and Baltic Sea. It is compiled by the BSH and the BNetzA in cooperation with the BfN and the coastal federal states. The BFO addresses such as potential locations for corridors for cables and positions for the platforms.

As regards the BSR, a BFO was issued for the last time for the years 2016-2017.[133] Due to a change of legislation, the aspects which used to be part of the BFO will be part of the FEP from 2026.

5.1.4.3.2 From 2026: Land Development Plan

The **Land Development Plan** (*Flächenentwicklungsplan* – FEP), also issued by the BSH, will provide sectoral planning for the German EEZ in both the North and Baltic Sea regions following the passing of the WindSeeG.[134] As such, it shall be the central planning instrument for time periods from 2025 for both the construction and connection to the grid of OWF in order to ensure better regulatory coordination.[135] Although sectoral planning in territorial waters – up to 12 nm – falls under the competence of the *Länder* due to Germany's federal organisation, the FEP may concern coastal areas as well on the condition that an administrative agreement between the federal level and its regional counterpart has been entered. The concrete goals of the FEP are to increase the installed capacity of OWF up to 15 GW until 2030, to assure a spatial development of electricity production in OWF which is well structured and is space-efficient as well as the planning and development of efficient offshore connections.

According to the WindSeeG, the FEP shall, for the period from 2026 until at least 2030, determine the relevant territories and areas where OWF may be built, the chronological order and framework in which these areas will be put up for tendering and the capacity which shall be installed respectively in these areas, as well as possible routes for the electricity grid and precise locations as to where the grid crosses the border between EEZ and territorial waters or between two countries.[136] The FEP must be conceived so that OWF with an expected installed capacity of 700-900 MW may be tendered each year by the BNetzA and put into operation from 2026. It must also observe spatial planning requirements and may not endanger the maritime environment.

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[131] Sec. 2 par. 5 NABEG.

[132] Sec. 17a EnWG.

[133] BSH (2017), *Federal offshore grid plan for the German exclusive economic zone in the Baltic Sea 2016/2017 and environmental report*, available at https://www.bsh.de/DE/PUBLIKATIONEN/_Anlagen/Downloads/Offshore/Bundesfachplan-Ostsee/Bundesfachplan-Offshore-Ostsee-2016-2017.pdf?__blob=publicationFile&v=15.

[134] Sec. 4 par. 1 (1) WindSeeG.

[135] Printed paper of the German Parliament (BT-Drucksache) 18/8860, p. 269.

[136] Sec. 5 par. 1 WindSeeG.

The BSH issues the FEP in agreement with the BNetzA and for this purpose consults the BfN, the General Direction for Waterways and Navigation (*Generaldirektion Wasserstraßen und Schifffahrt*) which belongs to the resort of the BMWi, and the coastal federal states. As mentioned above, the FEP will encompass the determinations from the BFO as well as those – partially – of the O-NEP. The first FEP – along with its environmental report (*Umweltbericht*) – is deemed to be released in 2019.[137]

5.1.5 Strategic environmental assessment

In Germany, the carrying out of a strategic environmental assessment (SEA) is regulated by the UVPG. It is not an independent administrative procedure; rather it is integrated in the adoption procedure of the plans and programmes listed in Annex 5 UVPG.[138] Concerned are for example the BFO and the FEP. The concrete procedure for SEAs is regulated in the UVPG as well as in other relevant norms.[139]

The competent administrative authority issues an **environmental report** (*Umweltbericht*) containing information about the provisional contents of the plan, details about the concerned areas as well as possibly raised environmental concerns.[140] It gives other public authorities, which environment-related field of activity might be affected by the plan, the opportunity to raise objections. Public participation is foreseen by the UVPG, so that the public may express opinions about the project. The involvement of recognised environmental associations is explicitly welcome by the law. After assessment of the environmental report and all raised objections and remarks, the competent authority adopts or not the plan and must explain how it took into account the SEA.

If a plan may have substantial environmental impacts in another country, the competent German authority will inform the competent authorities of that country and allow their participation to the SEA in the same way than national authorities. The participation of the public from the concerned country is ensured in the same way as the German public participation.

5.1.6 Public participation

Since the entry into force of the EnWG 2012, public participation plays an important role in the development of the transmission grid (figure 5).

[137] Stiftung Offshore Windenergie, "BSH veröffentlicht Vorentwurf des Flächenentwicklungsplans zur Offshore-Windpark- und Stromnetzplanung in Nord- und Ostsee", 25 May 2018, https://www.offshore-stiftung.de/bsh-ver%C3%B6ffentlicht-vorentwurf-des-fl%C3%A4chenentwicklungsplans-zur-offshore-windpark-und (accessed 27 November 2018).

[138] Sec. 33 UVPG.

[139] For example, authorities of the *Land* which territorial seas are concerned by the FEP must provide information which are needed for the SEA, Sec. 5 par. 3 (4) WindSeeG.

[140] Such an environmental report is also for example required for the issuance of a NEP, sec. 12c par. 2 EnWG, or a FEP, sec. 6 par. 4 WindSeeG.

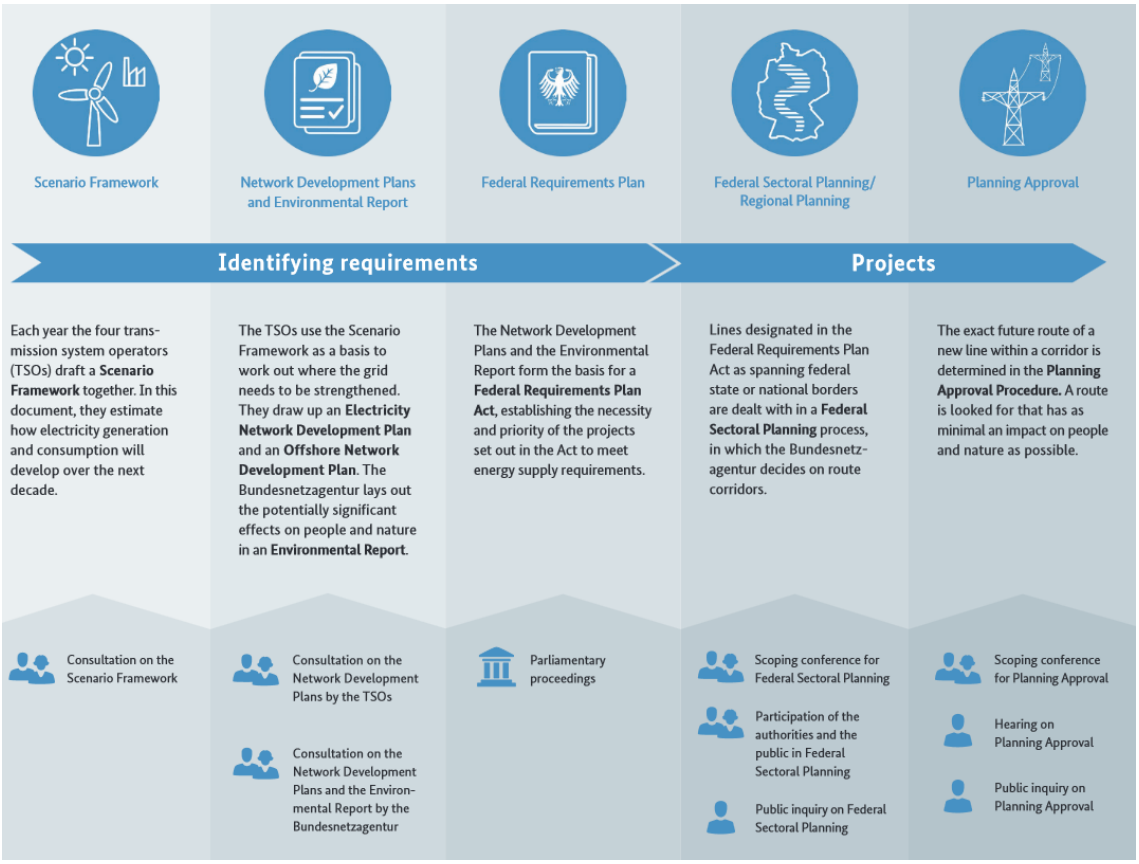

Figure 4. Public participation to grid expansion in Germany.
Source: BNetzA[141]

Public participation around the development of the electricity grid in Germany is encouraged by the "Dialogue of Citizens on the Electricity Grid" (*Bürgerdialog Stromnetz*), an initiative of the four German TSOs supported by the BMWi.[142] The initiative informs citizens on how they can participate in the public consultations around grid development, conducts conferences and workshops. An online platform for participation, mediation and information is set up, as are local offices for citizens in ten German cities.

5.2 Implementing the grid

5.2.1 Authorisation for cables

5.2.1.1 Authorisation for park-to-shore cables

Because of the federal constitutional organisation of Germany, authorisation procedures for offshore grid installations – and thus the competent administrative authority – depend on the location of the planned project. For areas within 12 nautical miles of the coast, the local *Länder* authorities have the competency for the approval of transmission grid

[141] BNetzA (2017), *Grid Expansion in Germany Public Participation*, available at https://www.netzausbau.de/SharedDocs/Downloads/EN/ParticipationFlyer.pdf?__blob=publicationFile (accessed 27 October 2018).
[142] Bürgerdialog-Stromnetz, "Wer wir sind", https://www.buergerdialog-stromnetz.de/initiative/wer-wir-sind/ (accessed 27 October 2018).

infrastructure. The BSH is responsible for approving OWFs and transmission grid infrastructure located within the EEZ. In Germany, the offshore wind facilities are usually set up in the EEZ because the territorial waters are subject to stricter nature protection laws due to coastal nature reserves.[143]

Because of the size and potential implications of offshore grid projects, these have to be the object of a planning approval procedure which is more complex than a mere authorisation procedure and allows for public participation.

5.2.1.1.1 In territorial seas within a Land

As mentioned above, the competency for authorisation in territorial waters belongs to the *Länder*. The building, operation and modification of high-voltage sea cables in territorial waters serving the purpose of the grid connection of OWF are subject to a planning approval procedure.[144] Even if federal law applies, regional public authorities are competent for the approval procedure. **Public participation** is foreseen by the law: the procedure must include a conference which is open to everyone, including the TSOs, environmental organisations and public interest stakeholders.[145]

5.2.1.1.2 In territorial seas with interregional / international character

The German legislator foresaw for the authorisation of sea cables in territorial seas with interregional – meaning with relation to several *Länder* – or international character are subject to a separate procedure pursuant to the NABEG. Though regional authorities are basically competent for projects within territorial seas, the Federal Government transferred this competence to the BNetzA.[146] The same procedural rules than for sea cables in territorial seas without interregional or international character applies with a few exceptions provided by the NABEG.[147] In particular, the Act foresees that a public conference is organised in which the project developers, environmental associations and public authorities can discuss the project.[148]

5.2.1.1.3 In the EEZ

The authorisation for grid installations serving the transmission of wind energy produced in the German EEZ is also subject to a **planning approval procedure**.[149] The previously applying SeeAnlV as well as the new WindSeeG both encompass the construction, operation and modification of installations in the German EEZ which serve the production and transmission of wind energy.[150] Hence, they apply to both power plants and the transmission grid, so that the approval procedure is the same as for OWFs.

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[143] Kuhbier Jörg, Prall Ursula, *Probleme bei der Planung und Genehmigung von Offshore-Windenergieanlagen*, p.386, available at http://www.vivis.de/phocadownload/Download/2010_is/2010_IS_385_398_Kuhbier.pdf. (accessed 27 October 2018).

[144] Sec. 43 par. 1 n° 3 EnWG.

[145] Sec. 43b par. 1 EnWG.

[146] Sec. 2 par. 2 NABEG in conjunction with the Regulation on the transfer of competence for the planning approval procedure of 23 July 2013 (BGBl. I p. 2582).

[147] Sec. 18 par. 3 (2) NABEG.

[148] Sec. 20 NABEG.

[149] For detailed information on the planning approval procedure, see below under 6.2.1.2.

[150] Sec. 1 par. 1 (1-2) SeeAnlV; sec. 2 par. 1 (3) WindSeeG.

The authorisation procedures and competences for laying transmission cables vary depending on whether the cables will be situated in territorial waters or in the EEZ. This complicates the authorisation process when an OWF is situated in the EEZ and the transmission cable must cross territorial seas on its way to the onshore connection point: in this case, several planning approval procedures must be performed.

5.2.1.1.4 Environmental impact assessment

Only high-voltage overhead power lines are subject to the obligation of an EIA, so that the assessment does not have to be carried out for see cables.[151]

5.2.1.2 Authorisation for interconnectors

The authorisation procedure for interconnector cables does not fall under the scope of application of the above-mentioned provisions. Instead, the laying of interconnectors in the German continental shelf requires an authorisation pursuant to sec. 33 of the Federal Mining Act.[152]

5.2.2 OWF connection

Under the new WindSeeG, the operator who won the tender procedure has a claim to be connected to the transmission grid.[153] The following sections describes the steps relevant to the realisation of the grid connection of OWFs.

5.2.2.1 Realisation of the connection

Before the construction works begins, the OWF operator and TSO enter a connection contract (*Netzanschlussvertrag*). This contract must contain a set of minimum provisions, among which the preparation of the connection capacity, limits of respective ownerships of the TSO and operator of the grid cables, technical specifications and their documentation, rights of access, disturbances and disruption of the connection, necessary requirements for the power plant, liability, running time of the plant and termination of the connection contract.[154] According to Sec. 17d par. 2 EnWG, the TSO must specify the date of construction completion to the OWF operator after the tendering procedure. Possible delays or deviations from the realisation timetable must be immediately reported by the TSO to both the plant operator and to BNetzA.

After the authorisation is granted, the project is supervised by the BSH.[155] Sec. 58 WindSeeG provides the legal framework for the dismantling of the transmission grid and related facilities.[156]

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[151] Sec. 1 par. 1 in conjunction with Annex 1 n° 19.1 UVPG.

[152] Federal Mining Act of 13 August 1980 (BGBl. I p. 1310), last modified by Article 2(4) of the Act of 20 July 2017 (BGBl. I p. 2808).

[153] Sec. 24 par. 1 n° 3 a) WindSeeG; for details on the tender procedure see below under 6.2.1.1.

[154] Sec. 4 par. 4 KraftNAV.

[155] Sec. 57 par. 1 (1) WindSeeG.

[156] These provisions also apply to the dismantling of generation facilities; see below paragraph 7.4.2.

5.2.2.2 Capacity allocation

Within the previous regulatory framework, operators of offshore wind parks could apply for capacity allocation at the BNetzA based on the O-NEP. Following the entry into force of the WindSeeG and its tendering procedure, the capacity allocated to an OWF is now determined by the results of the auction. The winner of the tender has a claim corresponding to the allocation of the successfully tendered capacity.[157]

5.2.2.3 Cost allocation

5.2.2.3.1 Cables connecting OWFs to the onshore grid connection point

Germany uses a shallow cost allocation model for onshore RES production, meaning that operators of RES-E production facilities carry the costs of connecting their facilities to the transmission grid.[158] An exemption to this principle applies however to OWFs, which connection cables – between transformer station and onshore grid connection point – are deemed part of the transmission grids.[159] As such, they are financed and constructed by the TSOs. Therefore, the cost allocation of OWF connection to the grid follows a **super-shallow** model.

5.2.2.3.2 Onshore grid reinforcement

Onshore grid reinforcement might also be necessary to transmit the future installed capacity. German grid operators have a legal obligation to optimise, reinforce and develop their networks in line with the connexion demands of RES-E producers.[160]

5.2.2.3.3 Financing of the connection

The TSOs can finance grid investment measures by passing on the costs to the grid users via their **grid tariffs**. To this purpose, they apply to the BNetzA for having the measure qualified as an "investment measure". This allows them to increase their allowed revenue cap accordingly, so that they may increase their grid tariffs to compensate the investment costs.[161] However, the costs of the mandatory insurance covering TSO liability towards OWF operators for grid stability measures are not considered part of these investment measures and may therefore not be passed on within the grid tariffs.[162]

Another potential source of financial support for grid investments is **research funding**. In the 6th Energy Research Program passed in 2015, the German government over € 860 million for research in the field of energy technology, with a focus on storage, grid construction and the integration of new technologies.[163]

Other funding comes from **loans** offered under favourable conditions. For example, the

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[157] Sec. 24 par. 3 b) WindSeeG.

[158] Sec. 8, sec. 16 par. 1 EEG.

[159] Sec. 2 par. 1 NABEG, sec. 12e EnWG.

[160] Sec. 12 par. 1 EEG.

[161] Sec. 23 par. 1 (2) n° 5 and sec. 11 par. 2 n° 6 ARegV.

[162] These costs may be passed on as an "offshore liability surcharge", see below under 5.3.3.

[163] BMWi, *Forschung für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung – Das 6. Energieforschungsprogramm der Bundesregierung*, available at https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/6-energieforschungsprogramm-der-bundesregierung.pdf?__blob=publicationFile&v=32 (accessed 27 October 2018).

European Investment Bank offered TenneT a loan of € 500 million in order to finance three OWF connection projects in the German North Sea, while the German public investment Bank KfW provided an investment of 25% of the NordLink interconnector – with TenneT owning the other 25% of the German part and the Norwegian TSO Statnett owning the Norwegian half of the cable.[164]

5.2.2.4 Liability for delayed connection

Other costs for the grid operators may arise from the compensation system as provided by the EnWG. The OWF operator is entitled to compensation for losses caused by the delayed connection of the installation if the responsible TSO misses the set connection deadline, on the condition that the OWF is ready for operation or at least the transformer station and the foundations are constructed.[165] The compensation may be claimed from the 11th day after expiration of the deadline and amounts to 90% of the payment that the OWF operator would have received if the grid were available minus 0.4 ct / kWh; this is calculated based on the average amount of power which a comparable installation would have fed into the grid during the duration of the missing connection.[166] Compensation for financial losses other than those mentioned in this provision may not be recovered.[167]

5.3 Operating the grid

5.3.1 Network stability measures

The EnWG establishes the measures that must be taken by the TSOs when the safety or reliability of the electricity supply in their respective control area is threatened or disturbed, legally defined as the "threat or occurrence of local failures or of short-term congestions of the transmission grid"; or when "the frequency, voltage or stability of the grid cannot be ensured properly by its operator".[168]

The implementation of these measures follows a chronological order which must be respected (figure 6). TSOs must in the first place take **grid-related measures**, which have effect only on the grid itself, in order to eliminate or to considerably reduce congestion, like switching interconnectors to change the flow of energy. On a second step, **market-related measures** follow, like redispatch or demand-side management; followed by the subsidiary use of net or capacity reserve.[169] If the implementation of the above-mentioned measures results are not sufficient to safeguard the security of supply or achieve it in timely manner, the TSOs then have the duty to intervene in order to adapt all power supplies, power transits and power take-offs in their control areas to the requirements of a safe and reliable operation.[170] Addressees of such measures, for example **curtailment** of power plants, must first be the operators of conventional plants, since the **prior dispatch of RES-E** must be guaranteed.[171] Therefore, OWE production will be curtailed only after conventional installations.

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[164] TenneT, "Weiterhin hohe Investitionen in Versorgungssicherheit und Energiewende", 8 March 2016, http://www.tennet.eu/de/news/news/tennet-weiterhin-hohe-investitionen-in-versorgungssicherheit-und-energiewende/ (accessed 27 October 2018).
[165] Sec. 17e par. 2 EnWG.
[166] Sec. 17e par. 1 EnWG.
[167] Sec. 17e par. 2 (3) EnWG.
[168] Sec. 13 par. 4 EnWG
[169] Sec. 13 par. 1 EnWG.
[170] Sec. 13 par. 2 EnWG.
[171] Sec. 14 par. 1 EEG.

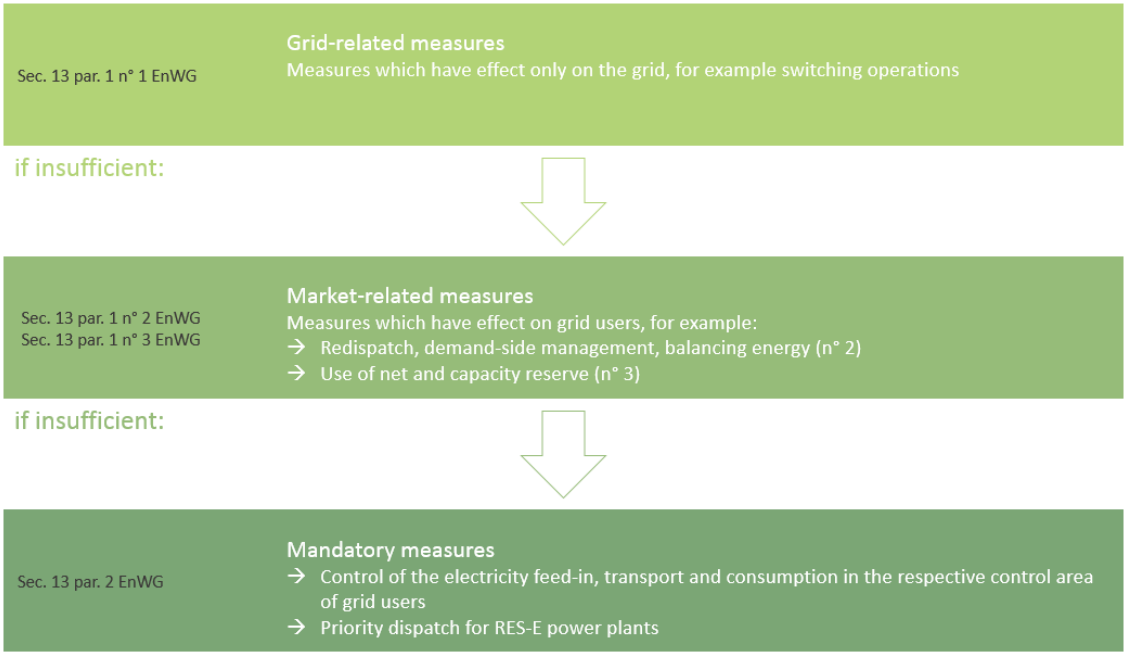

Figure 5. Hierarchy of the grid stability measures.
Source: IKEM (2018)

5.3.2 Liability

For **technical disturbances**, sec. 17e par. 1 (1) EnWG allows the OWF operator to claim compensation, which is based on the missed supply payment that the OWF operator would have received if the grid connection had been available.

The first ten days of the lack of connection are excluded from compensation unless it was intentional. The TSO is then responsible for satisfying the claim starting on the eleventh day of continuous disturbances or delays. Where there has been more than 18 days of interruption during a calendar year, operators are entitled to compensation immediately from the nineteenth calendar day.

The compensation claim must specify the wind conditions during the connection failure in order to calculate the due damages. Compensation is generally limited to 90 % of supply payments as set by the EEG.[172] If the connection failure over one-year results in a loss in expected revenue of more than 1%, the TSO must however provide full compensation. The liability of TSOs for any other loss of revenue due to grid disturbances is excluded.[173]

The right to a claim exists regardless of whether the grid operator was at fault for the technical disturbances or the missed deadline. However, if the connection default was deliberately produced, the grid operator must pay the entire losses amount starting since the first day of disturbances. If the operator is at fault, no compensation is due.

Operational maintenance work on the grid connection may also prevent plant operators to feed their electricity into the grid. According to sec. 17e par. 3 EnWG, OWF operators are

[172] Sec. 17e par. 1 EnWG and sec. 19, 47 EEG.
[173] Sec. 17 par. 5 EnWG.

entitled to receive a compensation from the relevant TSO for the lost revenues due to the lacking connection. The operator may claim compensation starting from the eleventh day of disconnection in a calendar year.[174]

5.3.3 Financing TSO liability: the offshore liability surcharge

The compensation costs borne by TSOs may not be taken into account for the calculation of grid tariffs.[175] Therefore, these costs may not be passed down to consumers by way of grid tariffs. The costs must however be split amongst the TSOs.[176] Sec. 17f EnWG sets a cost sharing mechanism between TSOs and final consumers, a shared liability which allows TSOs to partially transfer these costs to consumers as a "surcharge to the grid tariffs"[177]: the **offshore liability surcharge** ("*Offshore Haftungsumlage*"). Only strict liability costs may be split, and this only if the TSO has taken all reasonable measures to reduce the caused damages.

A TSO's degree of negligence determines the amount of damages that they may recover[178] which cannot be therefore transferred to the consumers. The law also caps TSO liability. In the case of damage caused by negligence but not gross negligence for example, liability is limited to € 17.5 million per damaging event.[179]

Sec. 17h par. 1 EnWG encourages the TSO to be insured for monetary and material damages. The Federal Council (*Bundesrat*) proposed a rule obligating TSOs to have insurance, but this was rejected by the Federal Government because of the lack of corresponding insurance policies. The TSOs must report to the BNetzA if they enter an insurance contract.

6. Generation

6.1 Capacity planning

Due to Germany's federal organisation, capacity planning differs depending on whether it takes place in the EEZ or in the territorial seas.

6.1.1 Capacity planning in the EEZ

Spatial planning in the EEZ belongs to the competency of the federal level. The ROG sets rules for the adoption of a **maritime spatial plan in the German EEZ** in form of a Regulation. This spatial plan ("*Raumordnungsplan"*) establishes goals and guidelines for the economic use, shipping safety, and protection of maritime environment. Due to the increased use of marine resources in the EEZ, an integrative approach to sustainable development is required. Accordingly, the BMVI, with the collaboration of the BSH, has adopted the AWZ Ostsee-ROV, which designates priority areas to the extent of 130 km^2 for the development of offshore wind energy in the Baltic Sea.[180] It also sets rules for conflicts with other sectors

[174] Sec. 17e par. 1 (1) EnWG.
[175] Sec. 17e par. 4 EnWG.
[176] Sec. 17f par. 1 (1) EnWG.
[177] Sec. 17f par. 1 (2) EnWG.
[178] Sec. 17f par. 2 EnWG.
[179] Sec. 17f par. 2 EnWG.
[180] Annex to sec. 1 n° 3.5 AWZ Ostsee-ROV.

and areas. For example, the security of maritime traffic may not be hindered, even in designated priority areas. The construction of OWFs is possible outside of these priority areas, but not in Natura 2000 areas.

Following the entry into force of the WindSeeG, the rules for maritime spatial planning have been modified. Pursuant to sec. 5 WindSeeG, a specific spatial plan (FEP) for OWE will be adopted by the BSH starting 2019 and updated at least every four years. This process takes place in cooperation with the BNetzA, the BfN, the General Direction for Waterways and Navigation and the coastal *Länder*.[181] The FEP will designate the areas suitable for OWF development for the period 2026 to 2030. These areas will then be the object of a preliminary investigation and an SEA before they are open to the tender procedure.[182] In May 2018, a draft FEP was published by the BSH, giving the public the possibility to express views on the plan.[183]

6.1.2 Capacity planning in the territorial sea

Maritime spatial planning in the territorial seas falls under the competence of the *Länder*, which adopt LEPs. These plans may contain provisions relevant to maritime spatial planning and the development of OWF which apply in the respective federal states. In **Schleswig-Holstein**, the 2010 LEP is deemed to be updated; a draft plan is foreseen for end of 2018, after which a public consultation procedure will take place.[184] In **Mecklenburg-Western Pomerania**, a spatial plan is in force since 2016.[185] The region has the project to integrate its capacity planning in territorial seas within the above-mentioned FEP by way of an administrative agreement between the government of the Land and the federal government.[186]

The WindSeeG foresees that the above-mentioned FEP may also provide maritime spatial planning in the territorial sea, if the Federal Government enters into an administrative agreement with the government of the respective *Land*. At the time of redaction, only an agreement with the Government of Mecklenburg-Western Pomerania is considered. Preliminary negotiations let to the designation of a priority area for OWE north of Warnemünde, as mentioned in the Land's LEP 2016.[187]

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[181] Sec. 6 par. 7 WindSeeG.

[182] Sec. 12 WindSeeG, Annex 5 n° 1.18 UVPG.

[183] BSH (2018), Draft FEP of the BSH 2019 for the German North and Baltic Sea, available at: https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/_Anlagen/Downloads/Aktuelles_FEP_Entwurf_FEP2.pdf?__blob=publicationFile&v=3.

[184] Schleswig-Holstein, "Landesplanung- Fortschreibung Landesentwicklungsplan", https://www.schleswig-holstein.de/DE/Fachinhalte/L/landesplanung_raumordnung/raumordnungsplaene/landesentwicklungsplan/neuer_landesentwicklungsplan.html (accessed 13 August 2018).

[185] Ministerium für Energie, Infrastruktur und Digitalisierung Mecklenburg-Vorpommern, "Aktuelles Programm (LEP M-V 2016)", https://www.regierung-mv.de/Landesregierung/em/Raumordnung/Landesraumentwicklungsprogramm/aktuelles-Programm/ (accessed 27 October 2018).

[186] Pursuant to sec. 4 par. 1 WindSeeG; see draft FEP of the BSH, available at: https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/_Anlagen/Downloads/Aktuelles_FEP_Entwurf_FEP2.pdf?__blob=publicationFile&v=3.

[187] BSH (2018), *Entwurf Flächenentwicklungsplan 2019 für die deutsche Nord- und Ostsee*, n° 5 October 1, available at https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/_Anlagen/Downloads/Aktuelles_FEP_Entwurf_FEP2.pdf?__blob=publicationFile&v=3 (accessed 27 October 2018).

6.2 Authorisation for capacity projects

The approval procedure for an OWF can take between two-and-a-half and three years, with the EIA taking approximately one year alone.[188] The following section provides details on the different procedures which are applicable depending on the location of the OWF. In each case, the procedure involves a **one-stop shop**.

6.2.1 Authorisation for projects in the EEZ

6.2.1.1 Tendering pursuant to WindSeeG

The permitting procedure was previously specified in the SeeAnlV, which was applicable for all the maritime facilities located in the EEZ. The entire process is now regulated by the WindSeeG which, in coordination with the new EEG 2017, also introduced a tendering procedure for OWF capacity which will be commissioned after 2021. The areas designated for OWE development in the FEP are tendered by the BNetzA.[189] Two main time frames are outlined by the WindSeeG: the **transitional period** for OWFs which will be commissioned between 2021 and 2025, and the **central model** for OWFs commissioned from 2026.

6.2.1.1.1 Transitional period

For the transition period, only "existing projects" which were at an advanced application stage before August 2016 are tendered.[190] Two tenders took place respectively in April 2017 and April 2018 for a total capacity of 3,100 MW. In the 2017 tender however, 60 MW were not allocated, so that a total of 1,610 MW was tendered in 2018. For commissioning in the year 2021, 500 MW were allocated exclusively in the Baltic Sea.

In the 2017 tender, projects were awarded exclusively in the North Sea.[191] In the 2018 tender, the following clusters were allocated in the Baltic Sea: Ostsee Cluster 1 to the Iberdrola Renovables Offshore Deutschland GmbH, Ostsee Cluster 2 to the Baltic Eagle GmbH and Ostsee Cluster 4 to the KNK Wind GmbH. The average bid of the 2018 tender amounted to 4,66 ct/kWh, with the lowest at 0,00 ct/kWh and the highest at 9,83 ct/kWh.[192]

6.2.1.1.2 Central model and common rules

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[188] BMWi (2015), *The energy transition – a great piece of work – Offshore wind energy – An overview of activities in Germany*, p. 11, available at https://www.bmwi.de/Redaktion/EN/Publikationen/offshore-wind-energy.pdf?__blob=publicationFile&v=3 (accessed 27 October 2018).

[189] Sec. 16 WindSeeG.

[190] Sec. 26 WindSeeG; see also Bundesnetzagentur, "Windenergieanlagen auf See", https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/Ausschreibungen/Offshore/offshore-node.html (accessed 27 October 2018).

[191] BNetzA, Decision number BK6-17-001, *WindSeeG - 1. Ausschreibung für bestehende Projekte nach § 26 WindSeeG – Ergebnisse der 1. Ausschreibung vom 01.04.2017*, available at https://www.bundesnetzagentur.de/DE/Service-Funktionen/Beschlusskammern/1BK-Geschaeftszeichen-Datenbank/BK6-GZ/2017/2017_0001bis0999/BK6-17-001/Ergebnisse_erste_Ausschreibung.pdf;jsessionid=4585BCDF639DC5BBCA7BA48F774B801A?__blob=publicationFile&v=3 (accessed 27 October 2018).

[192] BNetzA, Decision number BK6-18-001, *WindSeeG - 2. Ausschreibung für bestehende Projekte nach § 26 WindSeeG – Ergebnisse der 2. Ausschreibung vom 01.04.2018 – Bekanntgabe der Zuschläge*, available at https://www.bundesnetzagentur.de/DE/Service-Funktionen/Beschlusskammern/1BK-Geschaeftszeichen-Datenbank/BK6-GZ/2018/2018_0001bis0999/BK6-18-001/Ergebnisse_zweite_ausschreibung.pdf?__blob=publicationFile&v=3 (accessed 27 October 2018).

The yearly tender from 2021 will be open for a volume of 700 to 900 MW located in the priority areas set by the FEP.[193] Tenderers compete for capacity projects in the priority areas set by the FEP. Before tendering, these areas are the object of a preliminary investigation. This allows to provide tenderers with relevant information for the future auction and to assess the suitability of the areas for OWF construction.[194] Upon submitting their offer, tenderers must provide a safety deposit, which is reimbursed without delay to unsuccessful bidders after the tender has been awarded.[195] This deposit is then used in case the successful bidder does not respect a deadline and must pay a penalty.[196]

The bid is awarded to the lowest offer.[197] Through this, the tenderer obtains the exclusive right to perform a planning approval procedure for their OWF, a right to obtain a market premium for the electricity produced as well as a claim to be connected to the transmission grid amounting to the awarded capacity.[198]

The Clean Energy Package as well as sec. 5 EEG foresee a partial opening of RES tendered capacity to power produced in other countries. Rules for cross-border tendering are defined in the Cross-border Renewable Energy Regulation[199] for photovoltaic power, but not currently for offshore wind power. It remains to be seen whether Germany will adopt such a regulation for offshore wind power or possibly enter into bilateral agreements with neighbour countries. A good example of regional cooperation is the Agreement on the Establishment of a Framework for the Partial Opening of National Support Schemes to Support the Generation of Energy from Solar Photovoltaic Projects and for the Cross-border Administration of such Projects in the Context of a Single Pilot Run in 2016 adopted by Germany and Denmark in August 2016.[200]

6.2.1.2 Planning approval procedure

Just like for transmission cables[201], the construction of an OWF in the EEZ is subject to a **planning approval procedure** pursuant to the SeeAnlV or WindSeeG. Whether the SeeAnlV or the WindSeeG is applicable to a given installation is set by the **transitional provisions** of the Sec. 77 WindSeeG. For example, the SeeAnlV stays applicable, under certain conditions, to installations which will be put into operation until the end of 2020. However, whichever Act applies, the authorisation procedure for the construction, operation or signification change in an installation is the same since both laws refer in their wording to the planning approval procedure set in the VwVfG.[202] This procedure differs from a regular administrative authorisation procedure because of the **size and potential impact of the project on public interests**, especially the environment and maritime safety. The competent

[193] Sec. 17 WindSeeG.
[194] Sec. 9 WindSeeG.
[195] Sec. 21, 25 WindSeeG.
[196] See below under 6.3.1.
[197] Sec. 23 WindSeeG.
[198] Sec. 24 WindSeeG.
[199] Cross-border Renewable Energies Regulation of 10 August 2017 (BGBl. I p. 3102).
[200] BNetzA, *Agreement between Germany and Denmark (English Version)*, 8 August 2016, available at https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/ErneuerbareEnergien/Intern_Ausschreibungen/KoopVertr_DE_DK_englischeFassung.html?nn=698796 (accessed 27 October 2018)
[201] See above part 5.2.1; for clarity reasons, the authors focus on the new procedure pursuant to WindSeeG.
[202] Sec. 2 SeeAnlV / Sec. 45 WindSeeG.

authority is the BSH.[203]

A **hearing procedure** first has to be carried out.[204] The carrier of the project transmits the BSH a draft containing description and explaining the plan's design. The draft must also contain a description of foreseen safety and precautionary measures, a time schedule for the realisation of the planned measures until the entry into operation of the project as well as elements permitting the competent authority to assess the environmental impact of the project.[205] The BSH then asks other relevant administrative authorities to provide a statement about the plan. In the course of this hearing procedure, the public has to be consulted.[206] This public participation at an early stage leads to an optimisation of the project planning by ensuring transparency and thus promoting project acceptance.[207]

Each person whose interests might be affected by the project as well as accredited environmental associations may provide statements or raise objections against the plan within a deadline set by the BSH. After the consultation phase, the BSH will discuss the provided statements and objections with the carrier of the project and try to achieve compromises between stakeholders. Although the authority must consider the opinions submitted, public opinions are non-binding. It is then competent to take a final decision ("*Planfeststellungsbeschluss*")[208]; the project may only be authorised if it does not threaten the safety and ease of traffic or the safety of defence. It must also respect the maritime environment in that it does not raise concerns about polluting or disturbing bird migration.[209] The final decision has a **concentration effect** ("*Konzentrationswirkung*"), meaning that this single licensing authorisation comprises all other permits which would be necessary pursuant to other laws, for example in construction, water or nature conservation law.[210] The authorisation is given for **25 years** and can be prolonged once for a period of five years.[211]

A particularity for OWF authorisation under the WindSeeG is that the plan may only be approved if the project developer has previously won the tendering procedure.[212] The intention is to ensure that electricity production meets the demand and that grid stability is be secured. Due to the wording of sec. 44 WindSeeG, it is not possible to obtain authorisation for OWF outside of the tendering procedure. Tendering is the only way in which access to offshore wind capacity is possible for developers. There is no authorisation procedure for open-door projects like in Denmark, so that hybrid projects, where an OWF would be connected to a foreign cable or even to a power-to-gas plant, are not legally feasible according to the current framework. However, this might change in the course of the following year, as the BMWi proposed in April 2018 an amendment to the relevant legislation to enable the **construction of OWF without a grid connection**. The BSH will openly examine where such projects can be potentially located and concretely identify areas to this purpose.[213]

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[203] Sec. 2 par. 2 SeeAnlV / Sec. 45 par. 2 WindSeeG.

[204] Sec. 73 VwVfG.

[205] Sec. 4 par. 1 (1) SeeAnlV / Sec. 47 par. 1 WindSeeG.

[206] Sec. 73 par. 4 VwVfG.

[207] Printed paper of the German Parliament (BT-Drucksache) 17/9666, p. 1.

[208] Sec. 74 VwVfG.

[209] Sec. 5 par. 6 n° 2 SeeAnlV / Sec. 48 par. 4 n° 1 WindSeeG.

[210] Landmann/Rohmer UmweltR/Hagmann UVPG § 22 Rn. 22-23.

[211] Sec. 48 par. 7 WindSeeG.

[212] Sec. 46 par. 1 WindSeeG.

[213] ener|gate messenger, "Offshore-Windparks brauchen keinen Netzanschluss", 25 April 2018, https://www.energate-messenger.de/news/182692/offshore-windparks-brauchen-keinen-netzanschluss (accessed 27 October 2018).

Furthermore, administrative agreements between the BSH and the Länder may allow to build such projects in the territorial seas.

6.2.2 Authorisation for projects in territorial seas

Within the territorial seas the authorisation for projects falls into the competence of the *Länder*. For this reason, the concrete procedure which is applicable is decided by the legislator of the respective *Land*. In any case, the procedure will have to concretely assess whether the conditions of authorisation according to the BImSchG are fulfilled. Such an authorisation is necessary in the cases listed by the Annex 1 of the 4th BImSchV, to which **wind turbines with total height of more than 50m** belong.[214]

The authorisation procedure is slightly different depending on how many turbines the projected OWF comprises. The standard case is where 20 turbines or more will be built; in this case, the **standard procedure with public participation** will take place. In the case where less than 20 turbines will be built, a simplified procedure without public participation will be carried out. The procedure under BImSchG also has **concentration effect**, it is thus a **one-stop shop**.

6.2.3 Environmental impact assessment

As mentioned above, the carrying out of an EIA is regulated – independently from the nature of the authorisation procedure for a project – by the UVPG. It is not an independent administrative procedure resulting in the issuance of an administrative act; rather it is integrated in the planning approval or authorisation procedures for OWF mentioned above.[215] Unlike sea cables, OWF may be subject to an obligatory EIA. The BSH, which is competent for the planning approval procedure, first assesses whether the OWF project is subject to the obligation to carry out an EIA.[216] This is the case when the project concerns the construction, operation or substantial change in an installation listed in the Act. The UVPG foresees EIA for wind farms with a **total height of more than 50m** and differentiates between the number of wind turbines projected.[217] For **OWF with 20 and more turbines**, an EIA is mandatory.

Once the BSH has assessed that it will carry out an EIA, it communicates with the project developer about the course of the assessment, while the project developer has to provide the BSH with **substantial information about the project and its potential impacts on the environment**.[218] The BSH also asks other administrative authorities which fields of activity might be affected to provide statements about the project. **Public participation** is also ensured within a set time frame. The public may express opinions about the project, in particular recognised environmental associations may assist the BSH in this task. Numerous documents must be rendered public online, in particular information pursuant to the project and the statements of the public authorities involved.

Once in possession of all information from the project developer and after the public and other authorities have expressed concerns or remarks, the BSH assesses the environmental

[214] 4. BImSchV Annex 1 n° 1.6.

[215] Sec. 4 UVPG.

[216] Sec. 5 par. 1 UVPG.

[217] Sec. 6, 7 in conjunction with Annex 1 n° 1.6 UVPG.

[218] Sec. 5, 15 UVPG.

impact of the project and lets it flow as an important criterion into its permitting decision. If the project might affect a Natura 2000 site, the EIA might be carried out conjointly with an environmental assessment pursuant to Sec. 34 BNatSchG.

The BSH may also take the decision to reduce the extent of the EIA if the environmental impact of OWF in a particular area has already been the object of an SEA during the previous planning phases.[219]

If the project may have substantial environmental impacts in another country, the competent German authority informs the competent authorities of that country and allows their participation and that of the public of that country.

6.2.4 Legal challenging of authorisations

6.2.4.1 Legal action by third parties with legal interest

Authorisations can be legally challenged by third parties within an action for rescission ("*Drittanfechtung*") under the conditions of the Code of Administrative Procedure (*Verwaltungsgerichtsordnung* – VwGO) which is applicable to disputes of administrative nature. The VwGO permits a third party to obtain the annulment of the authorisation.

The plaintiff must argue that the authorisation violates their legally protected rights in order for their claim to be receivable in front of a court (legal standing). The claim must be filed within a monthly deadline.[220] The authorisation is annulled by the court insofar as it is unlawful and violates the claimant's subjective rights, such as health or property.[221]

6.2.4.2 Legal action by environmental organisations

Because they provide for an exception to the requirement of legal standing for the conduction of legal proceedings, lawsuits from environmental organisations are permitted only under certain circumstances regulated by special legal provisions. In Germany, this possibility is provided by the UmwRG and well as, in a subsidiary way, by the BNatSchG, provided that the project's permitting is subject to a mandatory EIA. [222]

Environmental lawsuits are open to **accredited organisations**.[223] These are German or foreign organisations which, according to their statutes, stand up for environmental protection, have minimum three years of existence, present sufficient seriousness and which membership is open to anyone who supports their goals. Competent for the recognition of these associations is the UBA, or the competent regional authority if the scope of an association does not override the territory of a *Land*. A list of recognised organisations is published by the UBA.[224]

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[219] Sec. 51 WindSeeG.

[220] Sec. 74 VwGO.

[221] Sec. 113 par. 1 (1) VwGO.

[222] Sec. 1 par. 1 (1) a) UmwRG; sec. 64 BNatSchG.

[223] Sec. 3 UmwRG.

[224] UBA, *Vom Bund anerkannte Umwelt- und Naturschutzvereinigungen*, 20 September 2018, available at https://www.umweltbundesamt.de/sites/default/files/medien/2378/dokumente/anerkannte_umwelt-_und_naturschutzvereinigungen.pdf (accessed 27 October 2018).

The course of the legal proceedings, which are of administrative nature, is described further in the law. A claim of a recognised organisation is admissible if the latter was entitled to participate in the administrative authorisation procedure, which is the case as mentioned above in the planning approval procedure.[225] The association must state that the authorisation possibly violated legal provisions and that it is therefore affected in its statutory scope of environmental protection goals. However, legal arguments are precluded if the association did not bring them up during the consultation phase of the planning approval procedure.[226]

Where a legal claim pursuant to the UmwRG is not permissible, for instance if an EIA is not necessary, the subsidiary provisions of Sec. 64 BNatSchG, which also provide for the possibility of environmental lawsuits, apply.

6.3 Construction of capacity projects

6.3.1 Time frame

Due to the planning function of the new tendering system in the WindSeeG, the German State has an interest in the OWF developers completing their installations and grid connection within a precise time frame.[227] This guarantees that the planned completion date for the OWF set in the tendering documents is respected.

Within a year after awarding of the tender, the successful bidder must have transmitted the necessary documentation to the BSH for the planning approval procedure. At the latest 24 months before completion date, the project developer must prove to the BNetzA that it has access to the necessary financing for the construction of the OWF; and at the latest three months before completion, the construction must have started. Some deadlines must also be respected after the completion date. The operator must prove towards the BNetzA the construction of at least an OWF within the following six months and the operational readiness of at least 95% of the awarded capacity within the following 18 months. If these deadlines are missed, the successful bidder must pay a penalty which will be deducted from the security deposit.[228]

6.3.2 Technical standards and supervision of the project construction

The operators are legally responsible for the technical standards of OWFs, which must be constructed and operated in a way that their technical security is ensured.[229] In 2014, the BMVI the **Offshore Wind Energy – Safety Framework Concept (OWE-SRK)**[230], a concept summing up all relevant security provisions in its competence area and providing operators with general security guidelines for the construction and operation of OWFs.

The project construction and operation are supervised by the BSH with the help of the

[225] Sec. 2 par. 1 UmwRG.

[226] Sec. 5 UmwRG.

[227] Sec. 59 WindSeeG.

[228] Sec. 60, 65 WindSeeG.

[229] Sec. 49 par. 1 EnWG.

[230] BMVI (2014), *Offshore Windenergie – Sicherheitsrahmenkonzept (OWE-SRK)*, available at https://www.bmvi.de/SharedDocs/DE/Anlage/VerkehrUndMobilitaet/Wasser/offshore-windenergie-sicherheitsrahmenkonzept.pdf?__blob=publicationFile (accessed 27 October 2018).

General Direction for Waterways and Navigation when this is necessary for guaranteeing traffic security.[231] The BSH is competent for the compliance of the project developer with the public interest such as public security, defence, maritime transport or environmental protection of the area, and may issue measures to stop the construction or operation of the plant until the hazard is removed.

6.3.3 Dismantling and obligation to restore

After expiry of the authorisation for operation, the OWF must be dismantled to the extent necessary for the safekeeping of public interests such as protection of the maritime environment, security of maritime traffic and defence purposes.[232] The original authorisation may contain the obligation for the project developer to provide another security deposit, which will serve to guarantee the developer's dismantling obligation. Furthermore, the site must be restored after dismantling in areas such as **nature reserves, national parks, and biosphere reserves**.[233] This condition applies in the EEZ as well as in territorial seas. The duty to restore only requires the **restoration of an existing biotope** and does not apply if parts of the construction have become a new habitat for wildlife.

Adequate measures for dismantling involve **removing the submarine cable system** or **deconstructing the wind farm facilities**. Environmental concerns related to dismantling usually include the effects on habitat protection areas and marine mammals such as porpoises as well as the effects on fish and biocoenoses on the seabed due to sediment re-suspension and turbidity plumes during the deconstruction phase.

Dismantling can possibly have a greater negative environmental impact than leaving parts of the installations in the sea. In those cases, **part or all the structures must be left behind**, unless dismantling is necessary for reasons of security or ease of traffic.[234] The opportunity to remove installations is therefore the object of a **case-by-case appreciation** of the competent authority. In general, a complete dismantling is not expected; for example, the foundation below the seabed will be left in most cases since it causes no threat for maritime traffic and would otherwise disturb the maritime environment.

As an alternative to dismantling, the legislator can decide that an area previously used for OWE generation can be used beyond the expiry date of the authorisation. In this case, the OWF operator will have to transfer the property of the installation as well as provide the necessary information to their successor – without compensation.[235]

6.4 Operation

6.4.1 Implementing the TSO's stability measures

In order to guarantee the security and the full functionality of the grid, TSO, as above mentioned in 5.3.1, is entitled and obliged to require the reduction of electricity which is feed-in the grid. The plant operator is responsible for the practically implementation of the curtailment measures necessary for stabilising the grid.

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[231] Sec. 57 WindSeeG.

[232] Sec. 58 WindSeeG.

[233] Sec. 15 par. 2 (4) BNatSchG.

[234] Anlage 3.5.1 (4), 3.5.2. Zu (4) AWZ Ostsee-ROV.

[235] Sec. 66 WindSeeG.

In the event of congestion that threatens grid security or reliability, the grid operator may, require the wind farm operator to curtail or shut down energy production as a last resort. Currently, the dispatch of OWE is still prioritised as it is a renewable generation source according to sec. 11 EEG.

In Germany, the wind farm operator is responsible for implementing the reduction measures. The TSO sends a signal through the grid, and the wind farm operator must then comply. Energy production is generally reduced incrementally, to 60 %, 30 % or 0 % of available capacity, although special arrangements are permitted in cases of technological difficulties.[236] Wind farm operators are required to outfit their wind farms with the necessary remote-control technology if the installed capacity exceeds 100 kW.

6.4.2 RES-E Remuneration

Before the last revision of the EGG in 2017, financial incentives for RES were provided through two different supporting mechanisms. The **feed-in tariff** (FIT), or "*Einspeisevergütung*", represents the oldest support scheme in Germany. A **market premium** for the funding of future renewable energy plants ("*Marktprämie*") was initiated in 2012. The new version of the EEG introduced in 2017 a new methodology for calculating the value of the market premium value for installations with a capacity of more than 750 kW. Installations with a capacity exceeding 100 kW may also get access to a **shortfall remuneration** ("*Ausfallvergütung*") for a maximum of three consecutive months and maximum six months per year.[237]

Until 2012, support was calculated by the legislator and set by law, applied only as a **FIT**. In 2012, the legislator added the option of direct marketing and incentivised it with a **sliding premium**. Operators of power plants with a capacity over 100 kW received the market premium if they sold their electricity directly on the market ("*Direktvermarktung*"). These plant operators were then entitled to receive the premium value in addition to the market price at which they directly sold the electricity produced. Hence, operator's revenues were partly determined by the market – the selling price being determined by the monthly average market value – and partly set by law – the premium being calculated as the difference between the monthly average market price and a technology-specific reference value set by law ("*anzulegender Wert*"). This involves also that the amount of the market premium had to be calculated every calendar month.

Financing RES remuneration

Support for development and operation of renewable energy sources is financed by the RES-surcharge mechanism ("EEG-Umlage"). Under this mechanism, all electricity consumers pay a surcharge on their actual consumption as part of the electricity price. The exact amount of the additional charge is annually estimated on the basis of historic and current data.

Exemptions from the *EEG-Umlage*

[236] BNetzA (2011), *Leitfaden zum EEG-Einspeisemanagement 1.0*, section 2.1.1, available at https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/ErneuerbareEnergien/Einspeisemanagement/Leitfaden_1_0/LeitfadenEEG_Version10_pdf.pdf?__blob=publicationFile&v=2 (accessed 27 October 2018).

[237] Sec. 21 par.1 n° 2 EEG.

Energy cost-intensive industries may be partially exempted from the payment of surcharges in order to avoid damage to their international competitiveness. According to sec. 64 EEG, upon application to the Federal Office of Economics and Export Control (BAFA), companies belonging to certain sectors may have access to the reduction if their electricity consumption exceeds 1 GWh per year. Self-suppliers may also be fully exempted from the surcharges.[238] Protests from associations, energy companies and private citizens about the reductions granted to energy-intensive companies led the EU Commission to qualify the measure as a state aid in 2014. This was later confirmed by the European Court of Justice.[239]

The new version of the EEG in 2017 established **three different layers of support schemes**, determined by the installed capacity of the farms. Installations with a capacity up to 100 kW continue to benefit of support schemes through the FIT system. The sliding premium is still obligatory for direct marketing and its value is determined by law for installation with a capacity from 100 kW up to 750 kW. For installations with a capacity above 750 kW, the bid placed in the competitive tendering process now determines the premium value. In other words, in 2017, the legislator replaced the reference value that was previously set by law with a price determined from the bidding process. The technology-specific reference value ("*anzulegender Wert*") is now based on the auction price (pay-as-bid pricing). As a result, for those installations, the total price is equal to the sum of the monthly average market price and the premium, which value is determined from the tendering. The time frame established for the payments is set on a period of 20 years.[240] Additionally, installations located in the territory of other EU countries may also be assigned 5% of the annual tendered capacity and benefit from the German RES remuneration.[241] This is in line with the EU's Clean Energy Package.

[238] See sec. 61 and following EEG.

[239] EU Commission, Decision 2015/1585 of 25 November 2014 on the aid scheme SA.33995 (2013/C) (ex 2013/NN) (implemented by Germany for the support of renewable electricity and of energy-intensive users); General Court of the European Union, Press Release No 49/16 of 10 May 2016 (Judgment in Case T-47/15,Germany v Commission), available at https://curia.europa.eu/jcms/upload/docs/application/pdf/2016-05/cp160049en.pdf (accessed 27 October 2018).

[240] Sec. 25 EEG 2017.

[241] Sec. 5 par. 2 EEG.

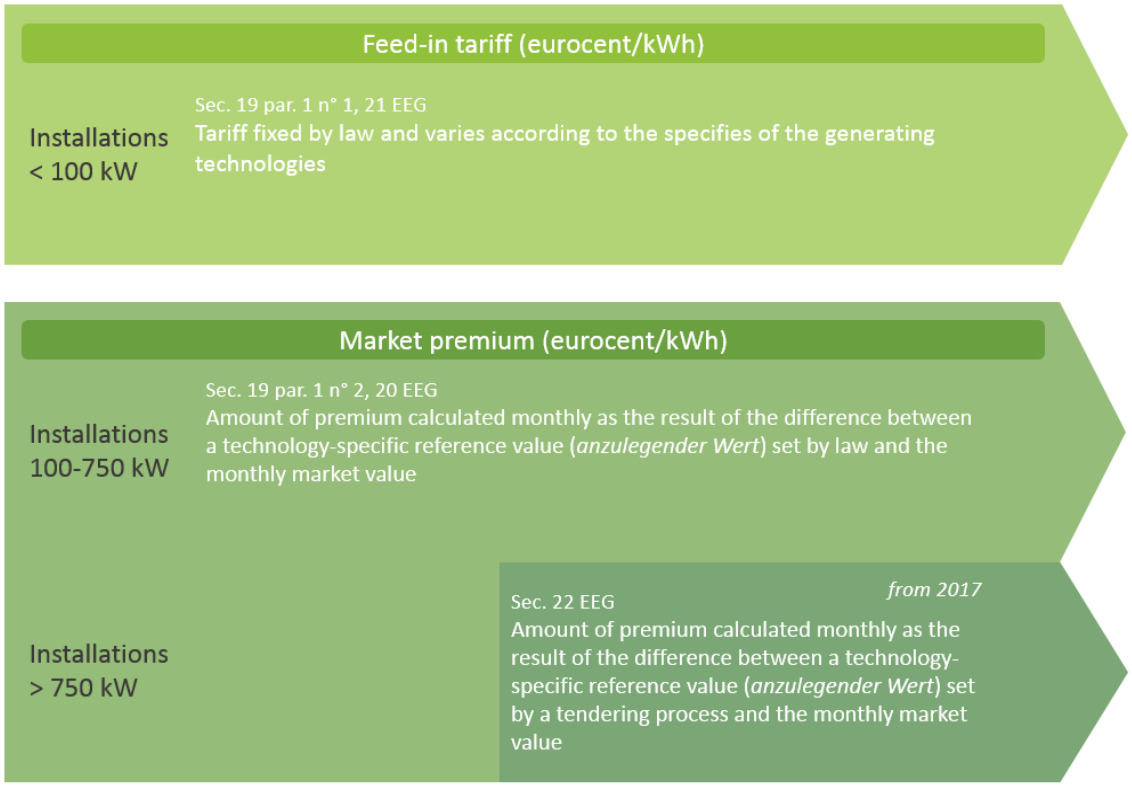

Figure 6. Overview of RES-E support in Germany.
Source: IKEM (2018)

References

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