



EUROPEAN COMMISSION

Brussels, 16.04.2015
C (2015) 2580 final

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Subject: **State aid cases SA.39723, SA.39724, SA.39725, SA.39726, SA.39731, SA.39732, SA.39733, SA.39735, SA.39738, SA.39739, SA.39741, SA.39742 (2014/N); SA.39722, SA.39727, SA.39728, SA.39729, SA.39730, SA.39734, SA.39736, SA.39740 (2015/NN): Support to 20 large offshore wind farms under the EEG Act 2014 (Germany)**

Sir,

1. PROCEDURE

- (1) By letter of 31 October 2014, Germany notified, pursuant to Article 108(3) of the Treaty on the Functioning of the European Union (TFEU), support for 21 individual offshore wind farms, registered under case numbers SA.39722 to SA.39742 (inclusive). The German authorities subsequently withdrew case SA.39737 (Windpark Offshore Albatros) as the project was merged with case SA.39731 (Windpark EnBW Hohe See). The Commission sent formal questions on 5 December 2014, to which the German authorities provided answers on 8 December 2014, 16 December 2014, 18 December 2014, 4 February 2015, 23 February 2015, 25 February 2015 and 2 March 2015. The Commission sent informal questions on 11 February 2015, 2 March 2015 and 3 March 2015 to which the German authorities provided answers on 17 February 2015, 2 March 2015 and 4 March 2015 respectively.
- (2) On 5 March 2015, Germany waived its right under Article 342 TFEU in conjunction with Article 3 of Regulation (EEC) No 1/1958 to have the decision adopted in German and agreed that the decision be adopted in English.

Seiner Exzellenz Herrn Frank-Walter STEINMEIER
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- (3) The projects were notified individually to the Commission as they exceed the 250 MW threshold set out in point (20)(b) of the Commission's Guidelines on State aid for environmental protection and energy 2014-2020 (hereinafter, "Guidelines")¹ and were not selected on the basis of a competitive bidding process.
- (4) The projects are very similar, differing only in certain technical aspects and engineering design. The proposed projects are therefore assessed together in one single decision.

2. DETAILED DESCRIPTION OF THE MEASURE/AID

2.1. Legal Basis, background and objective

- (5) The projects are to be supported under the "EEG-Act 2014" which was previously approved by the Commission on 23 July 2014². The EEG-Act 2014 includes support for electricity generated from renewable energy sources (RES).
- (6) According to Germany's National Renewable Energy Action Plan (NREAP), submitted to the Commission³, RES production (mainly wind and solar) was to account for 38.6% of gross electricity consumption in 2020. Offshore wind was to make a sizeable contribution (32TWh, or 10GW of capacity, in 2020 according to Table 10b of the NREAP). These developments were consistent with meeting Germany's binding target under Directive 2009/28/EC for an 18% share of energy from renewable sources in gross final consumption of energy in 2020.
- (7) The EEG-Act 2014 aims at ensuring that the share of RES electricity in electricity supplied to German final customers rises to 40-45% by 2025 and to 55-60% by 2035. According to Germany, offshore wind has a high cost reduction potential, which is however dependent on continued deployment ("learning-by-doing"). Due to the constrained potential for the deployment of other renewable energy technologies, Germany's RES electricity goals could not be met without offshore wind deployment. Under the EEG-Act 2014, generation capacity from offshore wind energy is to reach 6.5 GW of capacity by 2020 and 15 GW by 2030. The downward revision of Germany's deployment goals for offshore wind reflect delays in the commissioning of early offshore wind projects due to difficulties in securing grid connections.

2.2. Payments and financing flows

- (8) Operators of renewable power installations have the right to claim support for the renewable electricity produced in their installations from the transmission system operator ("TSO") (§19, §50 EEG-Act 2014). Support is granted in the form of a market premium ("direct selling", §34 EEG-Act 2014).

¹ 2014/C 200/01

² Case number SA.38632 (2014/N), C(2014) 5081 final.

³ <http://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>

- (9) In general, the support is granted by the relevant TSO from the moment the operator starts feeding electricity into the grid⁴. The EEG-Act 2014 establishes further an equalisation mechanism whereby the cost of support is spread between TSOs so that ultimately every TSO covers the costs of a quantity of electricity that corresponds to the average share of EEG electricity compared to the total electricity delivered to the final consumers in each area served by the individual TSO in the previous calendar year (§58(3) EEG-Act 2014).
- (10) As explained in Commission Decision 2014/C 200/01 of 23 July 2014, the EEG-Act 2014 does not impose on electricity suppliers the obligation to pass on the EEG-surcharge to final customers. At the same time, the EEG-Act 2014 recognises that consumers are obliged to pay the EEG-surcharge in principle (and in practice the EEG-surcharge is passed on), even though some of them have the right to obtain a partial waiver of that obligation (see in particular §64 EEG-Act 2014).

2.3. Level of market premium

- (11) The methodology to determine the market premium is established in Annex 1 to the EEG 2014. The premium is calculated according to the following formula:

$$MP = AW - MW$$

Where:

MP denotes the level of the market premium.

AW denotes the reference value ("anzulegender Wert")

MW denotes the (monthly) average electricity price for the technology ("Monatsmarktwert")

- (12) MP is set at zero should the above formula give a result less than zero. For offshore wind, MW is the monthly average price of electricity generated from offshore wind at the EPEX Spot exchange for the Germany/Austria price zone.
- (13) The support period is 20 years. For offshore wind power installations entering into operation as of 1 August 2014, the reference values are as follows:
- The standard initial reference value is paid only at the beginning of the support period. Under the so-called "Basismodell", it is in principle a 12 year period but can be longer when the installation is further away than 12 nautical miles from the shore (extended by 0.5 months for each full nautical mile beyond 12 miles) and in water deeper than 20 metres (extended by 1.7 months for each full meter deeper than 20 metres).
 - Alternatively, instead of the standard initial reference value for 12 years, offshore wind farms commissioned before 1 January 2020 can choose a higher initial reference value for a duration of 8 years (the so-called "Stauchungsmodell"). The

⁴ In more detail, network operators (in most cases the Distribution System Operator, "DSO") are obliged to pay the market premium to producers of EEG electricity established within their network area. DSOs have to immediately transfer the EEG electricity to their respective Transmission System Operators ("TSOs"). TSOs, in turn, are under the obligation to compensate the DSOs in their network area for payments for market premiums that DSOs have paid.

reference value for any extension period (due to depth of water or distance from shore) is the standard initial reference value (under the Basismodell).

- Following the initial period and any extensions, the reference value is EUR 39/MWh ("Grundwert").

(14) The initial reference values fall over time, as shown in the table below.

Table 1: Tariff supporting off shore wind.

Year of commissioning	Standard initial reference value (Basismodell)	Higher initial reference value (Stauchungsmodell)
Up to 2017	154 EUR/MWh	194 EUR/MWh
2018	149 EUR/MWh	184 EUR/MWh
2019	149 EUR/MWh	184 EUR/MWh
2020	139 EUR/MWh	N/A

Source: German authorities

(15) Average wholesale electricity prices are expected to be higher than the Grundwert value of EUR 39/MWh. Germany estimates the average spot price of electricity to increase from around EUR 30/MWh in 2014 to approximately EUR 80/MWh by 2040 (2014 prices). In practice, therefore, following the initial period (and any extensions) generators are expected to derive their revenues from selling their electricity on the market without additional support.

2.4. Production costs

(16) Germany has explained that reference values are based on expert studies on production costs prepared for the EEG-Act 2014. In particular, the reference values for offshore wind are based on an expert report carried out by IE Leipzig (the "2014 Experience Report").⁵ Based on survey data, which was able to take into account experience of actual projects that had recently been developed, and a literature review, the report presents estimates of the costs and Weighted Average Cost of Capital (WACC) for hypothetical offshore wind projects.

(17) Technical parameters for current projects with turbines greater or equal to 5 MW, are shown in Table 2 below.

⁵ www.bmwi.de/BMWi/Redaktion/PDF/XYZ/zwischenbericht-vorhaben-2e

Table 2: Technical parameters of offshore wind projects (two different cases).

Nennleistung ≥ 5 MW			
Parameter	Einheit	Fall 1.2 Ø Cluster 1-4	Fall 2.2 Ø Cluster 5-8
Standortparameter			
Küstenentfernung	[sm]	31,0	58,0
Wassertiefe	[m]	28,0	37,0
Anlagenparameter			
Durchschnittl. Nabenhöhe	[m]	92,0	92,0
Durchschnittl. Rotordurchmesser	[m]	126,0	126,0
Mittlerer spez. Energieertrag	[kWh/a/m ²]	1.644,1	1.724,3
Investitionen und Kosten			
Spezif. Gesamtinvestition	[€/kW]	4.500,0	4.700,0
Betriebskosten 1-10 a	[ct/kWh]	3,3	3,4
Betriebskosten 11-20 a	[ct/kWh]	4,0	4,1
Jährliche Kostensteigerung		2,0%	2,0%
Finanzierung			
Eigenkapital		35,0%	35,0%
Fremdkapital		65,0%	65,0%
Eigenkapitalverzinsung		12,0%	12,0%
Fremdkapitalverzinsung		6,0%	6,0%
Mischzinssatz		8,1%	8,1%
Vollbenutzungsstunden	[h/a]	4.100,0	4.300,0

Source: 2014 Experience Report, Tabelle 30

- (18) Table 2 shows "average" cases for two groupings of offshore wind farm development "clusters". Clusters 5-8 are further from shore and located in deeper water. This in turn is associated with higher load factors and investment and operating costs. The levelised cost of electricity in both cases above is approximately EUR 154/MWh.⁶
- (19) The 2014 Experience Report also presents estimated costs for future projects (predominantly expected to be in higher-numbered clusters), presented below. These are based on estimates of the cost reduction potential for offshore wind carried out by Prognos AG und Fichtner GmbH & Co KG⁷ ("the Prognos and Fichtner Report").

⁶ 2014 Experience Report, p.100, first paragraph.

⁷ <http://www.offshore-stiftung.de/node/76>

Table 3: Technical parameters of future offshore wind projects.

Nennleistung ≥ 5 MW				
Parameter	Einheit	Fall 2.2 Ø Cluster 5-8 (2017)	Fall 2.2 Ø Cluster 5-8 (2020)	Fall 2.2 Ø Cluster 5-8 (2023)
Standortparameter				
Küstenentfernung	[sm]	58,0	58,0	58,0
Wassertiefe	[m]	37,0	37,0	37,0
Investitionen und Kosten				
Spezif. Gesamtinvestition	[€/kW]	4.784,6	4.722,4	4.727,1
Betriebskosten 1-10 a	[ct/kWh]	3,1	3,2	3,3
Betriebskosten 11-20 a	[ct/kWh]	3,7	3,9	4,0
Jährliche Kostensteigerung		2,0%	2,0%	2,0%
Finanzierung				
Eigenkapital		35,0%	30,0%	25,0%
Fremdkapital		65,0%	70,0%	75,0%
Eigenkapitalverzinsung		11,5%	10,8%	10,8%
Fremdkapitalverzinsung		5,5%	5,0%	4,8%
Mischzinssatz		7,6%	6,7%	6,3%
Vollbenutzungsstunden	[h/a]	4.295,7	4.373,0	4.552,3

Source: 2014 Experience Report, Tabelle 44

- (20) Based on the survey of developers carried out, the required rate of return on equity for realised projects varied between 8% and 12%.⁸ As can be seen Table 2 and Table 3 above, the 2014 Experience Report selects a rate of return on equity towards the higher end of this range (11-12%) for the calculation of the WACC. Germany has explained that this is because the authors assume that future projects will require a rate of return in this range especially in light of the higher-than-expected costs experienced during the build of the earlier realised projects.
- (21) The Prognos and Fichtner Report⁹ explains that, for capital-intensive technologies such as offshore wind, the WACC has a large influence on levelised costs. The Prognos and Fichtner Report also explains why the WACC for offshore wind is expected to fall over time (as shown in Table 3 above):
- Lenders are likely to reduce the required share of equity as a result of reduced project risk. Since interest rates on debt are generally lower than the rate of return required by shareholders, the increased share of debt leads to a reduction in the WACC.
 - Interest rates on debt and required rates of return on equity are themselves expected to reduce over time due to reductions in the perceived risk of developing offshore wind projects.

⁸ 2014 Experience Report, p.64, last paragraph.

⁹ Section 2.5.

2.5. Description of notified projects

- (22) Germany plans to deploy offshore wind energy mainly in the high seas of the German North and Baltic Sea. Figure 1 and Figure 2 show the location of the offshore projects authorised or under construction in Germany.

Figure 1: Map of offshore wind farms in the North Sea.



Source: www.offshore-windenergie.net/en/wind-farms

Figure 2: Map of offshore wind farms in the Baltic Sea.



Source: www.offshore-windenergie.net/en/wind-farms

- (23) The following tables show characteristics of the selected projects. Table 4 shows the installed capacity and the total investment costs (together with the state aid case number). The wind farm Trianel Borkum – SA.39727 – will be built in two stages of 200 MW of installed capacity each. The first phase is expected to be commissioned in 2015 while the second phase in 2018, about 3 years from the 1st phase. Since the underlying assumptions on investment and operating costs incurred by the two phases are significantly different from each other, the German authorities submitted two separate financial analyses. The data for the two phases are presented in the Tables below.

Table 4: Installed capacity, total investment costs and grid cluster

SA number	Project name	Maximum Generation capacity	Total investment	Generation	Grid Cluster
		MW	EUR billions	GWh/year	
39722	Windpark Offshore Dan Tysk	288	[...]	[...]	5
39723	Windpark Offshore Nordsee One	332	[...]	[...]	3
39724	Windpark Arkona Becken Südost	385	[...]	[...]	1
39725	Windpark Veja Mate	402	[...]	[...]	6
39726	Windpark Borkum Riffgrund 2	450	[...]	[...]	2
39727	Windpark Trianel Borkum Part I	200	[...]	[...]	2
39727	Windpark Trianel Borkum Part II	200	[...]	[...]	2
39728	Windpark Offshore Global Tech I	400	[...]	[...]	6
39729	Windpark Offshore Nordsee Ost	295	[...]	[...]	4
39730	Windpark Offshore Butendiek	288	[...]	[...]	5
39731	Windpark EnBW Hohe See/Albatross	688	[...]	[...]	8
39732	Windpark Offshore Borkum Riffgrund 1	312	[...]	[...]	2
39733	Windpark Offshore Gode Wind 2	252	[...]	[...]	3
39734	Windpark Offshore Meerwind Süd/Ost	288	[...]	[...]	4
39735	Windpark Offshore Wikinger	350	[...]	[...]	1
39736	Windpark Offshore EnBW Baltic 2	288	[...]	[...]	3
39738	Windpark Offshore MEG I	400	[...]	[...]	2
39739	Windpark Offshore Deutsche Bucht	252	[...]	[...]	6
39740	Windpark Offshore Amrumbank West	288	[...]	[...]	4
39741	Windpark Offshore Sandbank	288	[...]	[...]	5
39742	Windpark Offshore Gode Wind 1	330	[...]	[...]	3

Source: German authorities, Commission own calculations, Offshore-windenergie.net¹⁰

- (24) In total, the 20 projects will deploy a maximum of 7.0 GW of offshore wind power for a total investment of up to 29.3. billion.
- (25) Table 5 shows the names of the generators, shareholders of the projects and target commissioning dates.

Table 5: Shareholders, commissioning date and tariff of the selected projects

Name of project	Name of generator	Shareholders	Final investment decision	Target commissioning date		Estimated tariff (EEG Act 2014, EUR/MWh)
				start	end	
Meerwind Süd / Ost	WindMW GmbH (Germany)	BCP Meerwind Germany GmbH (80%), Windland Energieerzeugungs GmbH (20%)	05.08.2011	Sep 2014	Dec 2014	154
Global Tech I	Global Tech I Offshore Wind GmbH (Germany)	HEAG Südthessische Energie AG (HSE) (24,9%), Stadtwerke München GmbH (24,9%), Axpo International S.A. (24,1%), Esportes Offshore Beteiligungs GmbH (10%), Windreich AG (0,05%), GTU I GmbH (2%), GTU II GmbH (4%), FC Wind 1 GmbH (5%), FC Wind 2 GmbH (5%), Norderland Projekt GmbH (0,05%)	17.12.2008	Sep 2014	Jan 2015	194
Nordsee Ost	Essent Wind Nordsee Ost Planungs- und Betriebsgesellschaft GmbH (Germany)	RWE Innogy GmbH (100%)	01.12.2009	Nov 2014	March 2015	194
DanTysk	Dan Tysk Offshore Wind GmbH (Germany)	Vattenfall Europe Windkraft GmbH (51%), Stadtwerke München GmbH (49%)	20.10.2010	Nov 2014	Jan 2015	194
Butendiek	OWP Butendiek GmbH & Co. KG (Germany)	1. IP Butendiek Wind K/S (22,50%); Tochtergesellschaft von Industriens Pension, Dänemark; 2. Marguerite Wind Butendiek S.à.r.l. (22,50%, Marguerite Holdings S.à.r.l. 66,67%; CDC Infrastructure 33,33%); Five danish pension fonds, organised by PKA (DK), 22,50% Project Ventures Butendiek Holding GmbH (22,50%, owned by Siemens Financial Services) wpd Butendiek Beteiligungs GmbH (10,00%; wpd AG 51,00%, ewz Deutschland GmbH 49,00%)	07.02.2013	Nov 2014	June 2015	194

¹⁰ <http://www.offshore-windenergie.net/en/wind-farms/grid-connections>

Name of project	Name of generator	Shareholders	Final investment decision	Target commissioning date		Estimated tariff (EEG Act 2014, EUR/MWh)
				start	end	
Borkum Riffgrund 1	Borkum Riffgrund 1 Offshore Windpark A/S GmbH und Co. oHG (Germany)	DONG Energy DK (50%), Kirkbi Invest A/S and Oticon Foundation (50%), (DK)	28.02.2011	Nov 2014	Jun 2015	194
Baltic 2	EnBW Baltic 2 GmbH	EnBW Energie Baden-Württemberg AG (100%)	28.04.2010	Dec 2014	Apr 15	194
Trianel Windpark Borkum Phase 1	Trianel Windkraftwerk Borkum GmbH Co.	34 Municipal Utilities (widespread shareholdings)	15.12.2010	Feb 2015	Apr 15	194
Amrumbank West	E.ON Kraftwerke GmbH (Germany)	E.ON Kraftwerke GmbH	02.11.2011	Feb 2015	Aug 15	194
Gode Wind II	Gode Wind 2 Offshore Wind Farm P/S GmbH &	DONG Energy DK (50%), dänische Rentenkassen inkl. PKA, IP, Lærernes Pension, Lægernes Pension (50%)	31.10.2013	Jul 2015	Jan 2016	194
Gode Wind I	Gode Wind 1 GmbH (Germany)	DONG Energy (DK) 100 %	31.10.2013	Apr 2016	July 2016	194
Sandbank	Sandbank Offshore Wind GmbH (Germany)	Vattenfall Europe Windkraft GmbH (51%), Stadtwerke München GmbH (49%)	11.08.2014	Aug 2016	Jan 2017	194
Wikinger	Iberdrola Renovables Offshore Deutschland	Iberdrola S.A. (Spain) (100%)	30.04.2014	Jan 2017	Jul 2017	194
Nordsee One	Nordsee One GmbH (Germany)	RWE Innogy GmbH (15%, Germany), North Land Power Inc. (85%, Canada)	estimated 31.03.2015	Mar 2017	Oct 2017	194
Veja Mate	Bard Phoenix Verwaltungs GmbH	Veja Mate Offshore Holding GmbH (100%)	estimated 31.03.2015	Jul 2017	Dec 2017	194
Borkum Riffgrund 2	Dong Energy Borkum Riffgrund 2 GmbH	DONG Energy (DK) 100 %		Jan 2018	Jan 2019	184
Arkona Becken Südost	AWE-Arkona Windpark Entwicklungs GmbH	E.ON Climate & Renewables GmbH (98%), Arkona Windpark Entwicklungs Beteiligungs GmbH (2%)	estimated in 2015	Jan 2018	Jan 2019	184
Hohe See / Albatros	EnBW Hohe See GmbH (Germany)	EnBW Energie Baden-Württemberg AG (100%)	estimated 30.11.2016	Mar-Jul 2019	Oct-Dec 2019	184
Deutsche Bucht	British Wind Energy GmbH (Germany)	Nibheis S.à.r.l. (100%)	Commitment of grid access without fixed date	July 2019	Dec 2019	184

Name of project	Name of generator	Shareholders	Final investment decision	Target commissioning date		Estimated tariff (EEG Act 2014, EUR/MWh)
				start	end	
Borkum West II 2. Phase	Trianel Windkraftwerk Borkum GmbH Co.	34 Municipal Utilities (widespread shareholdings)		Jan 2018	Dec 2018	184
MEGI	Nordsee Offshore MEGI GmbH (Germany)	Windreich GmbH (33,33 %), FC Windenergy GmbH (Tochter der Windreich GmbH, 66,67%):	estimated 30.06.2015	Jan 2017	Jan 2018	184-194

Source: German authorities. Status as of December 2014, with update taking into account the sale of project Albatros to EnBW and subsequent merger with project Hohe See.

(26) Germany has explained that the following projects have already started, or may start, receiving remuneration before a final Commission decision:

- SA.39722 (Dan Tysk)
- SA.39727 (Trianel Borkum)
- SA.39728 (Global Tech I)
- SA.39729 (Nordsee Ost)
- SA.39730 (Butendiek)
- SA.39734 (Meerwind Süd / Ost)
- SA.39736 (Baltic 2)
- SA.39740 (Amrumbank West)

2.6. Investment costs, operating costs and rate of return

(27) Different characteristics of the projects such as distance from shore; depth of water; wind farm and turbine design will impact the investment and operating costs and ultimately the return on investment.

(28) Germany submitted detailed financial calculation for each project. Table 6 shows the investment costs, operating costs and Internal Rate of Return (IRR) for each project.

Table 6: Investment costs, operating costs and rate of return.

Project name	Investment costs mEUR / MW	Operating costs real, EUR/MWh	IRR	
			post-tax, nominal%	pre-tax, nominal%
Windpark Offshore Dan Tysk	[...]	[...]	[...]	[...]
Windpark Offshore Nordsee One	[...]	[...]	[...]	[...]
Windpark Arkona Becken Südost	[...]	[...]	[...]	[...]
Windpark Veja Mate	[...]	[...]	[...]	[...]
Windpark Borkum Riffgrund 2	[...]	[...]	[...]	[...]
Windpark Trianel Borkum Part I	[...]	[...]	[...]	[...]
Windpark Trianel Borkum Part II	[...]	[...]	[...]	[...]
Windpark Offshore Global Tech I	[...]	[...]	[...]	[...]
Windpark Offshore Nordsee Ost	[...]	[...]	[...]	[...]
Windpark Offshore Butendiek	[...]	[...]	[...]	[...]
Windpark EnBW Hohe See/Albatross	[...]	[...]	[...]	[...]

Windpark Offshore Borkum Riffgrund 1	[...]	[...]	[...]	[...]
Windpark Offshore Gode Wind 2	[...]	[...]	[...]	[...]
Windpark Offshore Meerwind Süd/Ost	[...]	[...]	[...]	[...]
Windpark Offshore Wikinger	[...]	[...]	[...]	[...]
Windpark Offshore EnBW Baltic 2	[...]	[...]	[...]	[...]
Windpark Offshore MEG I	[...]	[...]	[...]	[...]
Windpark Offshore Deutsche Bucht	[...]	[...]	[...]	[...]
Windpark Offshore Amrumbank West	[...]	[...]	[...]	[...]
Windpark Offshore Sandbank	[...]	[...]	[...]	[...]
Windpark Offshore Gode Wind 1	[...]	[...]	[...]	[...]

Source: German authorities

- (29) Investment costs range between EUR 3.5 and 5.6 million/MW with an average of EUR 4.4 million/MW. Operating costs are in a range between EUR 20.0 and 43.2 /MWh with an average of EUR 30.6 /MWh. The rate of return on a post-tax basis is in the range between 3.1% and 9.4% with an average of 7%.
- (30) The projects' load factors are generally between 47% and 49%. However, some projects show significantly lower load factors. In particular the projects [...] and [...] have load factors of 41%. The lower and higher load factor among all projects is 41% and 50% respectively with the average close to 47%.
- (31) Germany explained that project [...] is located in the Baltic Sea with less favourable wind resources. Moreover, the project is located at shorter distance from the coast, further reducing the load factor.
- (32) The lower load factor of project [...] is due instead to wind farm design and the choice of wind turbines. Being an old concession, the wind farm is located closer to other wind parks with turbines spaced closer together. Moreover, the turbines have lower mast height than those used in other projects. Lower mast height and wake effects contribute lowering the load factor.

2.7. Other forms of support

2.7.1. *NER 300*

- (33) Two projects will receive also funding from the European NER300 program. Project SA.39725 (Veja Mate) and project SA.39723 (Nordsee One) will receive EUR 112.6 million and EUR 70 million in investment aid respectively.

2.7.2. *KfW Offshore Programme*

- (34) Germany explained that the projects are financed in different ways. For some, lenders have limited recourse only to the project's shareholders. For others, lenders may have full recourse to the developer as a whole, including the entire

portfolio. These differences impact several parameters such as the risk profile of the project and the financing structure.

- (35) The programme “Offshore Windenergie”, run by the German development bank KfW, has been in place since 2012. It is intended to provide (in conjunction with other finance providers) non-equity financing to up to ten offshore wind farms. Access to financing is limited to project-financed wind farms. Company-financed wind farms cannot receive loans under the programme. The programme covers up to 50 % of the non-equity demand. At least one third of the total investment must be financed by equity.
- (36) So far, loans have been granted to three projects:
- In the case of the project SA.39728 – Global Tech 1, KfW was a member of a consortium of 19 banks (including 4 arranging banks). KfW’s offshore programme raised EUR 278 million.
 - In the case of the Meerwind Süd I Ost project, KfW was a member of a consortium of 8 banks (including 2 arranging banks) and of the Danish export insurer EKF. KfW’s offshore programme raised EUR 264 million.
 - In the case of the Butendiek offshore wind farm, KfW raised a total of EUR 194 million in a consortium of 11 banks (including 3 arranging banks) and the Danish export insurer EKF.
- (37) More applications for loans have been submitted, which are currently under assessment.
- (38) The purpose of the programme is to eliminate the shortfall in non-equity funding for project-financed offshore wind farms. Germany submits that currently, banks do not provide sufficient long-term financing for offshore wind farms. In general, banks provide only between EUR 20-50 million per wind farm, which would require the participation of 20 to 40 banks, assuming a requirement for EUR 1 billion non-equity funding. In addition, even if they are active in the offshore wind market, banks limit their participation in projects to prevent a concentration of risk. The KfW offshore wind programme is intended to address this market failure.
- (39) According to Germany, the programme does not grant loans at favourable conditions. KfW participates in the commercial bank tranche. Its conditions are matched with the terms offered by the commercial banks participating in the respective consortium.

2.7.3. *European Investment Bank funding*

- (40) Germany has explained that the following 4 projects will benefit from loans from the European Investment Bank (EIB):
- SA.39728 Global Tech I;
 - SA.39730 Butendiek;
 - SA.39736 EnBW Baltic 2

- SA.39727 Trianel Borkum (Phase 1)
- (41) The EIB provides lending in conjunction with other banks. Lending from EIB is limited to a maximum of EUR 150 million. Interest rates offered by the EIB are at most 50 basis points (i.e. 0.5 percentage points) lower than usual market interest rates.

2.8. Observations by the Member State

2.8.1. Impact on generation market shares

- (42) Germany has submitted data and information regarding the expected electricity production of each wind farm compared to the total amount of electricity produced by the companies which are the wind farms' respective majority shareholders. Data provided is limited to the main electricity generators in Germany (RWE, E.ON, EnBW, Vattenfall and Stadtwerke München) and large international developers (Iberdrola and DONG Energy), all of whom are active in developing offshore wind in Germany. The shares are shown in Table 7.
- (43) A caveat is that the actual historical data on the electricity production of the big energy suppliers in 2013 is compared with forecast data for wind electricity generation for 2019. The total volume of electricity produced by the undertakings may vary significantly until the start of operation of the wind farms. In addition, historical experience shows that developers (e.g. DONG Energy, EnBW, RWE) increasingly tend to sell their shares of offshore wind farms to other parties either before or shortly after the wind farms start operating.

Table 7: Share of the main electricity generators in the projects.

Company	2013 generation (TWh)	Share of total 2013 production	Wind farms owned (status as at December 2014)	Estimated 2019 production from share of wind farms owned (TWh)
RWE (incl. RWE innogy)	149.1	23.6%	Nordsee Ost (100%) and Nordsee 1 (15%)	1.3
E.ON	84	13.3%	Amrumbank and Arkona Becken Süd Ost (nearly 100%)	2.8
Vattenfall	70.3	11.1%	Dan Tysk and Sandbank (approx. 50%)	1.3
EnBW	51.7	8.2%	Baltic 2 and Hohe See (100%)	3.3
Stadtwerke München	6.9	1.1%	Dan Tysk and Sandbank (approx. 50%) Global Tech 1 (approx 25%)	1.7
Iberdrola	0	0.0%	Wikinger (100%)	1.3
DONG	0	0.0%	Gode Wind II and Borkum Riffgrund 1 (50%) Gode Wind I and Borkum Riffgrund 2 (100%)	4.8
Total	633			

Source: German authorities¹¹. Total 2013 electricity production for Germany sourced from Eurostat (Table ten00087 - Total gross electricity generation).

2.8.2. *Impact on electricity network stability in neighbouring markets*

- (44) Germany submits that electricity generation installations can affect the system stability of neighbouring states if there are undesired "loop flows". The process of grid development in the context of the grid development planning in Germany is designed in a way as to cover all electricity generation installations as well as all load situations. In this context, cross-border capacities are also taken into account.
- (45) The expansion of Germany's north-south power lines will in particular alleviate this problem. The German government assumes that the measures launched to accelerate the expansion of the transmission grid (in particular, the Grid

¹¹ The Commission is aware that alternative sources of data and methodologies for determining market shares exist. For example, see the table at p.30 of the 2014 joint monitoring report of the German Federal Network Agency and the Federal Cartel Office to the Council of European Energy Regulators (CEER), available at the following link:

http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20Reporting%202014/NR_nl/C14_NR_Germany-NL.pdf.

Germany has explained that the main differences between the figures in the 2014 monitoring report and the figures supplied in the context of the notification are due to differences in market definition (explained further on p.29 of the monitoring report). In particular, the 2014 monitoring report excludes EEG electricity, consumption of electricity produced on-site ("auto-consumption") and consumption by electric railways.

Expansion Acceleration Act and the Federal Requirements Plan Act) will have an impact.

- (46) To avoid unplanned cross-border loop flows at short notice, a virtual phase-shifter has been agreed with Poland. This virtual phase-shifter will be operated until physical phase-shifters at the interconnectors with Poland are constructed. Physical phase-shifters are also being planned at the border with the Czech Republic. Germany therefore does not expect that the construction of offshore wind power facilities will have an additional negative effect on neighbouring grids.

3. ASSESSMENT

3.1. Existence of aid

- (47) A measure constitutes State aid in the meaning of Article 107 (1) TFEU if it is granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain undertakings in so far as it affects trade between Member States.
- (48) As explained in Section 2.1 above, support is based on the EEG-Act 2014, which Germany considers not to constitute State aid. In particular, since the support to generators is not paid directly from the State budget or by a public entity (as described in Section 2.2 above), Germany argued that no state resources are involved.
- (49) However, the Commission has already assessed the existence of aid in the EEG-Act 2014¹². In its decision, it found that support for EEG electricity, including support for RES electricity, under the EEG-Act 2014 constitutes State aid.¹³ Hence, based on this assessment, to which reference is made, support under the notified measure also constitutes State aid.

3.2. Lawfulness of aid

- (50) Germany is already, or may be, granting aid to certain projects (listed in point 0 above) before a final Commission decision. Thus, in respect of these projects, Germany has breached the stand-still obligation set out in Article 108(3) TFEU.

3.3. Compatibility

- (51) The Commission has assessed the notified aid scheme on the basis of the Guidelines on environmental and energy aid for 2014-2020¹⁴ (EEAG), and in particular section 3.3 (Aid to energy from renewable sources). The EEAG apply since 1 July 2014 and to all on-going notifications (paragraph 247 EEAG).

¹² Case number SA.38632 (2014/N), C(2014) 5081 final.

¹³ See Points 149-152, 174-220 and 226 of the decision.

¹⁴ OJ C 200 of 28 June 2014, p. 1

- (52) According to point (120) of the EEAG, for operating aid schemes the general provision of Section 3.2 will be applied as modified by the specific provisions in subsection 3.3.1.

3.3.1. Objective of common interest

- (53) According to point (31) of the EEAG, Member States need to identify the objective of common interest pursued and explain the expected contribution of the measure to that objective. The German authorities have indicated that the notified projects are intended to increase the share of renewable energy in the German electricity mix. The promotion of the development of renewable energy is one of the aims of the Union's policy on energy pursuant to Article 194 TFEU. Also, the German authorities have explained the contribution of the projects to achieving the national target set out in the Renewable Energy Directive 2009/28/EC. The scheme is therefore directed at the objective of common interest of promoting the deployment of renewable energy.

3.3.2. Need for State intervention, incentive effect and appropriate instrument

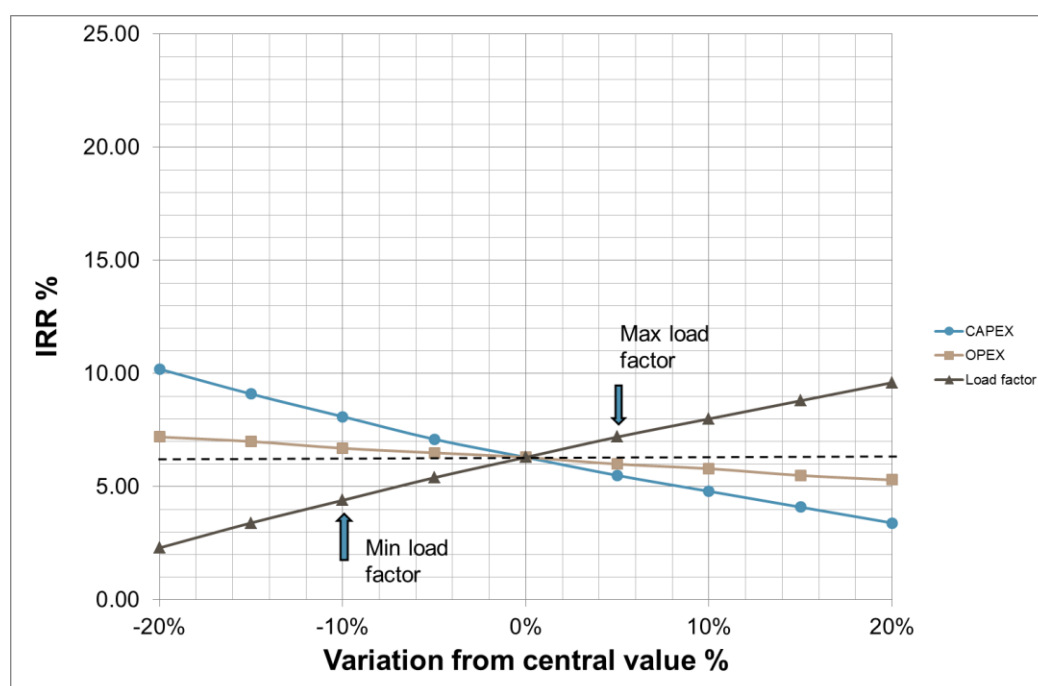
- (54) According to subsection 3.2.2 of the EEAG, the Member State needs to demonstrate that there is a need for State intervention and in particular that the aid is necessary to remedy a market failure that otherwise would remain unaddressed. In line with point (49) EEAG, an incentive effect occurs if the aid induces the beneficiary to change his behaviour towards reaching the objective of common interest which he would not do without the aid.
- (55) In the case of the production of electricity from renewable sources, the Commission presumes that a residual market failure remains, which can be addressed through aid for renewable energy, for the reasons set out in point 115 of the EEAG.
- (56) Germany provided detailed financial analysis illustrating the cost of each of the projects. Based on this analysis, the Commission notes that without the aid the notified projects would not be financially viable, as the costs of generating electricity (see paragraph (18)) would be much higher than the income from the sale of the electricity thus generated (see paragraph (15)). Without aid, the IRR of the notified projects would be significantly below investors' WACC. In most cases, the IRR would be negative. In only few cases the IRR without aid would be positive, but considerably low (around 1 % for the most profitable project). In such a situation, rational market players would not want to invest in the project. The aid therefore changes the behaviour of the recipients.
- (57) According to point (116) EEAG, in order to allow Member States to achieve their targets in line with the EU 2020 objectives, the Commission presumes the appropriateness of aid to energy from renewable sources provided all other conditions are met.
- (58) Consequently, in the light also of the assessment in the following sections, the aid for the notified projects is necessary, has an incentive effect and is granted by means of an appropriate instrument to address the objective of common interest.

3.3.3. Proportionality

- (59) According to point (69) EEAG, environmental aid is considered to be proportionate if the aid amount per beneficiary is limited to the minimum needed to achieve the environmental protection objective aimed for.
- (60) As explained in Section 2.3 above and in line with the requirement of point (124) of the EEAG, the aid is provided in the form of a variable premium, on top of the reference price for electricity.
- (61) As described in point (16) above, the premium was set administratively on the basis of expert studies (namely, the 2014 experience report). The analysis found a WACC of 8.1% (2013 commissioning) or 7.6% (2017 commissioning) or 6.7% (2020 commissioning), calculated on a post-tax nominal basis, to be appropriate for offshore projects in Germany. These rates are consistent with those previously approved by the Commission for offshore wind projects¹⁵.
- (62) The financial calculations submitted by Germany show that for most projects the IRR is below the value estimated to be required in the 2014 experience report. However, four wind farms ([...],[...],[...] – [...];[...] – [...] and [...] – [...]) have an IRR higher than the WACC deemed appropriate in the 2014 experience report. As shown in Table 6 the IRRs for these four projects are [...],[...],[...] and [...] for [...],[...],[...] and [...] respectively.
- (63) The Commission carried out an extensive sensitivity analysis of the projects' IRR with respect to the various input assumptions affecting the final outcome of the calculation. It found that the IRR is most affected by the assumptions about investment costs, operating costs and the load factor. Figure 3 illustrates the results of the sensitivity analysis for a typical project.

¹⁵ C(2014) 5074 final. OJ C 393 of 7 November 2014, p. 9 – 12.

Figure 3: Sensitivity analysis for a typical wind farm



- (64) Generally speaking, this analysis shows that the IRR is not particularly sensitive to the input assumptions. In more detail, as discussed in point (30) above, the assumed load factors amongst all projects vary between 41% and 50% with the average close to 47%. The arrows in Figure 3 show this range for the typical project. In this case, it can be seen that even an increase in the load factor towards the maximum seen amongst all projects would have little impact on the IRR. Given the explanations given by Germany (see point (31) and (32) above), for the two projects with a load factor of 41% ([...]-[...] and [...]-[...]), only limited upward variation in load factors is considered possible. For these reasons, overcompensation due to a higher than expected load factors is considered unlikely.
- (65) The four projects with a higher estimated IRR than the estimated WACC from the 2014 Experience Report (see paragraph (62)) have operating costs among the lowest assumed operating costs of all notified projects and average or below average investment costs, so significant additional downward variation in costs is considered unlikely. Three of the projects also have above average load factors, so significant additional upward variation in revenues is considered unlikely. The other (...) actually has the lowest investment costs of any of the notified projects. Hence, based on the sensitivity analysis, there is little scope for the IRR to increase beyond the estimated values. The post-tax nominal IRRs for the four projects are also consistent with those approved recently by the Commission for offshore wind projects in the UK¹⁶. For these reasons, overcompensation for these four projects is considered unlikely.

¹⁶ Decision C(2014) 5074 final in Cases SA.38758 (2014/N), SA.38759 (2014/N), SA.38761 (2014/N), SA.38763 (2014/N) & SA.38812 (2014/N) – United Kingdom Support for five Offshore Wind Farms: Walney, Dudgeon, Hornsea, Burbo Bank and Beatrice, OJ C 393 of 7.11.2014, p. 9 – 12.

- (66) The Commission verified the compliance of the notified measures with section 3.3.2.1 EEAG (Operating aid for electricity from renewable energy sources). The Commission notes that (in line with point (124) EEAG) the beneficiaries will sell the electricity produced directly in the market. The aid is granted as a variable premium, in line with point 124 (a) EEAG.
- (67) In the decision concerning the EEG-Act 2014, the Commission considered that the EEG-Act 2014 complied with point 124(b) EEAG¹⁷, since RES electricity producers receiving market premium payments would be either directly or indirectly subject to standard balancing responsibilities. The Commission also assessed whether there would be incentives for beneficiaries to generate at times of negative prices.¹⁸ The Commission observed that Germany has put in place measures ensuring that generators have no incentive to generate electricity under negative prices while at the same time ensuring that plants are not all switched off at the same time (which could lead to grid stability issues), but progressively. On that basis the Commission concluded that the condition of point 124(c) EEAG was fulfilled. Hence, based on this assessment, to which reference is made, support under the notified measure also complies with points 124(b) and 124(c) EEAG.
- (68) Point (126) EEAG requires that, from 1 January 2017, aid is granted in a competitive bidding process. Under the EEG-Act 2014, aid payments to beneficiaries begin to flow only as of the moment the project has been commissioned and starts generating electricity. However, in the Commission's view, in the present case which is characterised by significant lead times – from project conception, selection for a site, site preparation and applying for permits (including securing the authorization for construction and operation from the Federal Maritime and Hydrographic Agency) and grid connection to the final investment decision and, ultimately, commissioning – the relevant date to consider for applying point (126) EEAG is the date when the respective project developers are taking a final investment decision with a view to obtaining future aid payments based on the provisions of the EEG-Act 2014. In this regard:
- it has already been shown that aid is necessary for ensuring the projects' viability (see section 3.3.2); and
 - hence, developers will only make the significant financial commitment required to go ahead with a project if they expect that they in principle fulfil all the requirements for aid payments and that these payments will actually be made once they start feeding electricity into the grid.
- (69) The Commission estimates that all projects will take a final investment decision by end-2016:
- As shown by Table 5, final investment decisions for 17 of the notified projects will clearly be taken before 1 January 2017.

¹⁷ See Section 3.3.1.7 of the decision.

¹⁸ See Section 3.3.1.8 of the decision.

- For the remaining 3 projects for which final investment decision dates are not specified, complete commissioning is expected to take place by December 2019. This implies a final investment decision by the end of 2016, assuming a commissioning time of approximately 3 years, consistent with the other notified projects (commissioning times generally in the range of 2.5 to 5 years).
- (70) For all projects, aid is granted for a period not exceeding the depreciation period of the plants. Therefore the aid measures comply with point (131), as required by point (128) of the EEAG.
- (71) For two projects (SA. 39725 – Veja Mate and SA. 39723 – Nordsee One), the notified operating aid from the German government will be cumulated with Union funding from the European project NER300. These Union funds were taken into account when calculating the IRRs shown in Table 6.
- (72) As regards KfW loans, the German authorities have informed the Commission that these do not constitute State aid as they would be offered on market-terms in parallel to loans offered by commercial banks. Germany has therefore not notified these loans as State aid to the Commission and the present decision takes no position in this regard.
- (73) Loans financed from the EIB's own resources may, to extent that EIB interest rates are lower than market rates, reduce the support levels required by beneficiaries, by reducing beneficiaries' WACC. However, based on the information provided by Germany, for the four projects benefitting from EIB loans (see Section 2.7.3 above), the estimated maximum reduction in the WACC as a result of EIB financing is extremely small (0.067 percentage points)¹⁹. By contrast, the estimated post-tax IRR for these four projects is lower than the value estimated to be required in the 2014 experience report (by at least 0.1 percentage points). Based on this, the Commission concludes that the four projects receiving EIB funding are not over-compensated.
- (74) Based on the above, the aid granted for the notified projects is considered proportional.

3.3.4. *Distortion of competition and balancing test*

- (75) According to point (90) EEAG, the Commission considers that aid for environmental purposes will by its very nature tend to favour environmentally friendly products and technologies at the expense of other, more polluting ones. This effect of the aid will in principle not be viewed as an undue distortion of competition since it is inherently linked to its very objective.
- (76) As shown in Table 4 the electricity generated by each individual project would be a small fraction of the total generation in Germany (estimated by Eurostat at 633 TWh in 2013).

¹⁹ Assuming a total investment cost of EUR 1.12 billion (the lowest of the four projects) and maximum EIB lending of EUR 150 million, the EIB share of the initial financing would be at most 13.4%. Assuming a maximum interest rate advantage from EIB lending of 50 basis points, the reduction in the WACC resulting from EIB funding is $50 \times 13.4\% = 6.7$ basis points (0.067 percentage points).

- (77) Moreover, as shown in Table 7 once commissioned, the 20 projects will not increase market concentration in the German electricity market or strengthen the position of incumbent generators. Based on 2013 figures for total electricity generation and the estimated offshore wind generation figures provided by Germany, the market shares of Iberdrola and DONG Energy would be increased by 0.2 percentage points and 0.8 percentage points respectively. However, while these companies have a relatively large presence elsewhere in Europe, they currently have no generation capacity in Germany. The market share increases for the other established companies shown in Table 7 range between 0.2 and 0.5 percentage points and so are quite small. In the case of Stadtwerke München in particular, this would represent an increase from a very low base of 1.1%. In any event, the largest three German market players' shares of electricity generated by the 20 offshore wind projects are smaller than their respective shares of overall electricity generation (for 2013). Hence, if all 20 projects are realised as planned, and assuming all else constant, the realisation of all 20 offshore wind projects will dilute the overall generation market shares of the three largest generation companies in Germany, while allowing for significant market entry.²⁰
- (78) Finally, Germany is taking steps to reinforce the domestic electricity transmission network and connections with neighbouring countries (section 2.8.2). These measures should help to minimise any negative effects of the notified projects on stability of the electricity grid.
- (79) For these reasons, the aid to the 20 offshore wind projects does not have undue distortive effects on competition and trade so that the overall balance is positive, given the applicable conditions laid out in Section 3.3 of the EEAG are fulfilled.

3.3.5. Transparency

- (80) Member States are required under Section 3.2.7 of the EEAG to publish as of 1 July 2016 certain information related to the beneficiaries of aid.
- (81) As noted in the Commission's decision on the EEG-Act 2014 of 23 July 2014, Germany has committed that it will comply with this condition as of 1 July 2016 and explained that part of the information is already available. Hence, the requirements of section 3.2.7 of the EEAG are fulfilled.

3.3.6. Compatibility with Articles 30 and 110 TFEU

- (82) In accordance with point (29) of the EEAG, as the EEG-surcharge has the aim of financing the support for EEG electricity, the Commission has examined its compliance with Articles 30 and 110 TFEU.
- (83) As mentioned in the Commission's decision on the EEG-Act 2014 of 23 July 2014, Germany considers that there is no issue under Article 30 or 110 TFEU because the EEG-surcharge does not constitute a charge unilaterally imposed by a

²⁰ As noted in footnote 11, alternative data and methodologies exist for calculating market shares. The Commission has based its assessment on the data provided by Germany during the notification procedure. In particular, since the latter data includes EEG electricity, which is the subject of this notification, it is more appropriate for this purpose than the data presented in the 2014 monitoring report. Further, while using a different market definition could affect the percentages calculated in paragraph (77) above, it would be unlikely to significantly affect the conclusions.

Member State within the meaning of those articles. The Commission notes, however, that (i) the support to EEG electricity is financed through a surcharge imposed on electricity consumed in Germany; (ii) the charge is calculated on the amount of electricity consumed, i.e. it is imposed on the product itself; (iii) the obligation to pay that surcharge results from the law, i.e. it is a unilaterally imposed charge and (iv) the charge does not correspond to the price paid for a good (see decision C(2014) 5081 final for more details).

- (84) In the decision concerning the EEG-Act 2014, Commission has assessed whether there could be discriminatory treatment with regard to imported products. In particular, the Commission found that, in view of the commitments provided for under §2(6) EEG-Act 2014 (the opening of tenders to operators located in other Member States), the aid scheme, including its financing mechanism, complies with Articles 30/110 TFEU.
- (85) The above commitment will also apply to the notified measures subject of the present decision. Therefore the Commission considers that aid for the notified projects does not introduce any restrictions contrary to Article 30 or Article 110 TFEU.

4. AUTHENTIC LANGUAGE

- (86) As noted in Section 1, Germany waived its right to have the decision adopted in German. The authentic language will therefore be English.

5. CONCLUSION

The Commission regrets that Germany has already started granting aid to certain projects, in breach of Article 108(3) of the Treaty on the Functioning of the European Union.

However, it has decided, on the basis of the above assessment, not to raise objections to the aid on the grounds that it is compatible with the internal market pursuant to Article 107(3) of the Treaty on the Functioning of the European Union.

The Commission further notes that some of the involved projects are located in or in the proximity of Natura 2000 sites and must thus comply with Article 6(3)(4) of the Habitats Directive²¹ including the requirement to assess cumulative effects with other projects. This state aid assessment should not prejudice any possible scrutiny of the compliance of the projects with EU environmental law.

If any parts of this letter are covered by the obligation of professional secrecy according to the Commission communication on professional secrecy and should not be published, please inform the Commission within fifteen working days of notification of this letter. If the Commission does not receive a reasoned request by that deadline Germany will be deemed to agree to the publication of the full text of this letter. If Germany wishes certain information to be covered by the obligation of professional secrecy please indicate the

²¹ Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ L 206 22.7.1992, p. 7); Directive as last amended by Directive 2013/17/EU (OJ L 158, 10.6.2013, p. 193).

parts and provide a justification in respect of each part for which non-disclosure is requested.

Your request should be sent electronically in accordance with Article 3(4) of Commission Regulation (EC) No 794/2004.

Yours faithfully
For the Commission

Margrethe VESTAGER
Member of the Commission