East Anglia TWO and East Anglia ONE North Offshore Windfarms

Deadline 8 Offshore Ornithology Cumulative and In-Combination Collision Risk Update

Applicants: East Anglia TWO Limited / East Anglia ONE North Limited
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Applicable to East Anglia TWO and East Anglia ONE North

Revision Summary				
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Description of Revisions			
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Glossary of Acronyms

AEoI	Adverse Effect on Integrity
AOE	Alde-Ore Estuary
CRM	Collision Risk Model
FFC	Flamborough and Filey Coast
GBBG	Great Black-Backed Gull
HRA	Habitats Regulations Assessment
LBBG	Lesser Black-Backed Gull
ISAA	Information to Support Appropriate Assessment Report
MHWS	Mean High Water Springs
MSL	Mean Sea Level
NE	Natural England
NMC	Non-material change
SNH	Scottish Natural Heritage
SPA	Special Protection Area

Glossary of Terminology

Applicant	East Anglia TWO Limited / East Anglia ONE North Limited
Construction operation and maintenance platform	A fixed offshore structure required for construction, operation, and maintenance personnel and activities.
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Generation Deemed Marine Licence (DML)	The deemed marine licence in respect of the generation assets set out within Schedule 13 of the draft DCO.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Meteorological mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.

Monitoring buoys	Buoys to monitor *in situ* condition within the windfarm, for example wave and metocean conditions.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and landfall.
Offshore development area	The East Anglia TWO / East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical infrastructure	The transmission assets required to export generated electricity to shore. This includes inter-array cables from the wind turbines to the offshore electrical platforms, offshore electrical platforms, platform link cables and export cables from the offshore electrical platforms to the landfall.
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Offshore platform	A collective term for the construction, operation and maintenance platform and the offshore electrical platforms.
Platform link cable	Electrical cable which links one or more offshore platforms. These cables will include fibre optic cables.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.
Transmission DML	The deemed marine licence in respect of the transmission assets set out within Schedule 14 of the draft DCO.

1 Introduction

1. This cumulative and in-combination collision risk document has been updated at Deadline 8 as follows:

- Within REP5-083 Natural England pointed out an error in the East Anglia THREE figure for great black-backed gull which had not been reverted back from the Non Material Change (NMC) position to the consented position and therefore this error has been corrected;
- Following advice from Natural England in March 2021 that the Norfolk Vanguard project is no longer to be considered as being in the planning system and due to ongoing Natural England concerns surrounding Hornsea Project 3 estimates, the tables have been amended to capture this uncertainty (see Appendix 1); and
- The East Anglia TWO estimates for gannet and kittiwake apportioned to the Flamborough and Filey Coast (FFC) SPA have been updated to use the migration free breeding season (see ***section 2***).

2 Examination Updates

2.1 Apportioning of kittiwake and gannet for East Anglia TWO

2. At Deadline 4 (REP4-042 and described below) the collision risk modelling (CRM) predictions for the East Anglia ONE North project were updated to include the windfarm site boundary revision and at the same time the revision of gannet and kittiwake apportioning to the FFC SPA using the full breeding season (as advised by NE). No updates were made to the East Anglia TWO figures (since the design was unchanged) so this resulted in continued use of the migration-free breeding season for the apportioned collisions for East Anglia TWO. This has now been corrected in this document.

3. For the avoidance of doubt the collision risk modelling itself is not affected (i.e. the EIA and CIA figures), the only change is the months which are treated as part of the breeding or non-breeding seasons, and hence what proportion of the total collisions in those months are apportioned to the FFC SPA populations. The changes for East Anglia TWO are provided in ***Table 1*** and incorporated in Appendix 1 (from use of migration free to full breeding season):

Table 1 Updates to the East Anglia TWO FFC SPA Apportioned Collision Estimates Following a Change from the Migration Free Breeding Season to the Full Breeding Season. Figures in parentheses represent the 95% confidence intervals

Species	Season	Spring	Breeding	Autumn	Total
Gannet	Full breeding season	0.1 (0-0.1)	12.5 (4.5-24.3)	1.3 (0.8-1.8)	13.8 (5.3-26.2)
	Migration free	0.1 (0-0.2)	10.7 (4.2-20.4)	1.3 (0.9-1.9)	12.1 (5.1-22.5)
Kittiwake	Full breeding season	0.5 (0.3-0.9)	0 (0-0)	0.3 (0.1-0.5)	0.8 (0.4-1.4)
	Migration free	1.3 (0.6-2.1)	0 (0-0)	0.4 (0.1-0.8)	1.7 (0.7-2.9)

2.2 Changes to the East Anglia ONE North boundary

4. At Deadline 4 updated collision risk estimates for East Anglia ONE North were provided (REP4-042). These were calculated following a revision to the site boundary (to achieve a 2km separation from the Outer Thames Estuary SPA) and resulting change to the estimated density of birds in flight. These calculations were only been undertaken for the following species which did not have very low (<=3) predicted collision mortalities:

- Gannet;
- Kittiwake;

- Lesser Black-Backed Gull (LBBG), and
- Great Black-Backed Gull (GBBG).

5. Note that LBBG has was included, even though the original collision risk estimates were very low, due to the potential connectivity with the Alde-Ore Estuary SPA. No further changes have been made to the East Anglia ONE North figures.

2.3 Increase of draught height

6. Following detailed design reviews, the minimum draught height for both East Anglia ONE North and East Anglia TWO has been increased by 2m, to 24m above MHWS. This increase in the minimum draught height reduces the collision risk estimates at the two windfarms by up to 15% in some cases (see REP1-047). No further changes have been made to the draught height and the collision risk estimates for the Projects have only changed with respect to the points considered in ***section 2.1*** and ***section 2.2***.

2.4 In-combination totals

7. The Norfolk Boreas Deadline 8 collision risk estimates have been taken as the common position for all cumulative and in-combination projects. This therefore takes into account all post-application changes made to Norfolk Vanguard and Norfolk Boreas and includes the numbers submitted in the preliminary environmental information report (PEIR) for Hornsea Four. Predicted collisions at the Thanet Extension windfarm, which was refused consent in June 2020, were removed from consideration. The predicted kittiwake collision estimates for Hornsea Three was updated to the figure used by the Secretary of State in the Hornsea Three HRA.

8. Given the continued uncertainty around the status of the estimates for some projects or the planning status of some projects, the Applicants have amended the in-combination tables presented previously (REP4-042).

2.4.1 Hornsea Three

9. Hornsea Project Three has now been granted consent, however the estimates for collision risk used in the cumulative and in-combination collision risk tables have the following caveats:

- For kittiwake the total is given on the assumption that the compensation provided by Hornsea Project Three fully compensates for those collisions for the Flamborough and Filey Coast SPA and therefore zero collisions are attributed to the SPA from Hornsea Project Three; and
- As no update for species other than kittiwake were provided by Ørsted, the numbers for other species are taken from Ørsted (2019) and follow Natural

England advice with respect to the values to assign to this project provided to the Norfolk Boreas examination (Natural England 2019). It is assumed that these numbers will be over-estimates as they do not take into account mitigation provided in Ørsted's post-examination submissions. Based on the reduction in the kittiwake collision predictions, from 181 to 65-73, the degree of over-estimation for other species is expected to be approximately 60%.

2.5 Hornsea Four

10. The estimates provided for Hornsea Four remain those presented in that project's PEIR. It had been hoped that updated figures would be available, but there has been no updated information from Ørsted as the project has not yet submitted a DCO application.

2.6 Norfolk Vanguard

11. Following an Order of the High Court, the decision of the Secretary of State to grant the application by Norfolk Vanguard Limited for development consent for Norfolk Vanguard has been quashed. Natural England has advised that totals should be presented with and without Norfolk Vanguard as a result of this decision. There are no changes to the estimated collision from this project, but the numbers for the project have now been presented separately from the confirmed totals.

3 Updated cumulative and in-combination collisions

12. The cumulative and in-combination collision totals for gannet, kittiwake, LBBG and GBBG include the changes outlined above in ***section 2*** .

13. The cumulative and in-combination totals are provided in ***Appendix 1 Updated Cumulative and In-Combination Collision Risk Tables***. The Cumulative and in-combination totals are presented as follows:

- For each species the Applicants have included a row titled ***Total (all confirmed projects)***. This includes all projects previously agreed at Deadline 8 of the Norfolk Boreas examination (which is the commonly agreed position) with the following exceptions:
  - For kittiwake the totals exclude Hornsea Project Four and Norfolk Vanguard, these are presented separately; and
  - For gannet, lesser black-backed gull and great black-backed gull the totals exclude Hornsea Project Three, Hornsea Project Four and Norfolk Vanguard, these are presented separately.
- The Examining Authority, Natural England and Secretary of State can therefore see the confirmed total (i.e. those numbers and projects for which there is certainty) and incorporate the effects of the other projects as they see fit in their consideration of cumulative and in-combination effects.

4 Conclusion

14. Overall, the updates described within this cumulative and in-combination collision risk update do not alter the conclusions of negligible to minor adverse significance for the EIA and no Adverse Effects on Integrity for the HRA within the assessments submitted (***Chapter 12 Offshore Ornithology*** (APP-060) and the ***Information to Support Appropriate Assessment Report*** (APP-043)).

15. Project-alone collision mortalities for both Projects are already small when compared to other projects of a similar scale. These numbers have been further reduced from those submitted with the Applications following the increase in draught height for the Projects.

5 References

Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164.
Natural England (2019). Norfolk Boreas Offshore Wind Farm. Appendix 1 to the Relevant Representations of Natural England - Ornithology

Orsted (2019) Hornsea Project Three Offshore Wind Farm. Appendix 28 to Deadline 4 submission -Summary of positions in relation to collision mortality for the SPA populations of gannet and kittiwake.

Appendix 1 Updated Cumulative and In-Combination Collision Risk Tables

Introduction

16. In this Deadline 8 update, the Applicants have included a row titled **Total (all confirmed projects)** for each species. This includes all projects previously agreed at Deadline 8 of the Norfolk Boreas examination (which is the commonly agreed position) minus Hornsea Project Three, Hornsea Project Four and Norfolk Vanguard for gannet, lesser black-backed gull and great black-backed gull and minus Hornsea Four and Norfolk Vanguard for kittiwake.

Gannet

Table A0.1 Updated gannet cumulative and in-combination collision risk

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Beatrice Demonstrator	0.6	0	0.9	0.04	0.7	0.05	2.2	0.1
1	Greater Gabbard	14	0	8.8	0.42	4.8	0.3	27.5	0.7
1	Gunfleet Sands	-	-	-	-	-	-	-	-
1	Kentish Flats	1.4	0	0.8	0.04	1.1	0.07	3.3	0.1
1	Kentish Flats Extension	-	-	-	-	-	-	-	-
1	Lincs	2.1	2.1	1.3	0.06	1.7	0.1	5	2.3
1	London Array	2.3	0	1.4	0.07	1.8	0.11	5.5	0.2
1	Lynn and Inner Dowsing	0.2	0.2	0.1	0.01	0.2	0.01	0.5	0.2
1	Scroby Sands	-	-	-	-	-	-	-	-
1	Sheringham Shoal	14.1	14.1	3.5	0.17	0	0	17.6	14.3
1	Teesside	4.9	2.4	1.7	0.08	0	0	6.7	2.5
1	Thanet	1.1	0	0	0	0	0	1.1	0

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Humber Gateway	1.9	1.9	1.1	0.05	1.5	0.09	4.5	2
1	Westermost Rough	0.2	0.2	0.1	0.01	0.2	0.01	0.5	0.2
1	Hywind	5.6	0	0.8	0.04	0.8	0.05	7.2	0.1
2	Kincardine	3	0	0	0	0	0	3	0
2	Beatrice	37.4	0	48.8	2.34	9.5	0.59	95.7	2.9
2	Dudgeon	22.3	22.3	38.9	1.87	19.1	1.18	80.3	25.3
2	Galloper	18.1	0	30.9	1.48	12.6	0.78	61.6	2.3
2	Race Bank	33.7	33.7	11.7	0.56	4.1	0.25	49.5	34.5
2	Rampion	36.2	0	63.5	3.05	2.1	0.13	101.8	3.2
2	Hornsea Project One	11.5	11.5	32	1.54	22.5	1.4	66	14.4
3	Blyth Demonstration Project	3.5	0	2.1	0.1	2.8	0.17	8.4	0.3
3	Dogger Bank Creyke Beck Projects A and B	81.1	40.6	83.5	4.0	54.4	3.4	219.0	47.9
3	East Anglia ONE	3.4	3.4	131.0	6.3	6.3	0.4	141.0	10.1
3	European Offshore Wind Deployment Centre	4.2	0	5.1	0.25	0.1	0	9.3	0.3
3	Firth of Forth Alpha and Bravo	800.8	0	49.3	2.37	65.8	4.08	915.9	6.4
3	Inch Cape	336.9	0	29.2	1.4	5.2	0.32	371.3	1.7
3	Methil	6	0	0	0	0	0	6	0

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
3	Moray Firth (EDA)	80.6	0	35.4	1.7	8.9	0.55	124.9	2.3
3	Neart na Gaoithe	143	0	47	2.26	23	1.43	213	3.7
3	Dogger Bank Teesside Projects A and B	14.8	7.4	10.1	0.49	10.8	0.67	35.7	8.5
3	Triton Knoll	26.8	26.8	64.1	3.08	30.1	1.87	121	31.7
3	Hornsea Project Two	7	7	14	0.67	6	0.37	27	8
4	East Anglia THREE	6.1	6.1	33.3	1.6	9.6	0.6	49.0	8.3
6	Moray West	10	0	2	0.1	1	0.06	13	0.2
6	Norfolk Boreas	14.1	14.2	12.7	0.61	3.9	0.24	30.7	15.1
6	East Anglia TWO	10.7	12.5	24.2	1.3	47.7	0.1	39.6	13.8
6	East Anglia ONE North	12.4	12.4	11.0	0.52	1.1	0.07	24.5	13.0
	Total (all confirmed projects)	**1772**	**215.2**	**800.3**	**38.6**	**359.4**	**19.5**	**2888.8**	**276.6**
5	Norfolk Vanguard	8.2	8.2	18.6	0.89	5.3	0.33	32.1	9.4
5	Hornsea Project Three[1]	26	26	12	0.58	11	0.68	49	27.3
6	*Hornsea 4 (PEIR)*	43.3	43.3	9.9	0.48	8.1	0.5	61.3	44.3
	Total (all projects)	**1849.5**	**292.7**	**840.8**	**40.5**	**383.8**	**21**	**3031.2**	**357.6**

[1] Figures for Hornsea Project Three taken from Ørsted (2019) following advice in Natural England (2019). Note these are over-estimates as further mitigation has been applied but no updated collisions have been presented for species other than kittiwake.

Kittiwake

Table A0.2 Updated kittiwake cumulative and in-combination collision risk incorporating revised collision risk numbers for Hornsea Three (i.e. 181 down to 65-73) as submitted in an updated Hornsea Three assessment on the 14th February 2020 (Orsted, 2020)

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Beatrice Demonstrator	0.0	0.0	2.1	0.1	1.7	0.1	3.8	0.2
1	Greater Gabbard	1.1	0.0	15.0	0.8	11.4	0.8	27.5	1.6
1	Gunfleet Sands	-	-	-	-	-	-	-	
1	Kentish Flats	0.0	0.0	0.9	0.1	0.7	0.1	1.6	0.1
1	Kentish Flats Extension	0.0	0.0	0.0	0.0	2.7	0.2	2.7	0.2
1	Lincs	0.7	0.7	1.2	0.1	0.7	0.1	2.6	0.8
1	London Array	1.4	0.0	2.3	0.1	1.8	0.1	5.5	0.3
1	Lynn and Inner Dowsing	-	-	-	-	-	-	-	
1	Scroby Sands	-	-	-	-	-	-	-	
1	Sheringham Shoal	-	-	-	-	-	-	-	
1	Teesside	38.4	0.0	24.0	1.3	2.5	0.2	64.9	1.5
1	Thanet	0.2	0.0	0.5	0.0	0.4	0.0	1.1	0.1
1	Humber Gateway	1.9	1.9	3.2	0.2	1.9	0.1	7.0	2.2
1	Westermost Rough	0.1	0.1	0.2	0.0	0.1	0.0	0.5	0.1
1	Hywind	16.6	0.0	0.9	0.1	0.9	0.1	18.3	0.1
2	Kincardine	22.0	0.0	9.0	0.5	1.0	0.1	32.0	0.6
2	Beatrice	94.7	0.0	10.7	0.6	39.8	2.9	145.2	3.5
2	Dudgeon	-	-	-	-	-	-	-	
2	Galloper	6.3	0.0	27.8	1.5	31.8	2.3	65.9	3.8

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
2	Race Bank	1.9	1.9	23.9	1.3	5.6	0.4	31.4	3.6
2	Rampion	54.4	0.0	37.4	2.0	29.7	2.1	121.5	4.2
2	Hornsea Project One	44.0	36.5	55.9	3.0	20.9	1.5	120.8	41.0
3	Blyth Demonstration Project	1.7	0.0	2.3	0.1	1.4	0.1	5.4	0.2
3	Dogger Bank Creyke Beck Projects A and B	288.6	55.8	135.0	7.3	295.4	21.3	719.0	84.3
3	East Anglia ONE	1.8	0	160.4	8.7	46.8	3.4	209.0	12.0
3	European Offshore Wind Deployment Centre	11.8	0.0	5.8	0.3	1.1	0.1	18.7	0.4
3	Firth of Forth Alpha and Bravo	153.1	0.0	313.1	16.9	247.6	17.8	713.8	34.7
3	Inch Cape	13.1	0.0	224.8	12.1	63.5	4.6	301.4	16.7
3	Methil	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0
3	Moray Firth (EDA)	43.6	0.0	2.0	0.1	19.3	1.4	64.9	1.5
3	Neart na Gaoithe	32.9	0.0	56.1	3.0	4.4	0.3	93.4	3.4
3	Dogger Bank Teesside Projects A and B	136.9	26.4	90.7	4.9	216.9	15.6	444.5	46.9
3	Triton Knoll	24.6	24.6	139.0	7.5	45.4	3.3	209.0	35.4
3	Hornsea Project Two	16.0	13.3	9.0	0.5	3.0	0.2	28.0	14.0

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
4	East Anglia THREE	6.1	0	69	3.7	37.6	2.7	112.7	6.4
5	Hornsea Project Three	187.5	-	94.6	-	15.0	-	297.1	0 (*65-73*)*
6	Moray West	79.0	0.0	24.0	1.3	7.0	0.5	110.0	1.8
6	Norfolk Boreas	13.3	11.4	32.2	1.7	11.9	0.9	57.5	14.0
6	East Anglia TWO	16.8	0	7.9	0.3	17.7	0.5	42.3	0.8
6	East Anglia ONE North	33.7	0	8.1	0.43	10.2	0.25	51.97	0.7
	Total (all confirmed projects)	1344.6	172.6	1589	80.5	1197.8	84.1	4131.37	337.1
5	Norfolk Vanguard	21.8	18.7	16.4	0.9	19.3	1.4	57.5	21.0
6	*Hornsea 4 (PEIR)*	153.3	153.3	34.7	1.9	9.9	0.7	197.9	155.9
	Total (all projects)	**1519.7**	**344.6**	**1640.1**	**83.4**	**1227.0**	**86.2**	**4386.8**	**514**

* Note that the contribution from Hornsea Project Three to the FFC SPA total has been removed from the total on the assumption that these collisions will be fully compensated for by the project. The annual total shown in brackets (65-73) was the final apportioned estimate for the mitigated design (Orsted, 2020), however the EIA total of 297 reflects a previous project design with higher collisions as this has also not been updated (and hence this is an over-estimate of the project's contribution to the cumulative total).

Lesser Black-Backed Gull

Table A0.3 Updated lesser black-backed gull cumulative and in-combination collision risk

Tier	Windfarm	Breeding season		Nonbreeding season		Annual	
		Total	AOE SPA	Total	AOE SPA	Total	AOE SPA (nonbreeding season apportioned plus breeding season for wind farms <141km)*
1	Beatrice Demonstrator	-	-	-	-	-	-
1	Greater Gabbard	12.4	8	49.6	2	62	10
1	Gunfleet Sands	1	0.3	0	0	1	0.3
1	Kentish Flats	-	-	-	-	-	-
1	Kentish Flats Extension	0.3	0.1	1.3	0.1	1.6	0.2
1	Lincs	1.7		6.8	0.3	8.5	0.3
1	London Array	-	-	-	-	-	-
1	Lynn and Inner Dowsing	-	-	-	-	-	-
1	Scroby Sands	-	-	-	-	-	-
1	Sheringham Shoal	1.7	0.3	6.6	0.3	8.3	0.6
1	Teesside	0		0	0	0	0
1	Thanet	3.2	1.4	12.8	0.5	16	1.9
1	Humber Gateway	0.3		1.1	0	1.4	0
1	Westermost Rough	0.1		0.3	0	0.4	0
1	Hywind	0		0	0	0	0
2	Kincardine	0		0	0	0	0
2	Beatrice	0		0	0	0	0
2	Dudgeon	7.7	1.1	30.6	1.2	38.3	2.3
2	Galloper	27.8	18	111	4.4	138.8	22.4

Tier	Windfarm	Breeding season		Nonbreeding season		Annual	
		Total	AOE SPA	Total	AOE SPA	Total	AOE SPA (nonbreeding season apportioned plus breeding season for wind farms <141km)*
2	Race Bank	43.2		10.8	0.4	54	0.4
2	Rampion	1.6		6.3	0.3	7.9	0.3
2	Hornsea Project One	4.4		17.4	0.7	21.8	0.7
3	Blyth Demonstration Project	0		0	0	0	0
3	Dogger Bank Creyke Beck Projects A and B	2.6		10.4	0.4	13	0.4
3	East Anglia ONE	5.9	2.2	33.8	1.4	39.7	3.6
3	European Offshore Wind Deployment Centre	0		0	0	0	0
3	Firth of Forth Alpha and Bravo	2.1		8.4	0.3	10.5	0.3
3	Inch Cape	0		0	0	0	0
3	Methil	0.5		0	0	0.5	0
3	Moray Firth (EDA)	0		0	0	0	0
3	Neart na Gaoithe	0.3		1.2	0	1.5	0
3	Dogger Bank Teesside Projects A and B	2.4		9.6	0.4	12	0.4
3	Triton Knoll	7.4		29.6	1.2	37	1.2
3	Hornsea Project Two	2		2	0.1	4	0.1
4	East Anglia THREE	1.8	0.4	8.2	0.3	10	0.7

Tier	Windfarm	Breeding season		Nonbreeding season		Annual	
		Total	AOE SPA	Total	AOE SPA	Total	AOE SPA (nonbreeding season apportioned plus breeding season for wind farms <141km)*
6	Moray West	0		0	0	0	0
6	Norfolk Boreas	6.2	1.9	8.1	0.2	14.3	2.1
6	East Anglia TWO	4.2	1.6	0.5	0	4.7	1.6
6	East Anglia ONE North	0.9	0.2	0.6	0.1	1.5	0.3
	Total (all confirmed projects)	141.7	*26.8*	367	14.6	508.7	50.1
5	Hornsea Project Three	17.3		0	0	17.3	0
5	Norfolk Vanguard	8.4	2.5	3.6	0.1	12	2.6
6	*Hornsea 4 (PEIR)*	1.9		0	0	1.9	0
	Total (all projects)	**169.3**	**38.0**	**370.6**	**14.7**	**539.9**	**52.7**

* The apportioning of lesser black-backed gull collisions to the Alde Ore Estuary SPA from breeding colonies in Norfolk and Suffolk uses the connectivity rates estimated in the Table 1 of the ***Cumulative and In-Combination Collision Risk Update*** submitted at Deadline 1 (REP1-047).

Great black-backed gull

Table A0.4 Great black-backed gull cumulative collision risk

Tier	Windfarm	Breeding season	Nonbreeding season	Annual
1	Beatrice Demonstrator	0	0	0
1	Greater Gabbard	15	60	75
1	Gunfleet Sands	-	-	-
1	Kentish Flats	-	-	-
1	Kentish Flats Extension	0.1	0.2	0.3
1	Lincs	0	0	0
1	London Array	-	-	-
1	Lynn and Inner Dowsing	0	0	0
1	Scroby Sands	-	-	-
1	Sheringham Shoal	0	0	0
1	Teesside	8.7	34.8	43.6
1	Thanet	0.1	0.4	0.5
1	Humber Gateway	1.3	5.1	6.3
1	Westermost Rough	0	0	0.1
1	Hywind	0.3	4.5	4.8
2	Kincardine	0	0	0
2	Beatrice	30.2	120.8	151
2	Dudgeon	0	0	0
2	Galloper	4.5	18	22.5
2	Race Bank	0	0	0
2	Rampion	5.2	20.8	26
2	Hornsea Project One	17.2	68.6	85.8
3	Blyth Demonstration Project	1.3	5.1	6.3
3	Dogger Bank Creyke Beck Projects A and B	5.8	23.3	29.1
3	East Anglia ONE	0	46	46
3	European Offshore Wind Deployment Centre	0.6	2.4	3

Tier	Windfarm	Breeding season	Nonbreeding season	Annual
3	Firth of Forth Alpha and Bravo	13.4	53.4	66.8
3	Inch Cape	0	36.8	36.8
3	Methil	0.8	0.8	1.6
3	Moray Firth (EDA)	9.5	25.5	35
3	Neart na Gaoithe	0.9	3.6	4.5
3	Dogger Bank Teesside Projects A and B	6.4	25.5	31.9
3	Triton Knoll	24.4	97.6	122
3	Hornsea Project Two	3	20	23
4	East Anglia THREE	4.6	34.4	39
6	Moray West	4	5	9
6	Norfolk Boreas	6.9	28.7	35.6
6	East Anglia TWO	3.5	3.4	6.9
6	East Anglia ONE North	3.7	1.2	5.0
	Total (all confirmed projects)	171.4	745.9	917.4
5	Hornsea Project Three	19.4	46.6	66
5	Norfolk Vanguard	4.5	21.5	26
6	*Hornsea 4 (PEIR)*	3	13.6	13.6
	Total (all projects)	**198.3**	**827.6**	**1023.0**