STATEMENT OF FEASIBILITY

Statement No.:
C-DNV-SE-0190-08763-0

Issued:
2022-05-10

Issued for:

Concept

of

Hesselø Offshore Wind Farm

Comprising:

Metocean and ice conditions

Specified in Annex 1

Issued to:

Energinet Eltransmission A/S

Tonne Kjærsvej 65, 7000 Fredericia, Denmark

According to:

DNV-SE-0190:2021-09
Project certification of wind power plants

Based on the document:

CR-C-DNV-SE-0190-08763-0 Certification Report, dated 2022-05-10

Changes of the concept are to be approved by DNV.

Hamburg, 2022-05-10

For DNV Renewables Certification

Fabio Pollicino
Service Line Leader for Project Certification

DAkkS Deutsche Akkreditierungsstelle D-ZE-11053-01-00

By DAkkS according DIN EN IEC/ISO 17065 accredited Certification Body for products. The accreditation is valid for the fields of certification listed in the certificate.

Place, 2022-05-10

For DNV Renewables Certification

Iris Pernille Lohmann
Project Manager

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Wind farm layout and coordinates

Coordinate system and datum	World Geodetic System 1984 (WGS 84)
Corner coordinates of the wind farm	11° 55.130' E 56° 20.110' N
	11° 39.884' E 56° 25.724' N
	11° 50.963' E 56° 34.914' N
	11° 53.528' E 56° 37.052' N
	11° 54.539' E 56° 24.111' N
	11° 58.289' E 56° 21.108' N

Wind conditions – Normal

Annual average wind speed (at proposed hub height 140.0 m MSL)	9.64 m/s
Weibull A-parameter	10.89 m/s
Weibull k-parameter	2.22
Wind shear for operational conditions	0.088
Ambient turbulence / characteristic turbulence at 15 m/s (NTM)	6.0% / 8.2%
Air density	1.23 kg/m^3

Wind conditions – Extreme

Wind speed 50-year recurrence period, 10 min. (at proposed hub height)	40.50 m/s
Wind shear for EWM	0.095
Turbulence intensity for use with EWM	12.9%
Air density	1.23 kg/m^3

Marine conditions

Highest astronomical tide (HAT)	+0.33 m MSL
Lowest astronomical tide (LAT)	-0.37 m MSL
Significant wave height for 50-year recurrence period, Hm0,50-yr	5.0 m
Significant wave height for 1-year recurrence period, Hm0,1-yr	3.6 m
Peak wave period Tp for extreme for 50-year recurrence wave Hm0,50-yr	8.2 s
Peak wave period Tp for extreme for 1-year recurrence wave Hm0,1-yr	7.3 s
Extreme deterministic wave height for 50-year recurrence period, Hmax,50-yr	9.3 m
Extreme deterministic wave height for 1-year recurrence period, Hmax,1-yr	6.6 m
Wave period interval (10%-90% quantile) associated with Hmax,50-yr	7.0-8.3 s
Wave period interval (10%-90% quantile) associated with Hmax,1-yr	5.9-7.1 s
Extreme wave crest elevation* for 50-year recurrence period	7.1 m MSL
Extreme wave crest elevation* for 1-year recurrence period	4.8 m MSL
Extreme positive surge water level* for 50-year recurrence period	1.6 m MSL

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Extreme positive surge water level* for 1-year recurrence period	1.0 m MSL
Extreme negative surge water level* for 50-year recurrence period	-0.9 m MSL
Extreme negative surge water level* for 1-year recurrence period	-0.6 m MSL
Extreme depth averaged current speed for 50-year recurrence period	1.1 m/s
Extreme depth averaged current speed for 1-year recurrence period (OWF-1)	0.6 m/s

*excluding sea level rise and vertical land movement, which have not been decided for FEED

Sea ice parameters including return period	
Frost index 1/50 years	292 deg-days
Ice thickness 1/50 years	0.35 m
Ice crushing strength coefficient 1 years	0.85 - 1 MPa
Ice crushing strength coefficient – average ridges 1 years	0.66 MPa
Ice ridge consolidated layer thickness 1/50 years	0.56 m
Ice ridge keel depth 1/50 years	8.45 m

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Summary of scope of work

The table below lists the work packages of the concept evaluation and indicates if these work packages have been

- verified by DNV (verified)
- same as or covered by a certificate / statement this assessment is based on (as certified)
- taken as given without verification by DNV (as given by customer)
- not included in this assessment (not included)
- not present in this case (none).

1)	site wind and other enviromental conditions, mean/extreme wind speed	verified
2)	water depth, currents and mean/extreme sea state, if applicable	verified
3)	reliability of the sources of item 1. and 2.	verified
4)	grid connection possibilities resp. distance to main consumers, local rules of authorities	not included
5)	logistic accessibility for large components and human resources	not included
6)	general soil conditions, depth of effective foundation level below (soil or water) surface	not included
7)	general foundation type (on- or offshore, if offshore: fixed or floating)	not included
8)	corrosion protection strategy/corrosion control concept	not included
9)	general plant layout	not included
10)	size, type and number of wind turbines and their distances to each other	not included
11)	concept of substation with respect to structural, safety and electrical design	not included
12)	control of wind power plant	not included
13)	homogeneity of lifecycle concept of wind power plant, i.e. trade-off between dimensioning of components and maintenance/repair frequency, if applicable	not included
14)	standards to be applied for design and their interfaces. Advantages and disadvantages of different standard series and their holistic concept (i.e. fit of the design standard to the planned manufacturing standard)	not included
15)	risk analyses for different possible design approaches for the components of the wind power plant. Trade-off between high risk approach and its possible gains/losses as compared to conventional design	not included
16)	reviewing extent, contents and time horizon of test series required for newly innovated design parts or components.	not included