



## EVALUATION REPORT SITE CONDITIONS – WIND CONDITIONS – HESSELØ SOUTH

PREPARED FOR:  
**ENERGINET ELTRANSMISSION A/S**

**ORDER NO.: 15626318**

*Report No.: R15626318-0-2, Rev. 0,  
2025-01-17*

Wind Farm: Hesselø South

Evaluation Basis:  
IECRE OD-502: Operational Document,  
"Project Certification Scheme", Edition 1.0,  
2018-10

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**DOCUMENT HISTORY**

<b>REVISION</b>	<b>RELEASE DATE</b>	<b>AFFECTED PAGE(S)</b>	<b>MODIFICATION</b>
0	2025-01-17	-	Initial Document

## 1. DOCUMENTS

### 1.1 Examined Documents

/1.1.1/ EMD International A/S: Report  
"HESSELØ Site Wind Conditions Assessment",  
Doc. No. 240927\_23406\_B\_TS\_2, Rev. 2, 28.10.2024, 230 pages  
(DEWI-OCC Order-No.: 15626203 – Doc. No. -00+146)

### 1.2 Noted Documents

/1.2.1/ DNV: Certificate  
"Fugro Norway AS - ISO 9001 Management System Certificate",  
Doc. No. 10000409040-MS-NA-NOR, Rev. -, 2023-09-28, 2 pages  
(DEWI-OCC Order-No.: 15626203 - Doc No. -00c+150)

/1.2.2/ fugro Norway: Report  
"SWLB measurements - Danish Offshore Wind 2030  
Project Measurement Plan, All Lots",  
Doc. No. C75516/C75517/C75518\_Project\_Measurement\_Plan\_All\_Lots 09, Rev. 9, 2023-  
11-25, 50 pages  
(DEWI-OCC Order-No.: 15626203 – Doc. No. -00c+043)

/1.2.3/ fugro Norway: Data File  
"Stations and deployment record",  
Doc. No. EE676023543A63074826A562B18A2FD3, 71 KB  
(DEWI-OCC Order-No.: 15626203 – Doc. No. -00c+044)

/1.2.4/ Energinet: Folder  
"Buoy drawings and moorings"  
3 files  
(DEWI-OCC Order-No.: 15626203 - Doc No. -00c+001 - +003)

/1.2.5/ Energinet: Folder  
"Buoy pre-deployment verification reports"  
3 files  
(DEWI-OCC Order-No.: 15626318 - Doc No. -00c+004 - +006)

/1.2.6/ Energinet: Folder  
"Instrument Certificates"  
30 files  
(DEWI-OCC Order-No.: 15626203 - Doc No. -00c+007 - +036)

/1.2.7/ Energinet: Folder  
"Service Reports"  
6 files  
(DEWI-OCC Order-No.: 15626203 - Doc No. -00c+037 - +042)

/1.2.8/ DEWI-OCC GmbH: Evaluation Report

“Site Conditions – Measurement Campaign for Wind and Metocean Conditions – Kattegat & Hesselø South”

Doc. No. R15626203-0-1, Rev. 0, 2024-12-20, 6 pages

## 2. CERTIFICATION SCHEME

/2.1/ IECRE OD-502: Operational Document, "Project Certification Scheme", Edition 1.0, 2018-10

## 3. APPLIED STANDARDS AND GUIDELINES

The conformity evaluation was carried out based on the following standards and guidelines:

/3.1/ IEC 61400-3-1: "Wind energy generator systems – Part 3-1: Design requirements for fixed offshore wind turbines", Edition 1.0, 2019-04

/3.2/ IEC 61400-1: "Wind energy generator systems – Part 1: Design requirements", Edition 4.0, 2019-02

## 4. SCOPE OF EVALUATION

The wind conditions for the offshore wind farm Hesselø South documented in chapter 1 shall be evaluated for conformity with IECRE OD-502 /2.1/ and respective technical standards /3.1/ and /3.2/ with the purpose of use in the design basis for FEED design.

The documents in 1.1 shall be reviewed for completeness, correctness and consistency.

Marine conditions, soil conditions, electrical conditions and other site conditions are not subject of this evaluation report.

## 5. REMARKS

### 5.1 General information and site configuration

The offshore wind farm Hesselø South is located 40 km northwest off the north coast of Zealand and approximately 50 km east of the Djursland peninsular. The number and locations of wind turbines are not yet defined.

The documents listed in chapter 1 present the wind conditions for the offshore wind farm Hesselø South. The documentation details the wind conditions and relevant input parameters as well as the applied codes and standards to be used for the design basis for FEED design for the offshore wind farm.

The location of the planned wind farm area is given in /1.1.1/. Wind conditions at the site were derived on the basis of LiDAR measurements and modeling data and are detailed in /1.1.1/. Hydrographic conditions at the wind farm site, results of the geophysical and geotechnical campaigns, electrical network conditions, ice conditions and other site conditions are not part of this report.

### 5.2 Site Conditions

#### 5.2.1 Wind conditions

Wind conditions for the site of the offshore wind farm Hesselø South are detailed in /1.1.1/.

Wind data was derived on the basis of floating LiDAR measurements at one location. In total 12 months of measurements were derived by the company "Fugro". Independent testing and verification of the LiDAR buoys is documented in /1.2.2/ and /1.2.5/. Deployment times and information on instrumentation are documented in /1.2.3/.

The company "Fugro" is not recognized by IECRE as a testing laboratory for wind and metocean measurements. The qualification of the testing laboratory and the involved personnel as well as the quality of the measurement campaign were therefore confirmed by DEWI-OCC on the basis of the documentation /1.2.1/ to /1.2.7/. The evaluation of the measurement campaign is documented in /1.2.8/.

According to /1.1.1/ data was supplemented with secondary data from other measurement sites. Turbulence data is derived from secondary sources instead of on-site measurements.

Other data sources are listed including measurement period, measurement height and utilization of data.

Data quality and selection as well as processing of data for the chosen use are discussed.

For long term correction a meso-scale model with 22 years of data was used and a wind model was created. According to /1.1.1/ the wind model is validated several sets of secondary wind data. Relevant data is presented in /1.1.1/.

A height of 150 m above mean sea level is chosen as reference height. Should the hub height or other relevant assumptions of the final chosen wind turbine deviate from the presented height and assumptions, data shall be reassessed.

Parameters for extreme wind conditions and normal wind conditions as well as information for wind shear and turbulence intensity are given in /1.1.1/. Values for gust are not presented. Values for gust shall be determined once the wind turbine model is known and included in the project documentation.

Under consideration of all remarks, wind conditions as detailed in /1.1.1/ are suitable for application in the design basis for FEED design.

## 6. INTERFACE TO OTHER EVALUATION MODULES

- 6.1 The measurement campaign at the offshore wind farms Kattegat and Hesselø South is evaluated in R15626203-0-1
- 6.2 Metocean conditions for the offshore wind farm Hesselø South are evaluated in R15626318-0-3
- 6.3 Sea ice conditions at the offshore wind farm Hesselø South are evaluated in R15626318-0-4

## 7. CONDITIONS

- 7.1 Should the hub height or other relevant assumptions of the final chosen wind turbine deviate from the presented assumptions and height of 150 m above sea level, data shall be reassessed.
- 7.2 If additional on-site measurement data becomes available, wind parameters shall be reassessed.
- 7.3 Values for gust shall be determined once the wind turbine model is known and if gust is used in design, it shall be evaluated during further certification.
- 7.4 Once wind farm layout and WTG type are known, the wake induced turbulence shall be calculated and included in documentation.

## 8. CONCLUSION

The wind conditions for the offshore wind farm Hesselø South presented in /1.1.1/ submitted for review were found plausible and in conformity with IECRE OD-502 /2.1/ and the respective technical standards /3.1/ and /3.2/.

Under consideration of the remarks in this report there are no objections against the application of the wind conditions in the design basis for FEED design in the offshore wind farm Hesselø South.

Changes in the wind conditions shall be approved by DEWI-OCC GmbH; otherwise this report loses its validity.

Bremen, 2025-01-17

Expert in Charge

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