Regional Economy meeting

Henrik Egholm
1 November 2018

Ørsted

Ørsted team participating at todays event

Claus Bøjle Møller

Programme Director

Flemming Thomsen

Programme Director

Chris de Borst

Finance Manager

Klaasjaap Buijs

Construction Manager

Marjolein Hormes

Asset Manager

Steven Engels

General Manager Continental Western Euro

Joyce Goijaarts

HR Business Partner

Steen Carsten Larsen

Operations Manager

Henrik Egholm

EPC Director

Filip Engel

Sustainability Public Affairs & Branding

Stefan De Bruijn

Media Relations NL

Project summary

Project Specific Characteristics

Location

- Borssele site 1 & 2 (BSW01+02), Zeeland, South West of The Netherlands
- Two adjacent 380MW sites

Subsidy

- CFD: 72.7 EUR/MWh (nom.) w. floor price of 29 EUR/MWh
- Duration: 15 years fixed + 1 year extension

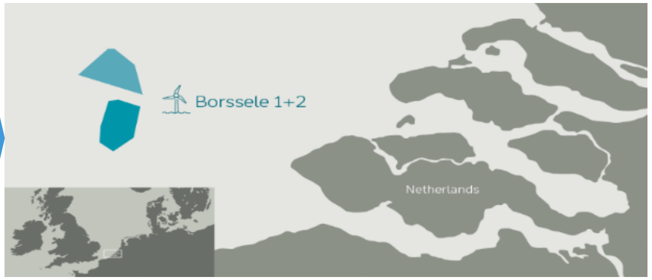
Modules

- Monopiles
- Array cable voltage 66kV
- On/offshore substation and export cable build by TenneT
- BSW01 and BSW02 connecting to the same offshore substation with a capacity of 700MW

Key Project dates

- Project award: 5 July 2016
- Substation energized: August 2019
- **Construction: 2020**
- First power deadline 5 July 2021 (5 years after award)

Borssele map

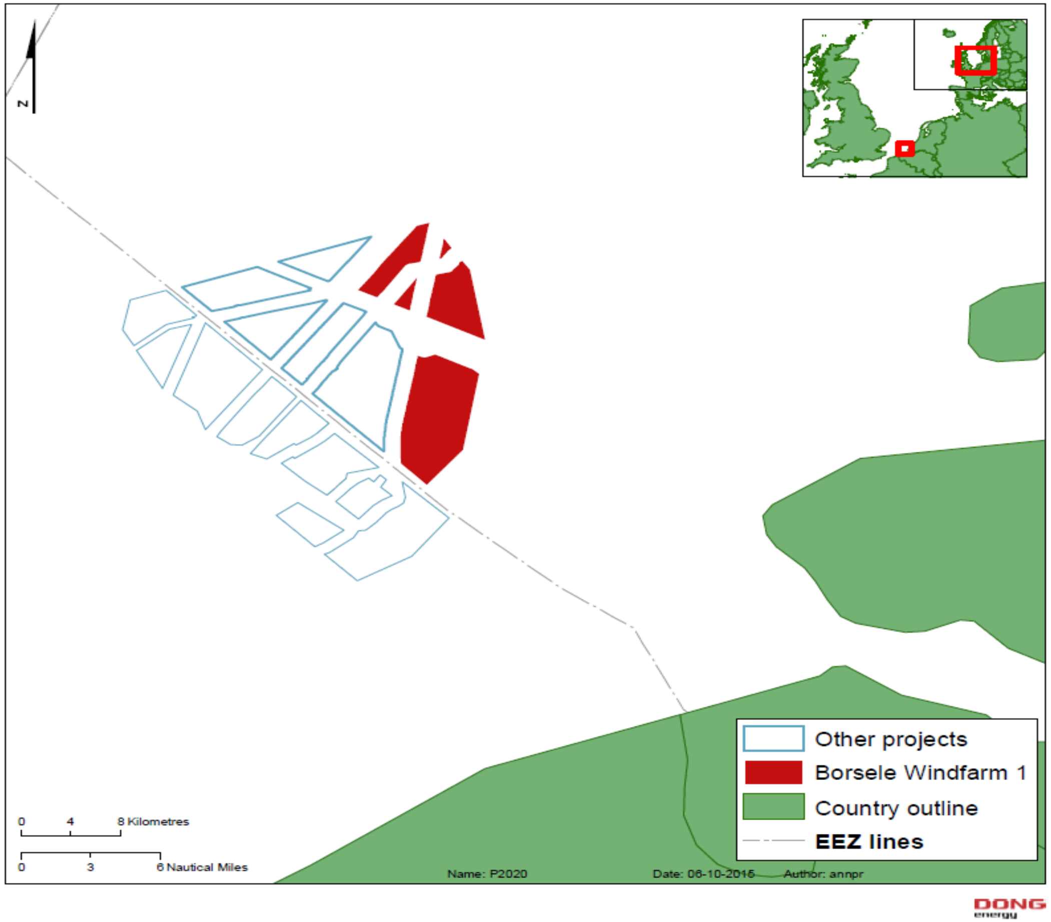


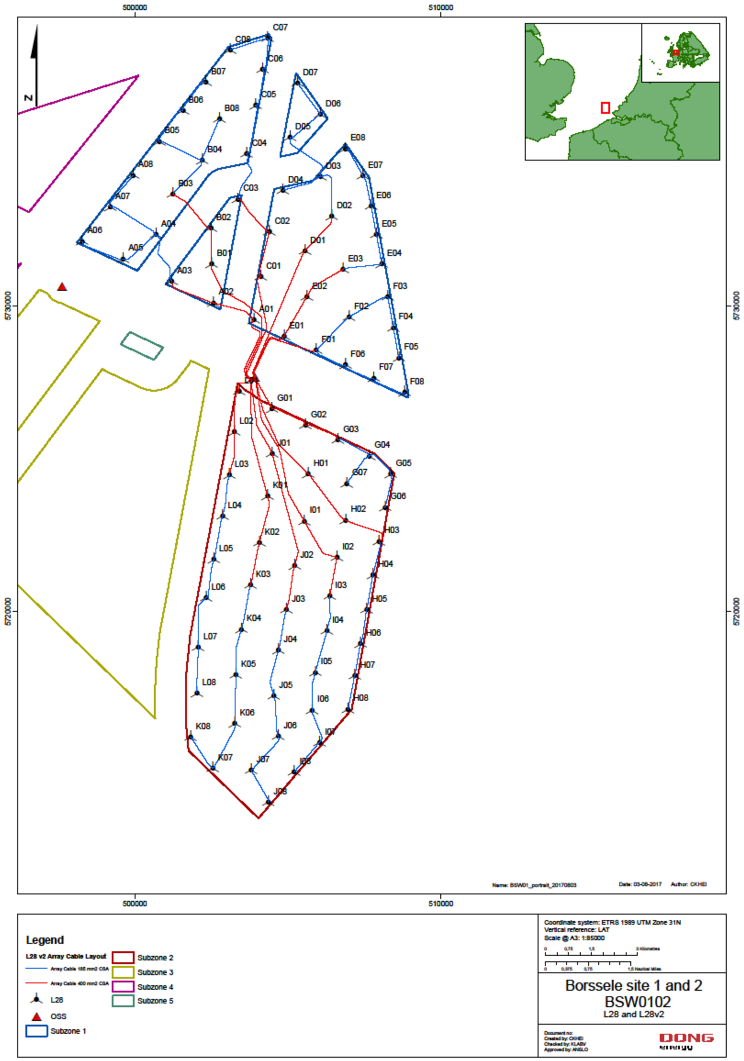
Key data and location

Capacity	**752 MW**
Size of the site	112 km²
Turbine type	Siemens – Gamesa 8MW
Number of turbines	**94**
Water depth	39.7 m to 14.0 m
Distance to shore (shortest)	22 km
Wind resource (at hub height)	9.5 m/s
Length of offshore cable route	TenneT scope
Length of onshore cable route	TenneT scope
O&M harbour	Vlissingen*
Construction harbour	TBC
Offshore substation	TenneT scope: 700 MW
Onshore substation	TenneT scope
Ørsted Ownership	100%
Subsidy regime	CFD: 72.7 EUR/MWh

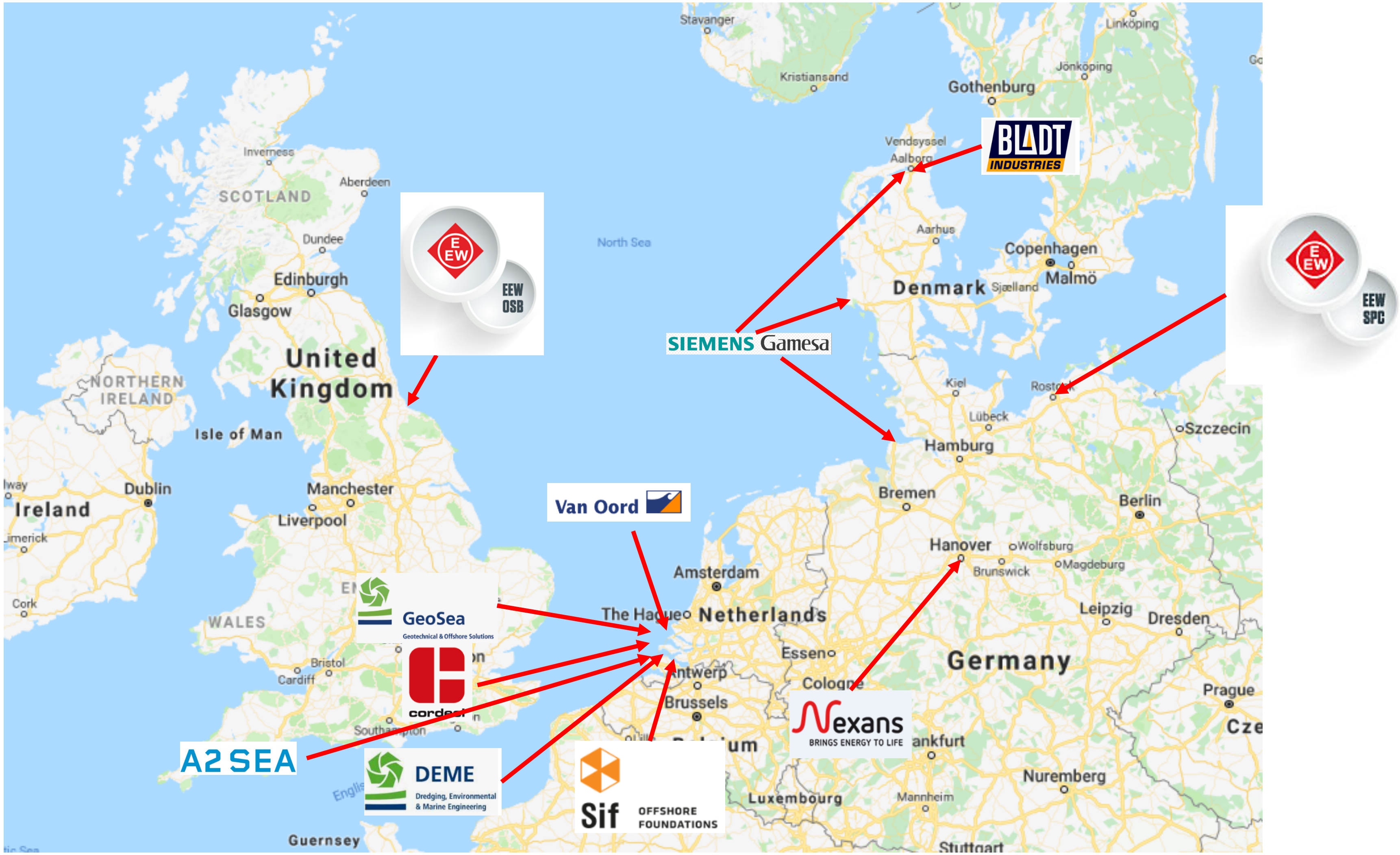
*Subject to final agreement

Borssele Site Overview and windfarm Layout

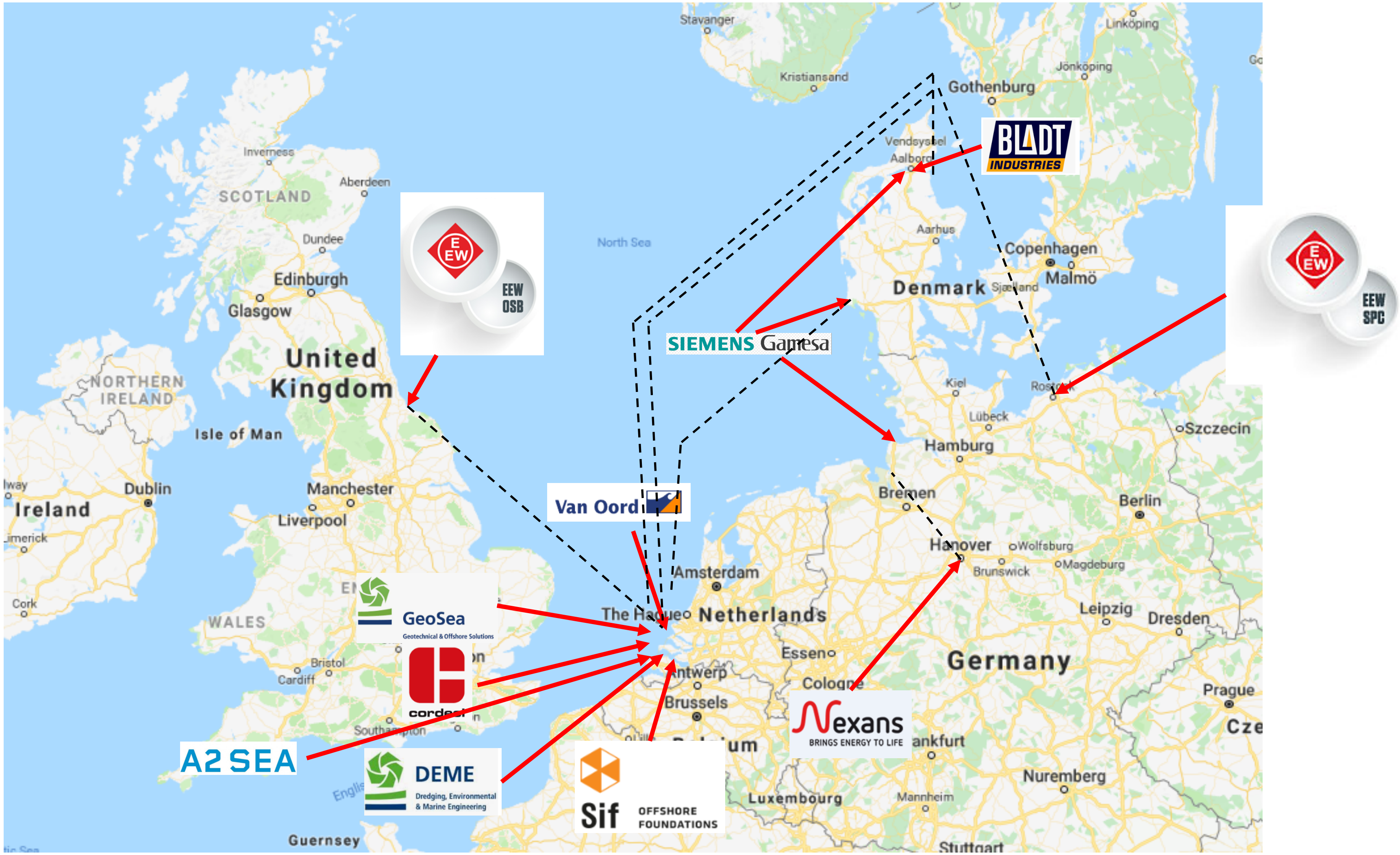

N
0 4 8 Kilometres
0 3 6 Nautical Miles
Other projects
Borsele Windfarm 1
Country outline
EEZ lines
Name: P2020
Date: 06-10-2016
Author: annpr
DONG energy


500000
510000
5730000
5720000
N
A01
A02
A03
A04
A05
A06
A07
A08
B01
B02
B03
B04
B05
B06
B07
B08
C01
C02
C03
C04
C05
C06
C07
C08
D01
D02
D03
D04
D05
D06
D07
E01
E02
E03
E04
E05
E06
E07
E08
F01
F02
F03
F04
F05
F06
F07
F08
G01
G02
G03
G04
G05
G06
G07
H01
H02
H03
H04
H05
H06
H07
H08
I01
I02
I03
I04
I05
I06
I07
I08
J01
J02
J03
J04
J05
J06
J07
J08
K01
K02
K03
K04
K05
K06
K07
K08
L02
L03
L04
L05
L06
L07
L08
Name: BSW01_portrait_20170803
Date: 03-08-2017
Author: CKHEI
Legend
L28 v2 Array Cable Layout
Array Cable 185 mm2 CSA
Array Cable 400 mm2 CSA
L28
OSS
Subzone 1
Subzone 2
Subzone 3
Subzone 4
Subzone 5
Coordinate system: ETRS 1989 UTM Zone 31N
Vertical reference: LAT
Scale @ A3: 1:85000
0 0,75 1,5 3 Kilometres
0 0,375 0,75 1,5 Nautical Miles
Borssele site 1 and 2
BSW0102
L28 and L28v2
Document no:
Created by: CKHEI
Checked by: KLABV
Approved by: ANSLO
DONG energy

Main Contractors for the assets and installation


EEW OSB
BLADT INDUSTRIES
SIEMENS Gamesa
EEW SPC
Van Oord
GeoSea Geotechnical & Offshore Solutions
cordeal
A2SEA
DEME Dredging, Environmental & Marine Engineering
Sif OFFSHORE FOUNDATIONS
Nexans BRINGS ENERGY TO LIFE
North Sea
SCOTLAND
United Kingdom
NORTHERN IRELAND
Ireland
WALES
Isle of Man
Denmark
Netherlands
Germany
Stavanger
Kristiansand
Gothenburg
Jönköping
Linköping
Vendsyssel
Aalborg
Aarhus
Copenhagen
Sjælland
Malmö
Kiel
Lübeck
Rostock
Szczecin
Hamburg
Bremen
Berlin
Hanover
Wolfsburg
Brunswick
Magdeburg
Leipzig
Dresden
Amsterdam
The Hague
Essen
Cologne
Antwerp
Brussels
Luxembourg
Mannheim
Nuremberg
Stuttgart
Prague
Inverness
Aberdeen
Dundee
Edinburgh
Glasgow
Manchester
Liverpool
Dublin
Limerick
Cork
Bristol
Cardiff
Southampton
Guernsey

Transport

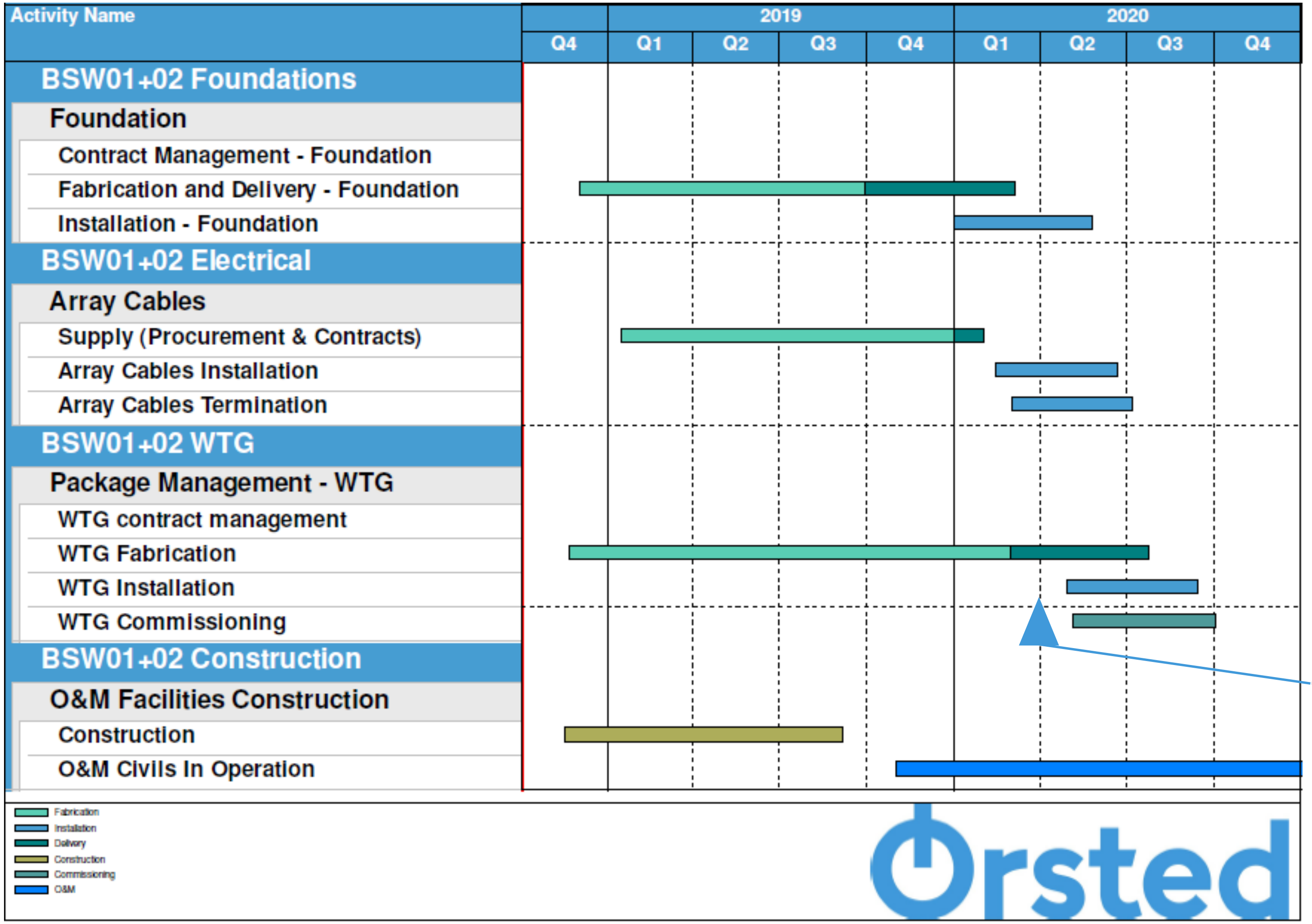

EEW OSB
BLADT INDUSTRIES
EEW SPC
SIEMENS Gamesa
Van Oord
GeoSea
Geotechnical & Offshore Solutions
cordes
A2SEA
DEME
Dredging, Environmental & Marine Engineering
Sif
OFFSHORE FOUNDATIONS
Nexans
BRINGS ENERGY TO LIFE
North Sea
United Kingdom
Denmark
Germany
Netherlands
Ireland
Gothenburg
Aalborg
Copenhagen
Rostock
Hamburg
Hanover
Amsterdam
The Hague

Ørsted

BSW01+02 Construction building, Dutch companies to bring construction building

AFBOUW NEDERLAND BV
ahrend
P
300 m

Time Schedule



Operations start offshore

BSW0102 Operational Set-up

Steen Carsten Larsen

Operations Manager

FACILITIES

- Hangar and helipad at airfield
- Office and warehouse at harbour
- Quay, cranes & pontoon for loading CTVs

LOGISTICS

- 2 full time CTVs
- 1 campaign CTV
- 1 Helicopter (400hrs/yr)

OFFSHORE SITE

94 x SWT-8.0-167

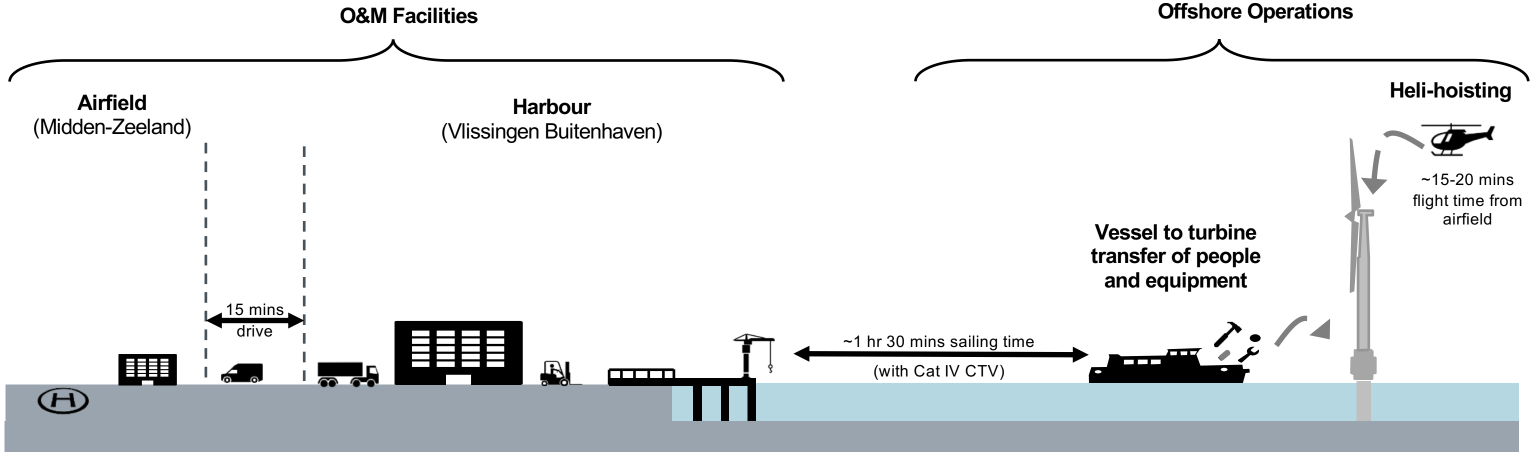
752 MW park capacity

WTGs installed 2020

Operations start 2020

STAFF

- 35-40 Technicians
- 10 - 20 Site management and administration staff
- 15 – 20 Vessel crew
- 4 Helicopter crew



O&M Facilities

Airfield
(Midden-Zeeland)

15 mins
drive

Harbour
(Vlissingen Buitenhaven)

Offshore Operations

~1 hr 30 mins sailing time
(with Cat IV CTV)

Vessel to turbine transfer of people and equipment

Heli-hoisting

~15-20 mins
flight time from
airfield

O&M Facilities

Safety & sustainability through design

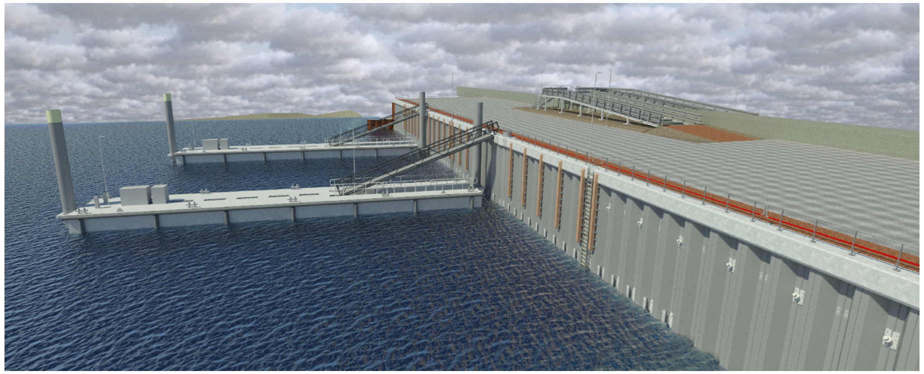
- Robust separation between people and vehicles with dedicated delivery area.
- Building creates more power than it uses.

Designed for flexible and efficient operations

- Sized for up to 60 technicians (i.e. 50% over staffing to provide flexibility for campaigns) and up to 20 office staff
- 2 floors: Mix of offices/changing rooms (~900 m^2) and warehousing (~1,100 m^2)
- Designed for efficient vessel operations:
    - Pontoons with berthing for 4 CTVs (incl. 1 maxi-CTV and compatibility with SES vessel confirmed)
    - Bunkering available at all pontoon berths.
    - Loading of CTVs at all berths possible with quayside cranes

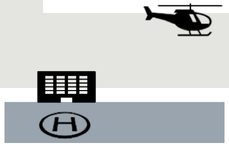
Timed to facilitate knowledge transfer

- EPC and site operations team to both use the O&M facilities during construction phase.



Helicopter Operations Set-up

Midden Zeeland Airport: Helicopter Supplier Scope

- Hangar & offices
- Security & customs service desk
- Passenger check-in & weighing
- Passenger handling + waiting area
- Cargo handling incl. dangerous goods
- Access to fuel facilities