

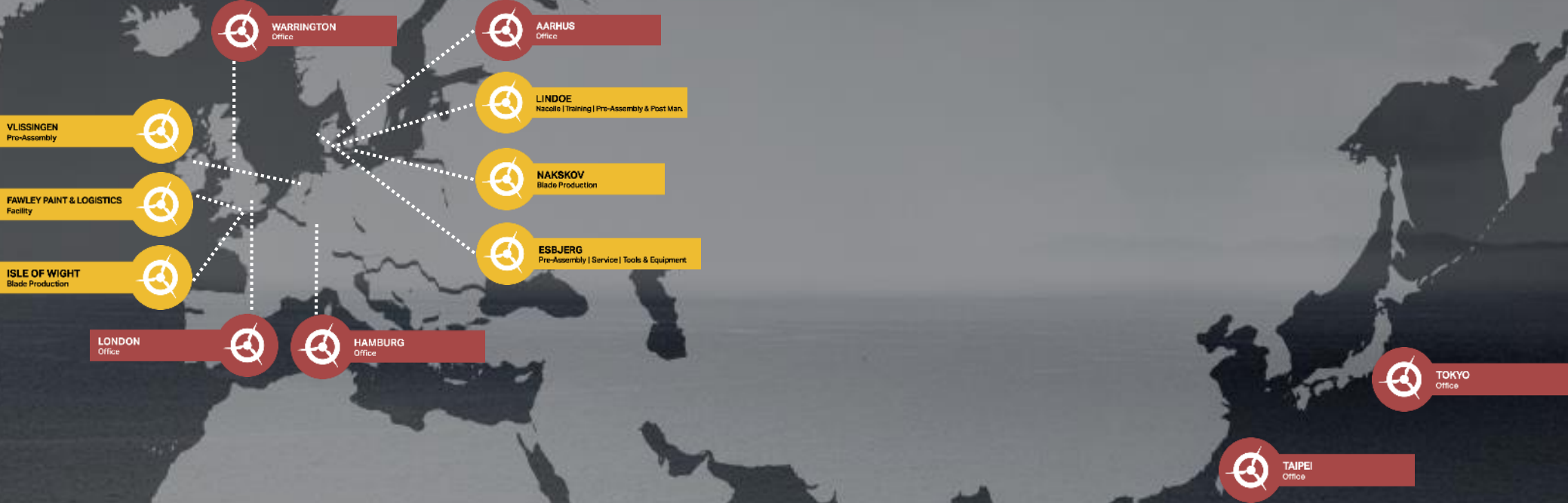
MHI Vestas – Company Presentation

Established in 2014 on decades of experience

Delivering affordable offshore wind power

- A joint venture between two industry leaders: Vestas Wind Systems A/S (50%) and Mitsubishi Heavy Industries Ltd (50%)
- Founded 1 April 2014, now employing ~2,600 employees
- Sole focus on offshore wind
- Our business is to design, manufacture, install and service wind turbines
- Our approach is truly collaborative – we aim to create strong partnerships with customers, suppliers and other stakeholders in the industry

MVOW global footprint – our offices, manufacturing & assembly facilities



The first double digit turbine belongs to us

9/26/2018 by MarCom



V164-10.0 MW

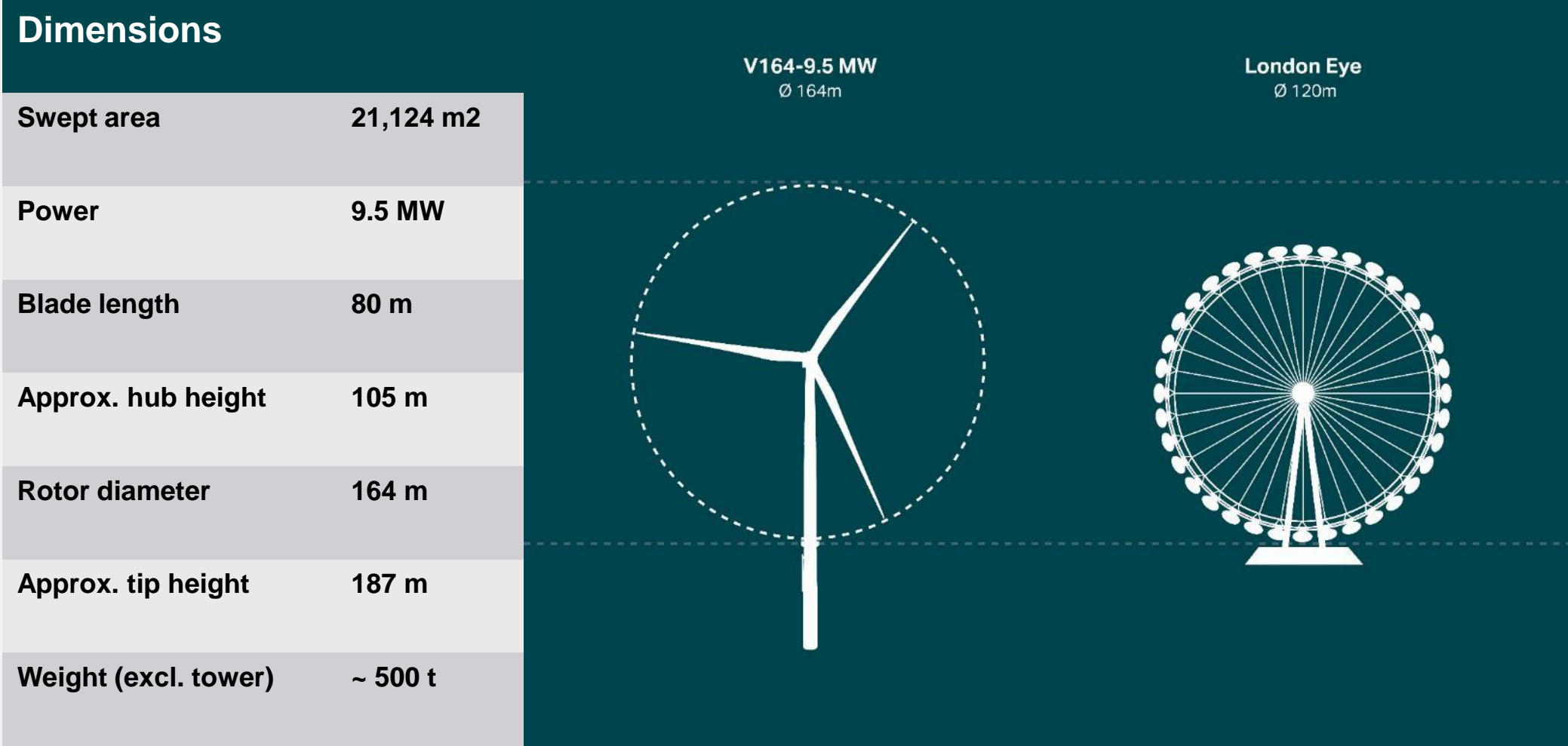
The offshore wind industry's long-anticipated, double-digit barrier has been broken - by us!

As announced at the Global Wind Summit in Hamburg on 25 September, the V164 turbine platform has now achieved a power rating of 10 MW. And the turbine is available for sale now.

"What was unreachable before has become the new benchmark," said CEO, Philippe Kavafyan. "In launching the V164-10.0 MW today, MHI Vestas is proud to contribute this major milestone to the offshore wind industry. And it gives us the opportunity to pay tribute to all the wind industry pioneers who have led us to this historic, double-digit nominal capacity."

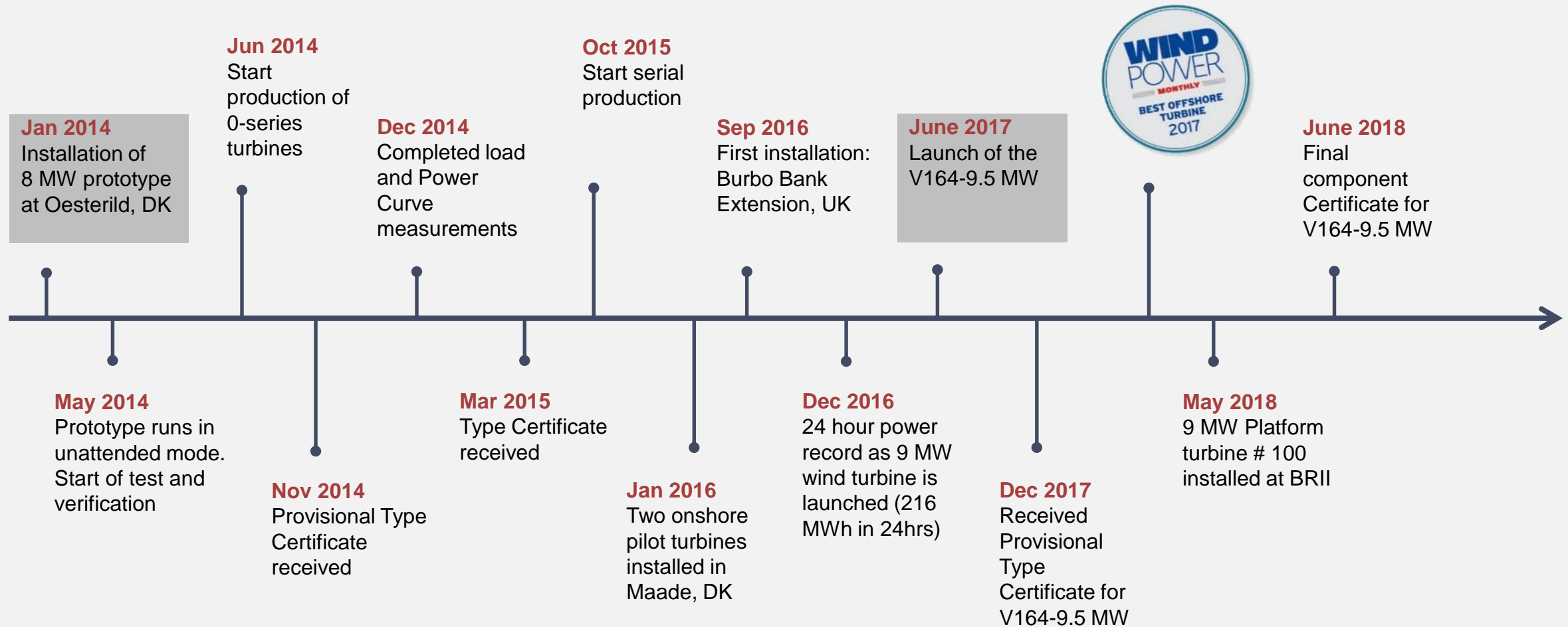
Dimensions of the V164-9.5 MW

The biggest commercially available offshore turbine – larger swept area than the London Eye



9 MW Platform development history

From 8.0 MW to 9.5 MW in just 3 years – proven concept, released for sale and installed



Testing and verification onshore, is key to a successful project offshore

V164: Rigorous testing and verification in simulated life cycle tests, in real life environments



Full scale drive train testing
Oil harbour, Denmark



Stress and fatigue testing of blades
at Isle of Wight, UK



Full scale nacelle testing
Lindoe, Denmark



Full scale turbine testing
Oesterild, Denmark



Tower testing,
Lindoe, Denmark

Reducing installation cost

Construction and value chain optimisation

Factory

€

Pre-assembly

€€

Offshore

€€€€€

- We are building **offshore projects onshore**
- Building on **experience**
- **Moving more processes** back to the factory
- Pre-assembly **concept**
- Improvement of **safety and quality**

Plug and play installation

Saving resources through our pre-assembly concept



- **Nacelles arrive fully assembled**, tested together with PCM and ready for installation from the factory
- **Blades delivered in a sea fastening**, no extra handling between the factory and installation
- **Power Converter Module (PCM) installed** in the bottom tower section fully assembled and tested from the factory
- **Towers fully assembled** before load out

Our Track Record ~ 3.8 GW Installed

1,098 turbines installed across 29 projects, ~3.2 GW under service

TUNOE KNOB

10 x V39-500 kW
(5 MW)
Npower Renewables
Denmark, 1995

IRENE VORRINK

28 x NEG Micon 600kW
(16,8 MW)
NUON (Vattenfall)
Netherlands, 1996

BOCKSTIGEN

5 x Windworld 550 kW
(2,75 MW)
Vindkompagniet (Vattenfall)
Sweden 1997

YTTRE STENGRUND

5 x NEG Micon 2MW
(10 MW)
Vindkompagniet (Vattenfall)
Sweden 2001

HORNS REEF

80 x V80-2.0 MW
(160 MW)
Vattenfall, Ørsted
Denmark, 2002

SCROBY SANDS

30 x V80-2.0 MW
(60 MW)
E.ON, United Kingdom
2004

NORTH HOYLE *

30 x V80-2.0 MW
(60 MW)
Npower Renewables
United Kingdom, 2004

KENTISH FLATS *

30 x V90-3.0 MW
(90 MW)
Vattenfall, United Kingdom
2005

BARROW *

30 x V90-3.0 MW
(90 MW)
Ørsted, United Kingdom
2006

EGMOND AAN ZEE

36 x V90-3.0 MW
(108 MW)
Shell, NUON
Netherlands, 2006

PRINCESS AMALIA *

60 x V80-2.0 MW
(120 MW)
Q7 Holding, Netherlands
2007

SPROGOE *

7 x V90-3.0 MW
(21 MW)
Sund & Baelt, Denmark
2009

ROBIN RIGG

60 x V90-3.0 MW
(180 MW)
E.ON, United Kingdom
2009

BELWIND 1 *

55 x V90-3.0 MW
(165 MW)
Belwind N.V., Belgium
2010

THANET *

100 x V90-3.0 MW
(300 MW)
Vattenfall, United Kingdom
2010

WINDFLOAT

1 x V80-2.0 MW
(2 MW - floating)
Windplus, Portugal
2011

KAAREHAMN *

16 x V112-3.0 MW
(48 MW)
E.ON, Sweden
2013

NORTHWIND *

72 x V112-3.0 MW
(216 MW)
Northwind N.V., Belgium
2013

HUMBER GATEWAY *

73 x V112-3.0 MW
(219 MW)
E.ON, United Kingdom
2014

KENTISH FLATS EXT *

15 x V112-3.3 MW
(50 MW)
Vattenfall, United Kingdom
2015

ENECO LUCHTERDUINEN *

43 x V112-3.0 MW
(129 MW)
Eneco, Mitsubishi
Netherlands, 2015

MAADE *

2 x V164-8.0 MW
(16 MW)
European Energy
Denmark, 2016

BURBO BANK EXT *

32 x V164-8.0 MW
(254 MW)
Ørsted, United Kingdom
2017

NOBELWIND *

50 x V112-3.3 MW
(165 MW)
Parkwind, Belgium
2017

BLYTH *

5 x V164-8.3 MW
(41,5 MW)
EDF Energy Renewables
United Kingdom, 2017

RAMPION *

116 x V112-3.45 MW
(400 MW)
E.ON, United Kingdom
2017

WALNEY EXT *

40 x V164-8.25 MW
(330 MW)
Ørsted, United Kingdom
2017

ABERDEEN BAY*

9 x V164-8.4 MW
2 x V164-8.8 MW
(92.4 MW)
Vattenfall, UK, 2018

BORKUM RIFFGRUND 2

56 x V164-8.3 MW
(450 MW)
Ørsted, Germany
2018

Our Pipeline

2,619.5 MW of firm orders, in line to supply ~2 GW

Under Installation / Unconditional Orders

Conditional Orders

Preferred Supplier

HORNS REEF 3

49 x V164-8.3 MW
(406 MW)
Vattenfall, Denmark
2018

TRITON KNOLL

90 x V164-9.5 MW
(860 MW)
Consortium, United Kingdom
2021

NORTHWESTER 2

23 x V164-9.5 MW
(224 MW)
Parkwind, Belgium
2019

ZONE 27

Turbines not disclosed
(100 + 452 MW)
CIP, Taiwan
2021 + 2023

NORTHER

44 x V164-8.4 MW
(370 MW)
Norther NV, Belgium
2019

MORAY EAST

100 x V164-9.5 MW
(950 MW)
Consortium, United Kingdom
2022

ZONE 29

Turbines not disclosed
(300 MW)
CSC, Taiwan
2024

DEUTSCHE BUCHT

31 x V164-8.4 MW
(252 MW)
British Wind Energy, Germany
2019

XI DAO

Turbines not disclosed
(48 MW)
CIP, Taiwan
2024

BORSSELE III/IV

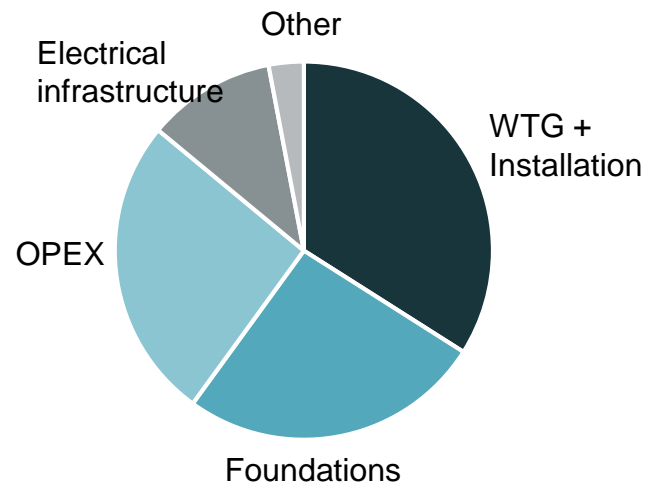
77 x V164-9.5 MW
(731,5 MW)
Consortium, Netherlands
2020

Objective is to reduce Cost of Energy (CoE)

V164-9.5 MW is a large step in the right direction but we are only in the maturation phase

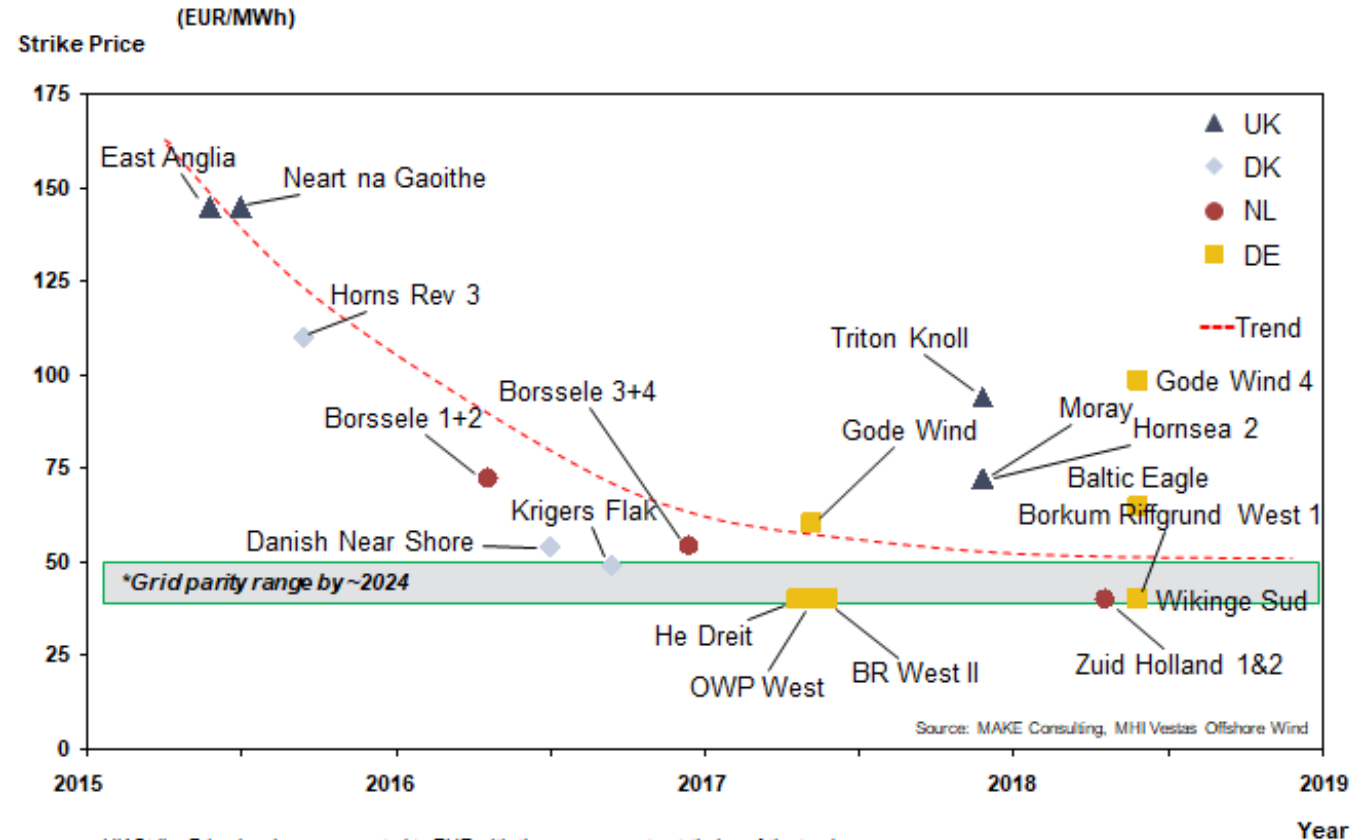
What does good look like?

- **Reliable** as OPEX share is 25% of CoE
- **Cheap** to reduce overall cost
- **Powerful (and large)** to cover large balance of plant cost



Low auction strike prices result in profitability pressure

Recently awarded subsidies



- UK Strike Price has been converted to EUR with the currency rate at timing of the tender
- Subsidy free tenders are described with the expected market price

Established in 2014 on decades of experience

Truly collaborative

Wind Energy Denmark

Nyt samarbejde:
Møllefabrikanter peger på
elementer, der kan
standardiseres

Nærmest traditionen tro var
standardisering at finde som tema ved
dette års Wind Energy Denmark. I
modsatning til tidligere, var temaet
denne gang ledsaget af et konkret
oplæg til elementer og processer, der
kan standardiseres



Hot list: Lifting tools, transport tools, etc

Not list: Design of Blades, Nacelle, etc.



Let's move the horizon.