

Offshore wind energy: 2021 mid-year statistics

WindEurope Market
Intelligence



Disclaimer

This report summarises offshore installations from 1 January 2021 to 30 June 2021.

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Content

	Page
Highlights	<u>4</u>
1. Offshore Wind Installations.....	<u>5</u>
2. Industry activity & supply chain.....	<u>17</u>
3. Finance highlights.....	<u>25</u>

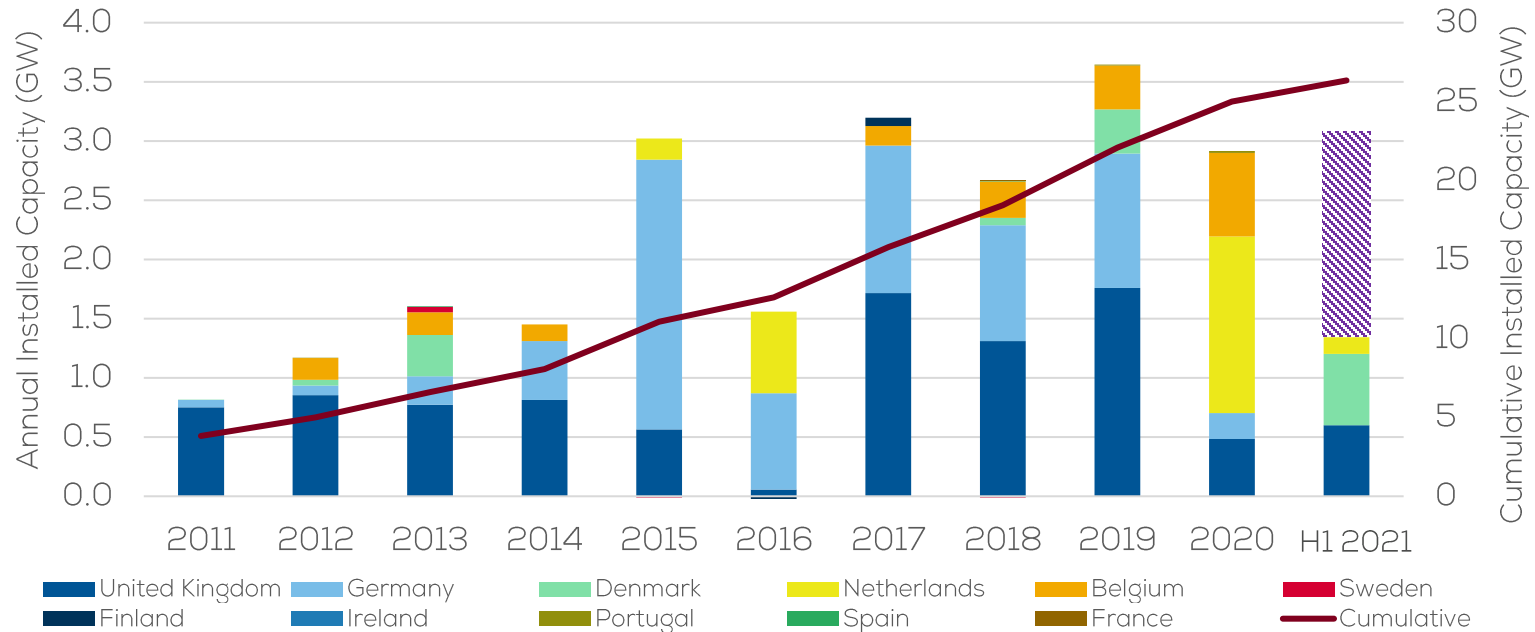
HIGHLIGHTS

- 1.3 GW (166 turbines) were connected to the grid in the first half of 2021. The installations took place in the UK, Denmark and Netherlands, all in the North Sea.
- 8 wind farms were under construction (once completed they will represent 5.4 GW). Five wind farms connected turbines, two are now fully commissioned.
- 2.1 GW of new offshore capacity were financed for a total €6.5bn.
- Turbines installed in most wind farms were 8-10 MW but there were orders for the first 14 MW turbines for the Sofia wind farm.
- Europe's offshore installed capacity is now 26 GW.

1. Offshore Wind Installations

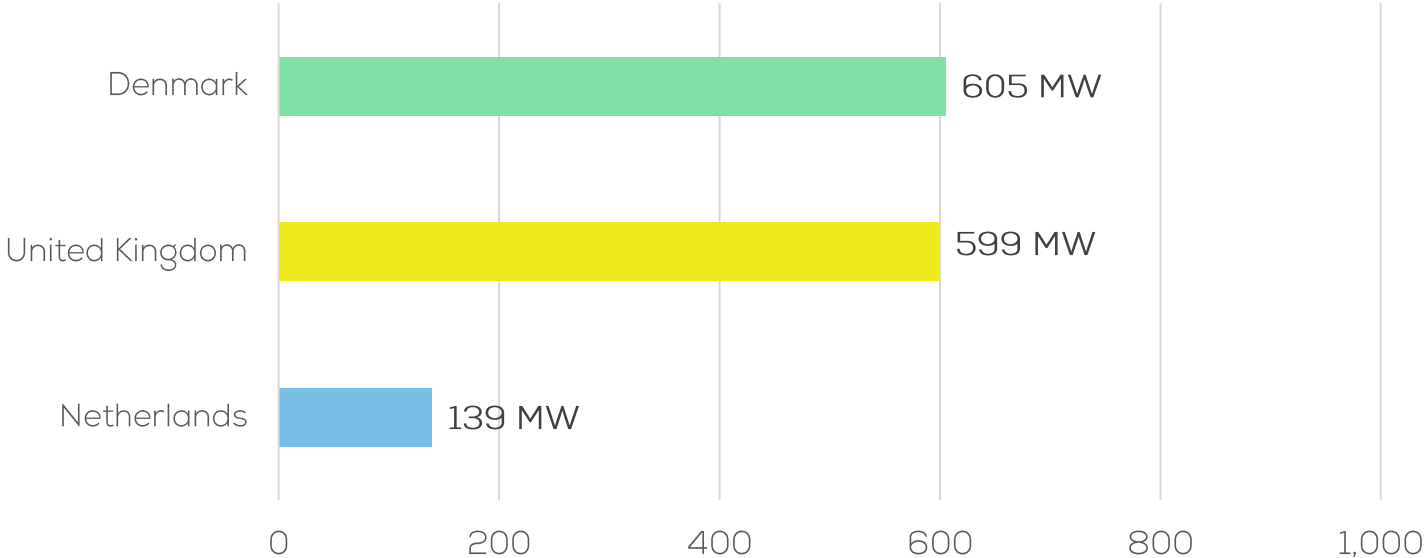
	Page
Annual installations	<u>6</u>
Half year installations per country.....	<u>7</u>
Half year installations per wind farm.....	<u>8</u>
Wind farms examples.....	<u>11</u>
Cumulative installations per country.....	<u>14</u>
Cumulative installations per sea basin.....	<u>16</u>

Europe installed 1.3 GW in the first half of 2021



Turbine were connected to the grid in the North and Baltic Sea

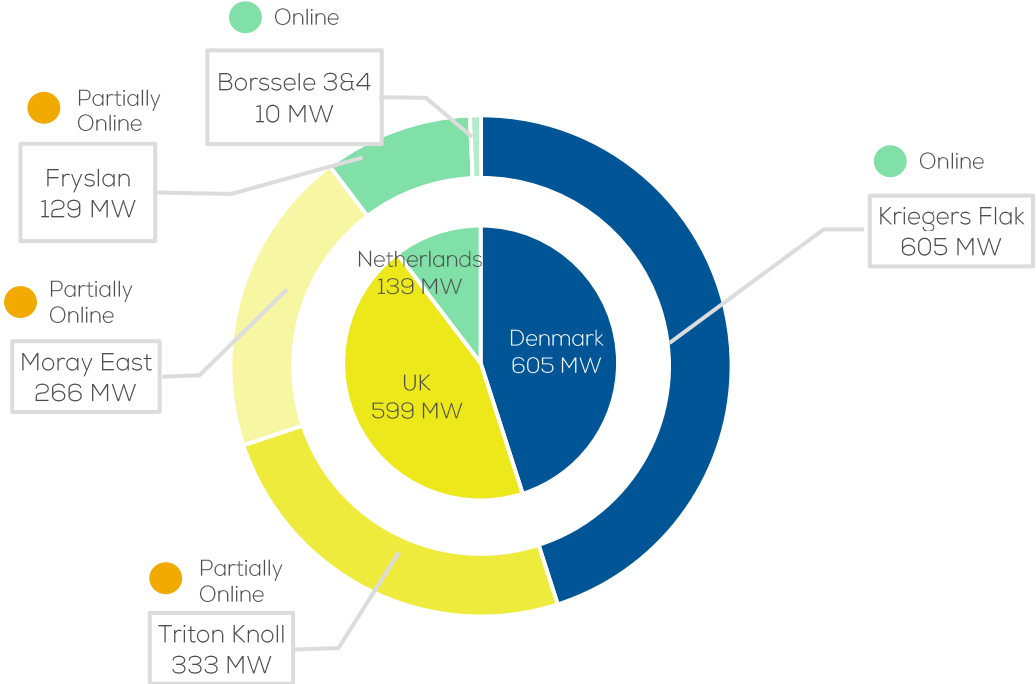
H1 2021



1,343 MW of capacity was connected to the grid across 5 wind farms

H1 2021

Capacity connected to the grid in H1 2021



166 turbines were connected to the grid across three countries

H1 2021

Works carried out at offshore wind farms with grid connections in the first half of 2021

COUNTRY	WIND FARM	CAPACITY CONNECTED IN H1 2021 (MW)	NUMBER OF TURBINES CONNECTED	TURBINE MODEL	TYPE OF FOUNDATION	STATUS*
Denmark	Kriegers Flak	605	72	SG 8.4-167 DD	Monopile	●●●●●
UK	Triton Knoll	333	35	V164-9.5MW	Monopile	●●○○○
	Moray East	266	28	V164-9.5MW	Jacket	●●○○○
Netherlands	Fryslan	129	30	SWT-4.4-130	Monopile	●●○○○
	Borssele 3&4	9.5	1	V164-9.5MW	Monopile	●●●●●
TOTAL		1,343	166			

3 wind farms installed foundations with turbines on the way – including fixed and floating

H1 2021

Works carried out at offshore wind farms without grid connection in First Half 2021

COUNTRY	WIND FARM	TOTAL NUMBER OF TURBINES	TYPE OF FOUNDATION	FOUNDATIONS INSTALLED TO DATE	TURBINE MODEL	TURBINES INSTALLED TO DATE	EXPECTED COMMISSIONING YEAR
UK	Kincardine	5	Semi-Sub	5	V164-9.6MW	5	2021
	Hornsea Two	165	Monopile	125	SG 8.4-167 DD	17	2022
France	Saint-Nazaire	80	Monopile	10	Haliade 150-6MW	-	2022

Kriegers Flak

605 MW

Fully commissioned

First offshore
hybrid project
and largest
wind farm in
Denmark



Owners:

Vattenfall (100%)

Turbines:

72 turbines –
SG 8.4-167 DD (SGRE)

Foundations:

Monopiles (EEW)

Cables:

JDR (inter-array)
NKT (export cable)

Marine Contractors:

Van Oord (Foundations)
Jan de Nul (Turbines)

Fryslan

383 MW

Partially online

Largest wind farm in a lake



Owners:

Windpark Fryslan BV
(85%) & Province
Fryslan (15%)

Turbines:

89 turbines –
SWT-4.4-130 (SGRE)

Foundations:

Monopiles (EEW)

Cables:

TFK (inter-array)
Vissen & Smit Hanab
(export cable)

Marine Contractors:

Van Oord (Full EPCI)

Saint-Nazaire 480 MW

Under construction

First wave of
commercial
wind farms in
France



Owners:

EDF (50%), Enbridge
(25.5%) & CPPIB (24.5%)

Turbines:

80 Haliade 150-6MW
(GE)

Foundations:

Monopiles (Sif)

Cables:

Prysmian and Louis
Dreyfus TavOcean
(inter-array)
Prysmian (export cable)

Marine Contractors:

DEME Offshore and
Eiffage Metal
(foundations)
Jan de Nul (turbines)

Offshore Wind in Europe

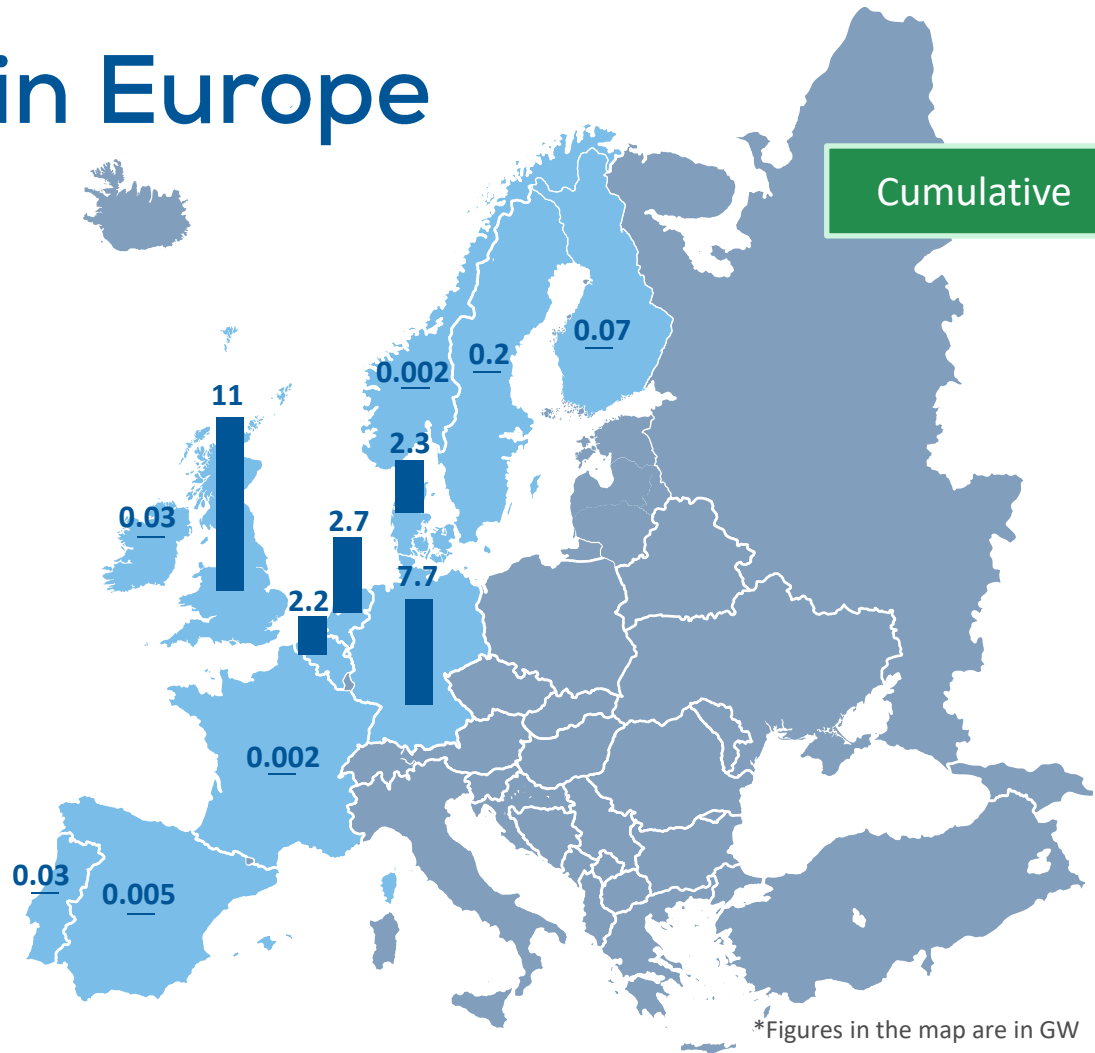
26,351 MW

Connected to the grid

12 Countries

5,566 Turbines

120 Wind Farms



Europe's installed capacity is concentrated in 5 countries

Cumulative

UK	42%	11,021 MW / 2,355 turbines
Germany	29%	7,689 MW / 1,501 turbines
Netherlands	10%	2,750 MW / 568 turbines
Denmark	9%	2,308 MW / 631 turbines
Belgium	9%	2,261 MW / 399 turbines
Others	1%	322 MW / 112 turbines

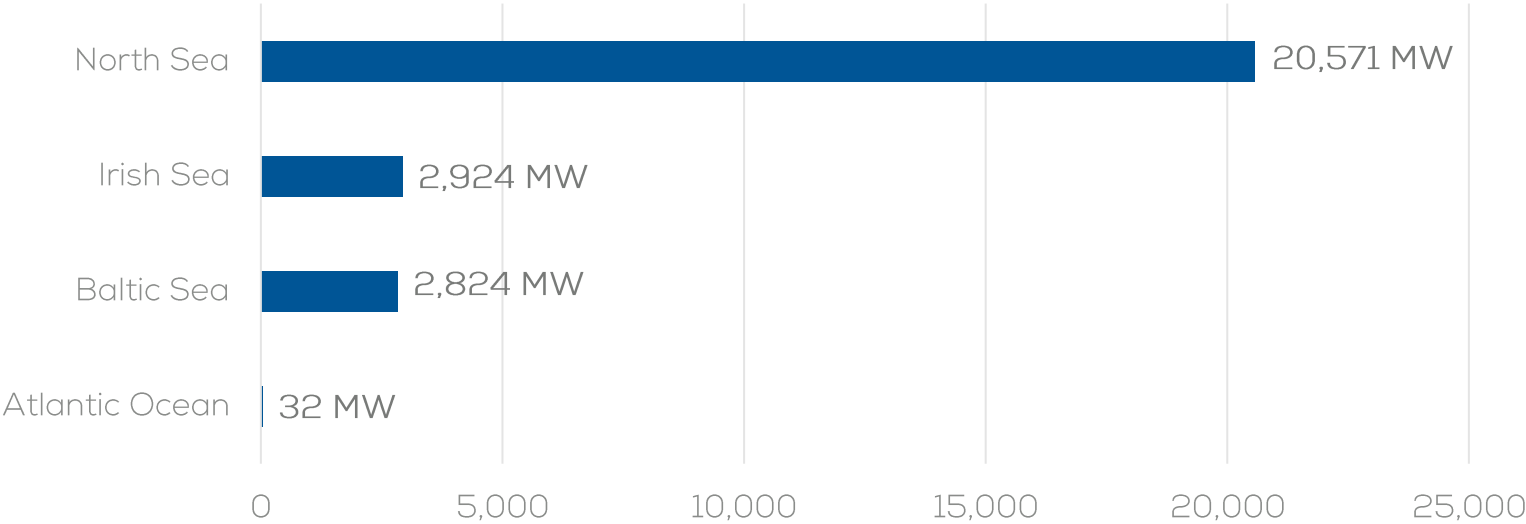
TOP 3 COUNTRIES REPRESENT

81%

OF ALL CAPACITY
CONNECTED

The North Sea hosts over three-quarters of all turbines connected to the grid

Cumulative



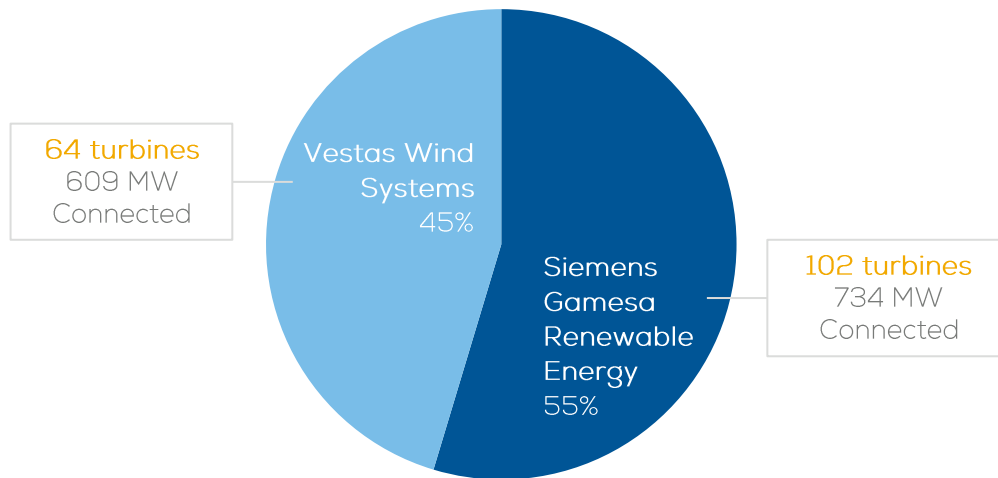
2. Industry activity and Supply Chain

	Page
Wind Turbines suppliers	<u>18</u>
Wind Farms Owners' share.....	<u>20</u>
Foundations.....	<u>21</u>
Cables.....	<u>23</u>
Marine Contractors.....	<u>24</u>

Grid-connected capacity is distributed between Siemens Gamesa and Vestas Wind Systems

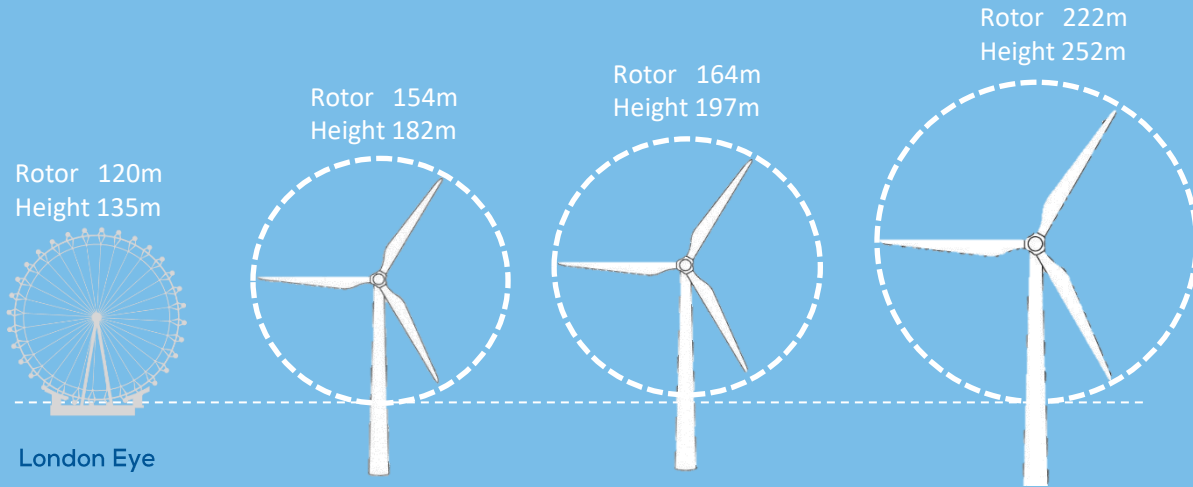
H1 2021

Wind turbine manufacturer's share of 2021 grid-connected capacity




241 turbines (2.5 GW) were ordered in the first half of 2021

H1 2021



Siemens Gamesa
Renewable Energy
SWT-7.0-154

 Courseulles-sur-Mer – 64 turbines

Vestas Wind
Systems
V164-9.5 MW

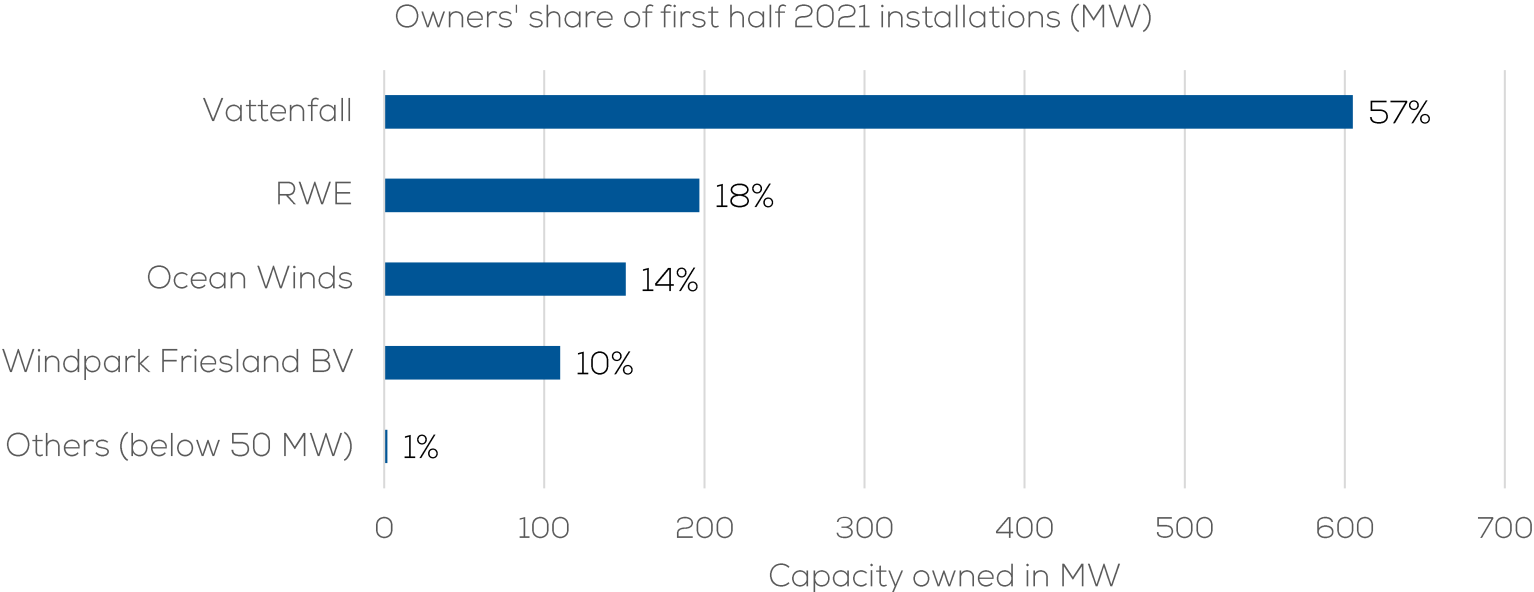
 Arcadis Ost 1 – 27 turbines
 Baltic Eagle – 50 turbines

Siemens Gamesa
Renewable Energy
SG 14-222 DD

 Sofia – 100 turbines

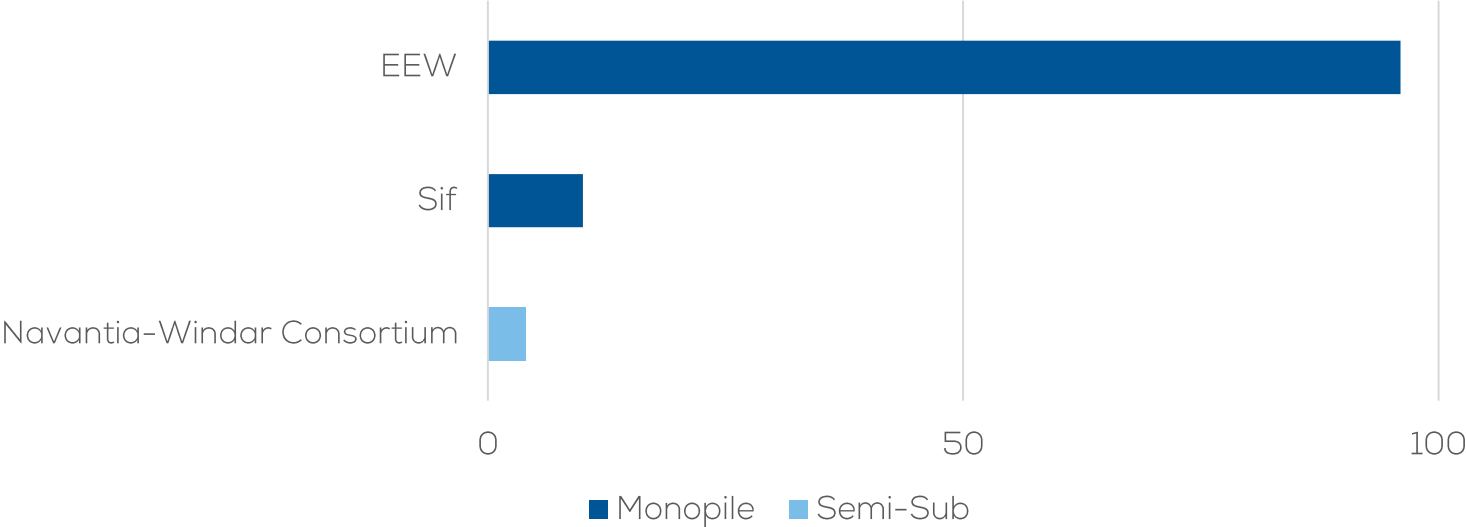
Vattenfall connected most turbines with the commissioning of Kriegers Flak

H1 2021



110 foundations were installed in the first half of the year, mostly monopiles supplied by EEW for Hornsea Two

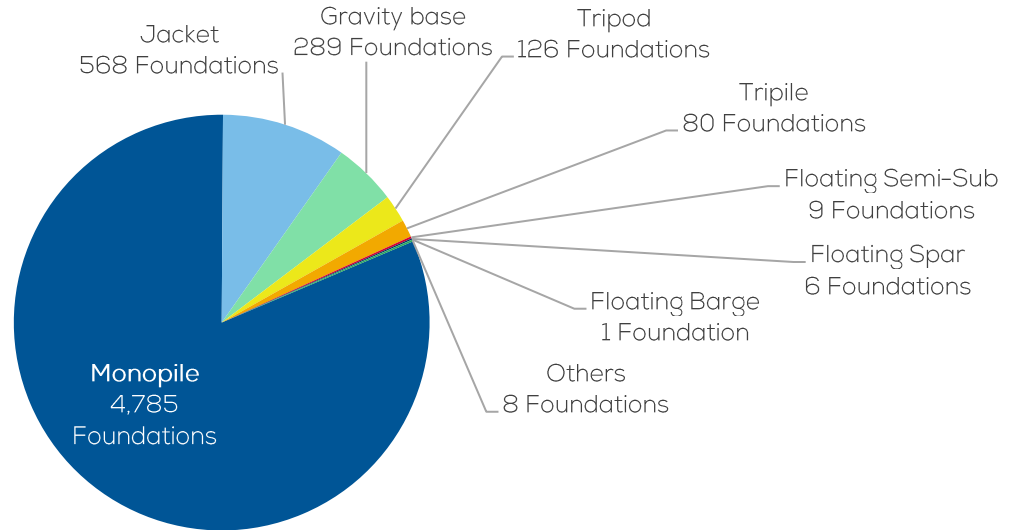
H1 2021



80% of the turbines today stand on monopiles

Cumulative

Share of substructure types for wind turbines installed*

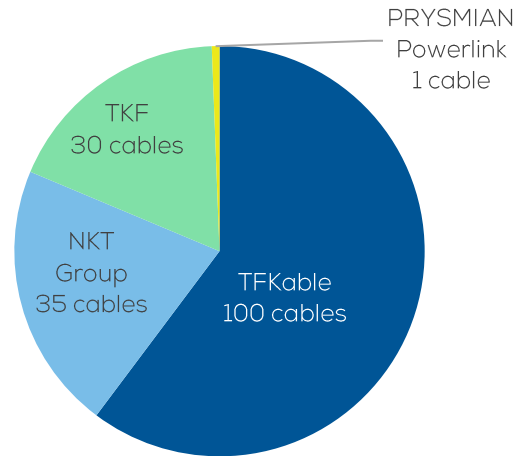


Four companies supplied inter-array cables; NKT Group dominates the supply of export cables

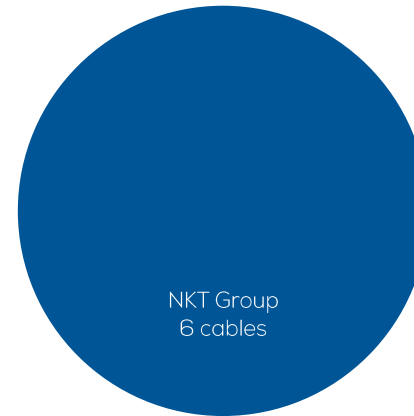
H1 2021

Cables energised by manufacturer in first half 2021

Inter-array cable



Export cable



DEME Offshore leads marine contractors in the first half of 2021 with works in four wind farms

H1 2021

Marine contractors for wind farms under construction in First Half 2021

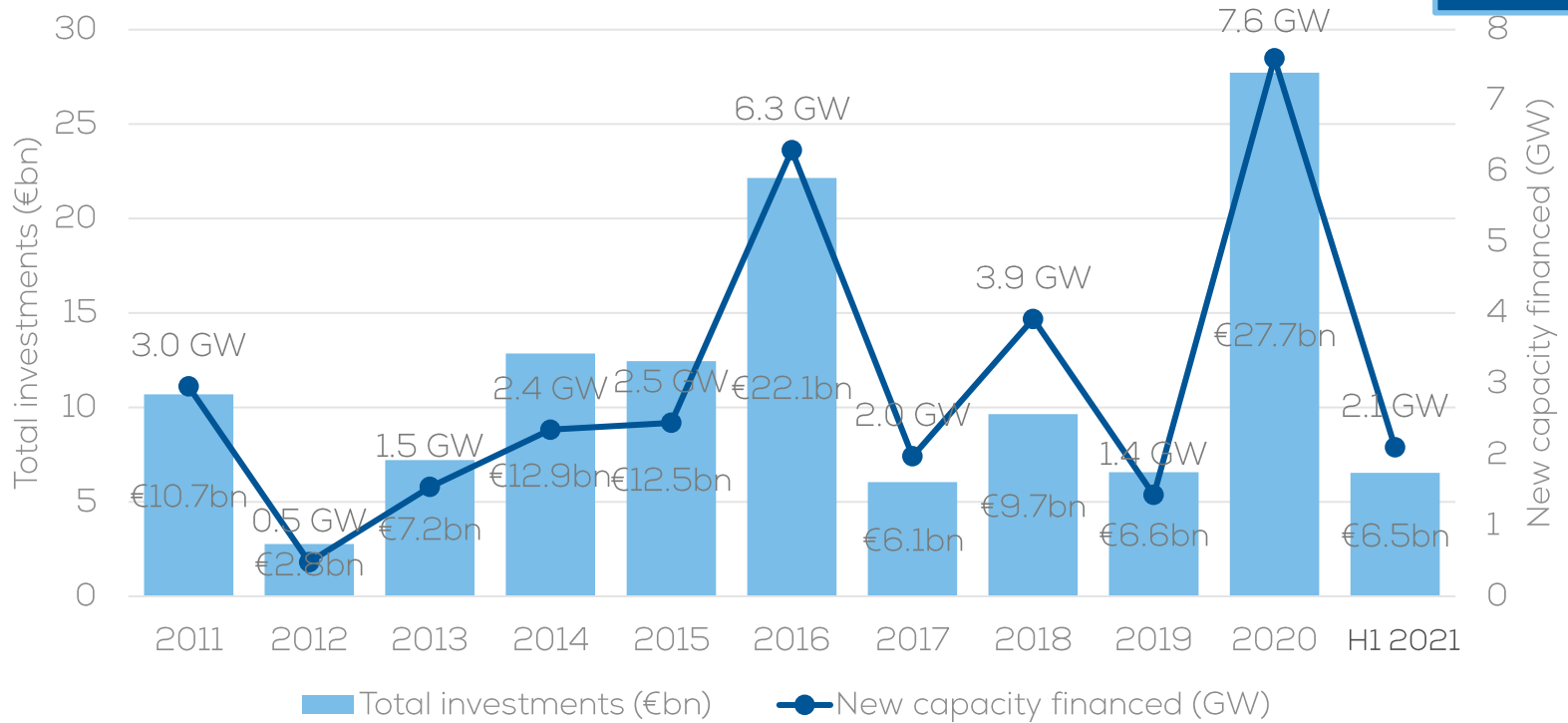
WIND FARM	MARINE CONTRACTORS
Fryslan	Van Oord (Foundations and turbines)
Hornsea Two	DEME Offshore (Turbines), Seaway 7 (Inter-array), Boskalis Subsea (Export)
Kincardine	Boskalis Subsea (Foundations and turbines)
Kriegers Flak	Jan de Nul (Turbines)
Moray East	Fred Olsen Windcarrier (Turbines), DEME Offshore (Inter-array)
Saint-Nazaire	DEME Offshore (Foundations)
Triton Knoll	Cadeler for DEME Offshore (Turbines)

3. Finance highlights

	Page
New offshore wind investments.....	<u>26</u>
Breakdown per project.....	<u>27</u>

H1 2021 saw €6.5bn of investment for 2.1 GW of new offshore wind capacity. A few projects are expected to reach financial close in H2.

H1 2021



Final investment decisions were taken for 4 new offshore wind farms in 3 countries for an average capex of 3.1m€/MW

H1 2021

Investments in European offshore wind farms in H1 2021

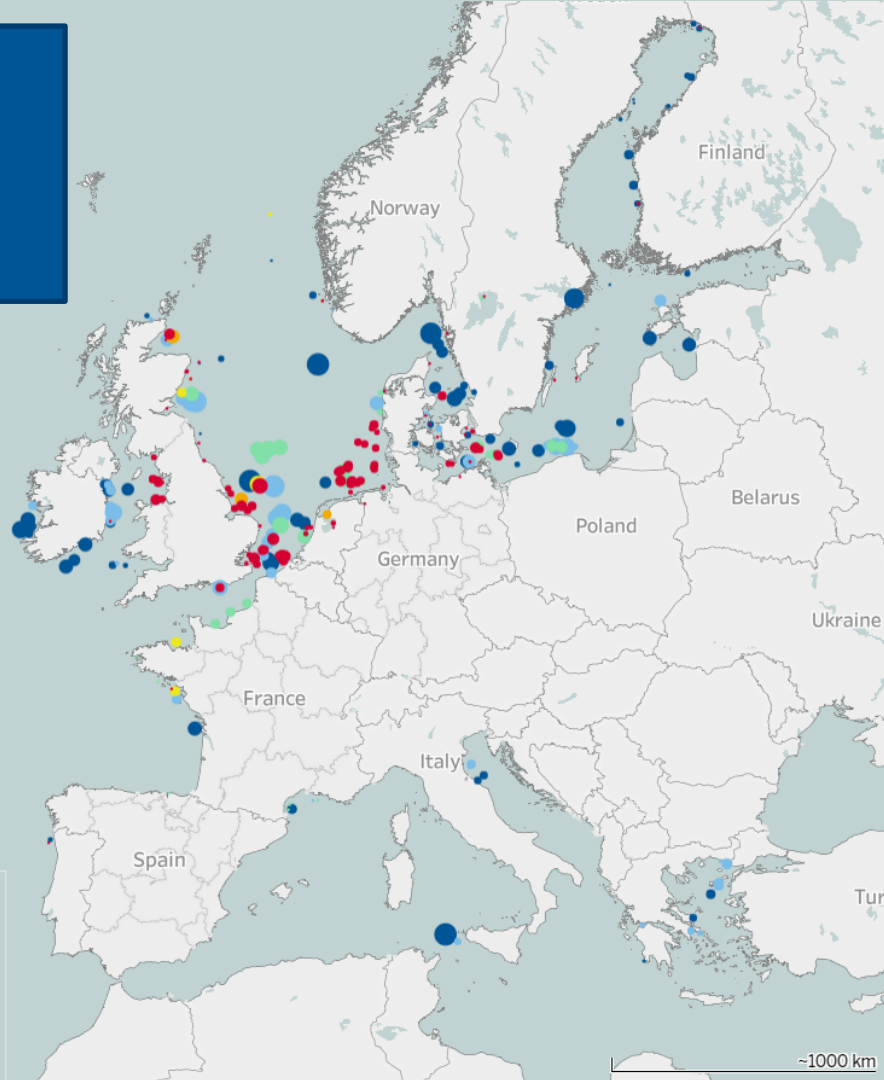
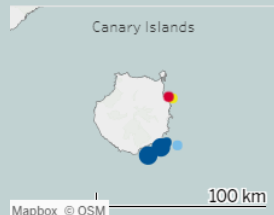
WIND FARM	COUNTRY	CAPITAL RAISED (€bn)	NEW CAPACITY FINANCED (MW)	CAPEX (m€/MW)
Courseulles-Sur-Mer	France	2.1	450	4.8
Arcadis Ost 1	Germany	0.9	257	3.5
Sofia	UK	3.5	1,400	2.5
TOTAL		6.5	2,107	

Access to WindEurope interactive maps and navigate all European wind farms in just a click



Click here

Wind
EUROPE



Europe's offshore wind
 26,351 MW connected to the grid
 5,566 turbines connected
 120 Wind Farms
 12 countries

Status of Offshore Wind Projects

- Online ■
- Partially online ■
- Planned ■
- Under construction ■
- Under permitting procedure ■
- With permits ■

Technology

(All) ▼

Country Details

	MW connectec	Turbines connected
UK	11,021	2,355
GERMANY	7,689	1,501
NETHERLANDS	2,749	568
DENMARK	2,308	631
BELGIUM	2,261	399
SWEDEN	192	80
FINLAND	71	19
IRELAND	25	7
PORTUGAL	25	3
SPAIN	5	1
NORWAY	2	1
FRANCE	2	1

Status update: 01/07/2021

Mapbox © OSM

100 km

~1000 km

THANK YOU

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