

# Global Offshore Wind Report

SEPTEMBER 2023

HY1  
2023

# About WFO

WFO is the world's leading business platform for the offshore wind industry. By connecting and supporting our members, WFO is helping to make offshore wind one of the world's leading sources of renewable energy.

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Tokyo 100-6611



Let's work together to make offshore wind one of the world's leading renewable energy sources.

## Dear offshore wind community,

It is my pleasure to present to you not only the latest half-year update of WFO's Global Offshore Wind Report, but also to share some exciting news with you.

Firstly, I would like to invite you to our WFO Global Summit in Barcelona in January 2024. Join us and meet the global offshore wind community. Hear about the latest industry trends in Europe, Asia-Pacific and the Americas from our high-profile speakers from around the world.

Secondly, I would like to thank Westwood Global Energy Group, WFO's exclusive Knowledge Partner, for their excellent contributions to this report. This allows us to provide you with even more relevant insights into the latest industry developments.

Finally, you will have noticed that the report has undergone a visual overhaul. Alongside the report we will also be launching our new WFO website soon where you can learn more about our members, our activities and how we promote offshore wind worldwide!

A handwritten signature in black ink, appearing to read 'Gunnar Herzig', written in a cursive style.

Gunnar Herzig

Managing Director

We are happy to invite you to our

# WFO Global Summit

Conference & Exhibition

31st January -  
1st February 2024

Barcelona  
Spain

The WFO Global Summit provides a comprehensive overview of the latest developments in bottom-fixed and floating offshore wind as well as key future topics such as offshore wind to hydrogen.



Register now



[global-summit.wfo-global.org](https://global-summit.wfo-global.org)

# Global Offshore Wind Outlook



Whilst leasing activity and the pipeline of projects appear robust, a range of factors, including the current cost inflation are putting the brakes on offshore wind aspirations (for some), with project delays and cancellations already evident. Westwood expects a period of rationalisation by the value chain accompanied by an evolved offshore wind model. We remain cautiously optimistic about our outlook as the industry remains invested even whilst navigating these new risks.

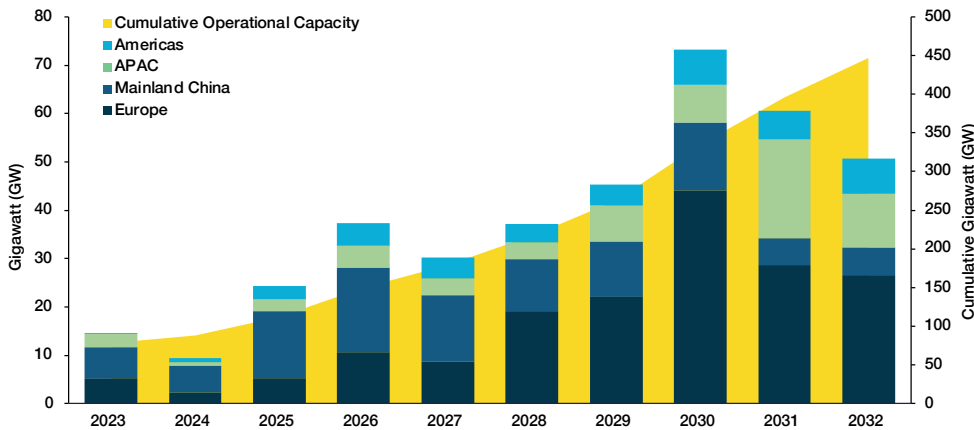
Leasing activity in HY 1 2023 is off to a strong start, anchoring the sector for future offshore wind build out.

- 21.8GW worth of offshore wind acreage was awarded in HY 1 2023. Notable leasing rounds that took place include the Innovation and Targeted Oil & Gas (INTOG) round in the UK, alongside 10 Polish offshore wind sites.
- Westwood expects more than 43 GW of lease capacity to be awarded in 2H 2023<sup>1</sup>, with over 18 GW of this capacity being attributed to lease awards in Germany, as well as expected awards in the Gulf of Mexico (USA) and Japan. The remaining capacity is expected to be awarded in Mainland China, with the award of sites in Guangdong Province making up the bulk of this.

## Global Annual Capacity Installations 2023-2032



Westwood  
Global Energy  
Group



Source: Westwood WindLogix

Long-term capacity outlook remains robust, with operational offshore wind capacity set to increase seven-fold by 2032 relative to 30 June 2023's standing.

- By 2032, operational capacity is forecast to reach 447 GW. Whilst fixed-bottom developments are set to dominate projected additions (94%), commercial floating wind (6%) will begin to make a dent in the overall pie.
- Incumbent markets such as Mainland China, the UK, Germany and the Netherlands will remain a stronghold but nascent markets such as the US and South Korea will start to see their offshore wind projects come into fruition.
- A further 12.7 GW of capacity is anticipated to come online by the turn of the year.



<sup>1</sup> At the time of writing, several leases have been awarded, particularly 11 GW in Germany which were awarded in July and August 2023



# Global Offshore Wind Turbine OEM Market Share

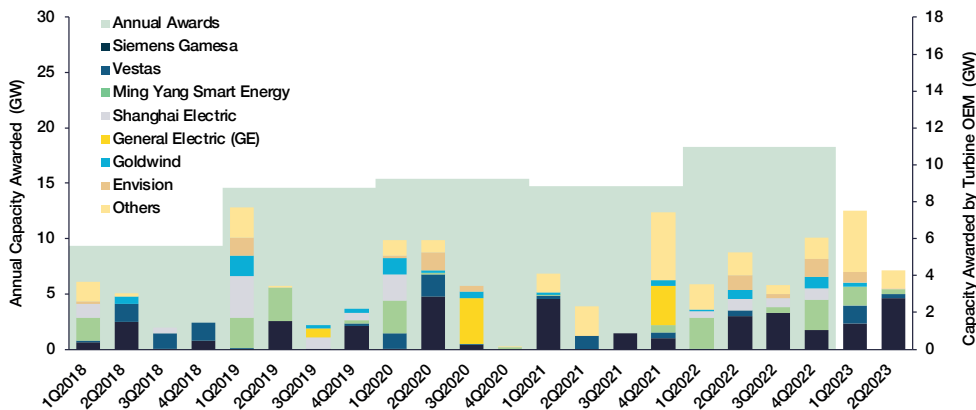
11.8 GW worth of turbine contracts awarded in HY 1 2023, with Siemens Gamesa bagging 36% of the total.

- Adding to Siemens Gamesa’s offshore backlog were contracts signed for the supply of 107 SG 14-236 DD turbines for the 1,498 MW Baltica 2 project in Poland as well as the supply of 95 SG 14 - 236 DD turbines (that will be power boosted to 14.7 MW) for the 1,396.5MW East Anglia Three project in the UK. Ming Yang Smart Energy (MYSE) came in second with over 1.2 GW of orders, whilst Vestas came in third place with just under 1.2 GW worth of contract wins in HY 1 2023.
- Considering the overall 2018-1H 2023 period, Siemens Gamesa leads with a market share of 26%, followed by MYSE (14%) and Vestas (9%).

## Global Offshore Wind Turbine Capacity Awards



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Source: Westwood WindLogix

# Offshore Wind HY1 2023 Theme



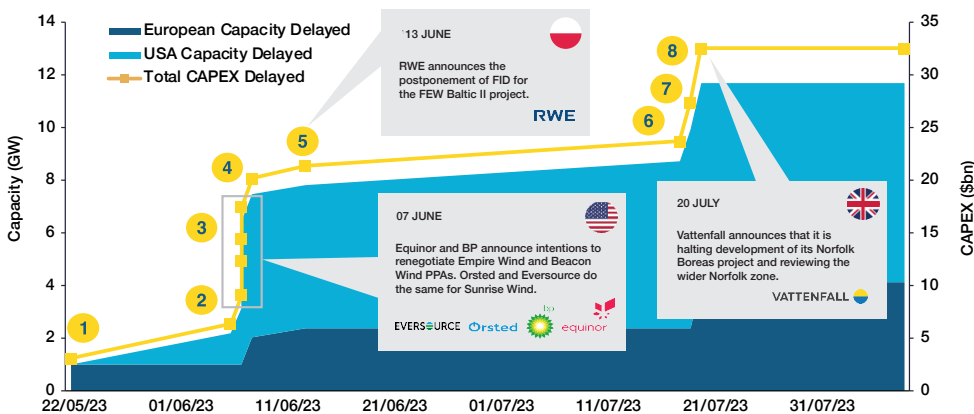
The offshore wind sector is facing headwinds but market stakeholders remain invested, albeit with a cautious lens.

- Since May 2023, 11 offshore wind projects (associated with some 11.6 GW, equivalent to \$32.6bn of EPCI capex) have reportedly been affected by the recent cost inflation by means of a delay/cancellation/indefinite postponement of the project altogether or by means of renegotiation/cancellation in existing offtake agreements.
- Most of the capacity affected so far has been in the US, with project developers cancelling or seeking to renegotiate their Power Purchase Agreements (PPAs) to secure more favourable prices. The impact is also being felt in Europe, with Vattenfall announcing in July that it was halting development of its 1.7 GW Norfolk Boreas project offshore UK.
- In navigating the perils of cost inflation, developers are reevaluating and optimising portfolios with Orsted announcing in June that they will be applying stricter financial scrutiny of projects/prospects to ensure high value creation. Other developers have responded to rising costs by reducing their geographical focus. Mainstream Renewable Power, for example, has opted to shelve plans in the US and instead focus on opportunities in Asia and Europe.
- Changes in the offshore wind business model are in the making, leading to new challenges and opportunities for the value chain.

## Delays to Offshore Wind Projects May-Aug 2023



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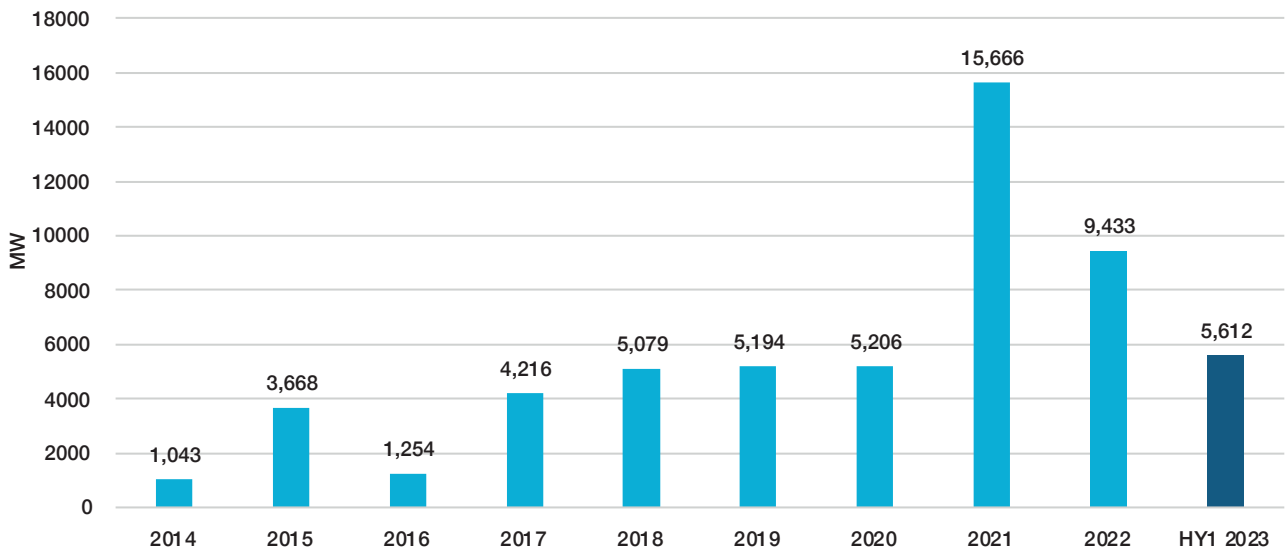
Source: Westwood WindLogix

Date	Country	Developer	Note
1 22 May	Norway	Equinor	Equinor announces the indefinite postponement of Norwegian floating offshore wind farm Trollvind.
2 06 June	USA	Shell, Ocean Winds	Ocean Winds and Shell announce the termination of their SouthCoast PPA with Massachusetts.
3 07 June	USA	Eversource, Orsted, BP, Equinor	Equinor and BP announce intentions to renegotiate Empire Wind and Beacon Wind PPAs. Orsted and Eversource do same for Sunrise Wind.
4 08 June	Poland	Orsted, PGE	Orsted and PGE announce that the FID of the Baltica 3 project will be delayed.
5 13 June	Poland	RWE	RWE announces the postponement of FID for the FEW Baltic II project.
6 18 July	USA	Eversource, Orsted	Orsted and Eversource's PPA bid for Revolution Wind 2 is rejected, despite being the only bid in the auction.
7 19 July	USA	Avangrid	Avangrid and utility partners agree to terminate the PPA for the Commonwealth Wind project.
8 20 July	UK	Vattenfall	Vattenfall announces that it is halting development of its Norfolk Boreas project and reviewing the wider Norfolk zone.

# Global Offshore Wind Growth

Global growth slows down compared to HY1 2022

Annually Added Offshore Wind Capacity



A total of 5.6 GW of global offshore wind capacity was added during HY1 2023

New capacity in HY1 2023 was lower than in HY1 2022 (6.8 GW)

Globally, 15 new offshore wind farms were taken into operation in Asia (10) and Europe (5)

# 5.6 GW

Globally added offshore wind capacity in HY1 2023

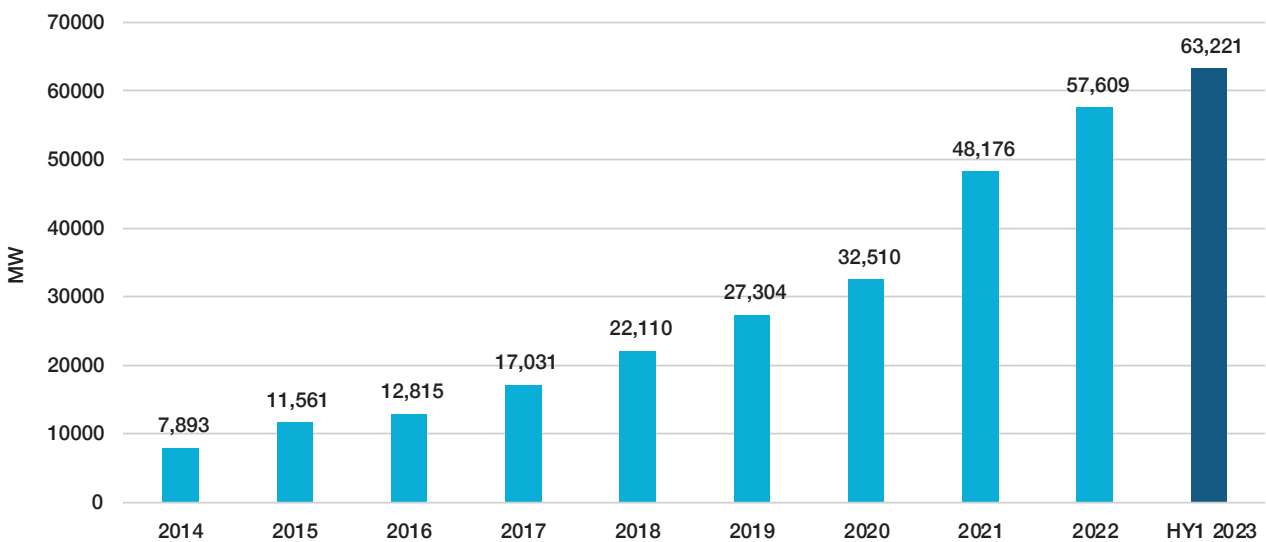


# Global Growth

Global offshore wind capacity surpasses 60 GW

Global offshore wind capacity<sup>2</sup> in operation - Cumulative

IN OPERATION



Globally, installed offshore wind capacity reached 63.2 GW by the end of HY1 2023, 45 % of which (28.7 GW) is now installed in China

The average size of a newly added offshore wind farm during HY1 2023 was 374 MW compared to 205 MW during HY1 2022

Worldwide, 272 offshore wind farms are currently in operation of which 150 are in Asia, 120 in Europe and 2 in the USA

# 63.2 GW

Global offshore wind capacity in operation

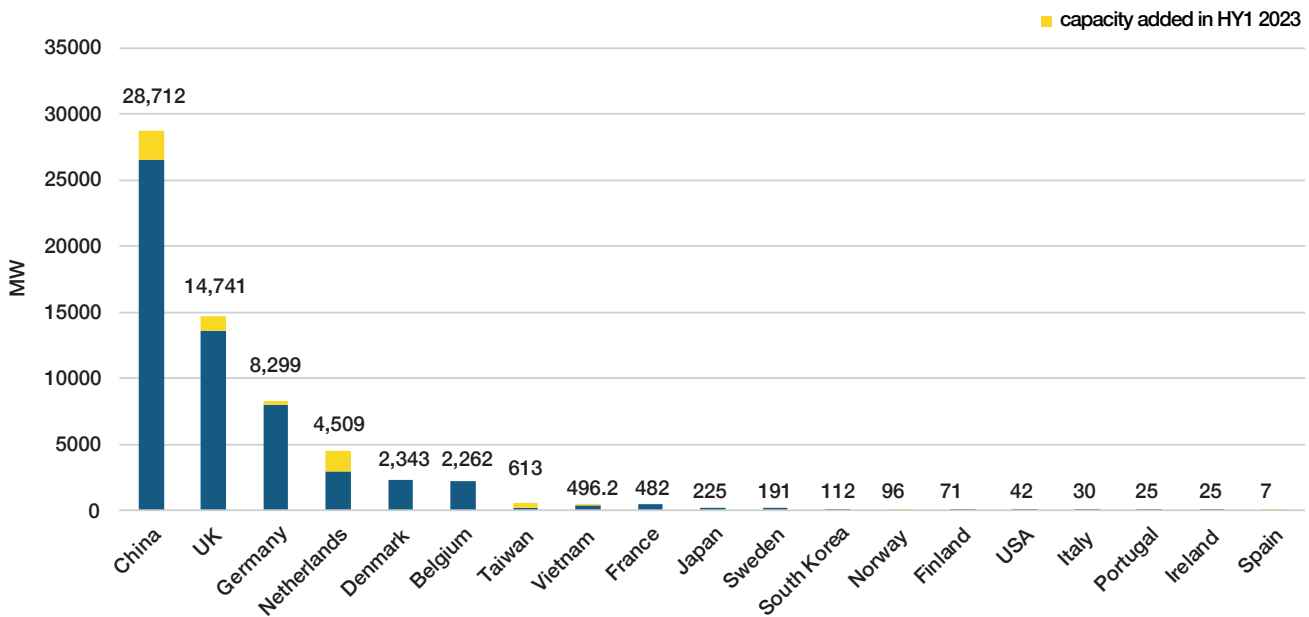
<sup>2</sup> In operation: all turbines installed and first power

# Top Markets

Floating offshore wind turbines installed in Europe and Asia

Global offshore wind capacity in operation<sup>3</sup> – by country

IN OPERATION



China's growth continues, albeit at a slower pace with 2.2 GW of newly installed capacity during HY1 2023, increasing its total installed capacity to 28.7 GW

The UK completed the GW-scale Seagreen offshore wind farm (1.1 GW) while Germany added the 257 MW Arkadis Ost project in the Baltic Sea

Floating offshore wind turbines were successfully installed in Norway (88 MW), China (7.5 MW) and Spain (2 MW)

# 2.2 GW

Offshore wind capacity added in China

<sup>3</sup> In operation: all turbines installed and first power

# In Detail:

Global offshore wind farms put into operation in HY1 2023

No.	Wind farm	MW	Units	MW/unit	Turbines	Location
1	DemoSATH (floating)	2	1	2	-	ES
2	CNOOC Guan Lan (floating)	7.5	1	7.25	MySE7.25-158	CN
3	Hywind Tampen (floating)	88	11	8	SG 8.0-167 DD	NO
4	Shenquan Phase 1 Part 2	91	13	7	-	CN
5	Tan Phu Dong 1	100	24	4,2	V150-4.2 MW	VT
6	Rudong H13	150	30	5	H171-5.0	CN
7	Arkadis Ost	257	27	9.5	V174-9.5 MW	DE
8	Changle Area A	300	36	10/8	DEW-D10000-185, GW175-8.0	CN
9	Changle Area C 2	300	30	10	DEW-D10000-185, SG 10.0-193 DD	CN
10	Formosa 2	376	47	8	SG 8.0-167 DD	TW
11	Cangnan 1 - Phase 1	400	49	6.25/10	-	CN
12	Shandong Bozhong B	400	47	8.5	SEW8.5-230	CN
13	Huadian Yangjiang Qingzhou III	500	67	6.8/8.3	MySE6.8-158, MySE8.3-180	CN
14	Seagreen	1140	114	10	V164-10 MW	UK
15	Hollandse Kust Zuid	1500	139	11	SG 11.0-200 DD	NL
Total		5,612				

# 1.5 GW

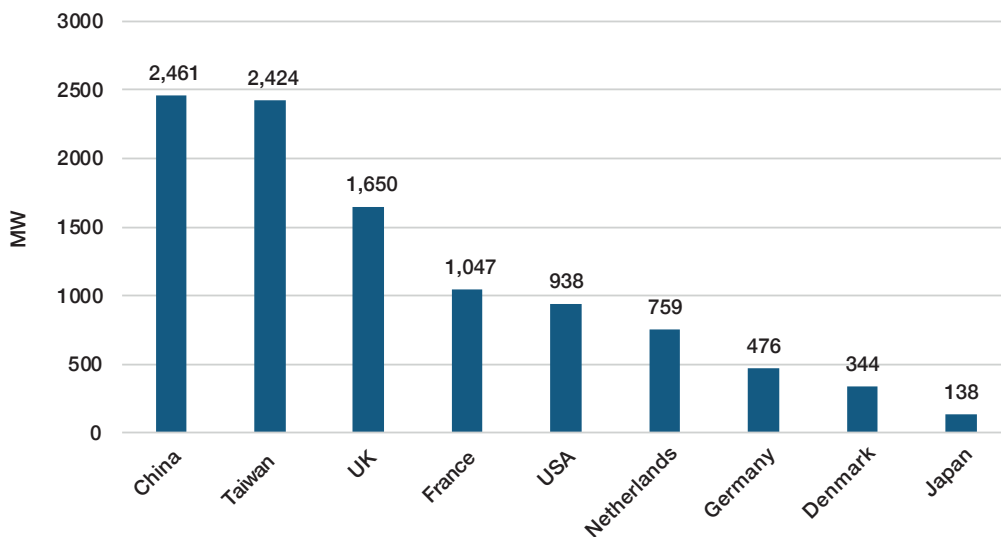
Largest project put into operation in HY1 2023

# Construction

## Offshore wind growth slows down in HY1 2023

Global offshore wind capacity under construction<sup>4</sup> by the end of HY1 2023

UNDER CONSTRUCTION



China's offshore wind sector slows down with a total capacity of 2.46 GW currently under construction in Chinese waters

Taiwan is a close follower with 2.42 GW currently under construction in the Taiwan Strait

The UK is in third place with 1.65 GW under construction including the GW-scale project Dogger Bank A (1.2 GW) and Neart na Gaoithe (0.45 GW)

# 10.2 GW

Global offshore wind capacity under construction

<sup>4</sup> Under construction: first offshore wind foundation installed

# In Detail:

## Offshore wind farms under construction

No.	Wind farm	MW	Units	MW/Unit	Turbine	Location
1	Nyuzen	9	3	3	MySE3.0-135	JP
2	Goto (floating)	16.8	8	2.1	Hitachi 2.1	JP
3	Provence Grand Large (floating)	24	3	8	SWT-8.0-154	FR
4	Eoliennes Flottantes du Golfe du Lion (floating)	30	3	10	V164-10.0	FR
5	Pingtai Waihai	111	11	11/8	D10000-185, GW175-8.0	CN
6	Ishikari	112	14	8	SG 8.0-167 DD	JP
7	South Fork	132	12	11	SG 11.0-200 DD	US
8	Longyuan Putian Nanri Island I 2	180	45	4	SWT-4.0-130	CN
9	CGN Huizhou I	250	40	6.5	MySE6.45-180	CN
10	Zhong Neng	295	31	9.5	V174-9.5MW	TW
11	Zheneng Taizhou 1	300	40	7.5	DEW-D7500-186	CN
12	Fujian Putian City Flat Bay Three Zone C	308	44	7	SWT-7.0-154	CN
13	Zhangpu Liuaio Phase 2	312	21	13/16	D13000-245, GWH252-16MW	CN
14	Vesterhav Nord/Syd	344	41	8	SG 8.0-167 DD	DK
15	Near na Gaoithe	450	54	8	SG 8.0-167 DD	UK
16	Baltic Eagle	476	50	9.5	V174 9.5	DE
17	Saint-Brieuc	496	62	8	SG 8.0-167 DD	FR
18	Fécamp	497	71	7	SWT-7.0-154	FR
19	Guodian Xiangshan 1 2	500	41	12	-	CN
20	Mingyang Yangjiang Qingzhou IV	500	43	12/11	MySE 11-230, MySE 12-242	CN
21	Changfang and Xidao	589	62	9.5	V174-9.5 MW	TW
22	Yunlin	640	80	8	SG 8.0-167 DD	TW
23	Hollandse Kust Noord	759	69	11	SG 11.0-200 DD	NL
24	Vineyard Wind 1	806	62	13	Haliade-X 13MW	US
25	Greater Changhua 1 & 2a	900	111	8	SG 8.0-167 DD	TW
26	Dogger Bank A	1200	95	13	Haliade-X 13MW	UK
Total		10,236				

# 1.2 GW

World's largest offshore wind farm under construction



Photography credits:  
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