

# Global Offshore Wind Report

2021



February 2022



WORLD FORUM  
OFFSHORE WIND

## Top 5 facts about WFO

WFO: 100% Offshore Wind



**Non-profit**  
organisation  
founded in 2018



**Initiatives**  
Floating Offshore Wind Committee  
Offshore Dispute Resolution Committee



**75+ global**  
member  
organisations



**Global setup**  
with offices in  
Hamburg, New York,  
Tokyo, and Taipei



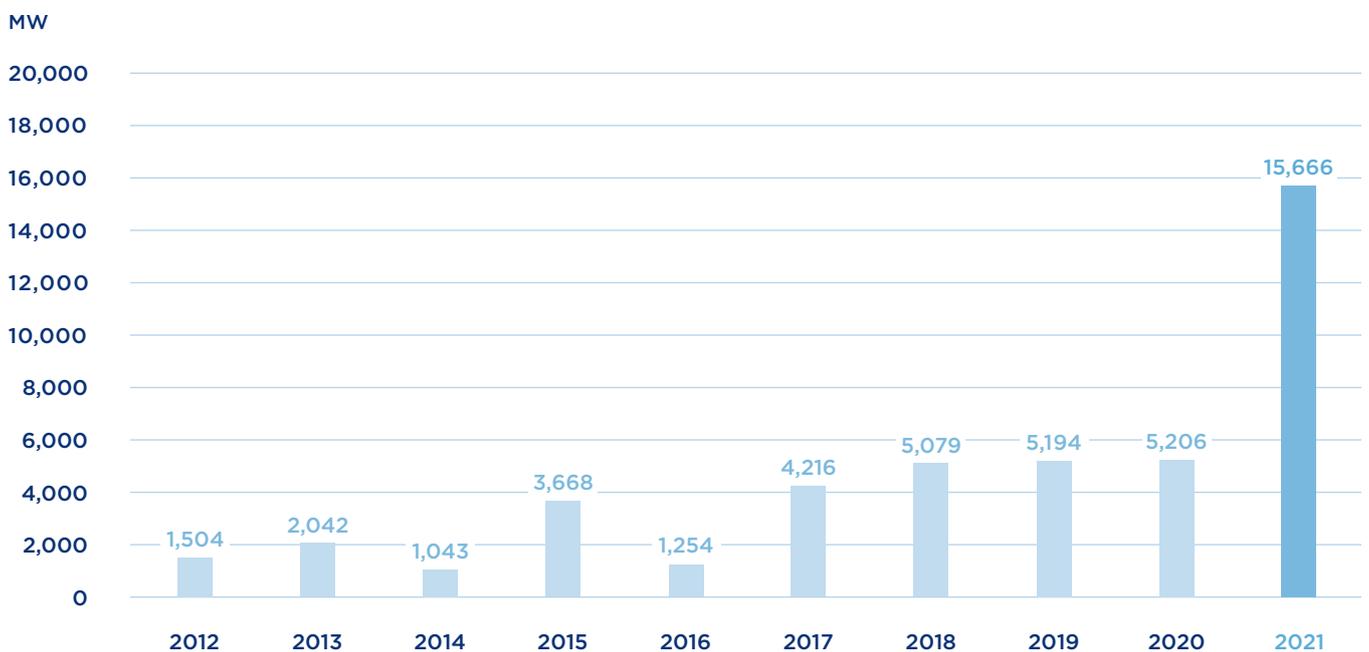
**Core activities**

1. Information
2. Events
3. Government Advisory

**World Forum Offshore Wind (WFO)** is the world's only organisation 100% dedicated to fostering the global growth of offshore wind energy. WFO's international members represent the complete offshore wind value chain including utilities, manufacturers, service firms and non-profit organisations.

# Phenomenal growth in China makes 2021 a new record year for offshore wind installations

## Annually added offshore wind capacity



- **15.7 GW** of global offshore wind capacity were added in 2021, driven by China due to the expiration of the Chinese feed-in tariff by the end of 2021
- Globally, **53** new offshore wind farms went into operation<sup>1</sup> in China (45), the UK (3), the Netherlands (2), Denmark (1), Taiwan (1), and Norway (1)
- The **average size** of a newly added offshore wind farm during 2021 was **296 MW** compared to 347 MW in 2020, due to many 200–300 MW projects in China

<sup>1</sup> In operation: all turbines installed and first power



# 15.7 GW

Globally added offshore wind capacity in 2021

## In detail: offshore wind farms put into operation in 2021

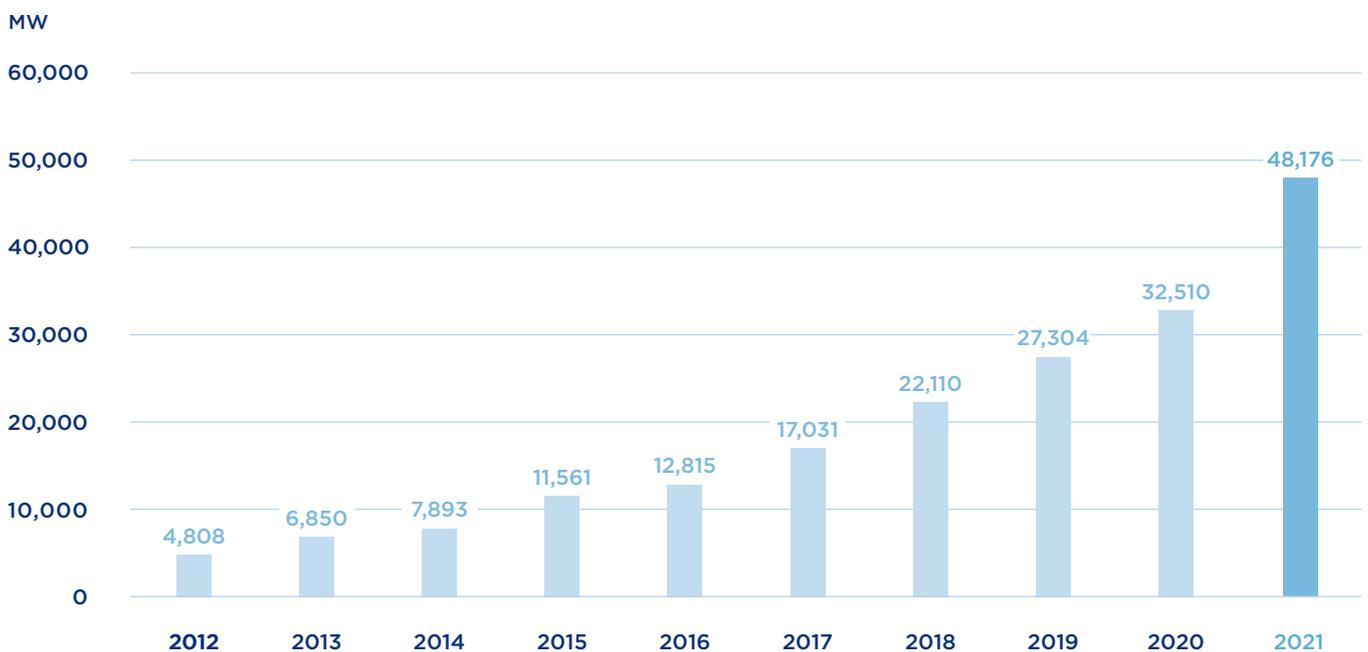
No	Wind Farm	MW	Units	MW/Unit	Turbine	Location
1	TetraSpar demo (floating)	4	1	3.6	Siemens Gamesa SG 3.6	NO
2	CTGNE Yangjiang Shapa III - demo (floating)	6	1	5.5	MySE5.5-155	CN
3	Borssele 5	19	2	9.5	MHI-Vestas V164-9.5	NL
4	Kincardine (floating)	50	6	9.5	Vestas V164-9.5 MW, Vestas V80-2 MW	UK
5	CTGNE Yangjiang Shapa III - A2	100	47	6.5	MySE6.45-180	CN
6	Sheyang H2-1	104	23	4.5	EN-148/4.5	CN
7	Changhua Phase 1	109	21	5.2	Hitachi 5.2 MW	TW
8	Zhuhai Guishan Hai Demonstration 1	120	37	3.0/6.45	MySE3.0-112, UP3000-108, MySE6.45-180	CN
9	Fujian Putian City Flat Bay (Zone F)	200	29	7.0/6.0	SWT-7.0-154, SWT-6.0-154	CN
10	Shicheng Fishing Port	200	29	7.0	SWT-7.0-154	CN
11	Zhanjiang Wailuo 200MW 2	200	32	6.3	SWT-6.25-172	CN
12	Zhugensha H1 - Dongtai V	200	50	4.0	-	CN
13	Fengxian 1	206	32	6.5	MySE6.45-180, GW184-6.45MW0	CN
14	Datang International Shantou Lemen I	245	35	7.0	SWT-7.0-154	CN
15	Fujian Putian City Flat Bay Two (Zone B)	246	41	6.0	SWT-6.0-154	CN
16	Qidong H1	250	42	6.25/5.2	SWT-6.25-172, EN-161/5.2	CN
17	Qidong H2	250	42	6.25/5.2	SWT-6.25-172, EN-161/5.2	CN
18	Guodian Zhoushan Putuo District 6-2	252	63	4.0	SWT-4.0-130	CN
19	Shengsi 5+6	282	45	6.3	SWT-6.25-172	CN
20	CECEP Yangjiang Nanpeng Island	300	55	5.5	MySE5.5-155	CN
21	CSIC Jiangsu Rudong H3-1	300	60	5.0	H151-5MW, H171-5.0MW	CN
22	CTGNE Jiangsu Dafeng H8-2	300	58	4.5/6.45	GW 155-4.5MW, GW171-6.45MW	CN
23	CTGNE Yangjiang Shapa I	300	55	5.5	MySE5.5-155	CN
24	CTGNE Yangjiang Shapa III - A1	300	47	6.5	GW171-6.45MW, MySE6.45-180	CN
25	CTGNE Yangjiang Shapa V	300	47	6.5	MySE6.45-180	CN
26	Huadian Fujian Fuqing Haitan Strait	300	46	7.0/6.2	MySE7.0-158, H171-6.2MW	CN
27	Huaneng Dalian Zhuanghe II	300	60	5.0	H171-5.0MW	CN
28	Huaneng Guanyun 1	300	48	6.5	GW184-6.45MW, GW171-6.45MW	CN
29	Huaneng Shandong Peninsula South 4	300	58	5.2	EN-161/5.2	CN
30	Rudong H8	300	67	5.0/4.0	H171-5.0MW, SWT-4.0-146	CN
31	SPIC Binhai South H3	300	75	4.0	SWT-4.0-146	CN
32	Zhanjiang Xuwen-North	300	47	6.5	MySE6.45-180	CN
33	Zhuhai Jinwan	300	55	5.5	MySE5.5-155	CN
34	CTGNE Yangjiang Shapa IV	300	43	7.0	DEW-D7000-186	CN
35	Zhejiang Jiaying 1	301	74	4.0	XE148-4000, SWT-4.0-146	CN
36	Sheyang H1	302	67	4.5	EN-148/4.5	CN
37	Sheyang H2	302	67	4.5	EN-148/4.5	CN
38	SPIC Shandong Peninsula South 3	302	58	5.2	EN-161/5.2	CN
39	Zhugensha H2	302	67	4.0/6.0	SWT-4.0-146, SWT-6.0-172	CN
40	Qidong H3	305	50	6.25/5.2	SWT-6.25-172, EN-161/5.2	CN
41	Shenquan 1	316	53	5.5/7.0	MySE5.5-155, SWT-7.0-154	CN
42	Huaneng Dalian Zhuanghe IV 1	350	51	7.5/6.2	DEW-7.5MW-186, H171-6.2MW	CN
43	Rudong H2	350	70	5.0	H171-5.0MW	CN
44	Windpark Fryslan	383	89	4.3	Siemens Gamesa SWT-4.3-130	NL
45	CTGNE Yangjiang Shapa II	400	62	6.5	MySE6.45-180, GW171-6.45MW	CN
46	Rudong H10	400	100	4.0	SWT-4.0-146	CN
47	Rudong H6	400	100	4.0	SWT-4.0-146	CN
48	Shengsi 2	400	67	6.45/6.25	MySE6.45-180, SWT-6.25-172	CN
49	SPIC Rudong H4	400	100	4.0	SWT-4.0-146	CN
50	CGN Shanwei Houhu	500	91	5.5	MySE5.5-155	CN
51	Kriegers Flak	605	72	8.0	Siemens Gamesa SG 8.0-167 DD	DK
52	Triton Knoll	857	90	9.5	Vestas V164-9.5 MW	UK
53	Moray East	950	100	9.5	Vestas V164-9.5 MW	UK
<b>Total</b>		<b>15,666</b>				

# Global growth

## Offshore wind capacity jumps to almost 50 GW

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

IN  
OPERATION



- Globally, installed offshore wind capacity reached **48.2 GW** by the end of the year 2021, 40% of which (19.7 GW) is now installed in China
- During the 2<sup>nd</sup> half of 2021, new offshore wind installations exceeded the first six months by far with **14,045 MW** due to China's vast buildout
- Worldwide, **215** offshore wind farms<sup>3</sup> are currently in operation of which 110 are located in Europe, 103 in Asia and 2 in the USA

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

<sup>3</sup> Wind farm: project consisting of at least two offshore wind turbines



# 48.2 GW

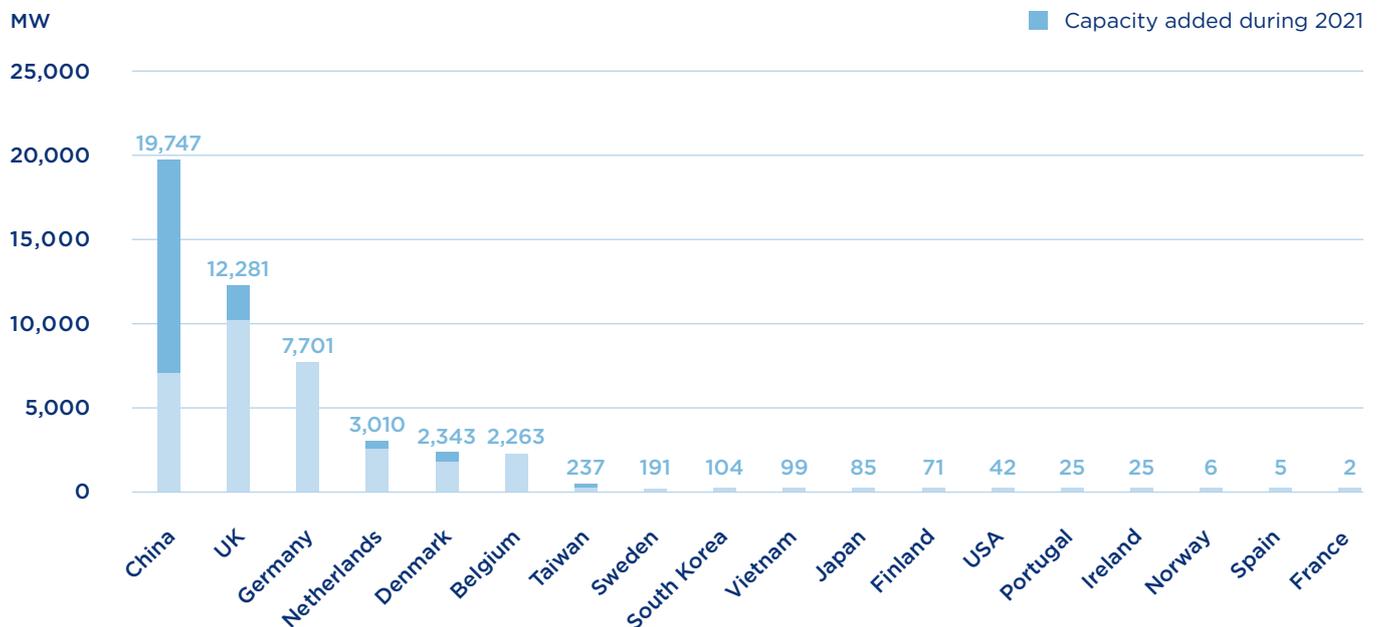
Global offshore wind capacity in operation

## Top markets

China becomes the largest offshore wind market by far ahead of the UK and Germany

Global offshore wind capacity in operation<sup>4</sup> - by country

IN  
OPERATION



- **China** grew phenomenally with **12.689 MW<sup>5</sup>** of newly installed capacity during 2021, increasing its total installed capacity to **19.7 GW**
- **China** is now the world's largest offshore wind market by far with almost as much installed capacity as the UK and Germany combined
- **Germany** falls behind China and the UK with a stagnant total of 7.7 GW and no new capacity added or under construction during 2021

<sup>4</sup> In operation: all turbines installed and first power

<sup>5</sup> Difference between figures of China's National Energy Administration (16.9 GW) is due to definition of operational capacity

# 12.7 GW

Offshore wind capacity added in China in 2021

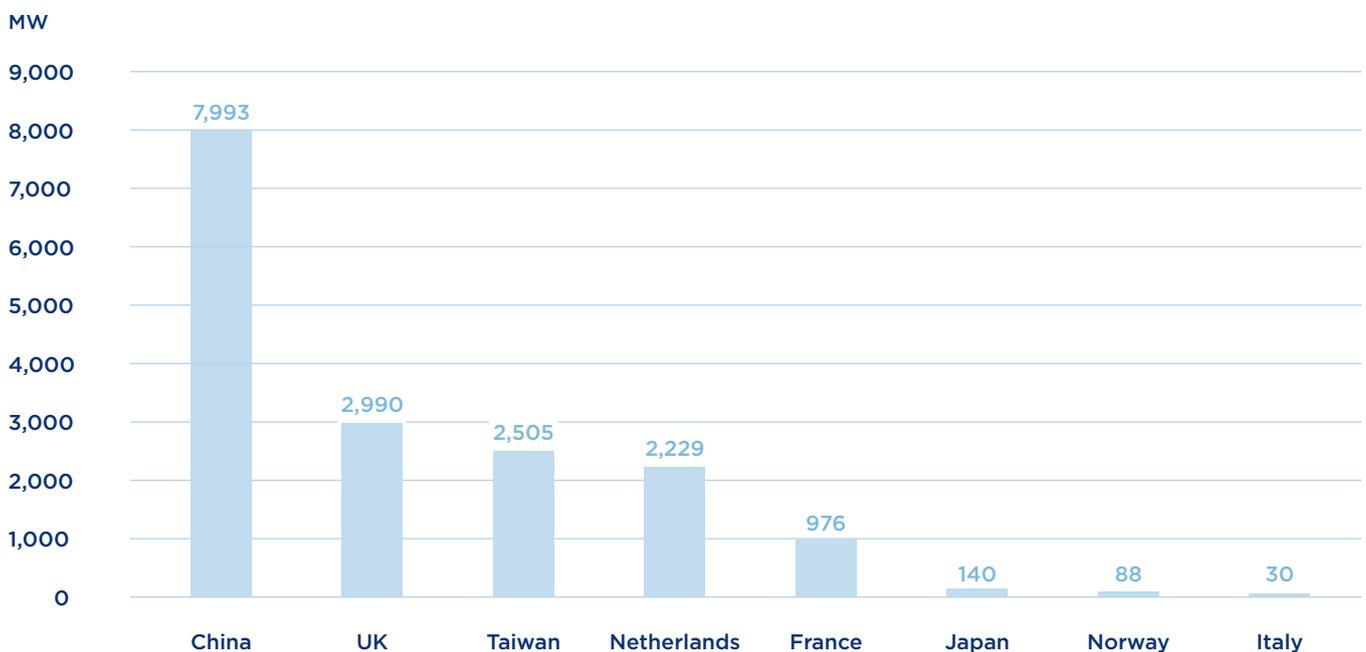


## Construction

Strong growth in China and in new markets around the world

Global offshore wind capacity under construction<sup>6</sup> until end of 2021

UNDER  
CONSTRUCTION



- **China's** offshore wind sector continues to grow rapidly with a total capacity of **8 GW** currently under construction
- In **France, Japan** and **Italy** the first **commercial-scale** offshore wind farms went into construction
- In **Norway** the world's largest **floating** offshore wind farm (88 MW) is currently under construction

<sup>6</sup> Under construction: first offshore wind foundation installed



# 17 GW

Global offshore wind capacity under construction

## In detail: offshore wind farms under construction<sup>7</sup> worldwide

No	Wind Farm	MW	Units	MW/Unit	Turbine	Location
1	Taranto	30	10	3.0	MySE 3.0-135	IT
2	Pingtang Strait Gongtie Bridge Lighting Project	34	5	6.7	GW154-6.7MW	CN
3	Pudong New District Donghai Bridge Project	46	7	6.5	W6.5F-185	CN
4	Jiangjiasha	50	15	3.3	GW 155-3.3MW	CN
5	Akita Port	56	13	4.2	V117 - 4.2 MW	JP
6	Zhuhai Guishan Hai Demonstration 2	83	12	7.0	DEW-D7000-186, MySE6.45-180	CN
7	Noshiro Port	84	20	4.2	V117 - 4.2 MW	JP
8	Hywind Tampen (floating)	88	11	8.0	SG 8.0-167 DD	NO
9	CSIC Jiangsu Rudong H3-2	100	20	5.0	H151-5MW	CN
10	Huadian Yuhuan 1 South	146	20	7.0	DEW-D7000-186	CN
11	Rudong H13	150	30	5.0	H171-5.0MW	CN
12	Huadian Yuhuan 1 North	154	22	7.0	DEW-D7000-186	CN
13	Longyuan Putian Nanri Island I 2	180	45	4.0	SWT-4.0-130	CN
14	Fujian Pingtan Datang Changjiangao	185	37	5.0	MySE5.0-133	CN
15	Changle Area C 1	200	20	10.0	DEW-D10000-185	CN
16	Rudong H15	200	40	5.0	H171-5.0MW	CN
17	Longyuan Putian Nanri Island I 1	204	51	4.0	SWT-4.0-130	CN
18	Dafeng H5	206	32	6.45	GW184-6.45MW	CN
19	Xinliao	206	32	6.45	MySE6.45-180	CN
20	CGN Pingtan Island	240	60	4.0	SWT-4.0-130, MySE5.5-155	CN
21	CGN Huizhou I	250	40	6.5	MySE6.45-180	CN
22	Guodian Xiangshan 11	254	41	6.2	H171-6.2MW	CN
23	Fuqing Xinghua Bay 2	288	46	6.7	GW154-6.7MW, DEW-G5000-140	CN
24	Changle Area A	300	36	10.0	DEW-D10000-185, GW175-8.0MW	CN
25	Changle Area C 2	300	37	10.0	DEW-D10000-185, SG 10.0-193 DD	CN
26	Dafeng H6	300	47	6.5	GW184-6.45MW	CN
27	Rudong H5	300	75	4.0	SWT-4.0-146	CN
28	Zhejiang Jiaying 2	300	50	6.0	SWT-6.0-154	CN
29	Yuedian Yangjiang Shapa	300	47	6.45	MySE6.45-180	CN
30	Zhanjiang Xuwen-South	300	47	6.45	GW171-6.45MW	CN
31	Mingyang Yangjiang Shapa	300	46	6.5	MySE6.45-180	CN
32	Longyuan Jiangsu Dafeng H4	302	47	6.5	GW184-6.45MW	CN
33	Fujian Putian City Flat Bay Three Zone C	308	44	7.0	SWT-7.0-154	CN
34	Formosa 2*	376	47	8.0	SG 8.0-167 DD	TW
35	SPIC Rudong H7	400	100	4.0	SWT-4.0-146	CN
36	CGN Shanwei Jiazi II	403	62	6.5	MySE6.45-180	CN
37	Nearst na Gaoithe	450	54	8.4	SG 8.0-167 DD	UK
38	Saint-Nazaire	480	80	6.0	GE Haliade 160-6MW	FR
39	Saint-Brieuc*	496	62	8.0	SG 8.0-167 DD	FR
40	Guodian Xiangshan 12	500	41	12.0	-	CN
41	CGN Shanwei Jiazi I	503	78	6.5	MySE6.45-180	CN
42	Changfang and Xidao	589	62	9.5	V174-9.5 MW	TW
43	Yunlin	640	80	8.0	SG 8.0-167 DD	TW
44	Hollandse Kust Noord	759	69	11.0	SG 11.0-200 DD	NL
45	Greater Changhua 1&2a	900	111	8.0	SG 8.0-167 DD	TW
46	Seagreen	1,140	114	10.0	V164-10 MW	UK
47	Hornsea 2	1,400	165	8.4	SG 8.0-167 DD	UK
48	Hollandse Kust Zuid	1,540	140	11.0	SG 11.0-193 DD	NL
<b>Total</b>		<b>17,021</b>				

<sup>7</sup> Under construction: first offshore wind foundation installed

\* Only pin-piles were installed by the end of 2021

**JOIN  
US!**

**World Forum Offshore Wind e.V.**

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