

Thank you for joining
The Event will start shortly



Launch of NORWEP Global Offshore Wind Market Report 2024

29 August 2024 13:00 CEST



Stavanger/Munkebo, 29. August 2024

Launch of the Global Offshore Wind Annual Market Report 2024

Agenda

Presentation of NORWEP Annual Global Offshore Wind Market Report 2024 & industry expectations

Klaus Udesen, Director Offshore Wind, Norwegian Energy Partners

Comments and discussion



Norwegian Energy Partners

An independent non-profit foundation established to support the Norwegian energy industry's international activities.

350 partners/company members mainly from the Norwegian offshore, energy and maritime industries.

Founded by major Norwegian industry and trade organisations in collaboration with the government.



Our Founders

Organisations

- Renewables Norway
- Federation of Norwegian Industries
- Offshore Norway
- Norwegian Shipowners' Association
- The Norwegian Confederation of Trade Unions

Norwegian Government

- Ministry of Petroleum and Energy
- Ministry of Trade and Industry
- Ministry of Foreign Affairs

Industry

- Equinor
- Statkraft





Combining Norwegian competence with international energy needs





What do we do?

- **Market Intelligence** - Provide market and project information to NORWEP partners and Norwegian industry at large.
- **Technologies & Solutions** - Map Norwegian competence and technology to fit needs in the offshore wind & energy industries.
- **Create relevant dialogues** between Norwegian industry and international partners and clients.



Our wind markets

With an extensive international network and local advisors in key markets, we identify new business opportunities and open doors for the Norwegian offshore wind industry around the world.

Our advisors have an extensive international network of industry contacts and deep local knowledge.

This knowledge is even more important in the years to come as sales propositions will need to focus even more on the value for the customer.





2024 report takeaways - a mixed picture

The Global offshore wind industry is facing harsh headwinds as mature markets are struggling with significant cost increases, supply chain constraints and policy changes, leaving some projects stranded. Project cancellations together with challenging permitting processes have reduced portfolio growth rates seen earlier.

Markets across all regions are at risk of missing ambitious government targets.

Nevertheless, near 50 GW of capacity was auctioned and near 5 GW entered full operations during last year. 12 GW are currently under construction while 5 GW of projects across Germany, Poland, the UK, the US and South Korea reached FID during the period.

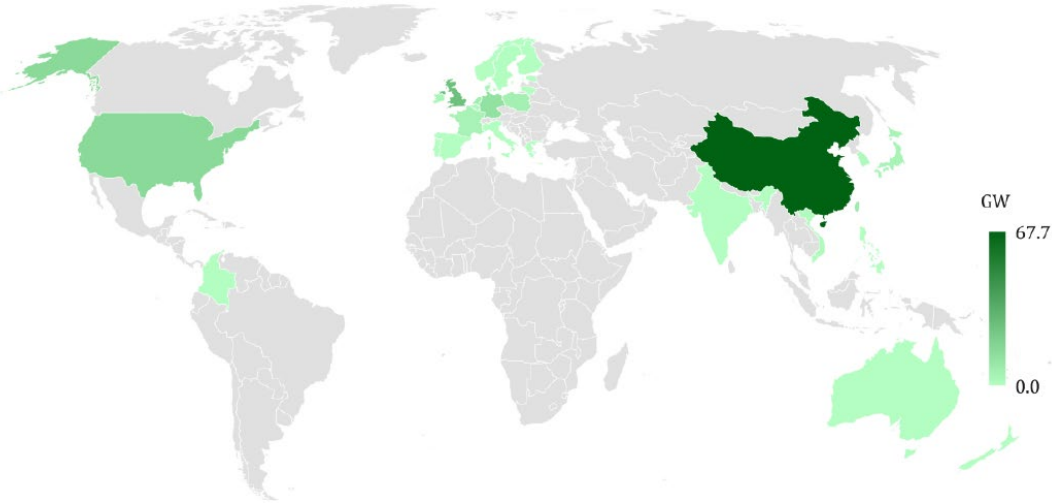
Governments and regional policymakers (EU) are supportive of the industry, boosting auction volumes and increasing speed. More governments are considering offshore wind a major part of the electricity mix – spurred on by energy security concerns and net zero considerations.

Hence, up to 380 GW of global offshore wind capacity could be operational by 2034, more than 5 times the current capacity installed.



Slower growth..

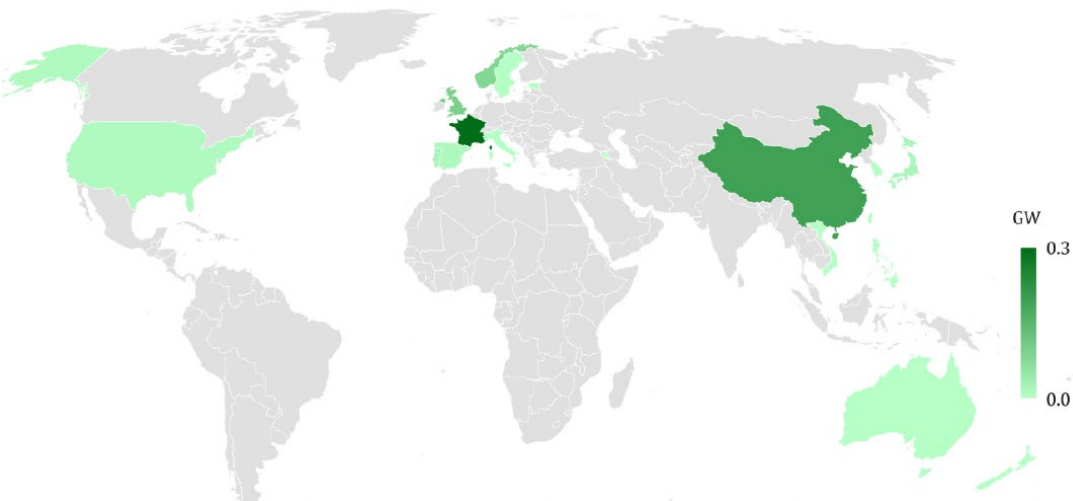
Total global capacity in operations or with a secured route to market was 171 GW at the end of 1H 2024, up from 156.2 GW at end 1H 2023 – with only 66 GW added to the total pipeline of 1 526 GW.



Country	Operational	Secured	Development
China	37,746	30,000	90,521
United Kingdom	14,690	11,796	87,803
USA	174	15,380	122,645
Germany	8,251	4,056	50,160
The Netherlands	3,745	7,192	17,400
Taiwan	1,513	6,388	38,908
Poland	-	5,930	10,871
France	1,475	3,178	5,743
Japan	311	4,037	51,674
Denmark	2,473	1,176	12,452
Ireland	25	3,380	6,785
Belgium	2,261	-	3,500
South Korea	106	1630	58,138
Vietnam	777	312	65,349
Sweden	191	-	128,590

73.9 GW Operational	97.2 GW Secured	1,357 GW In Development**	1,526 GW Total
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What about floating?



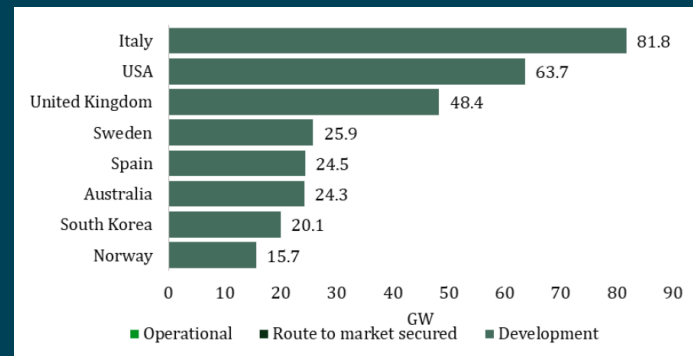
0.22 GW
Operational

0.6 GW
Secured

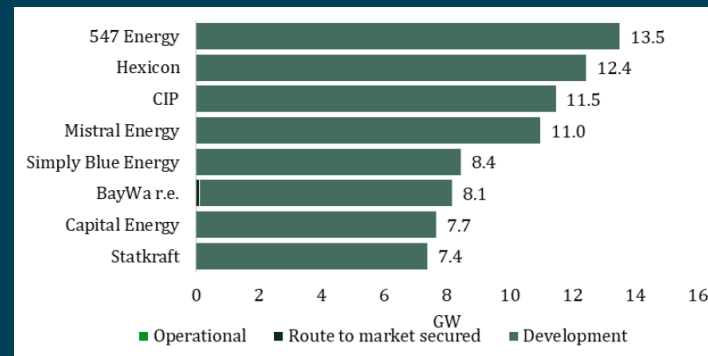
480.5 GW
In Development**

481.5 GW
Total

Key markets



Key developers





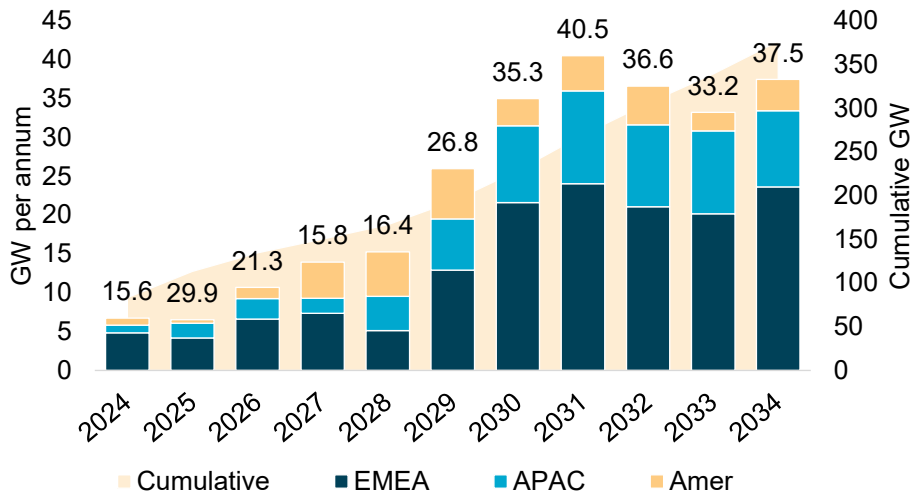
Upcoming auctions

		2024 H1		2024 H2		2025 H1		2025 H2		2026	
		2024 H1		2024 H2		2025 H1		2025 H2		2026	
Lease Auctions	Lease & Offtake	EMEA	Germany 2.5 GW	France A06 0.5 GW	Denmark 6.5 GW	Germany 2 GW	Noordhinder Nord 0.7 GW	Germany 2 GW	Noordhinder Nord 0.7 GW	Germany 2 GW	
		EMEA	Ilmuiden Ver Alpha and Beta 4 GW	Spain* TBA	Denmark 3.5 GW	Denmark 3.5 GW	Noordhinder Sud 1.4 GW	France A07 & A08 2.5 GW	Utsira Nord 1.5 GW	Noordhinder Sud 1.4 GW	
		EMEA	Lithuania 0.7 GW		France A07 & A08 2.5 GW		Fairy Bank 1.4 GW				
	APAC	India Gujarat 0.5 GW	Taiwan Round 3-2 3 GW	India - Tamil Nadu 0.5 GW	Taiwan floating wind demo* 0.18 - 0.54 GW	Taiwan Round 3-3* 3 GW	Japan Round 5* TBA				
	AMER	Japan Round 3 1.1 GW		Japan Round 4* TBA							
	Offtake Only	EMEA		AR6 TBA	ORESS 2.1* 0.9 GW	AR7 TBA	AR8 TBA				
APAC	AMER	New York 4 (NY4), 1.7 GW	Massachusetts, Connecticut, Rhode Island 3.6 GW, 2 GW, 1.2 GW New Jersey 4 4 GW								
APAC	APAC		South Korea* TBA	Philippines* TBA	South Korea* TBA	South Korea* TBA	South Korea* TBA	Australia - Victoria* TBA			

*Expected. Date to be confirmed.



Stable higher growth..

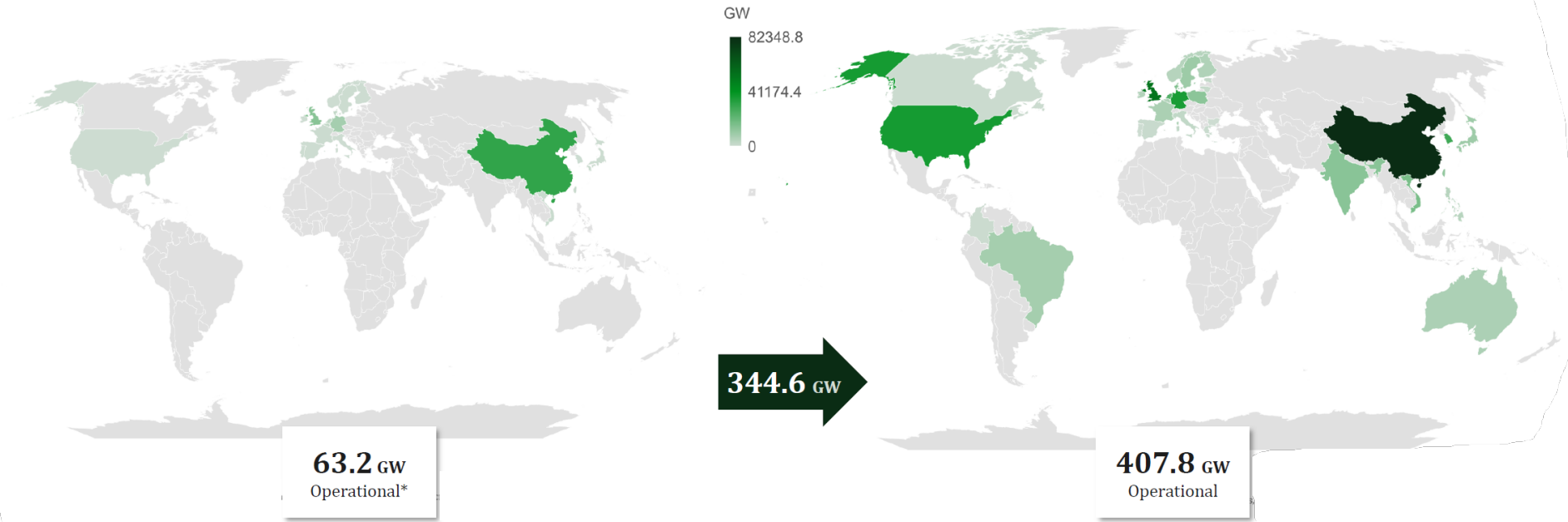


- Capacity commissioned to approach 380 GW i 2034 (excl. China), doubling yearly capacity installations.
- A strengthened policy framework support a consistent stream of tenders and capacity auctions - ensuring more projects secure a route to market through to 2034 in the EMEA.
- APAC commissioning expected to grow rapidly with identified routes-to-markets and permitting rounds.
- In the Americas, the US is replacing lost projects with new, holding up the pipeline, while Canada and the LATAM countries are developing regulation and testing the market with first auctions.
- Several emerging countries are considering offshore wind, developing regulations and processes.
- Ambitious government targets nevertheless might be missed due to supply chain constraints and administrative delays.



Global commissioning forecast 2033

In the next 10 years ERM predicts that over 340 GW of offshore wind capacity will be built



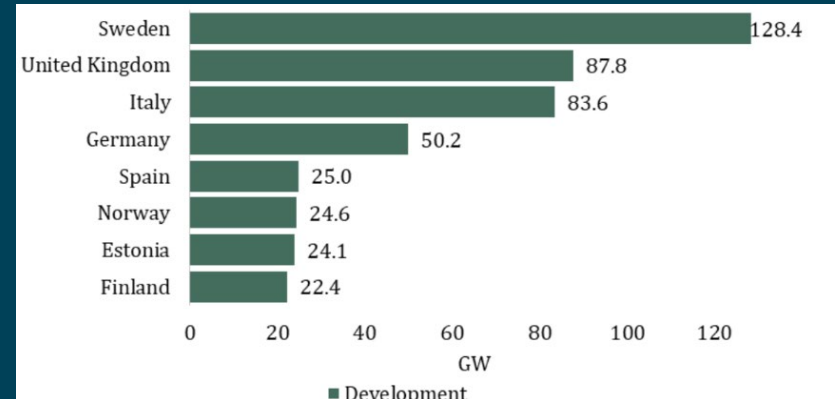
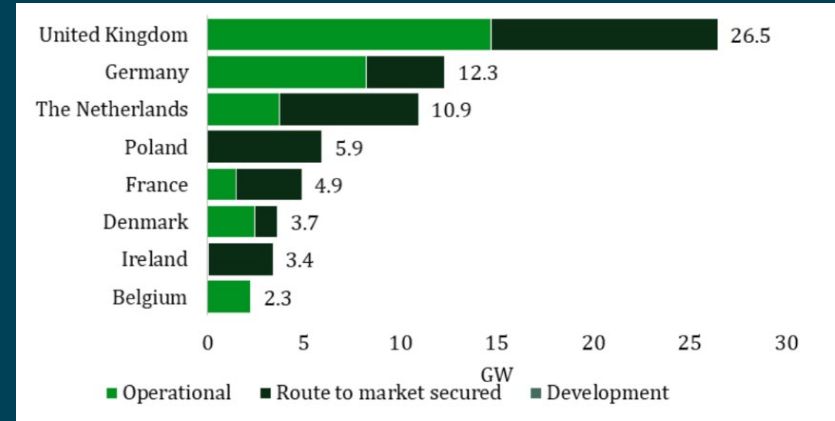
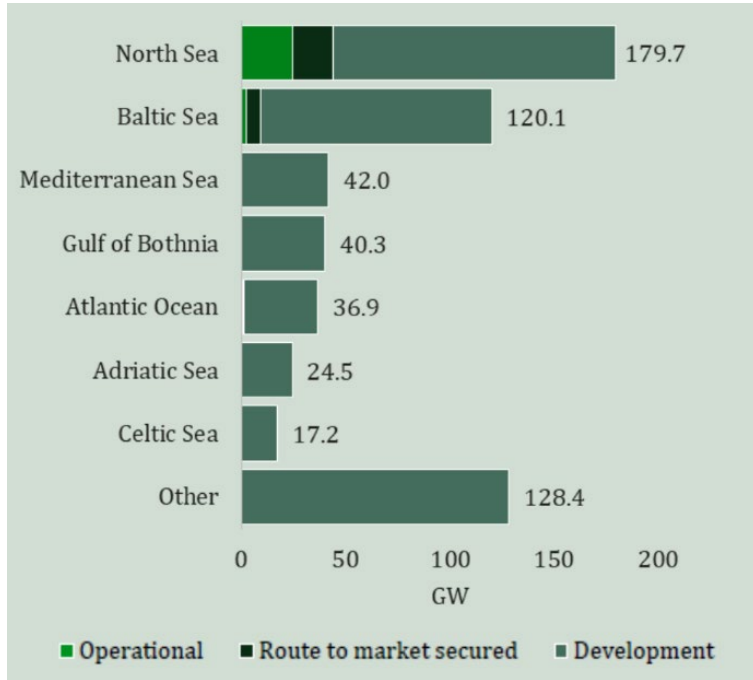
63.2 GW
Operational*

344.6 GW

407.8 GW
Operational

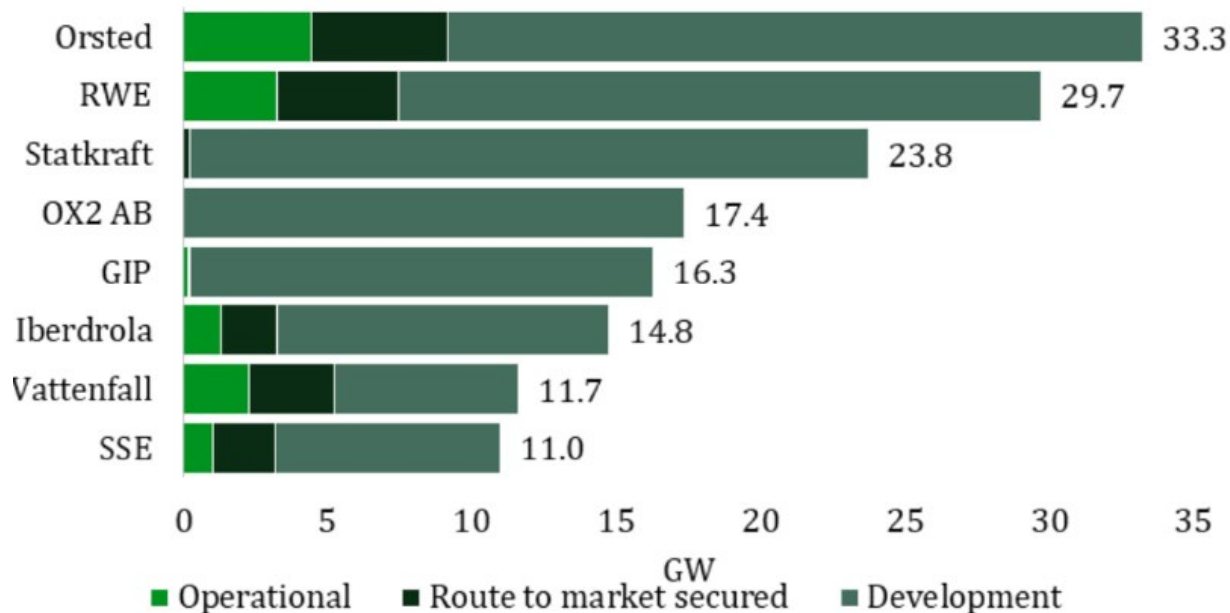


At our doorstep..



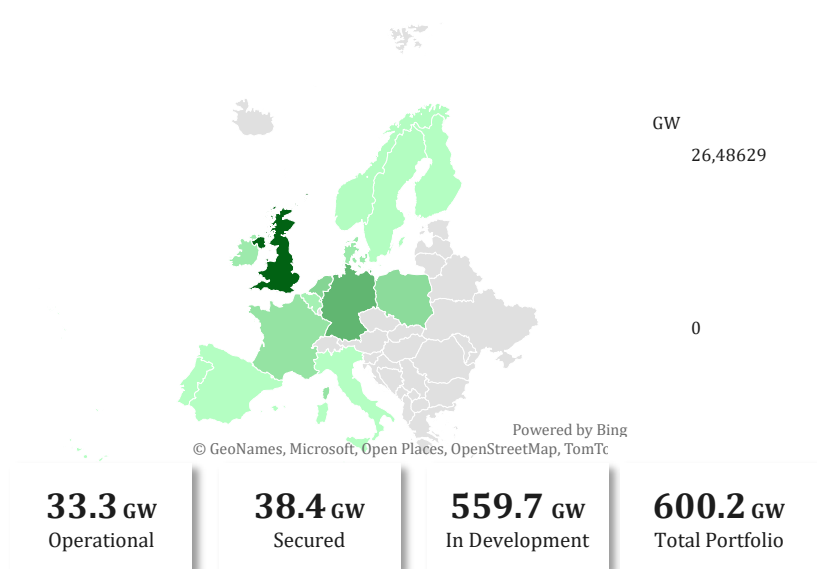


Major owners of European project portfolios



The total 74.9 GW of operational and secured offshore wind capacity in the EMEA region is largely driven by the UK (37%), followed by Germany (17%) and the Netherlands (15%). The rest of EMEA contributes with 31%.

Key markets, operational and route to market capacities, GW



Operational includes projects where all components of the project have been commissioned and the project is supplying power at its full capability. **Secured (or Route to Market Secured)** includes projects that have secured an offtake contract for power purchase (the mechanism differs by country; CFD, PPAs, ORECs, FIT/FIP, etc.), but have not completed commissioning. **In Development** includes all projects which have not secured an offtake contract, including those in the early stages of development through to those in planning or consented.

Top countries in terms of offshore wind capacity that is operational or route-to-market secured, MW

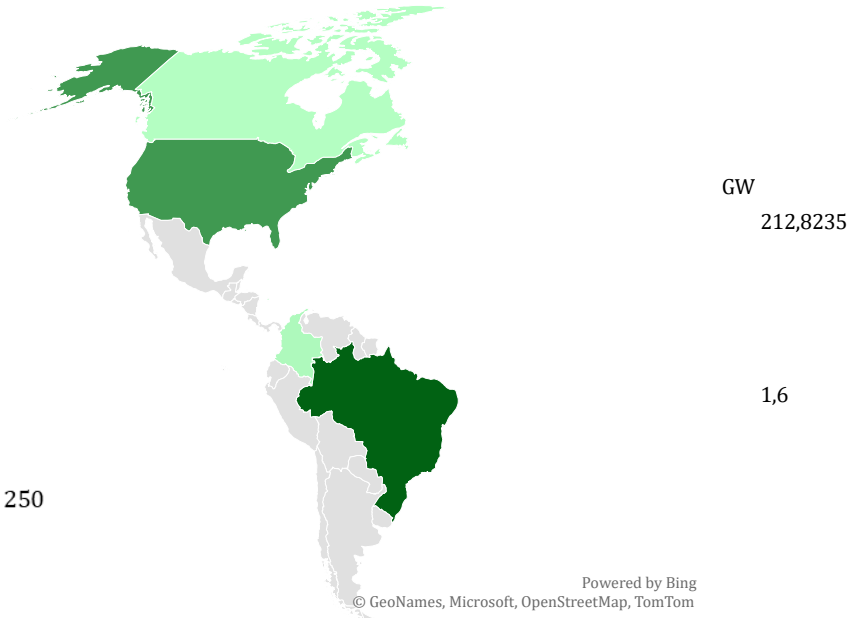
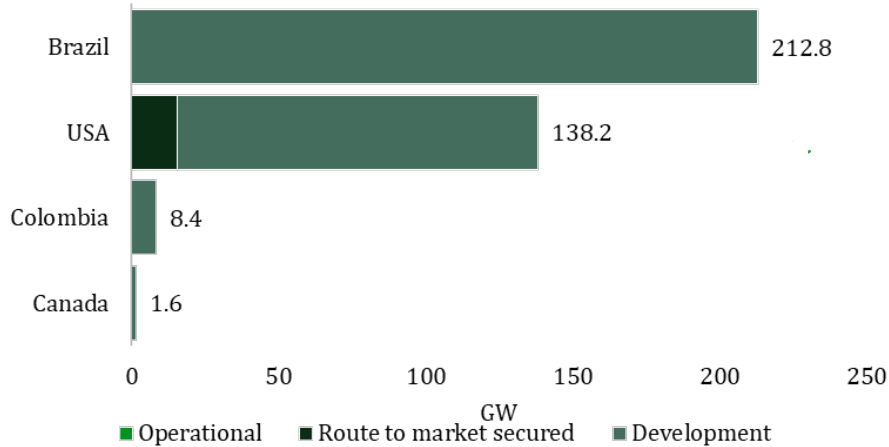
#	Country	Operational	Secured	Development	Rank Change
1	United Kingdom	14,690	11,796	87,803	-
2	Germany	8,251	4,056	50,160	-
3	The Netherlands	3,745	7,192	17,400	-
4	Poland	-	5,930	10,871	-
5	France	1,475	3,428	5,503	-
6	Denmark	2,473	1,176	12,452	-
7	Ireland	25	3,380	6,785	-
8	Belgium	2,261	-	3,500	-
9	Norway	93	1,500	23,147	▲
10	Sweden	1	-	128,399	▼
11	Finland	68	-	22,372	-
12	Italy	30	-	83,558	-
13	Portugal	-	-	12,907	-
14	Spain	7	11	24,998	-

Ranking based on operational capacity in addition to capacity with a route to market secured. Development capacity includes early-stage development projects, some of which have overlapping areas, leading to an over-inflated portfolio.



Americas

Total offshore wind portfolio (GW)*



0.17 GW
Operational

15.38 GW
Secured

345.4 GW
In Development

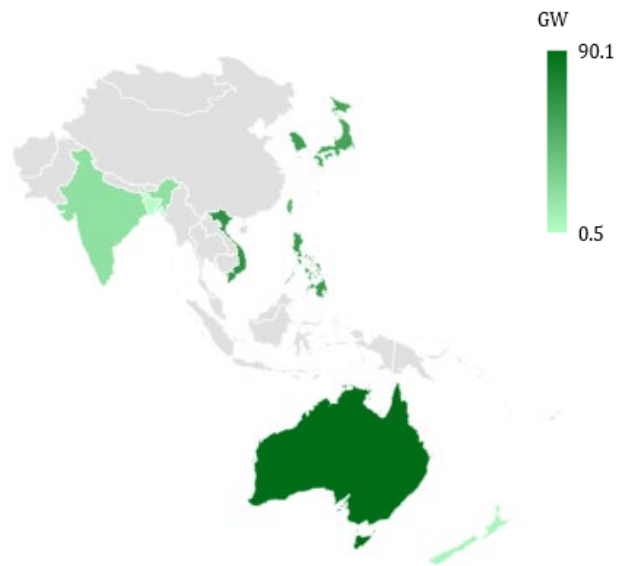
361.0 GW
Total Portfolio



APAC ex. China

Total offshore wind portfolio (GW)*

Country	Operational	Secured	Development
Australia	-	-	90,100
Vietnam	777	313	65,350
Philippines	-	-	59,817
South Korea	107	1,630	56,438
Japan	312	3,662	51,408
Taiwan	613	7,288	40,500
India	-	-	19,190
New Zealand	-	-	6,300
Bangladesh	-	-	500



1.7 GW
Operational

12.3 GW
Secured

392.1 GW
In Development

407.2 GW
Total Portfolio

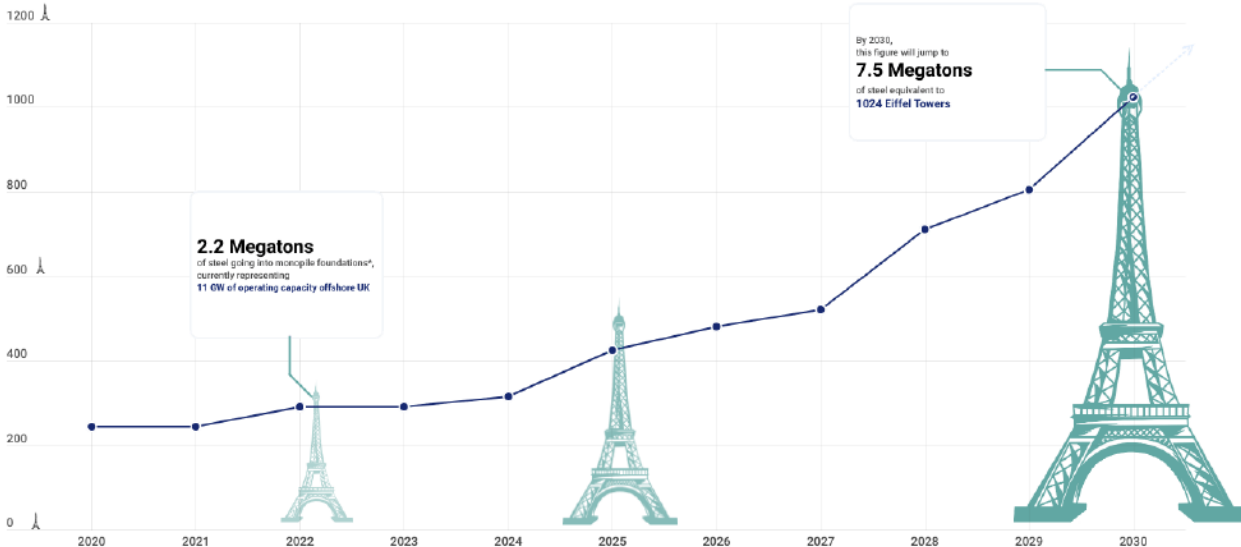


Offshore wind steel demand..

Growing appetite for steel in Offshore Wind

Quadrupling of UK monopile capacity highlights massive steel demand

Eiffel Towers' worth of steel ↴



*By 2030, based on Spinegrie's target of 48 GW of bottom-fixed capacity, among them 40 GW being on monopile foundations.
The weight of the Eiffel Tower steel structure is ca. 7300 tons. Monopile foundations including transition pieces.



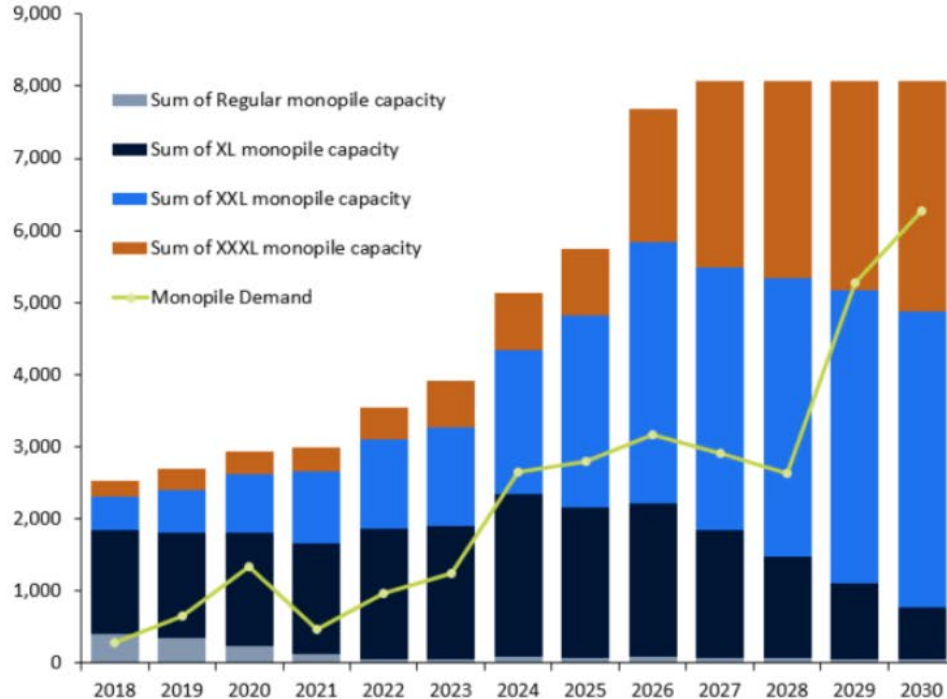
- “Offshore wind towers will need nearly 500% more steel in 2031 compared to 2022 demand levels. As the volume of orders increases, similarly the annual spend on towers will increase five-fold, with the cumulative spend from 2022 to 2031 reaching €15 billion (\$15.3 billion).”
- ““..towards 2025 the growth in demand will significantly outpace the growth in supply.”

WoodMac at EUROMETALS annual meeting Nordics 2022.



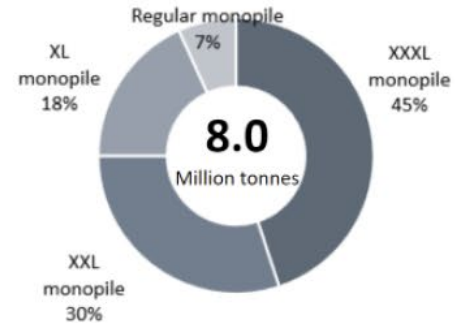
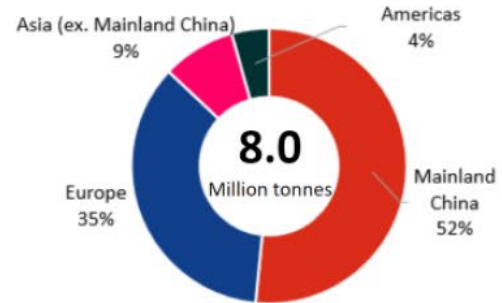
European monopile bottlenecks might be avoided with Chinese imports..

Global monopile supply and demand
Thousand tons per annum



Source: Rystad Energy OffshoreWindCube; Rystad Energy research and analysis

Global supply of monopiles by 2030, by region and type
Thousand tons per annum

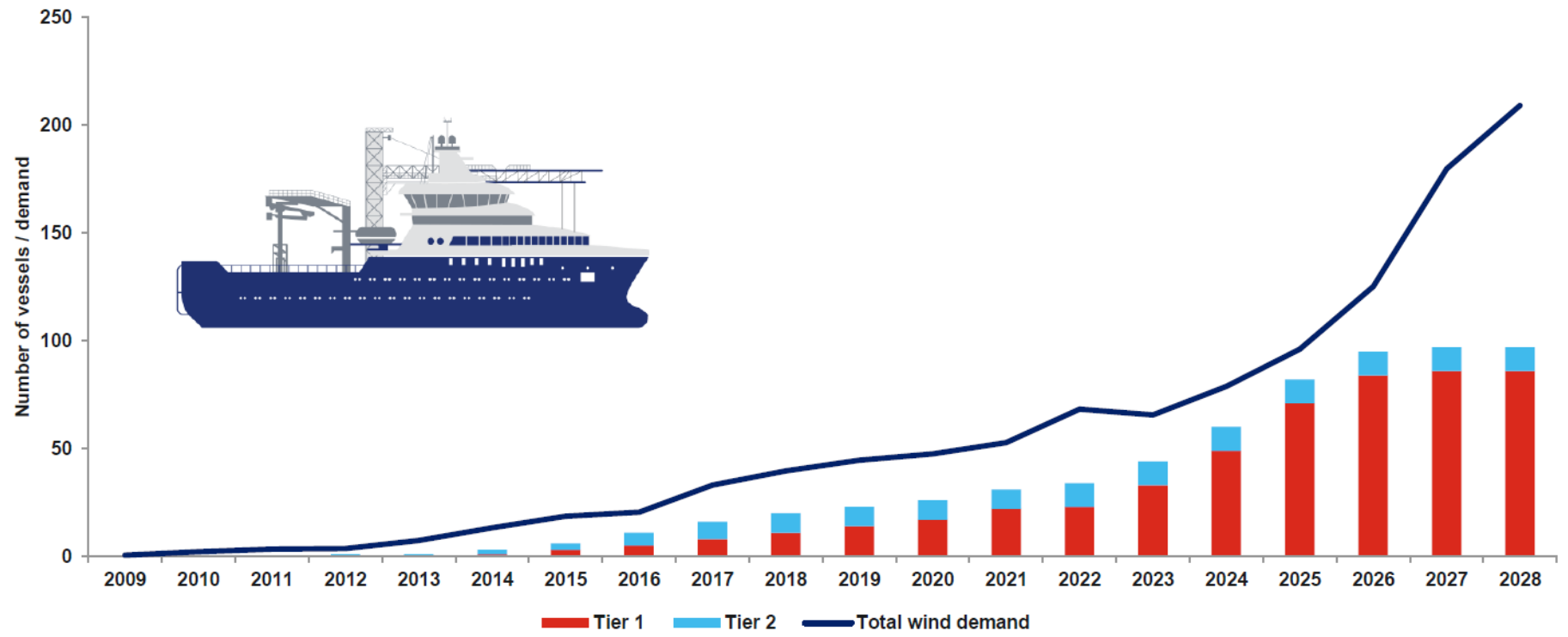


C/SOV Supply & demand

• Ex. US and China



• Total wind demand international



Source: Clarksons Offshore Renewables

Ships, ships and more ships

- 500 transport, installation, operation and maintenance vessels involved



Source: Clarksons Offshore Renewables



Key Challenges

- Financial viability, inflation, supply chain scarcity and cost of capital driving LCOE cost increase
- Transmission & Interconnection
- Long lead items such as Marshalling & manufacturing ports
- Local content, such as the Jones Act in US, it drives cost
 - Global vs domestic supply chain (US, Taiwan, China, Japan)
- Permitting (building a 1 GW offshore wind farm can be only 4 years if you have good supplier agreement ready beforehand, ref – RWE in Denmark (awarded in 2022 and to be installed in 2026), however due to permitting the real time spent is +- 10 years.
- People



Possibilities

- **Use the Oil & Gas learning curve**
 - Safety culture
 - Digitalization
 - Remote operation – top side and subsea
 - High quality suppliers, services and technology – drive down OPEX
- **Committed industry partners:**
European learning curve, de-risking project cost base





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