Wind Turbine Orders Monitoring

Q4 2023 statistics

Wind EUROPE

windeurope.org

May 2024

Scope

This report summarises wind turbine orders that were placed between 1 October 2023 and 31 December 2023.

WindEurope tracks announced wind turbine orders on the basis of publicly available information on commercial transactions and future deals, categorising them into firm orders and conditional orders.

Orders of Enercon turbines are not included because they are not publicly available.

For details of the methodology for estimating undisclosed orders see the Methodology slide at the end of the deck.

Analysis contained in this report relates to firm and disclosed orders only unless stated otherwise.

TEXT AND ANALYSIS:

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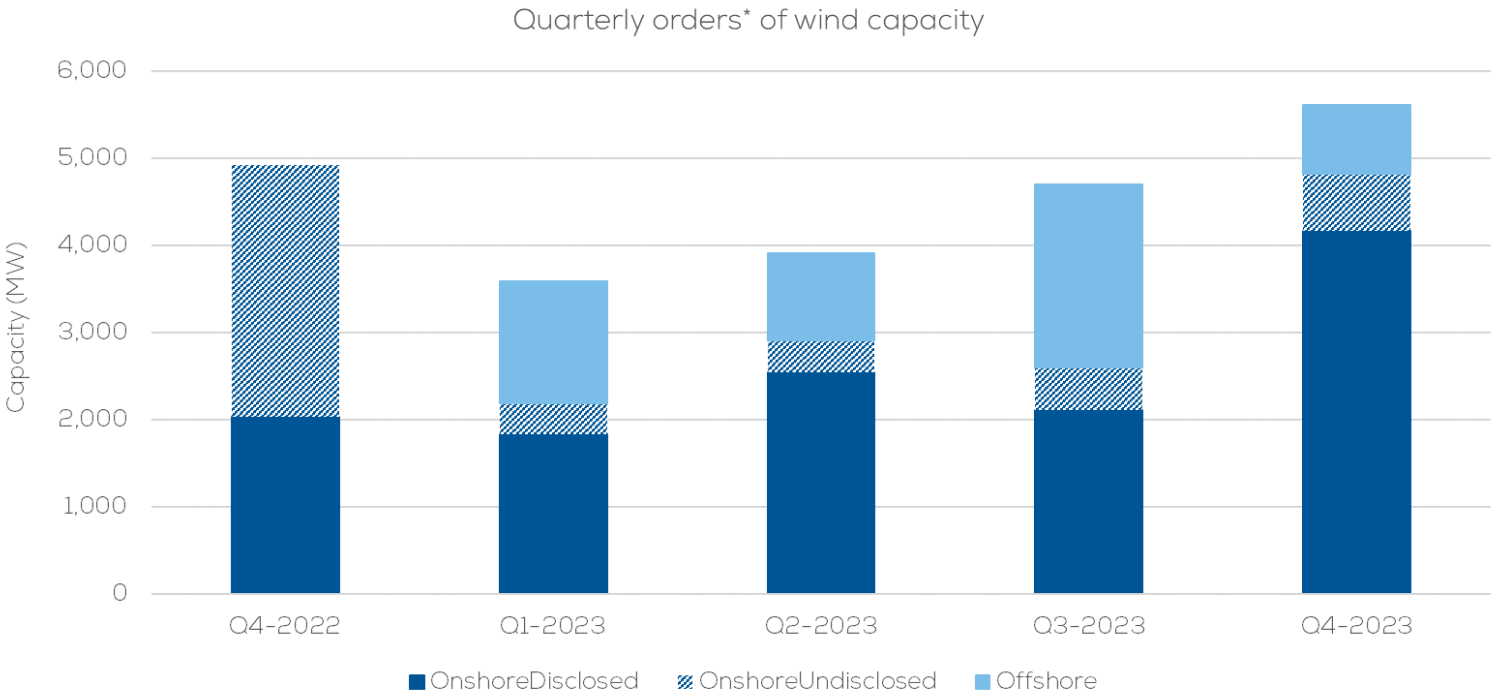
Content

Q4 2023 HIGHLIGHTS

- There were orders for a total of 5.6 GW (of which 0.7 GW undisclosed) across 14 countries. There was one offshore order (780 MW).
- The total ordered capacity was up 19% on Q3 2023 and 14% year-on-year.
- Spain led ordered capacity with 1.1 GW, followed by Germany (922 MW) and the Netherlands (780 MW).
- Nordex received 46% of all the disclosed ordered capacity, followed by Vestas (37%), GE (14%) and Ming Yang (3%).
- We tracked 3.3 GW of orders in Q4 2023 that featured an Operation & Maintenance (O&M) contract.
- WindEurope tracked firm orders for 101 wind farms in Q4 2023.

With 5.6 GW of orders, Q4 2023 was 19% up on Q3 2023 and 14% up year-on-year.

Onshore + Offshore

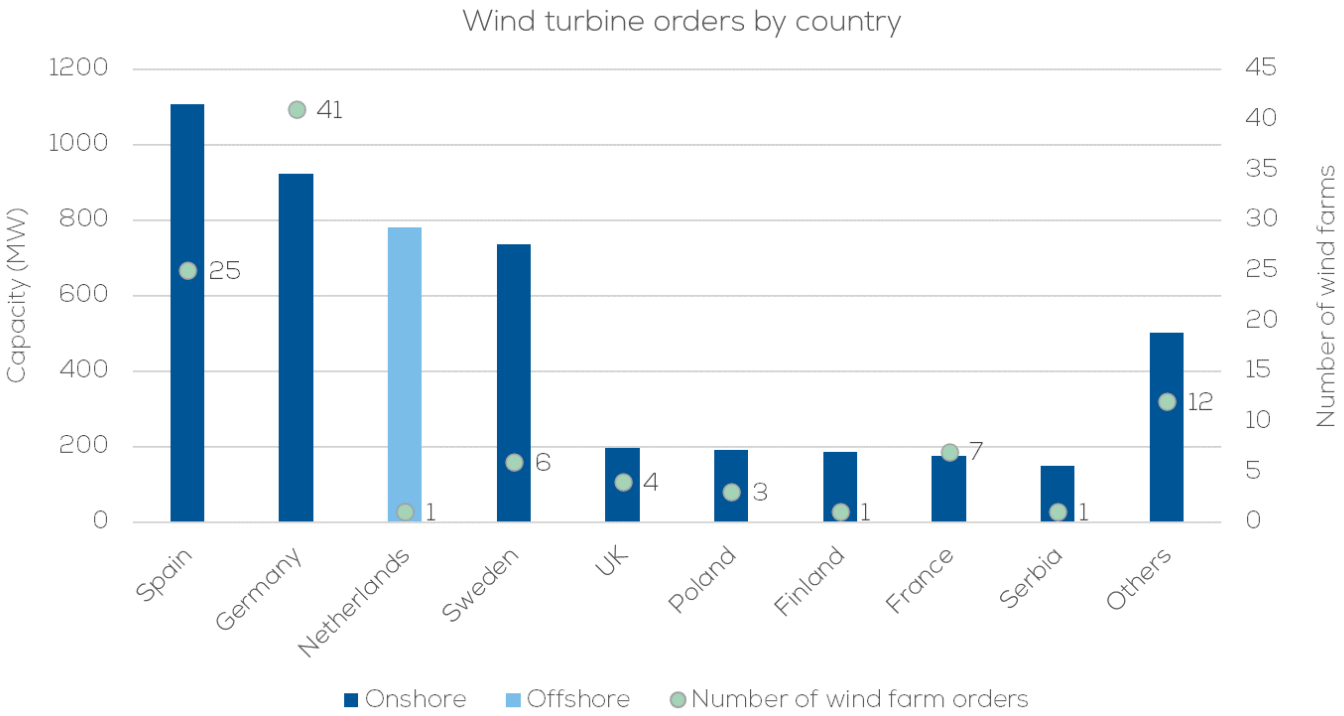


*See Methodology (slide 26) for an explanation of undisclosed orders

Source: WindEurope

Spain led ordered capacity with 1.1 GW, followed by Germany (922 MW) and the Netherlands (780 MW).

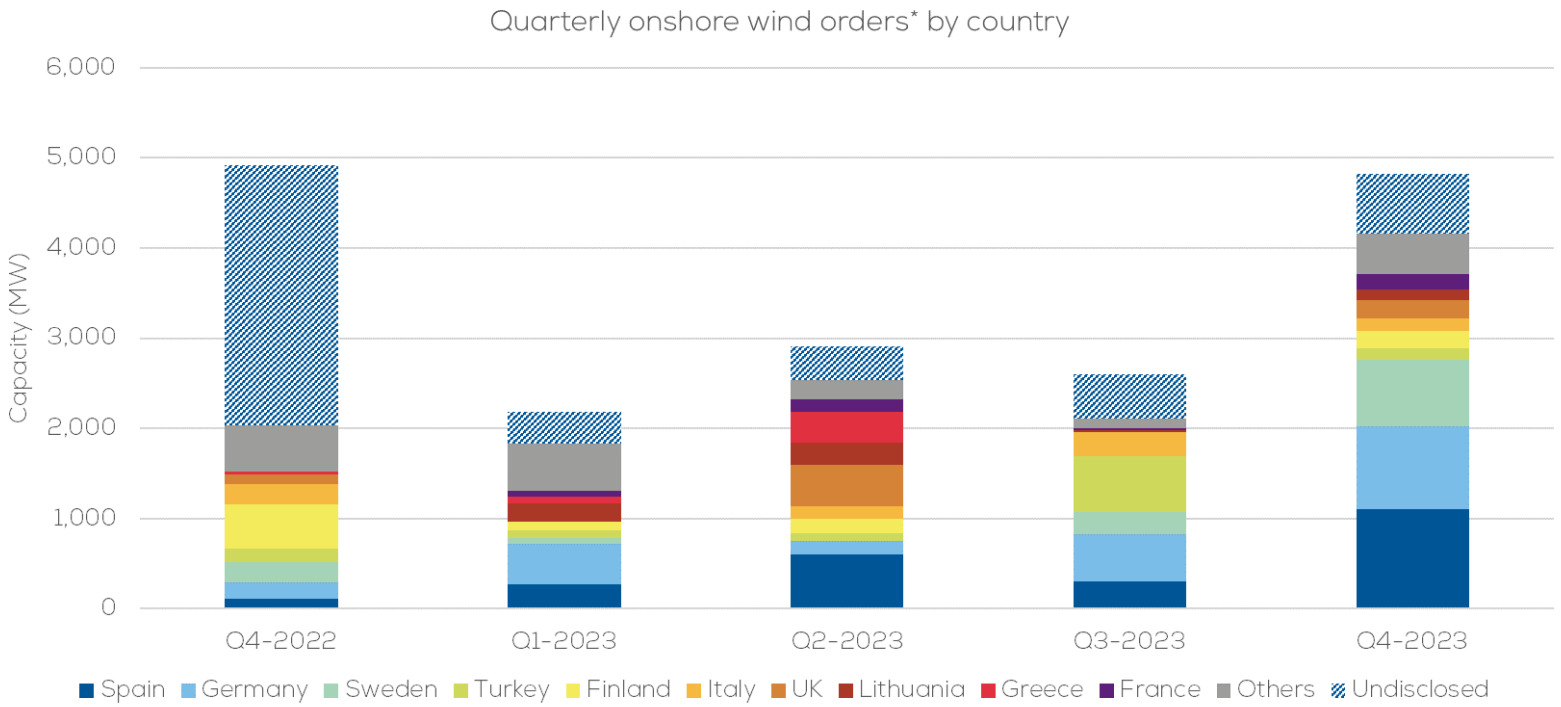
Onshore + Offshore



Source: WindEurope

Onshore orders in Q4 were almost double the average quarterly orders in Q1-Q3.

Onshore

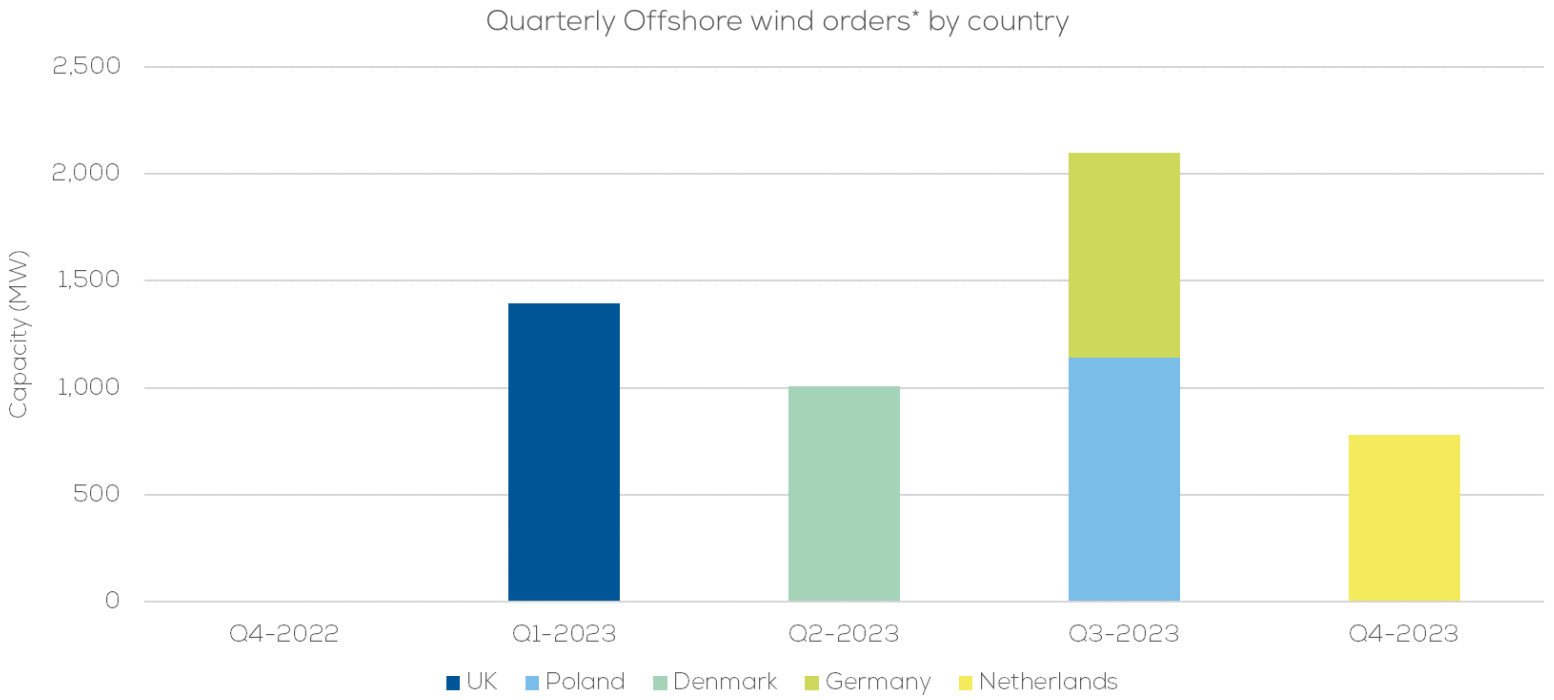


*See Methodology (slide 26) for an explanation of undisclosed orders

Source: WindEurope

Q4 2023 offshore wind turbine orders totaled 780 MW from one order in the Netherlands.

Offshore

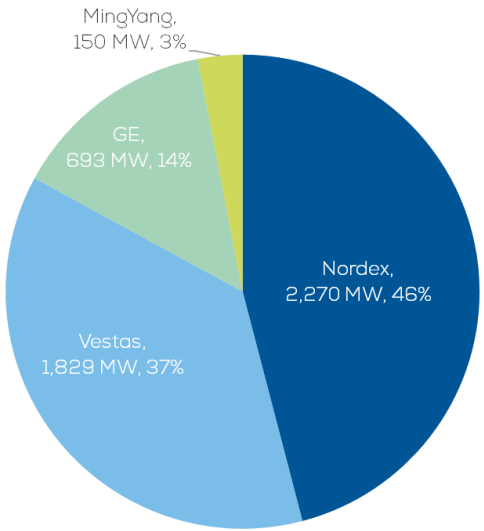


Source: WindEurope

Nordex had the most disclosed ordered capacity in Q4 2023, followed by Vestas and GE.

Onshore + Offshore

Wind turbine orders by OEM



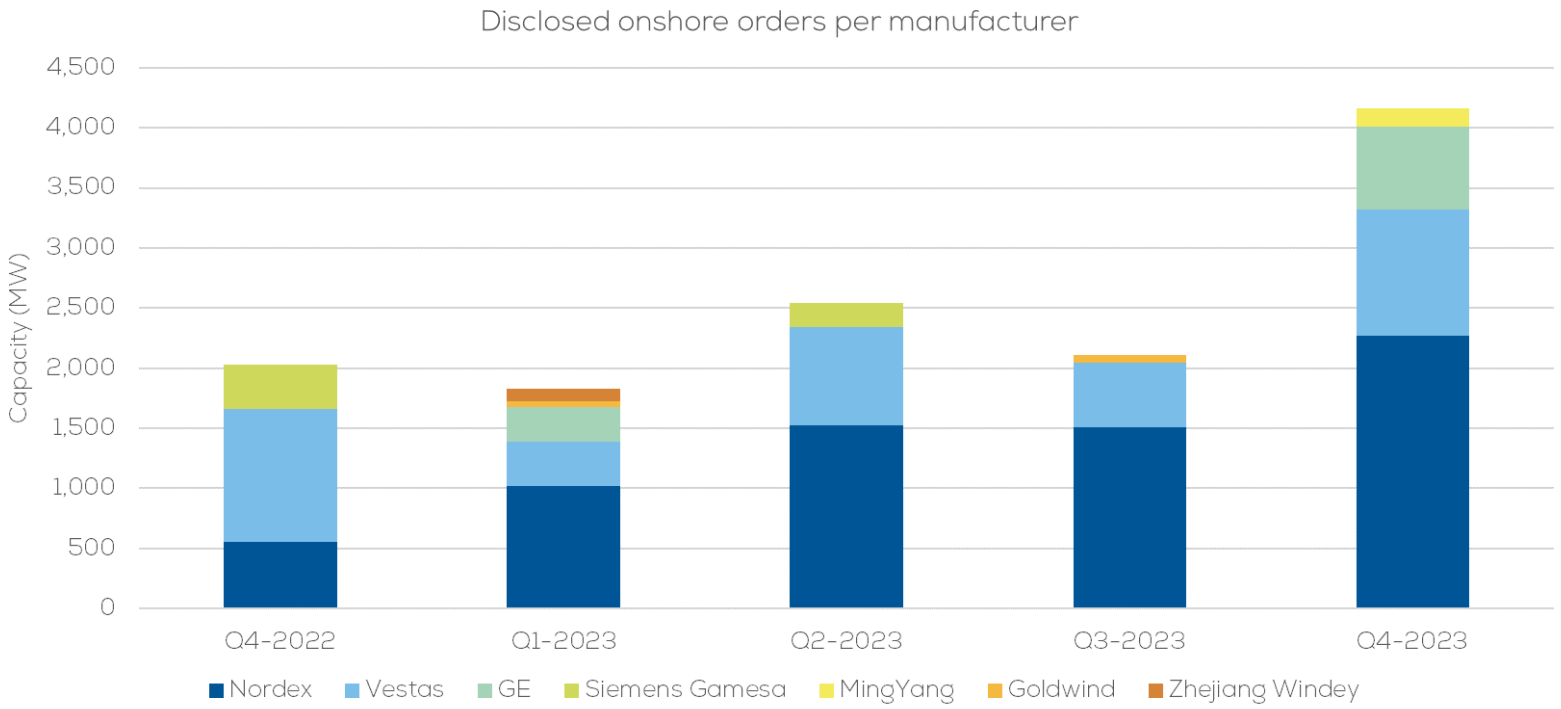
Top 5 ordered turbines

Turbine model	Ordered capacity	Number of turbines
N163/6.X	941 MW	136
V236-15.0 MW	780 MW	52
GE 6.1-158	693 MW	110
N149/5.X	541 MW	95
V162-6.2 MW	524 MW	84

Source: WindEurope

In Q4 2023 four OEMs disclosed onshore orders totaling 4.2 GW, double than amount in Q3.

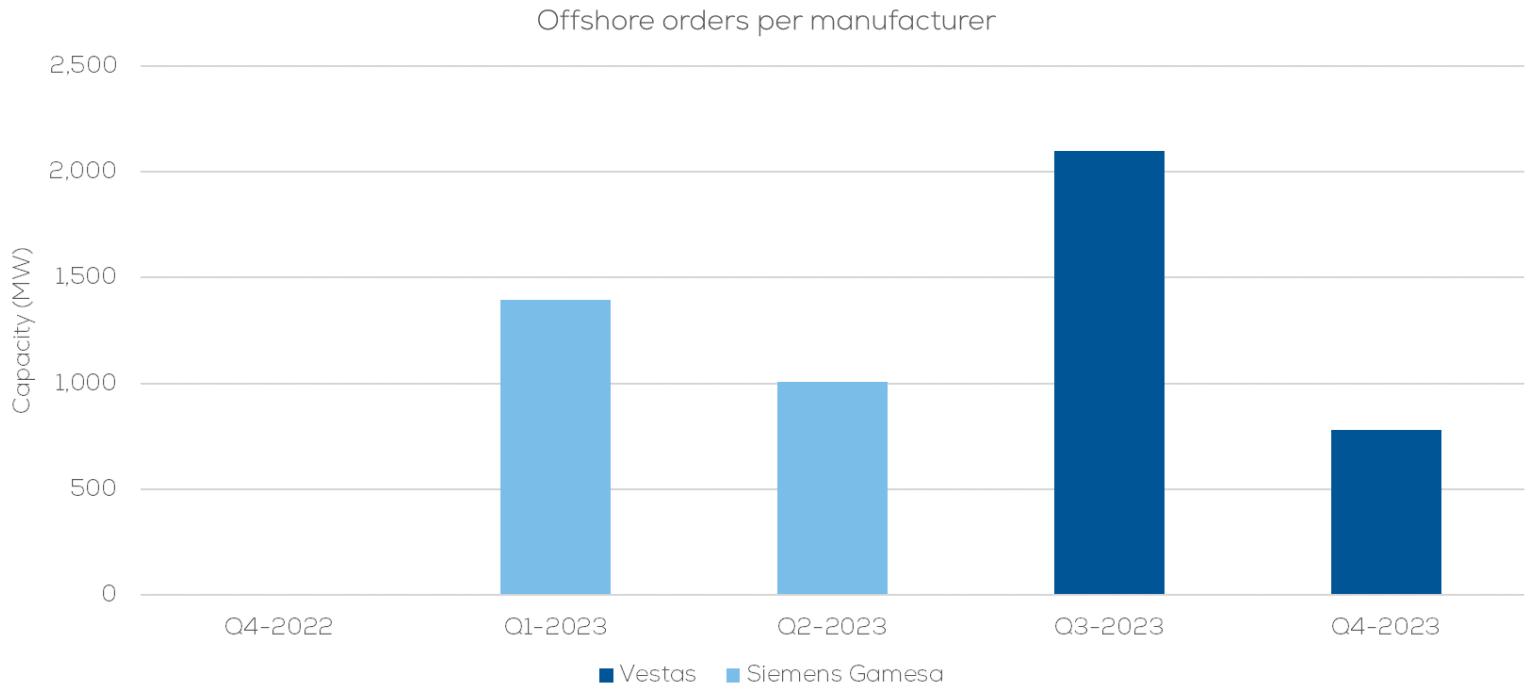
Onshore



Source: WindEurope

Vestas received the only order for offshore wind turbines in Q4 2023, for the Hollandse Kust West VI wind farm.

Offshore



Source: WindEurope

The top five disclosed buyers accounted for 67% of the Q4 2023 disclosed ordered capacity.

Onshore + Offshore

Top 5 buyers of disclosed orders

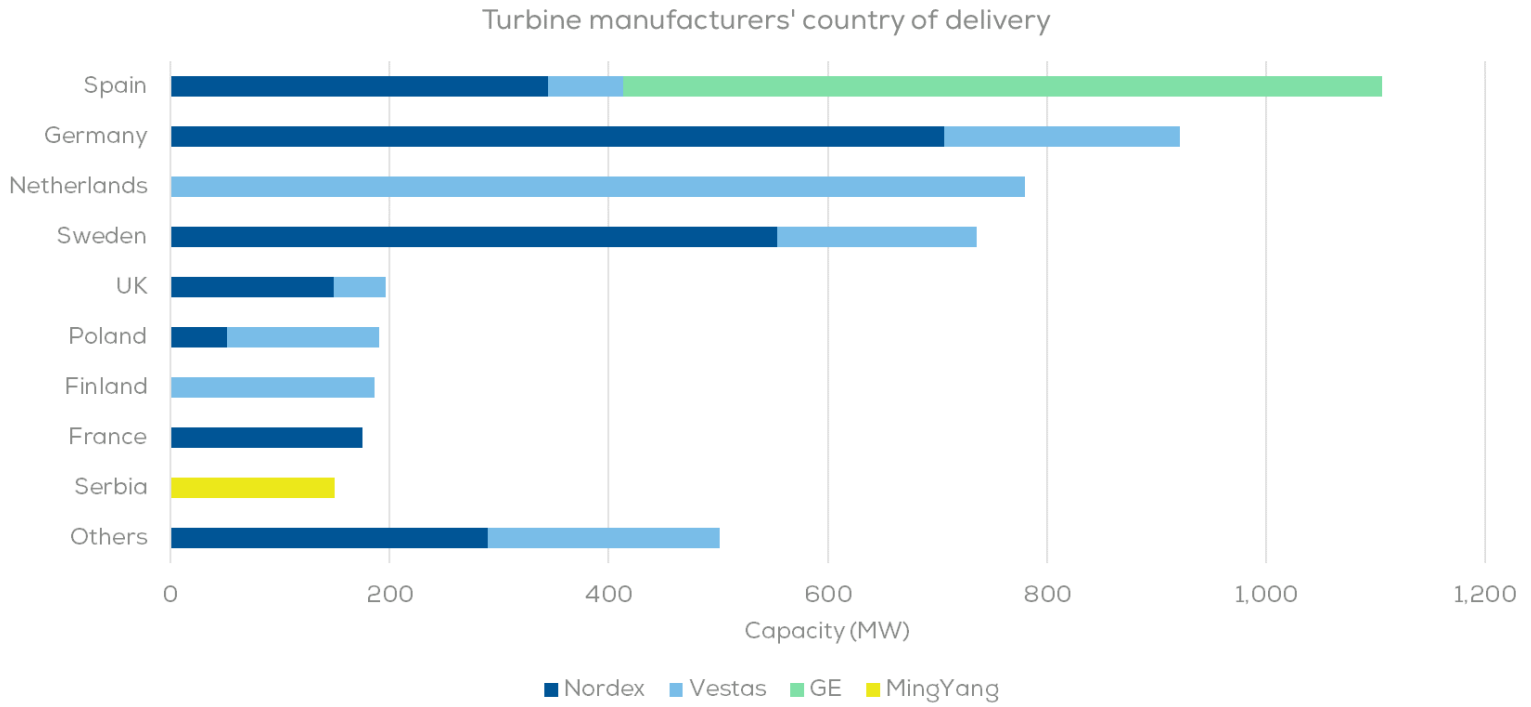
Buyer	Ordered Capacity
Ecowende	780 MW
Forestalia	693 MW
Renewable Power Capital	553 MW
UKA	197 MW
Ilmatar	186 MW

Offshore Onshore

Source: WindEurope

In Q4 2023 Nordex disclosed orders in 11 countries, Vestas in 9, GE and MingYang in 1 country respectively.

Onshore + Offshore



Source: WindEurope

75% of onshore orders had a power rating above 5 MW; all offshore turbines ordered were 15 MW.

Onshore + Offshore

	2 to 4 MW	4 to 5 MW	5 to 6 MW	6 to 7 MW	7 to 8 MW	10 to 16 MW
Spain		7 turbines	44 turbines	129 turbines		
Germany	1 turbines	19 turbines	79 turbines	45 turbines	12 turbines	
Netherlands						52 turbines
Sweden			12 turbines	42 turbines	56 turbines	
UK		13 turbines	25 turbines			
Poland	69 turbines	6 turbines				
Finland				30 turbines		
France	12 turbines	12 turbines	13 turbines			
Serbia				25 turbines		
Italy		30 turbines	3 turbines			
Turkey			6 turbines		13 turbines	
Lithuania				19 turbines		
Croatia					8 turbines	
Belgium	9 turbines	6 turbines				
Total	**91 turbines**	**93 turbines**	**182 turbines**	**290 turbines**	**89 turbines**	**52 turbines**

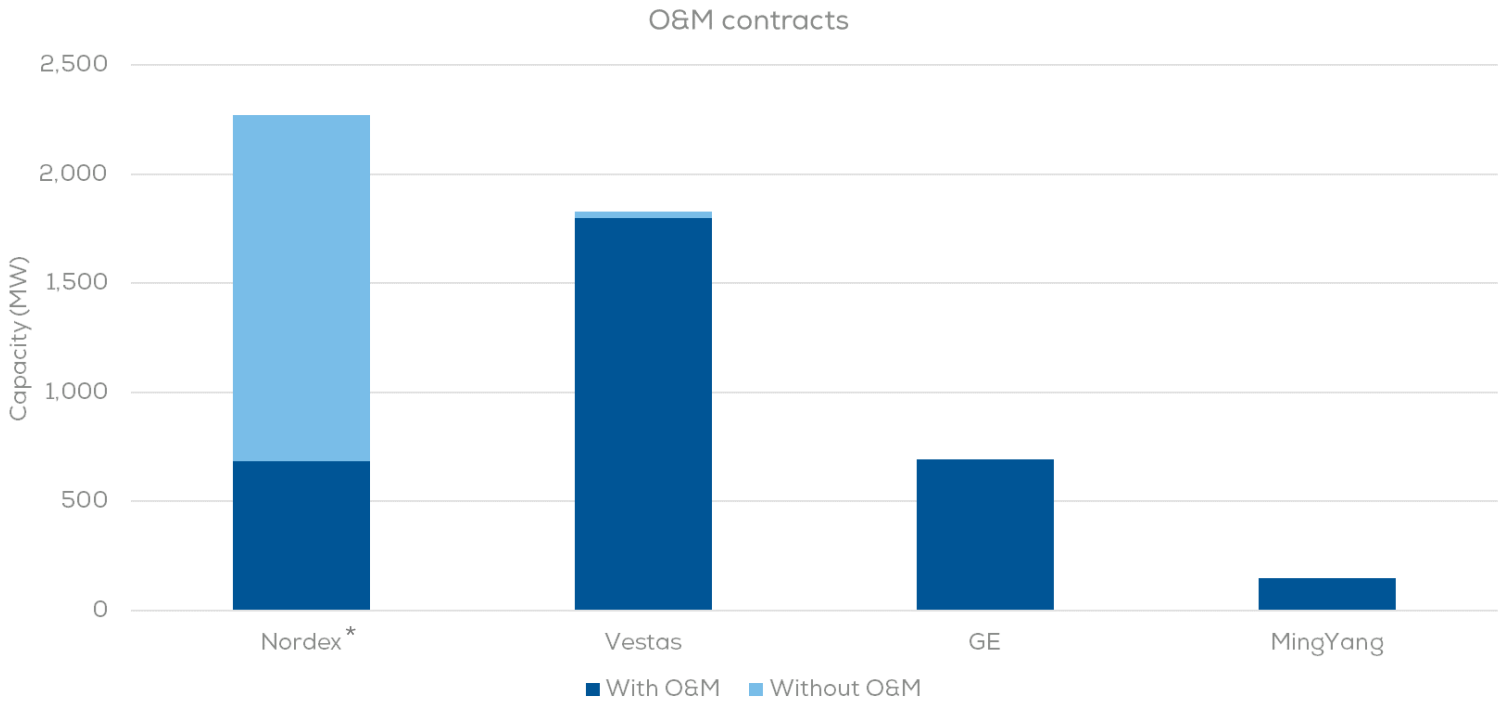
Onshore Offshore

Wind EUROPE

Source: WindEurope

3.3 GW of orders in Q4 2023 featured an Operation & Maintenance (O&M) contract.

Onshore + Offshore

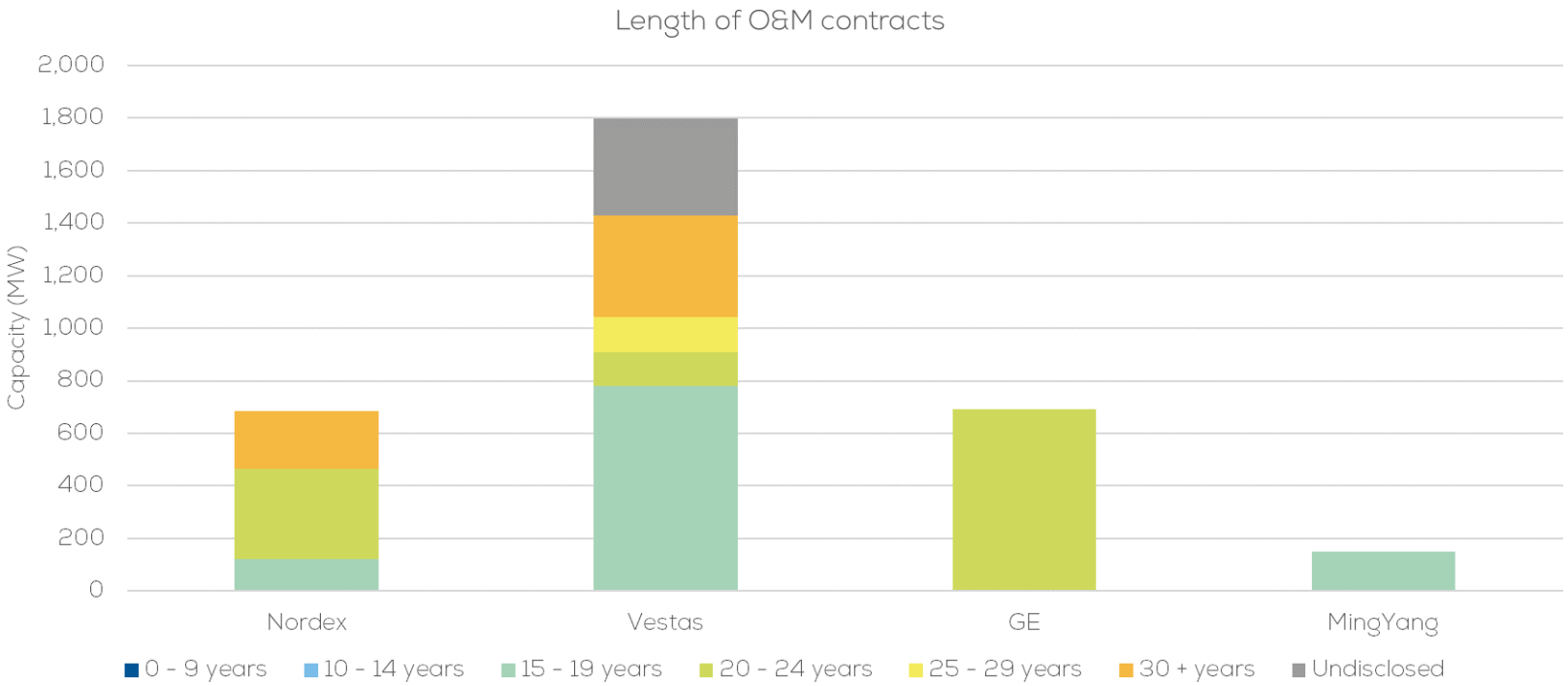


*It is expected that most of the Nordex orders featured an O&M contract. However, we were only able to verify O&M contracts for orders covering 684 MW.

Source: WindEurope

The length of disclosed O&M service agreements ranged between 15 and 35 years.

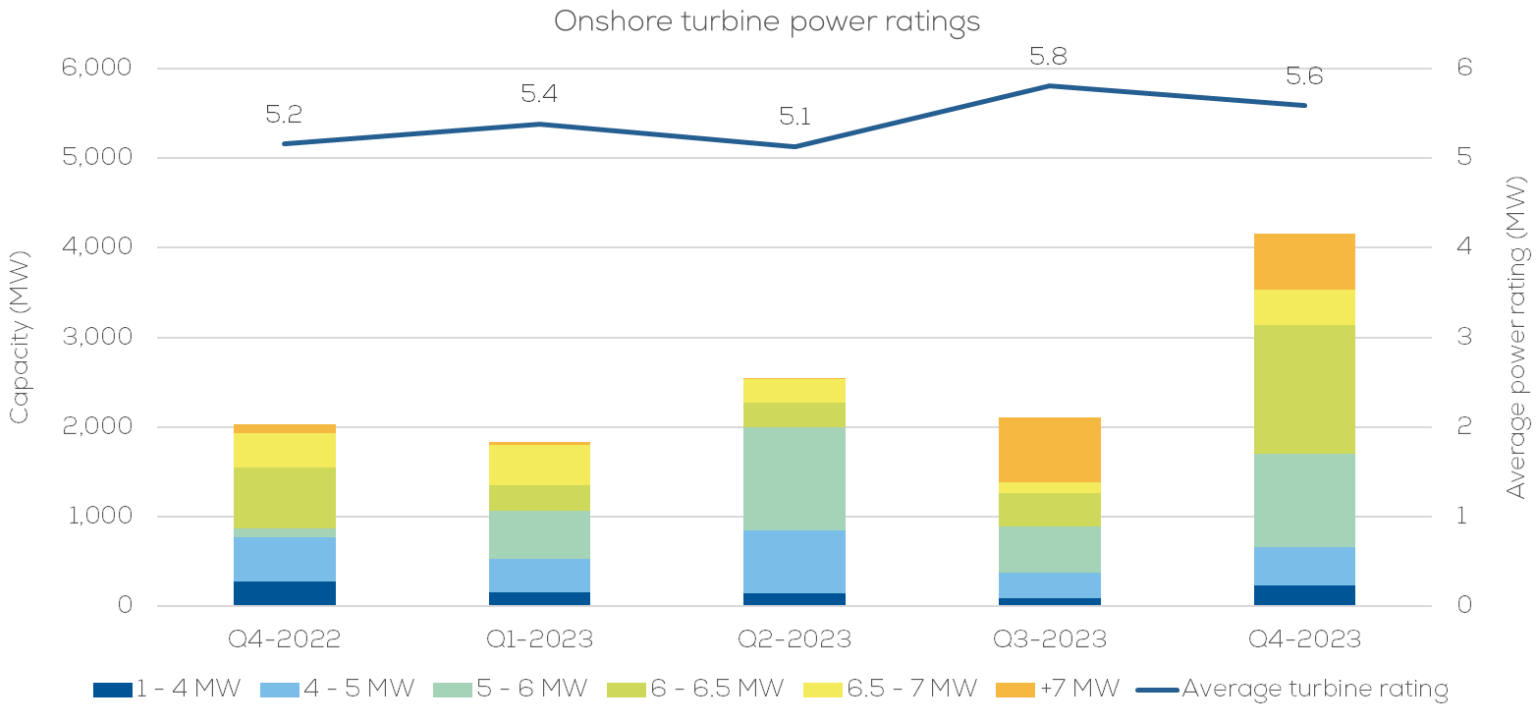
Onshore + Offshore



Source: WindEurope

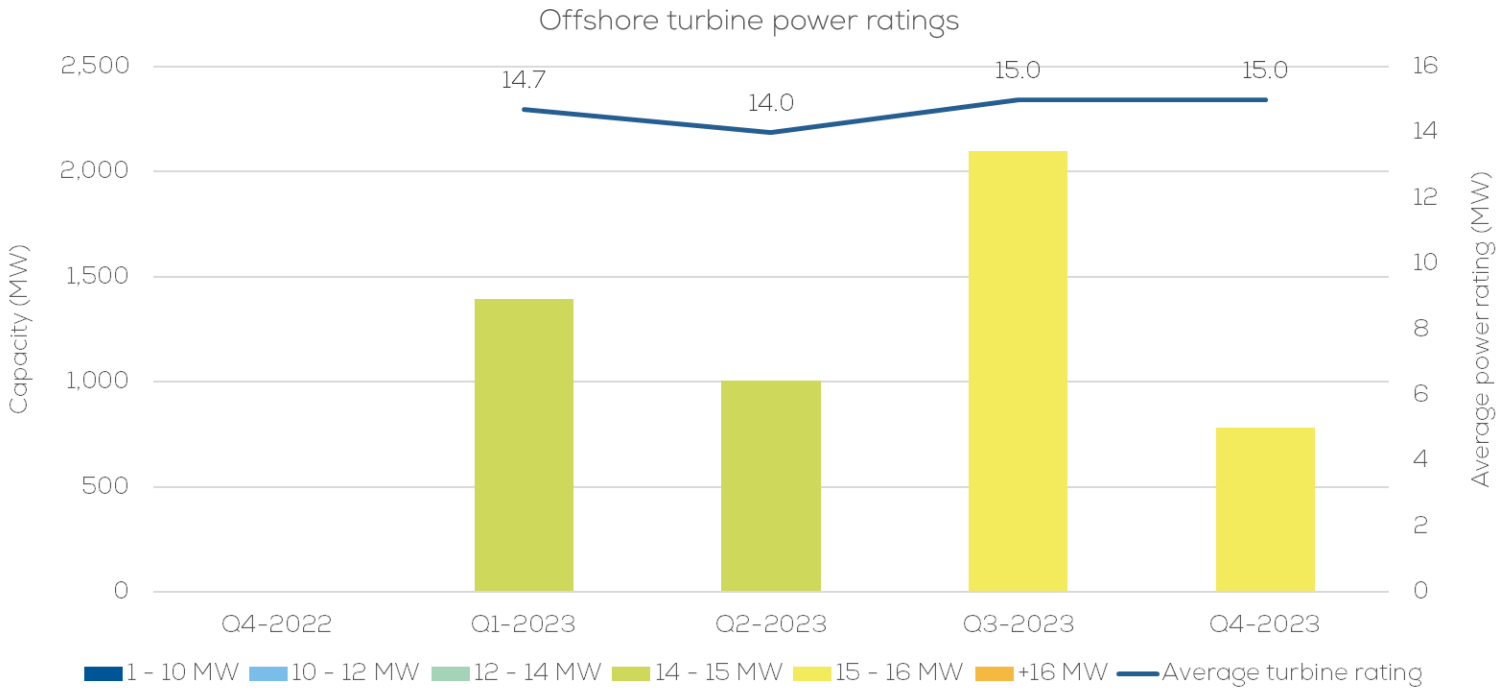
The average onshore turbine size ordered in Q4 2023 decreased to 5.6 MW, down from 5.8 MW in Q3.

Onshore



Source: WindEurope

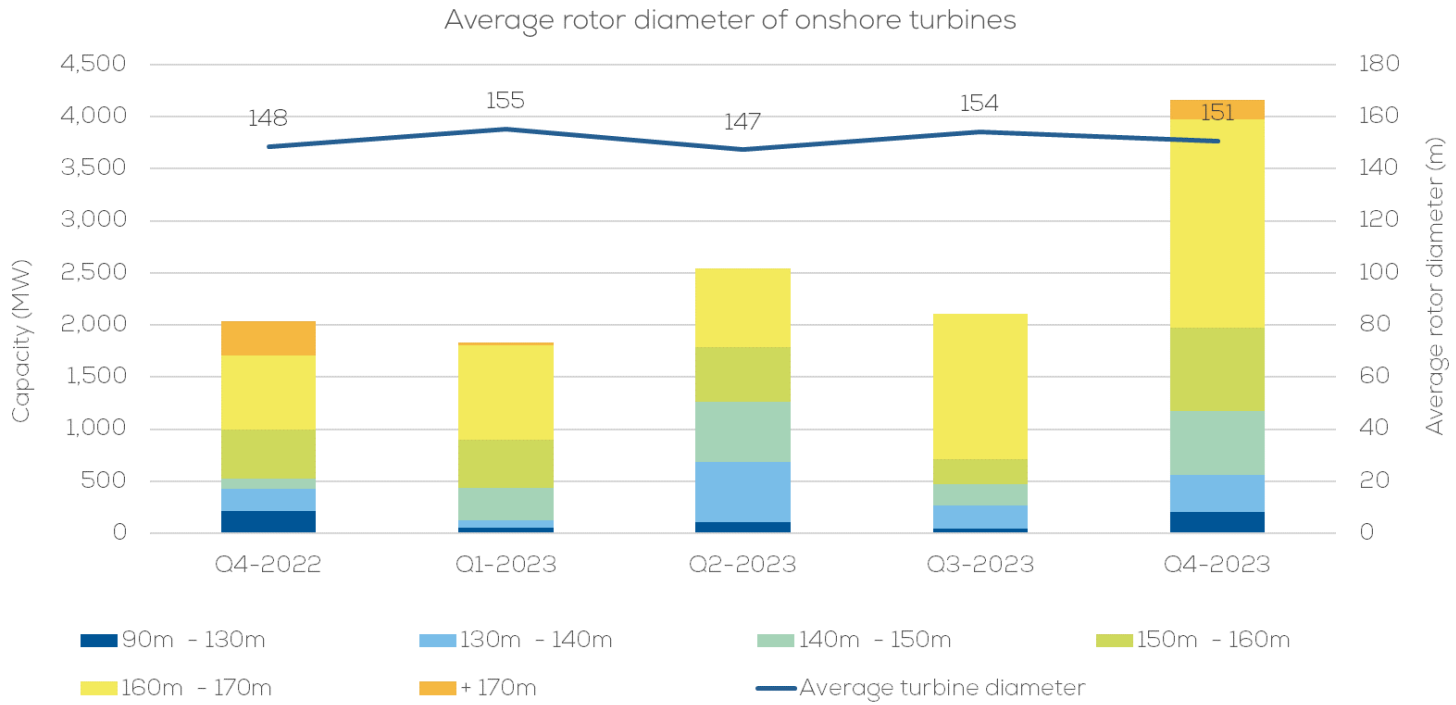
The average offshore turbine size ordered in Q4 2023 was 15 MW, the same as that recorded in Q3.



Source: WindEurope

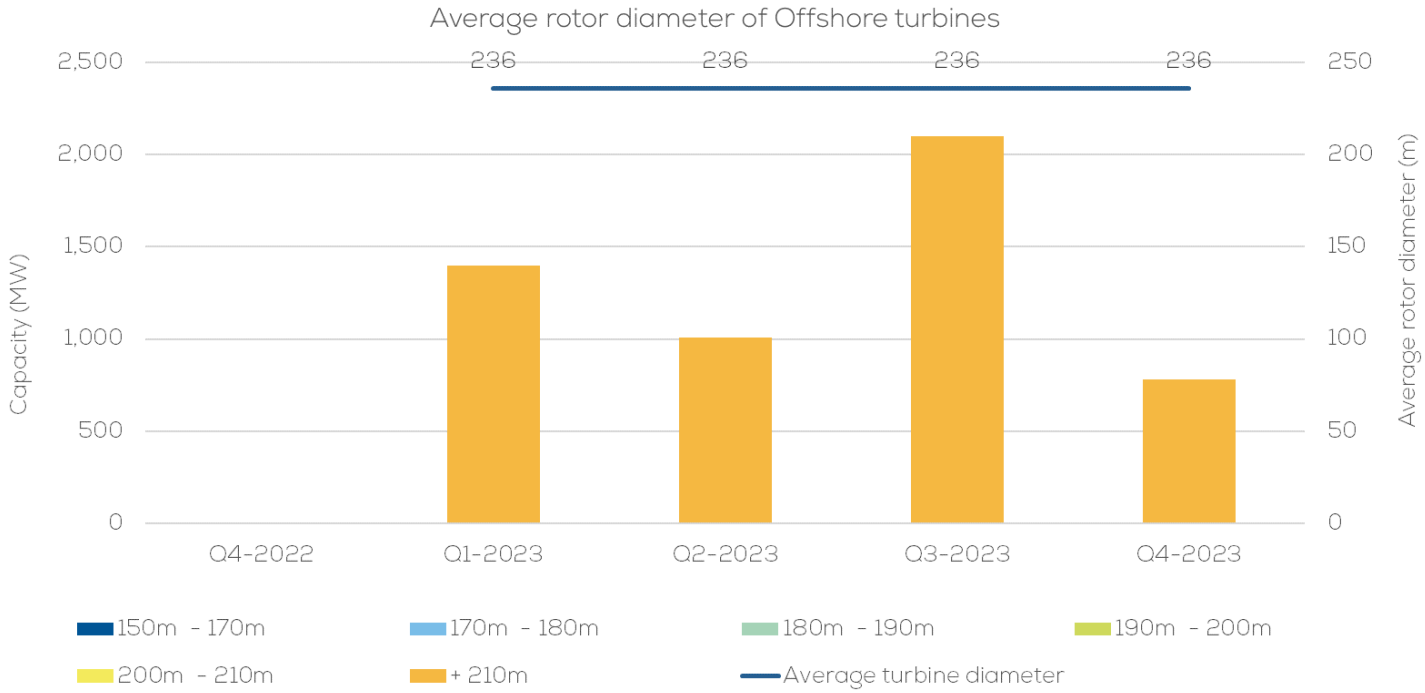
The average rotor diameter of onshore turbine orders in Q4 2023 was 151 metres, down 3 metres from Q3.

Onshore



All offshore wind turbines ordered in 2023 had a diameter of 236 meters.

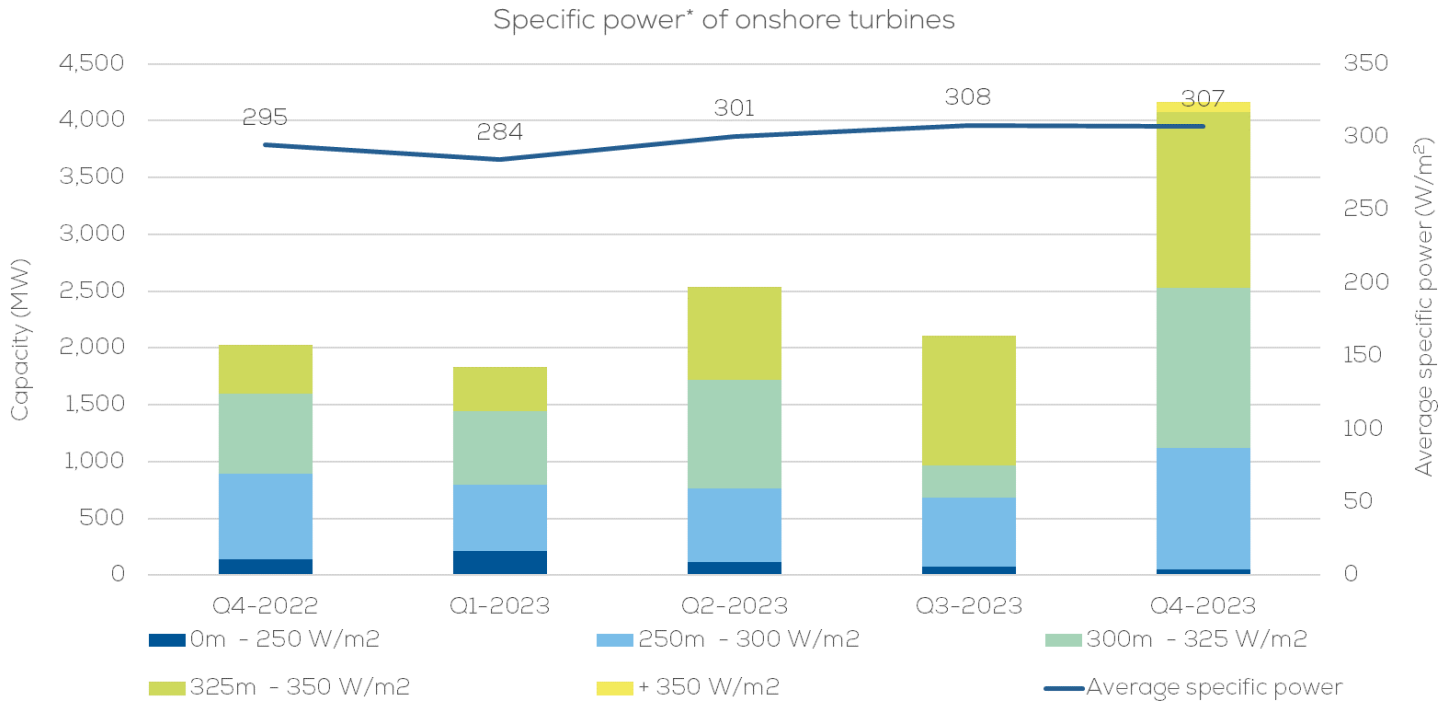
Offshore



Source: WindEurope

The average specific power of onshore turbines ordered in Q4 2023 was similar to that in Q3.

Onshore

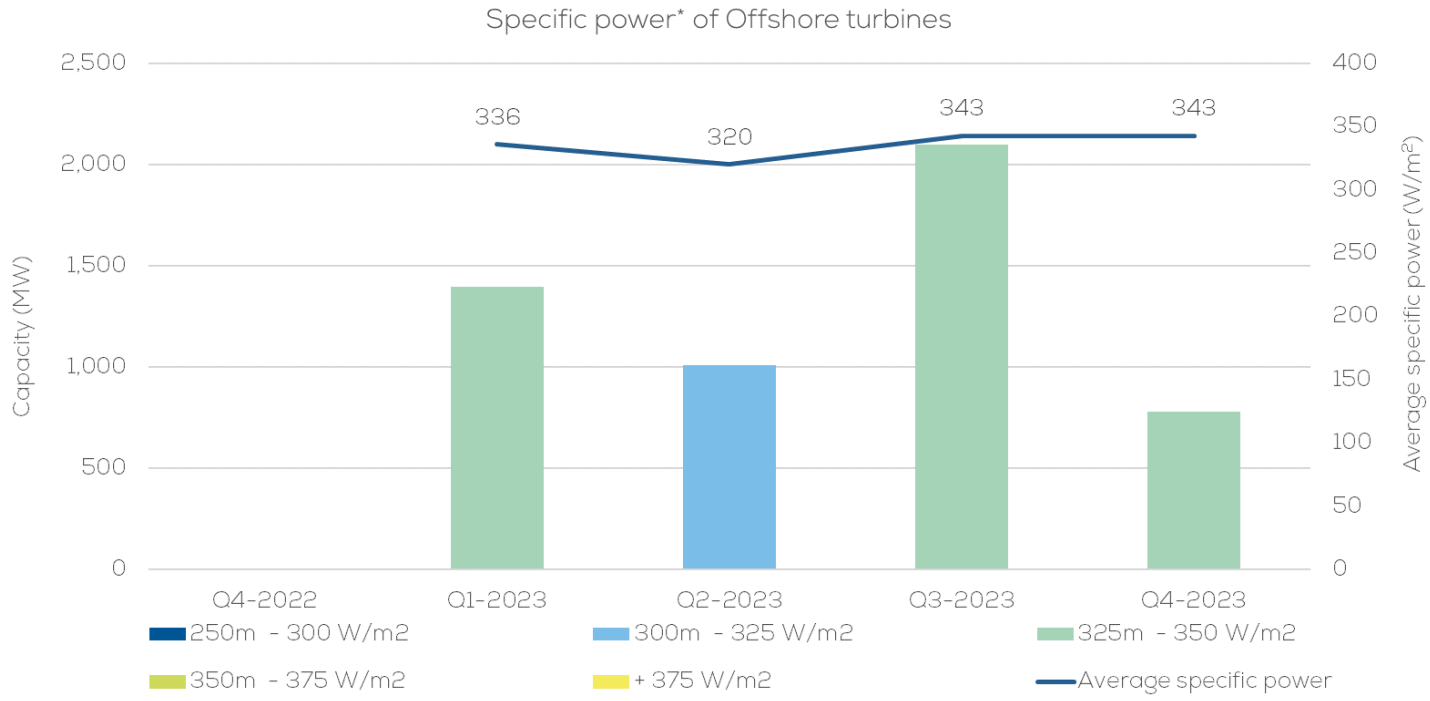


*See Annex (slide 25) for an explanation of the concept of specific power

Source: WindEurope

The average specific power of offshore turbines ordered in Q4 2023 was 343 W/m², the same as in Q3.

Offshore

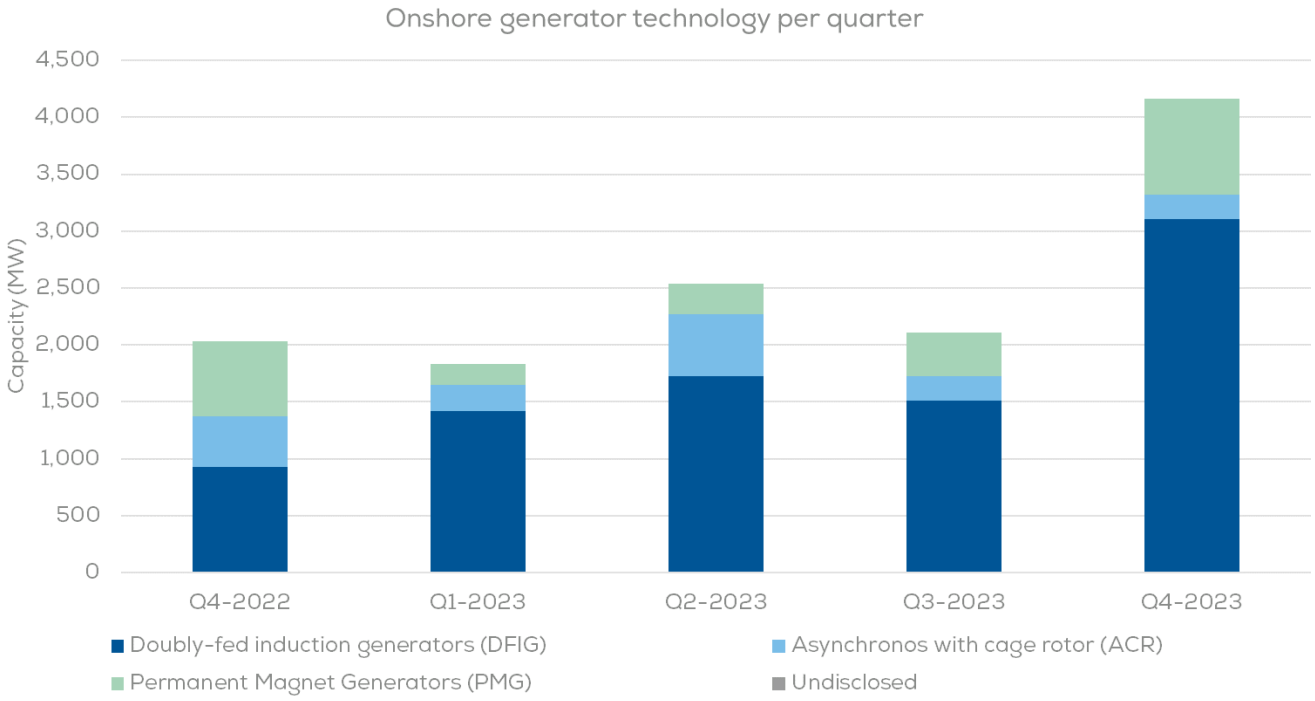


*See Annex (slide 25) for an explanation of the concept of specific power

Source: WindEurope

Most onshore ordered capacity for Q4 2023 was for doubly-fed induction generators.

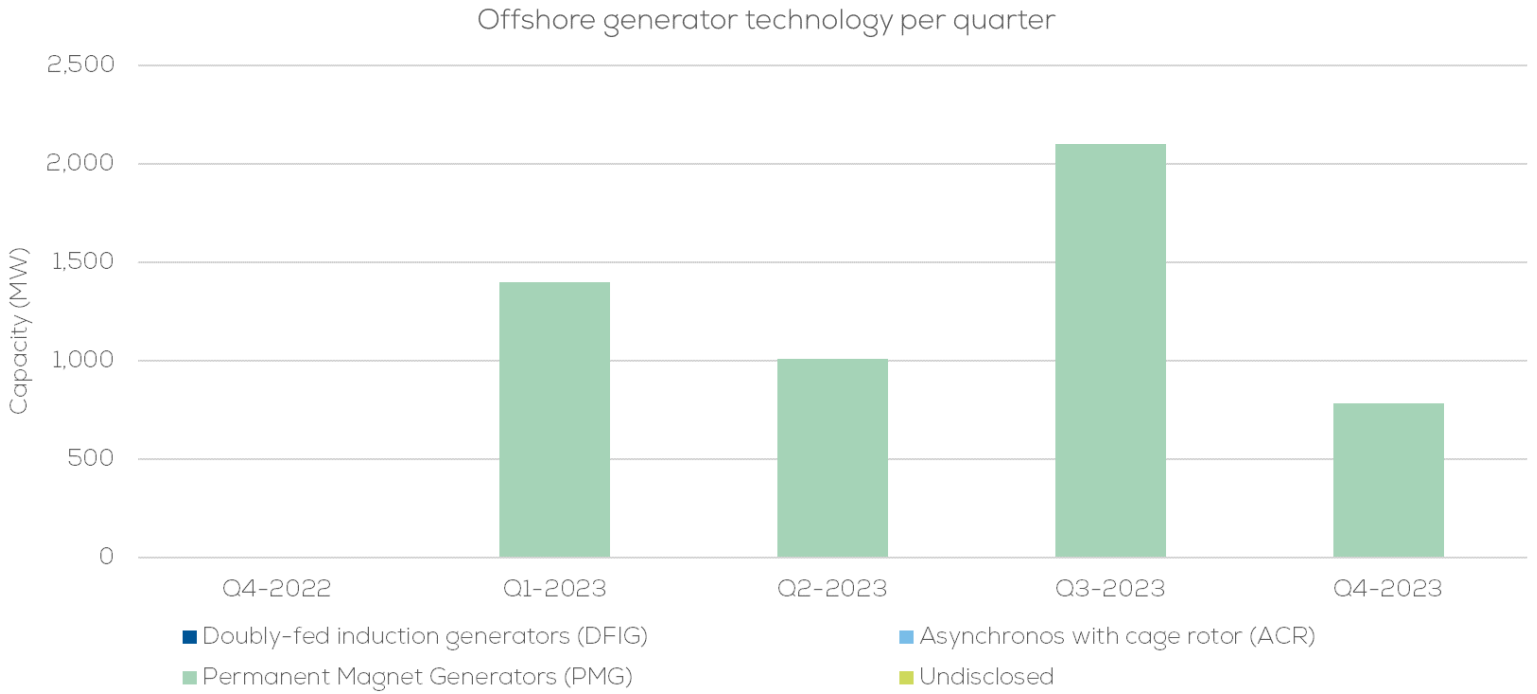
Onshore



Source: WindEurope

All offshore ordered capacity in 2023 was for permanent magnet generators.

Offshore



Source: WindEurope

ANNEX - SPECIFIC POWER:

The relation between generator capacity and rotor area can be referred to as specific power (W/m^2). Lower specific powers can lead to greater capacity factors for the same wind conditions. Thus, the evolution of specific power is a factor worth monitoring.

Methodology

WindEurope counts wind turbine orders on the basis of publicly available deals and distinguishes between firm orders and conditional orders. From Q2 2022, undisclosed orders are estimated by deducting firm orders from the total capacity reaching a Final Investment Decision (FID) for the quarter. In Q4 2023 undisclosed orders were updated impacting past estimates.

All types of orders are tracked but analysis per country and company is carried out on firm orders alone, unless specified. We do not track Enercon's orders because they are not publicly available. Furthermore, we do not track small-scale turbines (i.e., those smaller than 1 MW).

Orders are tracked by relying, among others, on:

- offshorewind.biz
- rechargenews.com
- renewablesnow.com
- renews.biz
- windpowermonthly.com
- cleanenergypipeline.com

Results are then cross-checked with companies' officially released information on their websites:

- GE www.ge.com/renewableenergy
- Goldwind www.goldwind.com/en/
- MingYang Smart Energy www.myse.com.cn/en/
- Nordex Acciona www.nordex-online.com/en
- Siemens Gamesa Renewable Energy www.siemensgamesa.com/en-int
- Suzlon Wind Energy A/S www.suzlon.com/
- Vestas www.vestas.com/
- Windey Energy www.windeyenergy.com/en