



Offshore Wind in Europe and the Baltic Sea

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THE EUROPEAN OFFSHORE WIND SECTOR



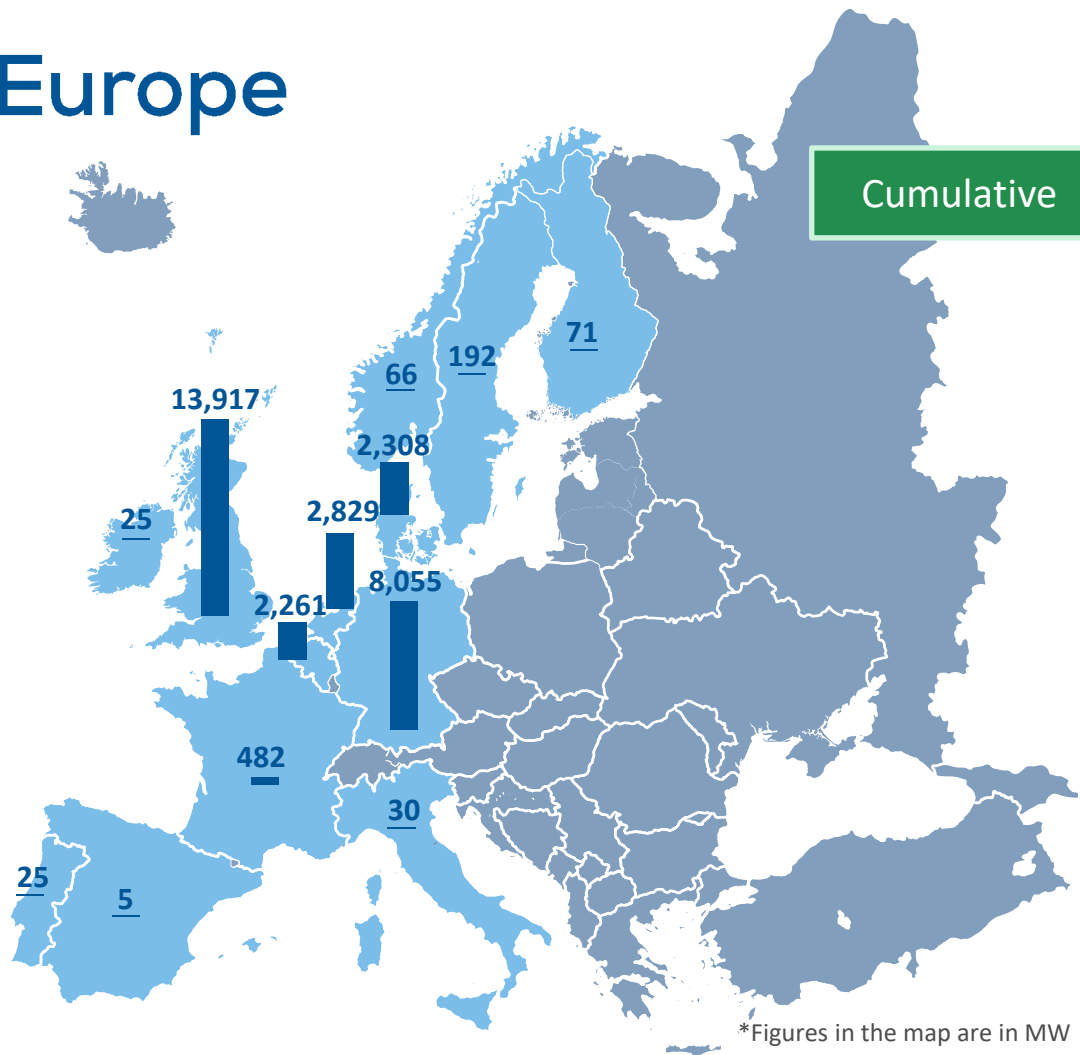
Offshore Wind in Europe

30,266 MW
connected to the grid

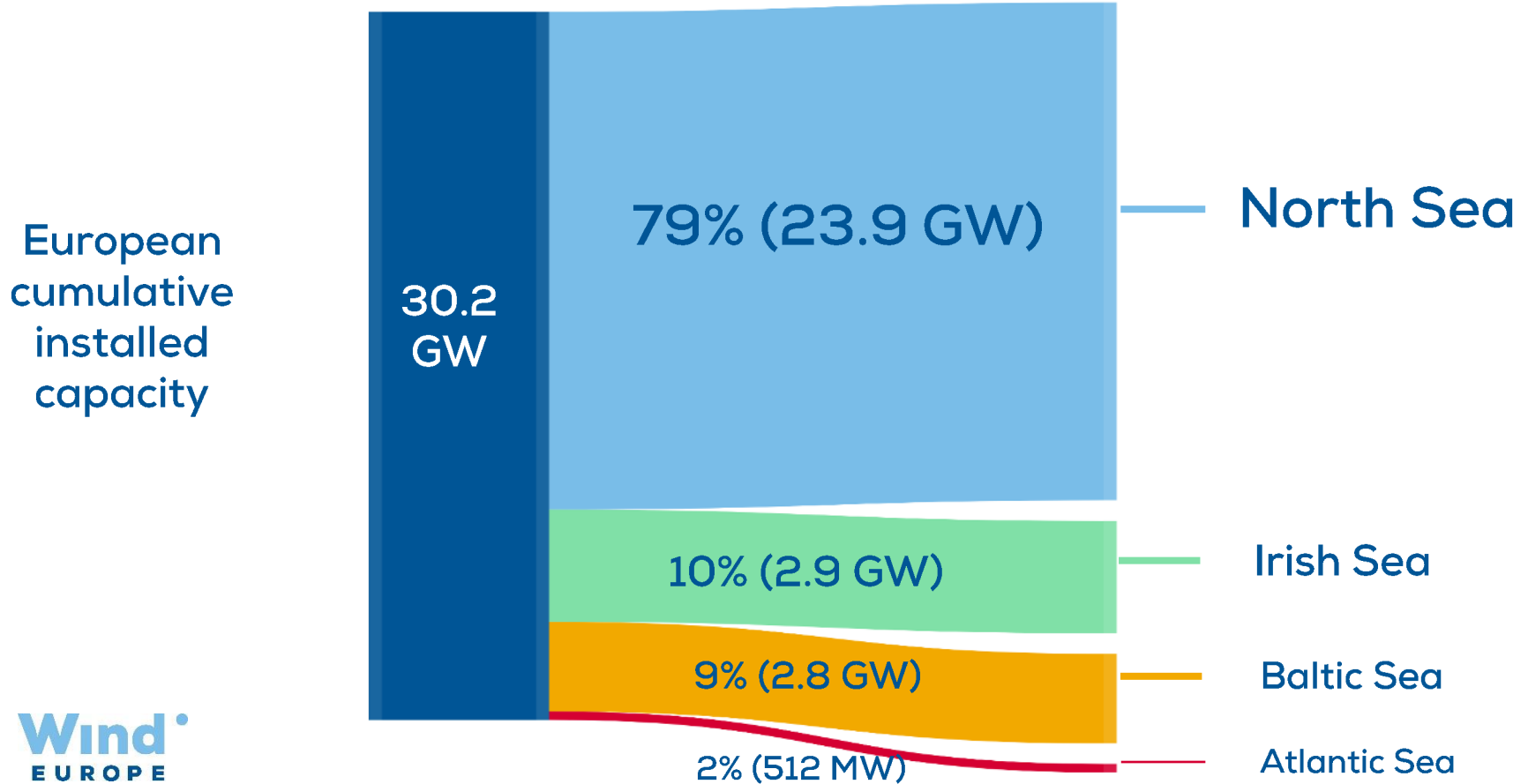
13 countries

5,954 turbines

126 wind farms



Share by Sea Basin



Economic benefits of offshore wind in Europe

€7.5bn
EU GDP
contribution

1 new
offshore wind
turbine
=
€15m
to the
economy

Employment in offshore wind energy in Europe

77,000
offshore jobs
in Europe
today

200,000
offshore jobs
in Europe in
2030

Governments want more wind

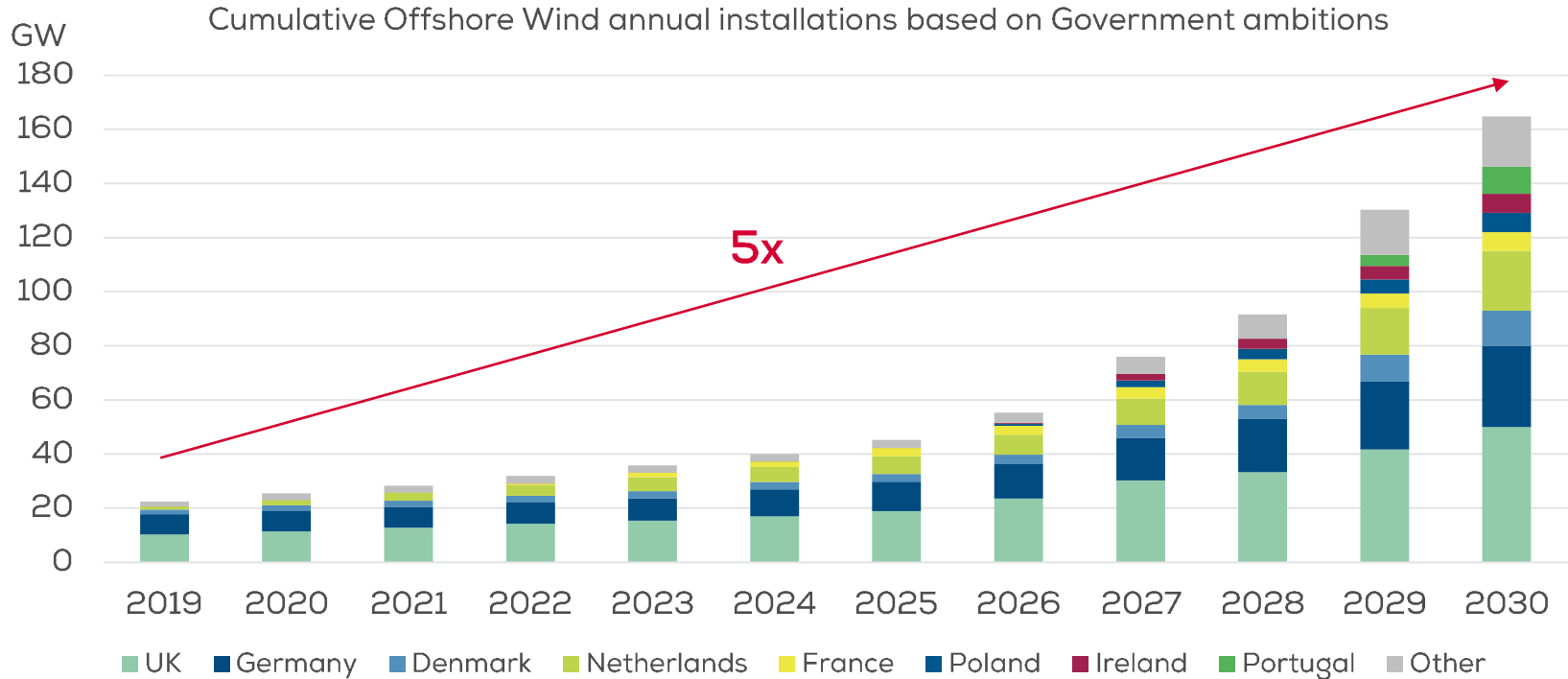
North Seas, 12 September 2022
76 GW by 2030



Baltic Sea, 30 August 2022
20 GW by 2030

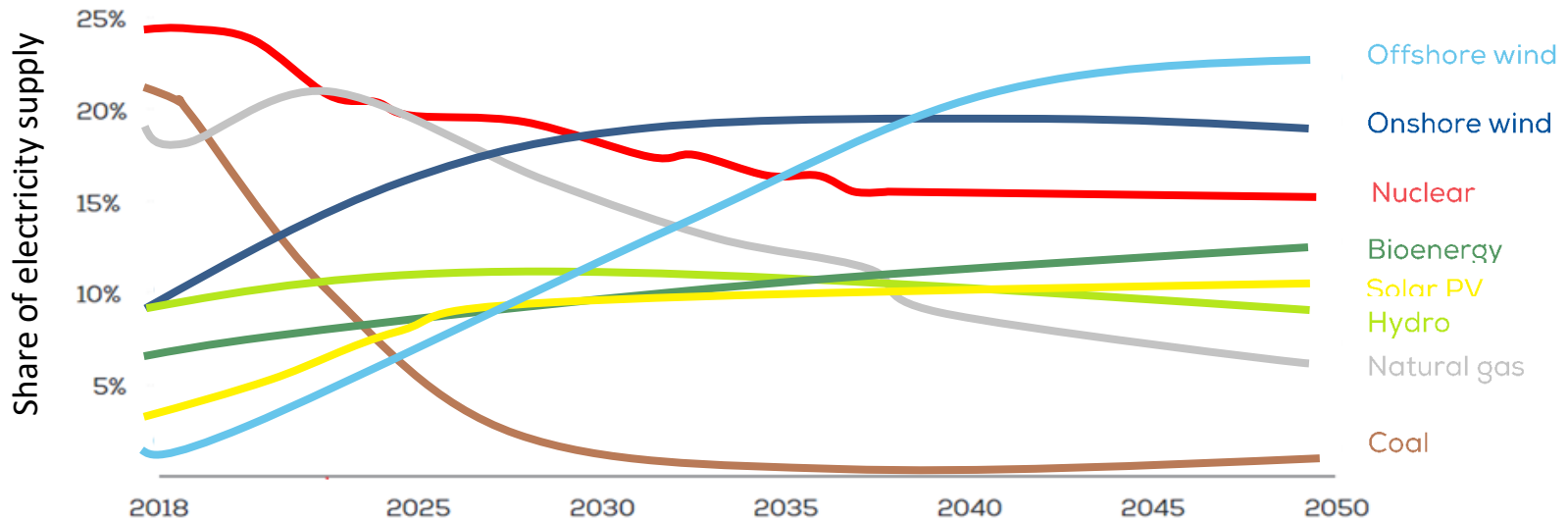


With the revision of targets, governments pledge 165 GW of offshore wind by 2030



Offshore wind will be the main source of electricity generation by early-2040

Shares of electricity generation by technology in the European Union, Sustainable Development Scenario



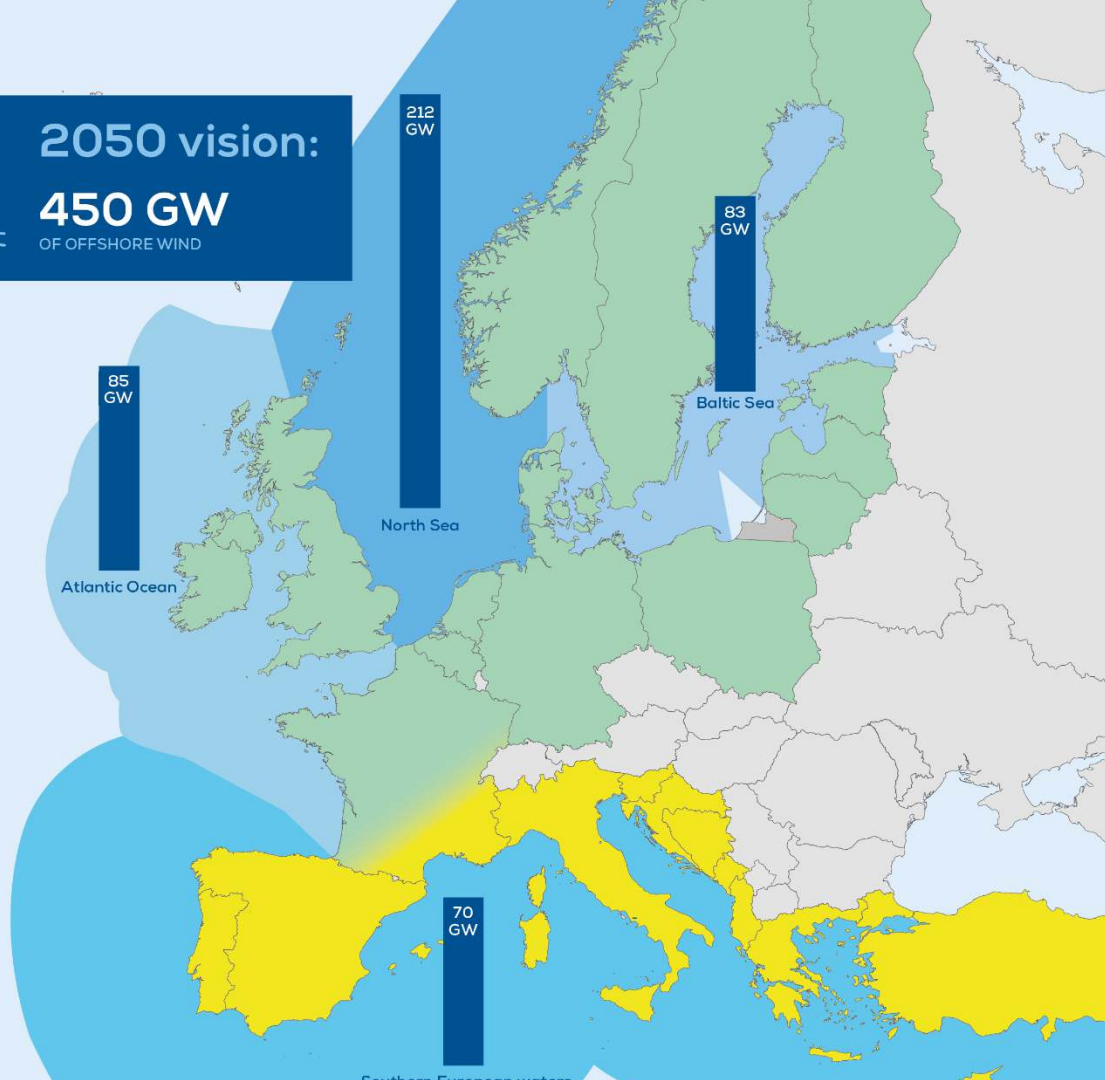
Offshore wind: 2050 target



2050 vision:
450 GW
OF OFFSHORE WIND

North Sea: 212 GW
Baltic Sea: 83 GW
Atlantic Ocean: 85 GW
Mediterranean: 70 GW

Total: 450 GW



Technology

Vindeby

4.95 MW

1991: First offshore
wind farm in the world



11 x 450 kW
Siemens Gamesa
Renewable Energy

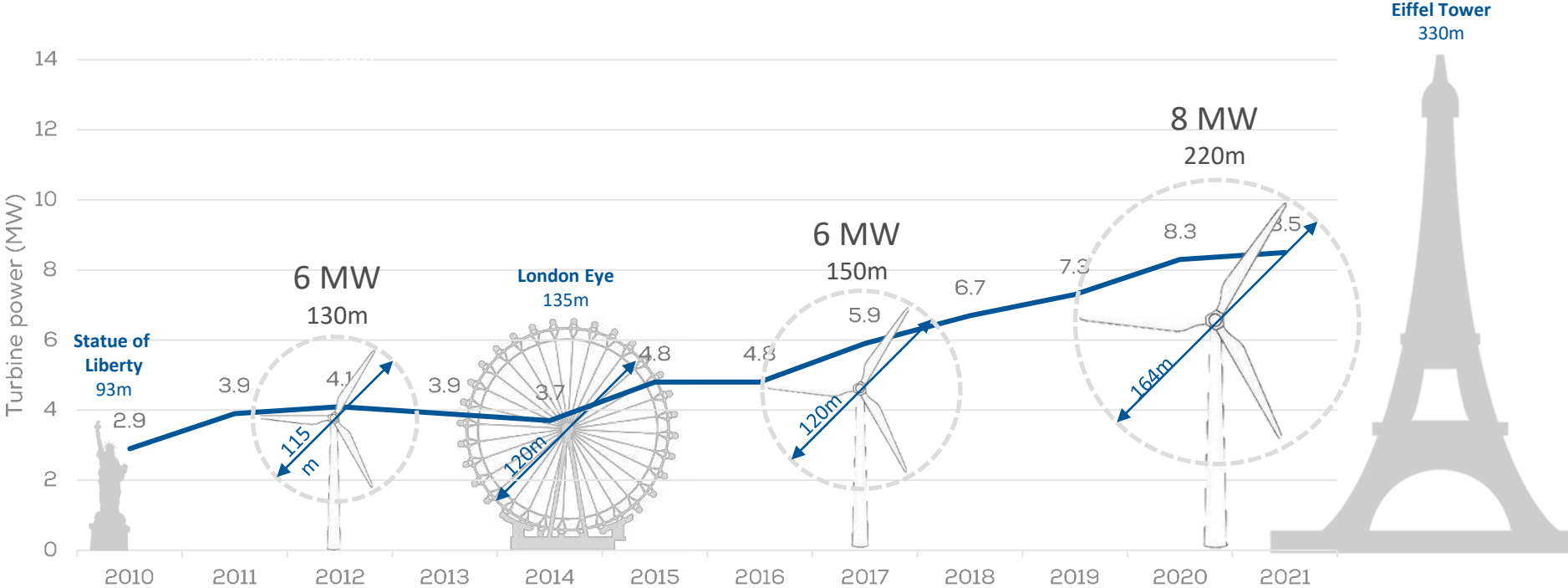


Clean electricity for
2,000 households

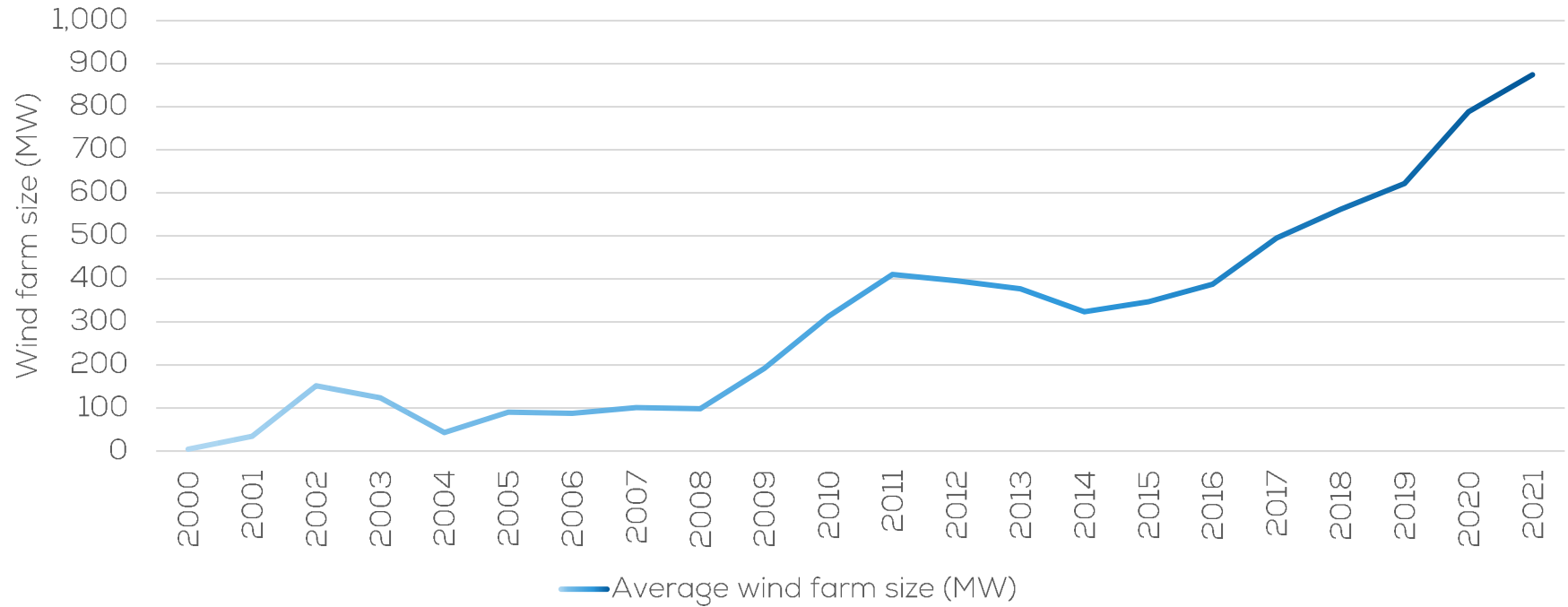


Turbine power has tripled in 10 years

Average turbine grid-connected



Wind farms size has doubled in 10 years



Hornsea Two

1,386 MW

Online



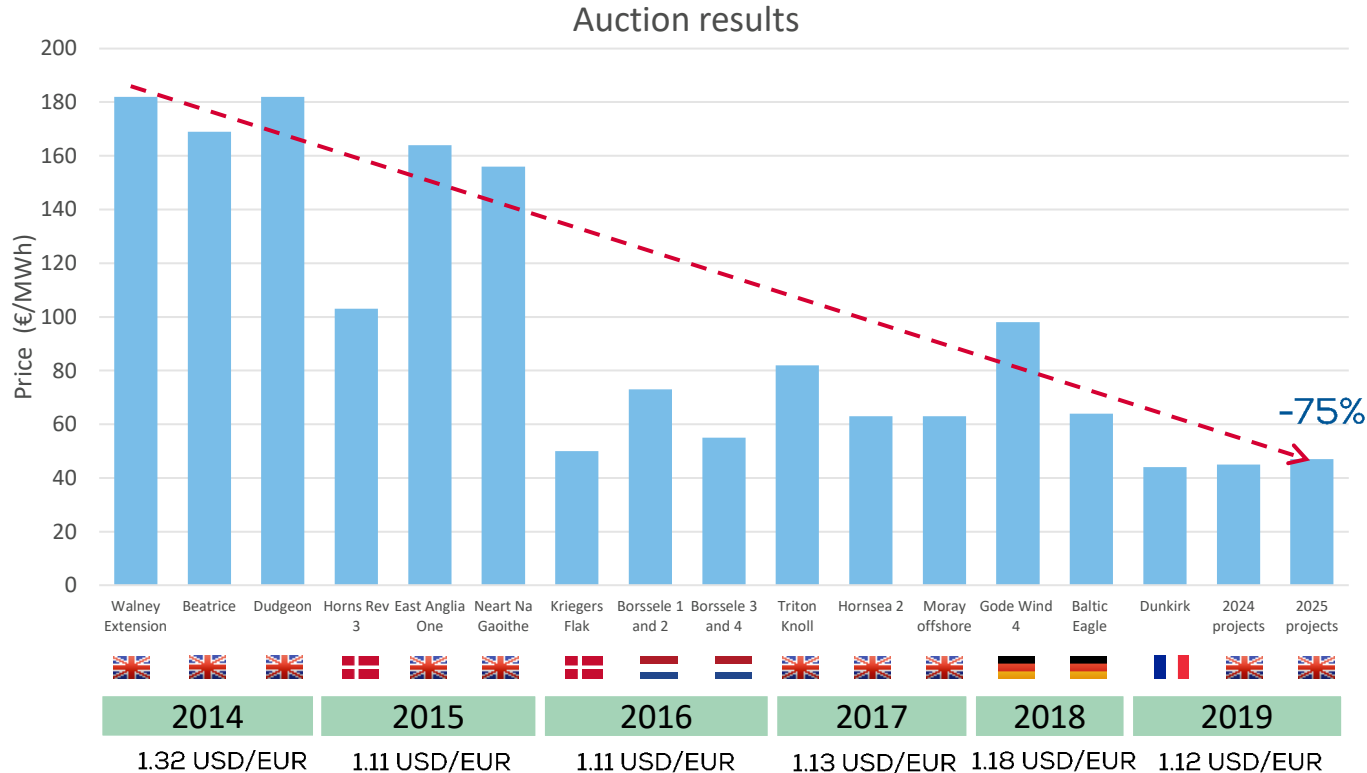
165 x 8 MW
Siemens Gamesa
Renewable Energy



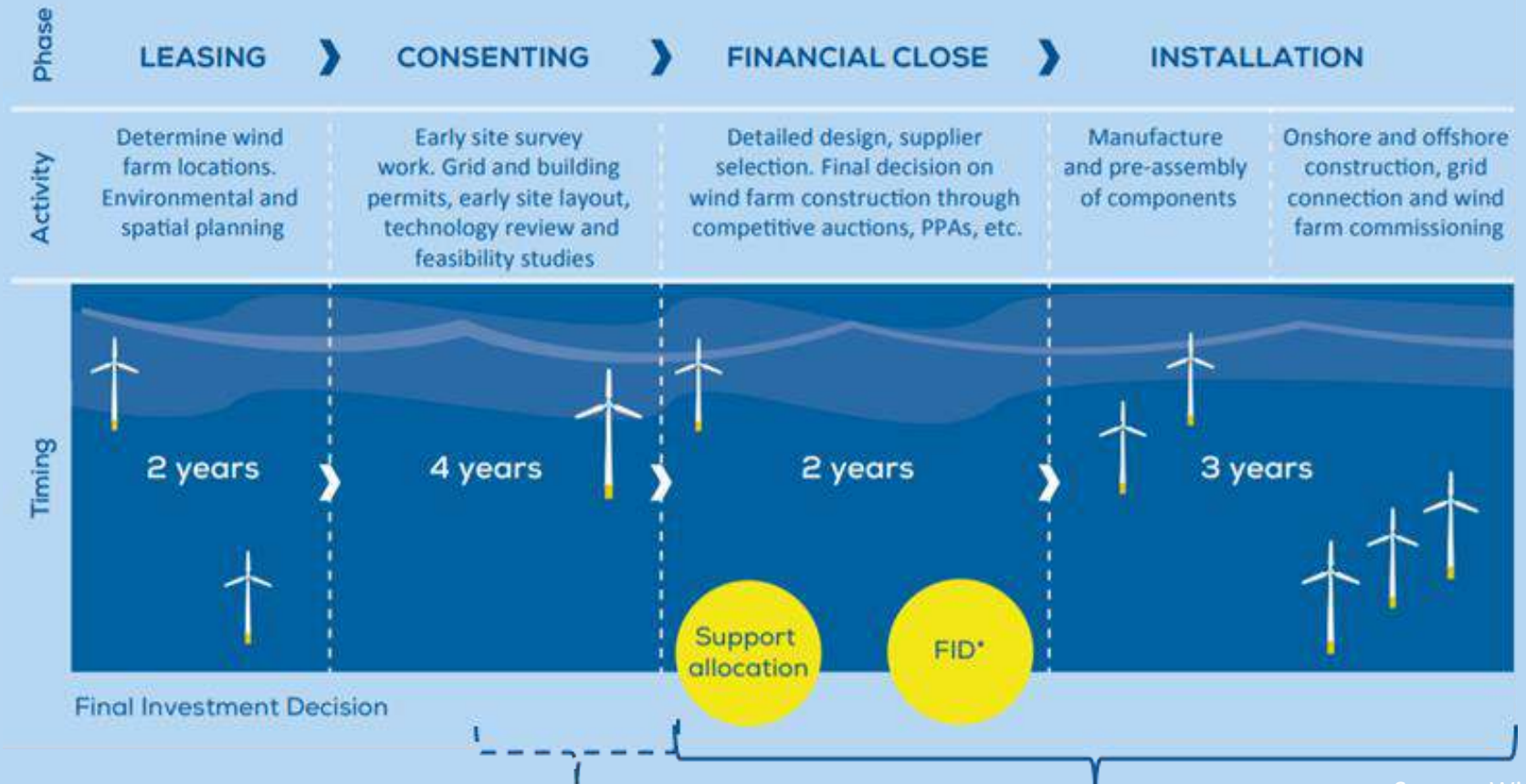
Clean electricity for
1,400,000 households



The introduction and evolution of auction models made offshore wind competitive



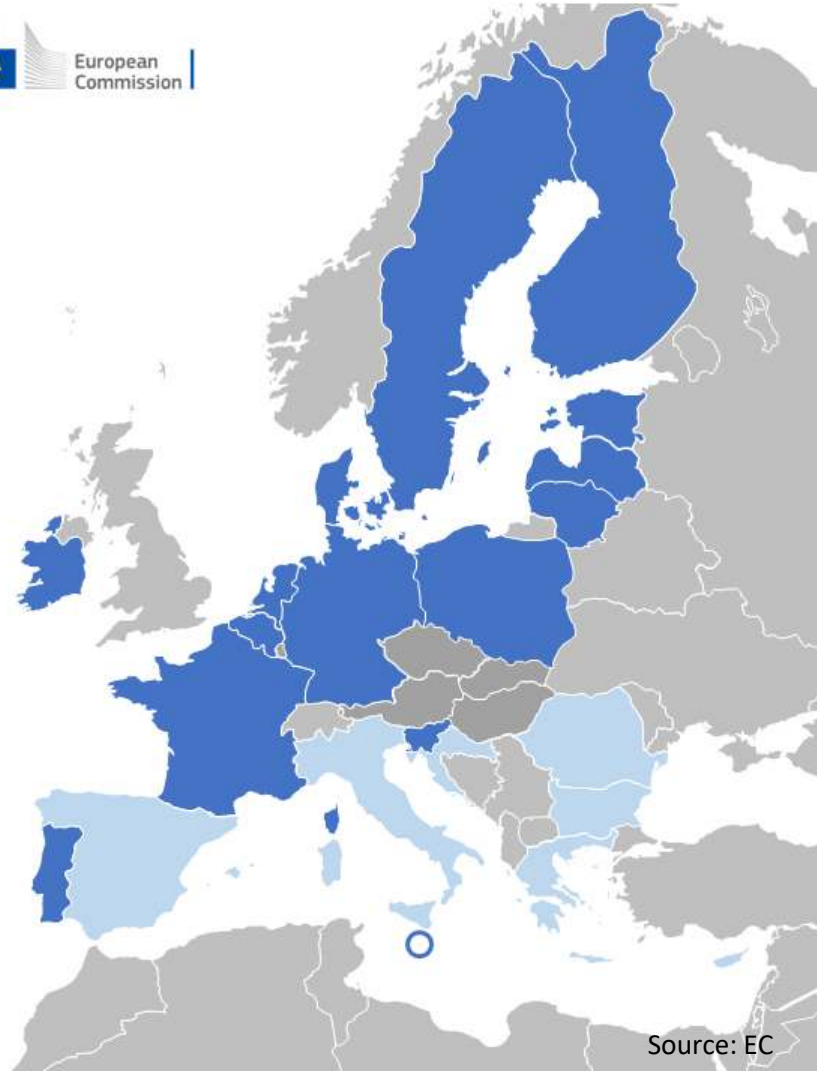
Offshore wind farm development takes time



HOW TO REACH THE TARGETS: PRIORITIES IN THE BALTIC SEA

A blue-tinted photograph showing the top of a wind turbine nacelle. Several workers in safety gear are visible on the roof, working on the structure. In the background, a vast sea of wind turbines stretches across a hilly landscape under a cloudy sky.

Maritime Spatial Planning



Cumulative MSP in EU

Area available for OW (sq. km)	Equivalent Capacity (GW)	% of sea	Expected to 2030 (GW)
52,000 sq. km	220 GW	2.9%	±100 GW

Sustainability and Biodiversity

Wind[•]
EUROPE

Kriegers Flak substation installation using double bubble curtain
© Van Oord



Interactions with Defence



1. Engagement with defence
2. Kick-off trials and demonstrators
3. Safety distances / veto right / permitting

[WindEurope's "Wind energy and defence" event on 27/04/2023, Copenhagen](#)

Investments in ports

An aerial photograph of a large-scale port construction project. The foreground and middle ground are dominated by hundreds of white, conical wind turbine nacelles and tower sections, neatly arranged in long rows on a flat, paved or dirt surface. In the background, there are various industrial structures, including tall chimneys, cranes, and buildings, situated near a body of water. The sky is overcast.

€8.5bn
by
2030

Production capacity needs to be expanded



Offshore
turbines

7 GW → 20 GW
p.a.

Foundations

275 → 1,300
p.a.

Substations

5 → 20 HVAC
or 10 HVDC
p.a.

Workers

77,000 →
250,000

Vessels

56 new ones
by 2030

Array
cables

1,200 km →
2,160 km p.a.

Offshore hybrids: plan a grid fit for purpose



THANK YOU

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