PORTS AT THE SERVICE OF THE WIND INDUSTRY

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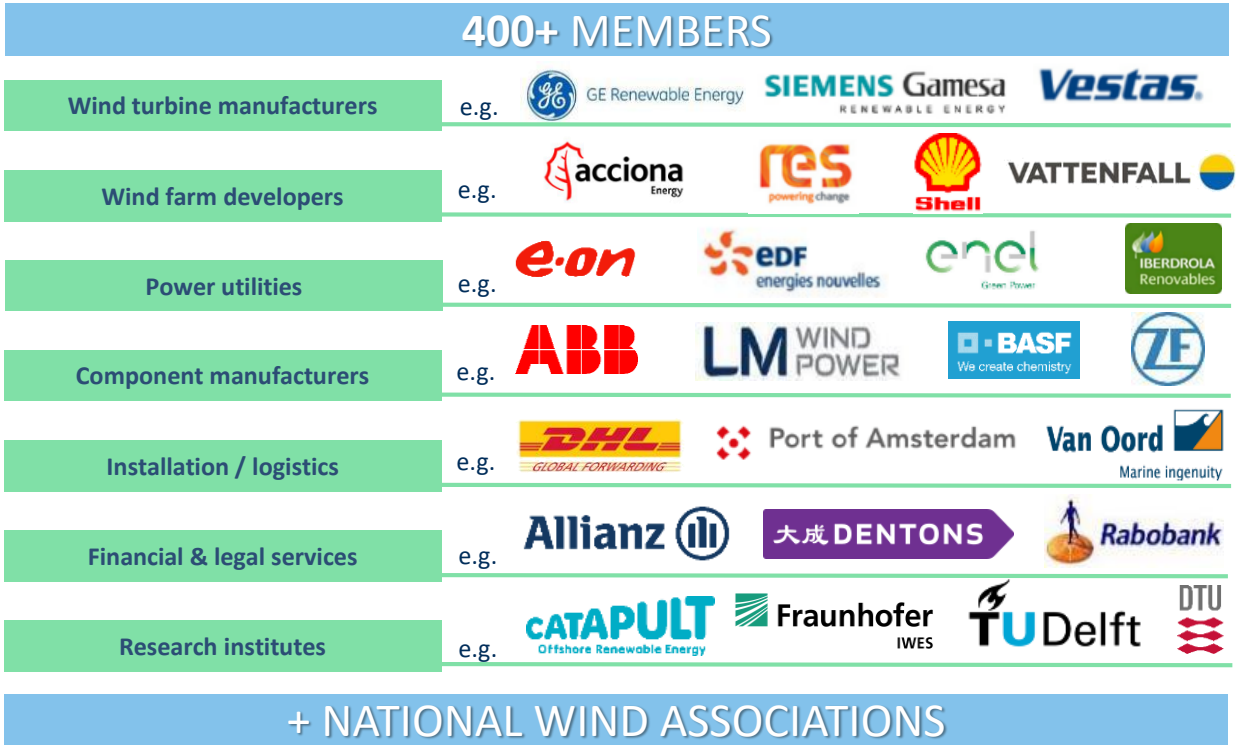
May 2019

WindEurope: the European Wind Energy Association



Wind EUROPE

Wind energy in Europe

189 GW

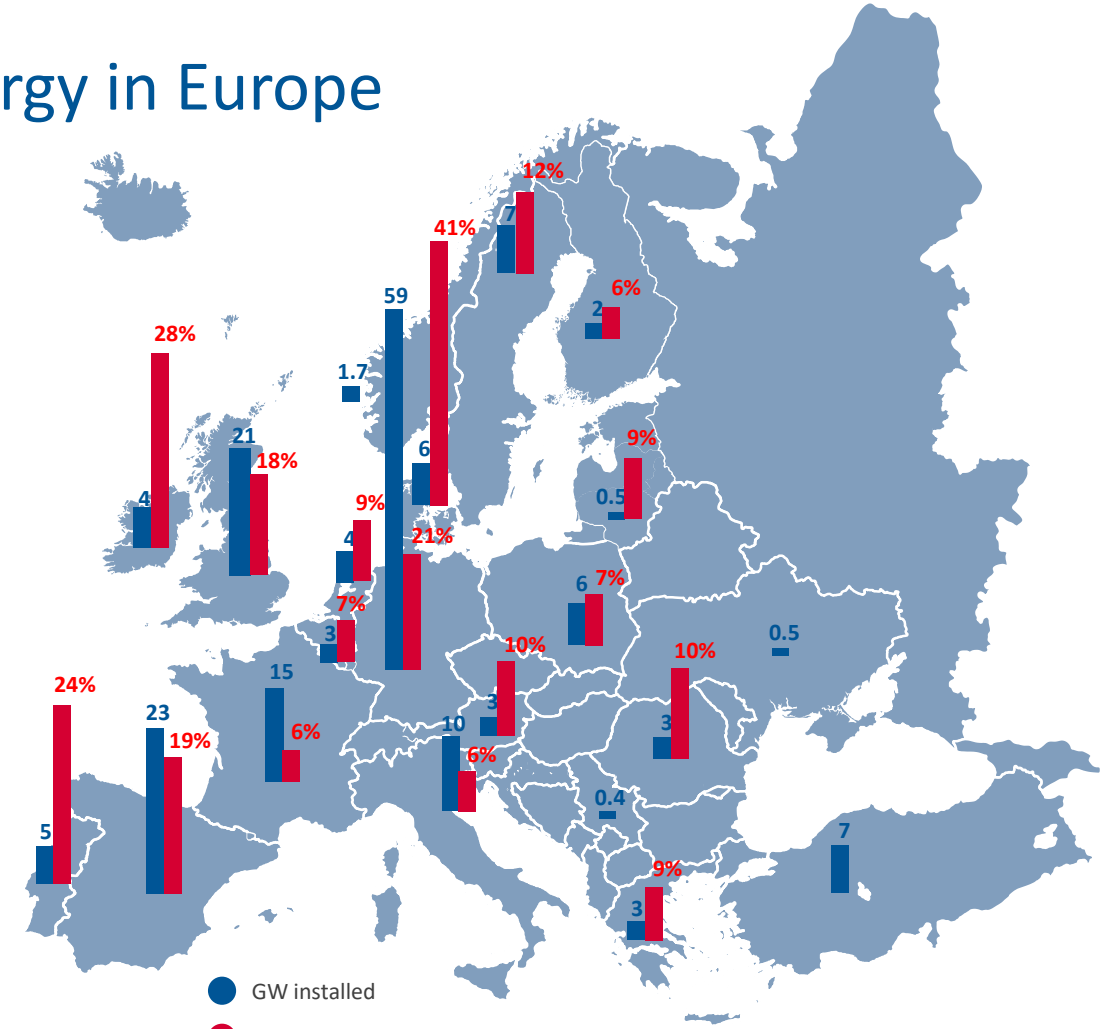
Of which:

18.5 GW

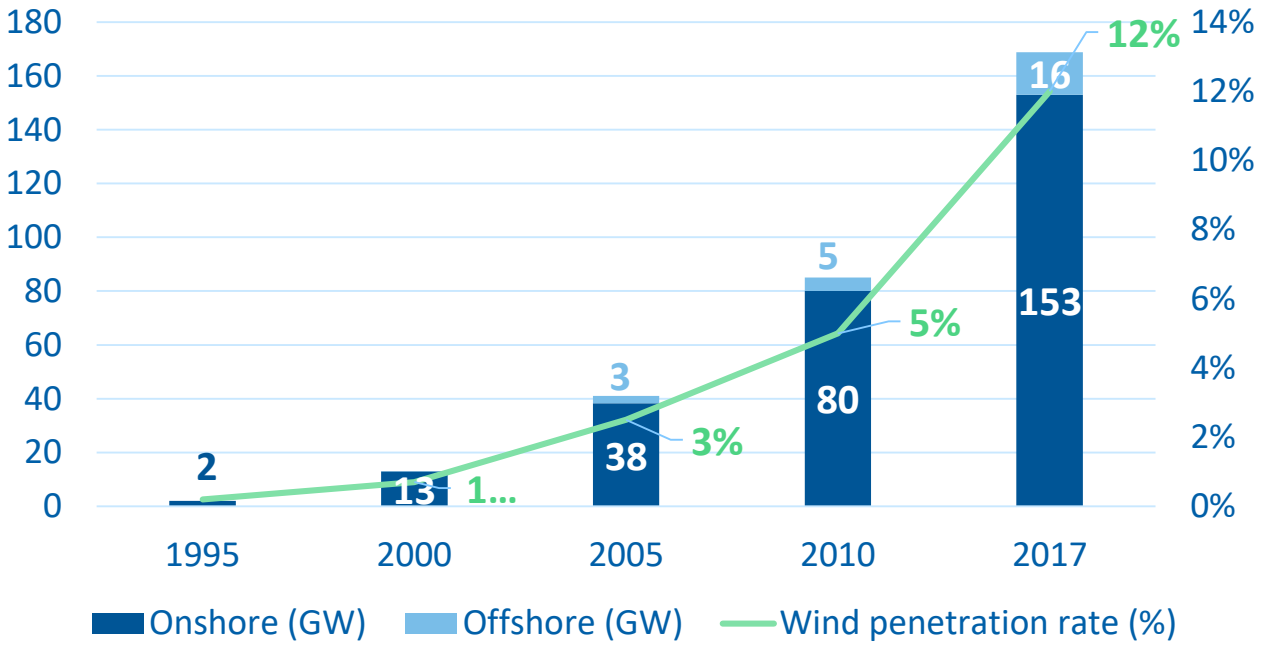
offshore

14%

of 2018 EU power demand



Growth of wind energy in Europe



Contribution to EU economy

- 263,000 jobs
- €36bn GDP contribution
- €8bn exported
- €28bn invested
- €5bn fossil fuel savings p.a.

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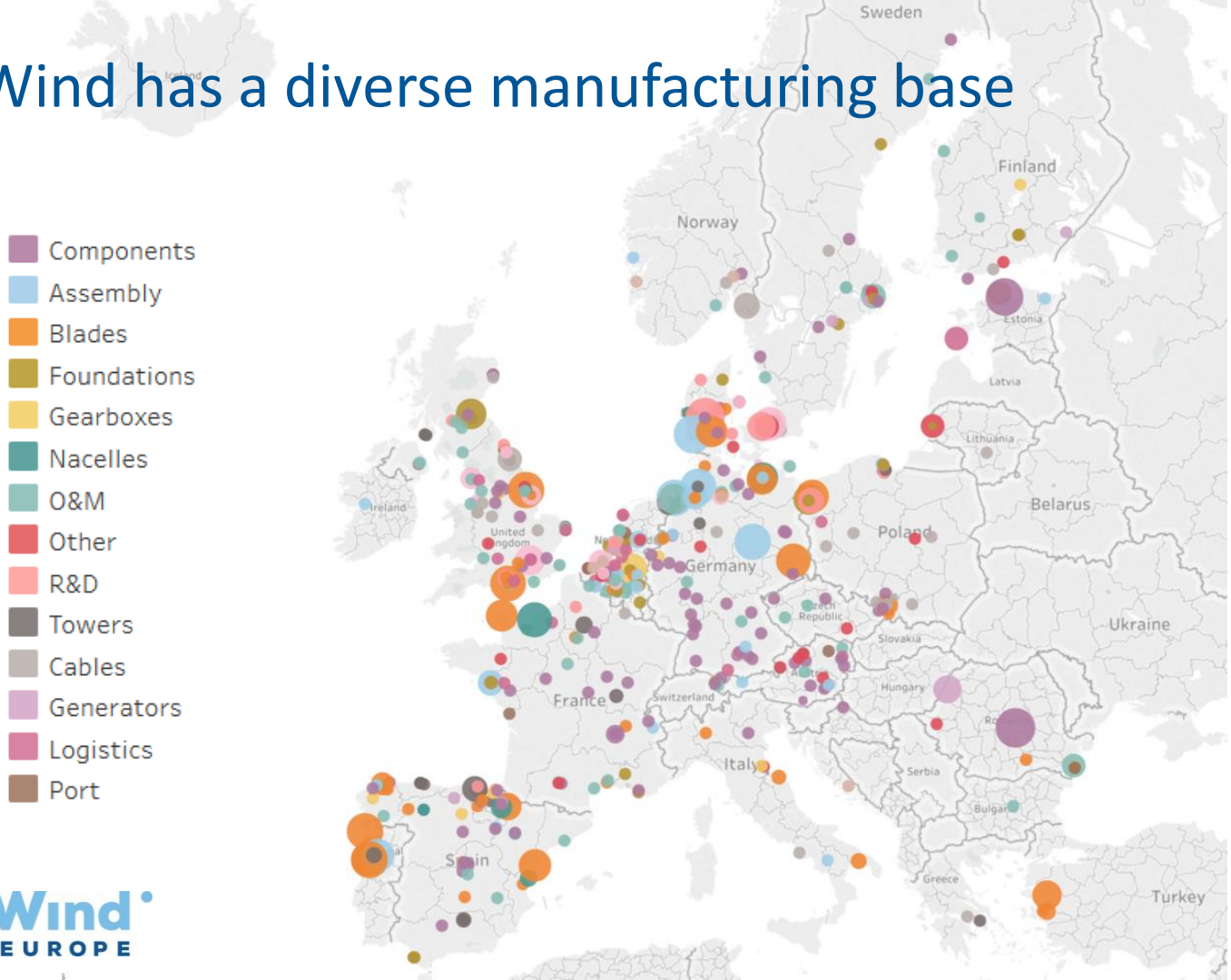
Wind has a diverse manufacturing base



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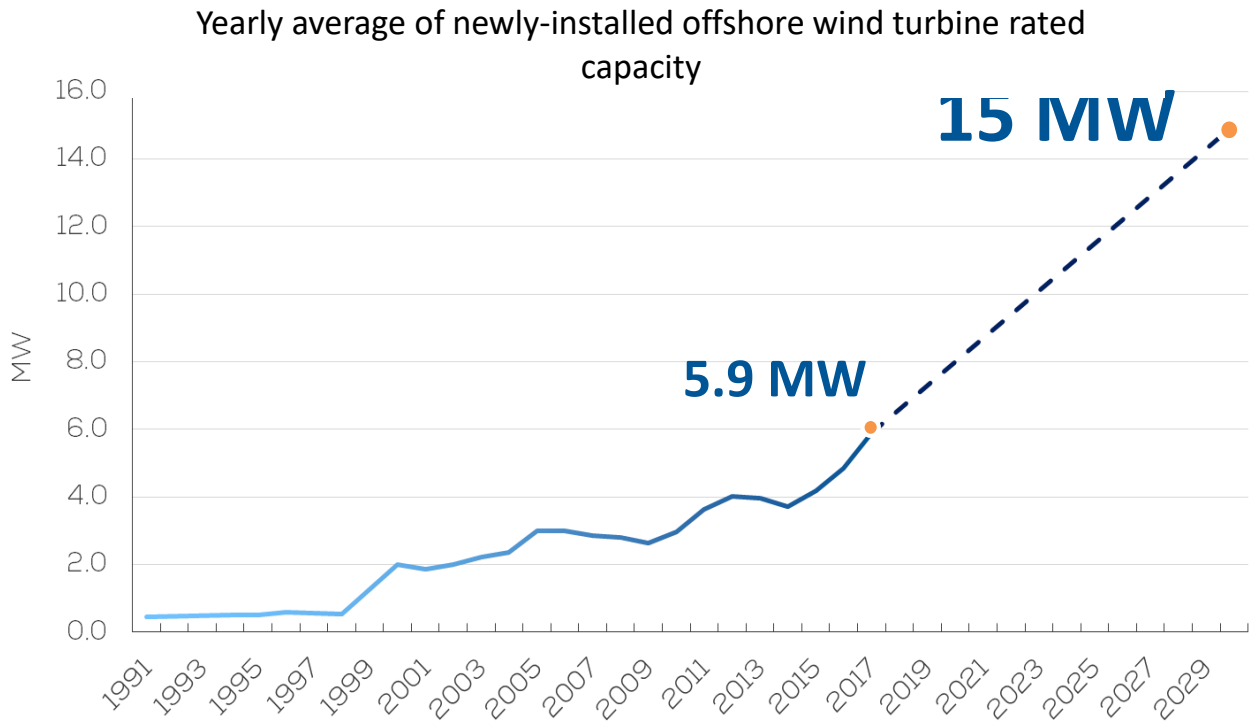
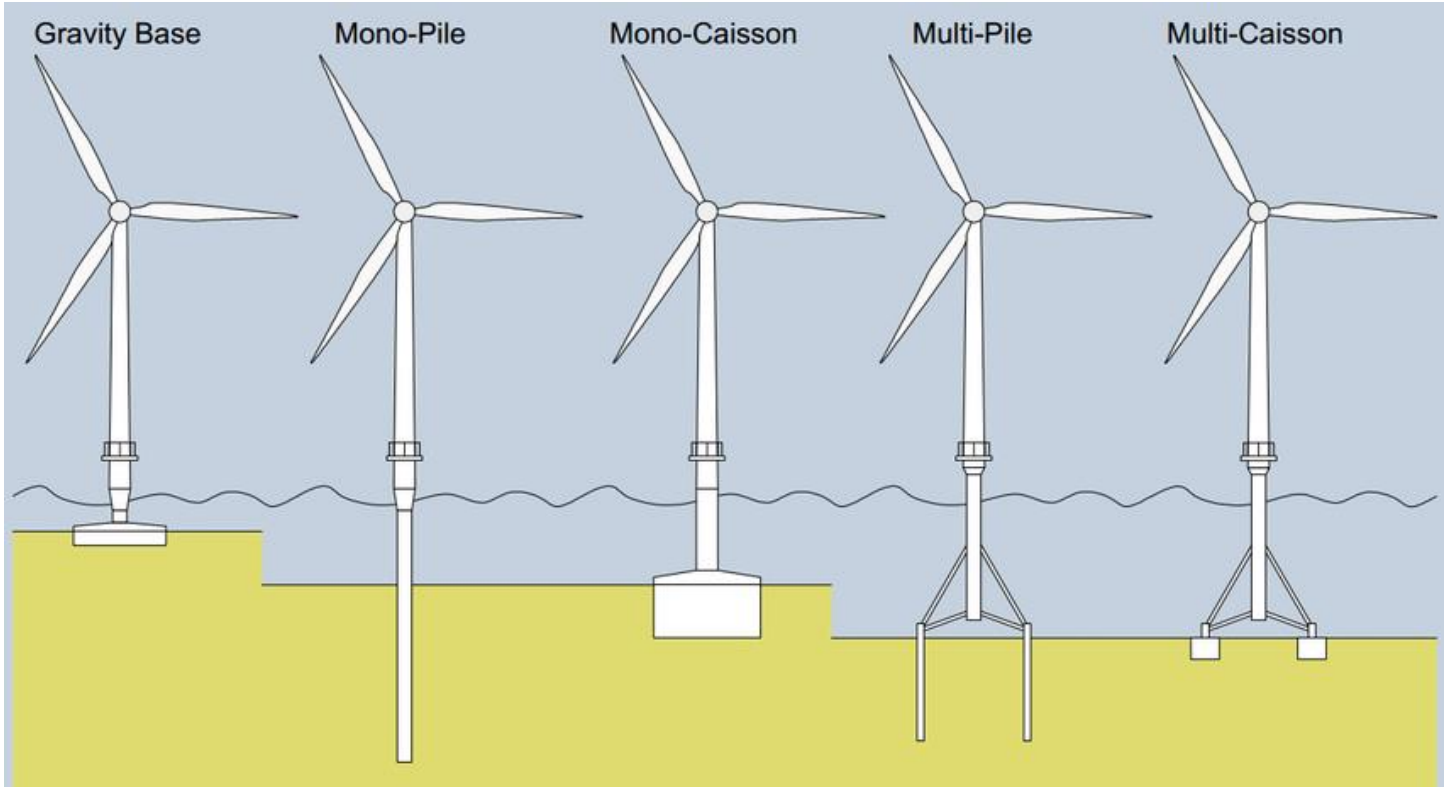
Offshore turbines are getting larger



Source: WindEurope

Bottom fixed foundations



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Floating offshore wind

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Offshore Wind Ports Platform

- 14 Ports in the platform;
- 4 meetings per year;
- Publication "**A statement from the offshore wind ports**" (2017);
- Internal report "**Ports and port services for offshore wind in 2030**" (2018);
- Infographic launch in Hamburg 2018.

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A VISION FOR EUROPEAN PORTS

Total installed offshore wind in Europe

2020	2025	2030
28 GW 6,000 turbines	49 GW 8,000 turbines	70 GW 10,000 turbines

Source: WindEurope

PORTS SERVICES IN 2030

BY 2030, PORTS WILL NEED TO ANNUALLY SUPPORT:

O&M	Installations	Repowering	Decommissioning	Life Extension
70 GW 10,000 turbines	7 GW 460 turbines	1 GW 70 turbines	750 MW 600 turbines	1.5 GW 500 turbines

PORTS' CONTRIBUTION TO LCOE REDUCTION

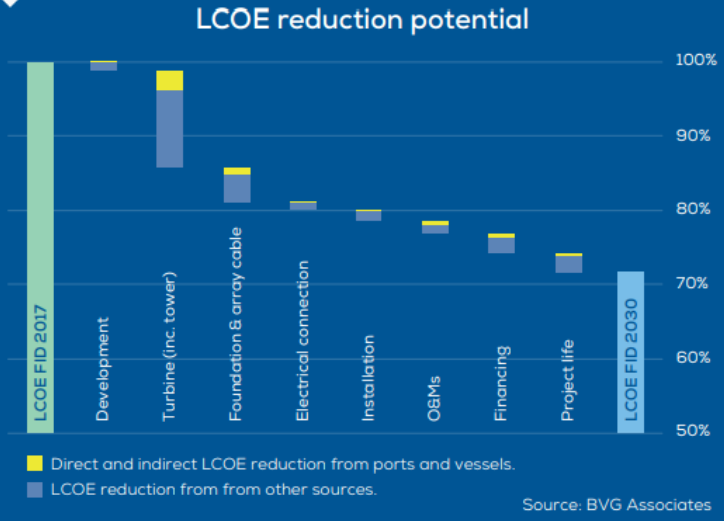
SAVINGS POTENTIAL FROM 2017 TO 2030

***5.3%** Total LCOE reduction

1.8% Direct

3.5% Indirect

*The 5.3% LCOE saving is equivalent to what would be achieved by a project CAPEX reduction of €185,000/MW of new wind farm capacity.



Source: BVG Associates

INVESTMENT REQUIREMENTS

INVESTMENTS IN PORT INFRASTRUCTURE DRIVE COST REDUCTION IN OFFSHORE WIND

Ports will use this money for upgrading, redesigning and adapting existing facilities combined with new infrastructure

€0.5 - €1bn Investment

10% - 20% CAPEX saving

These investments would save the equivalent **CAPEX of €5.5bn** for 30 GW of new offshore installations.

THANK YOU

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