



Status and Outlook for the Wind Sector

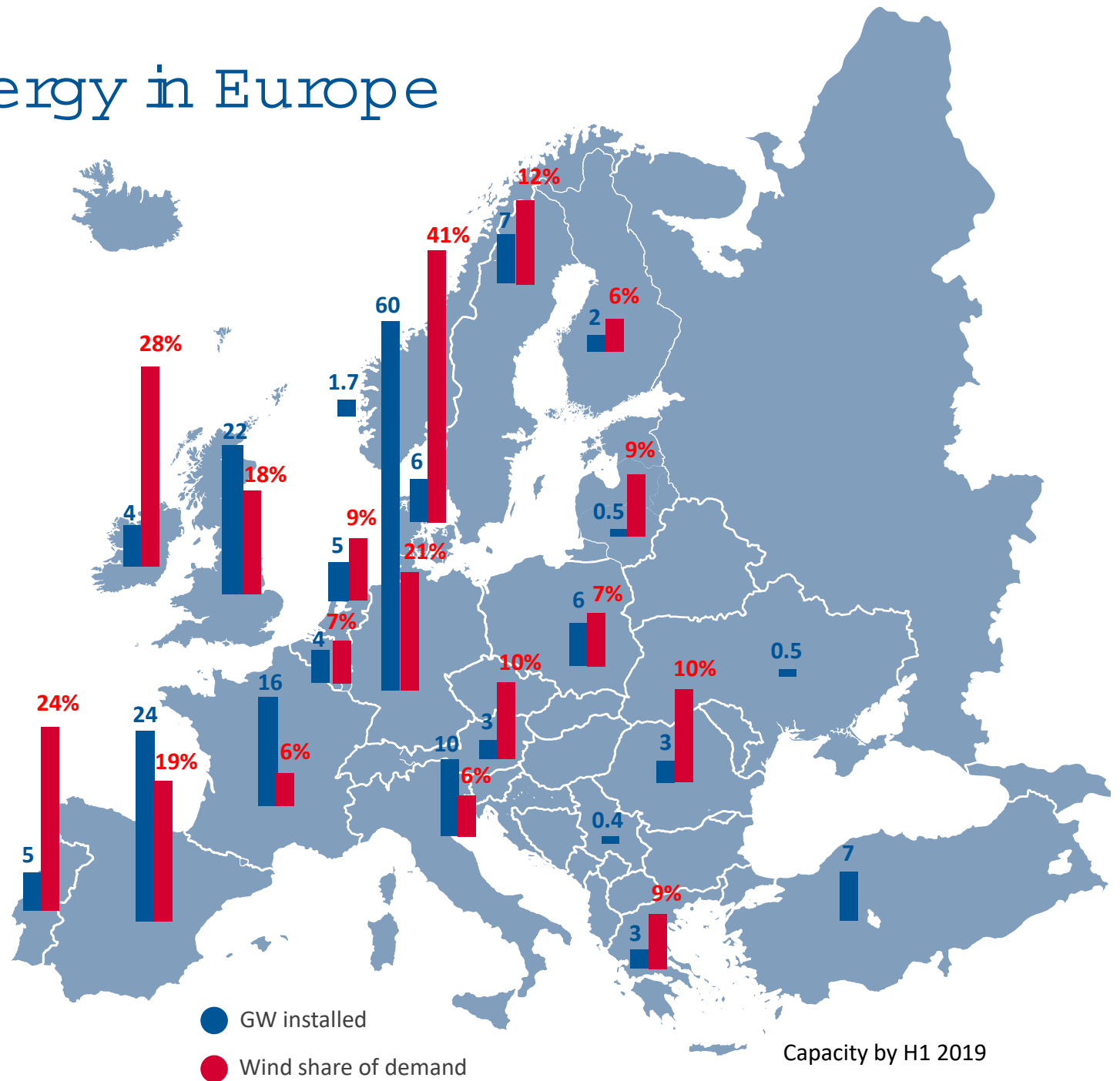
Giles Dickson

Wind energy in Europe

194 GW

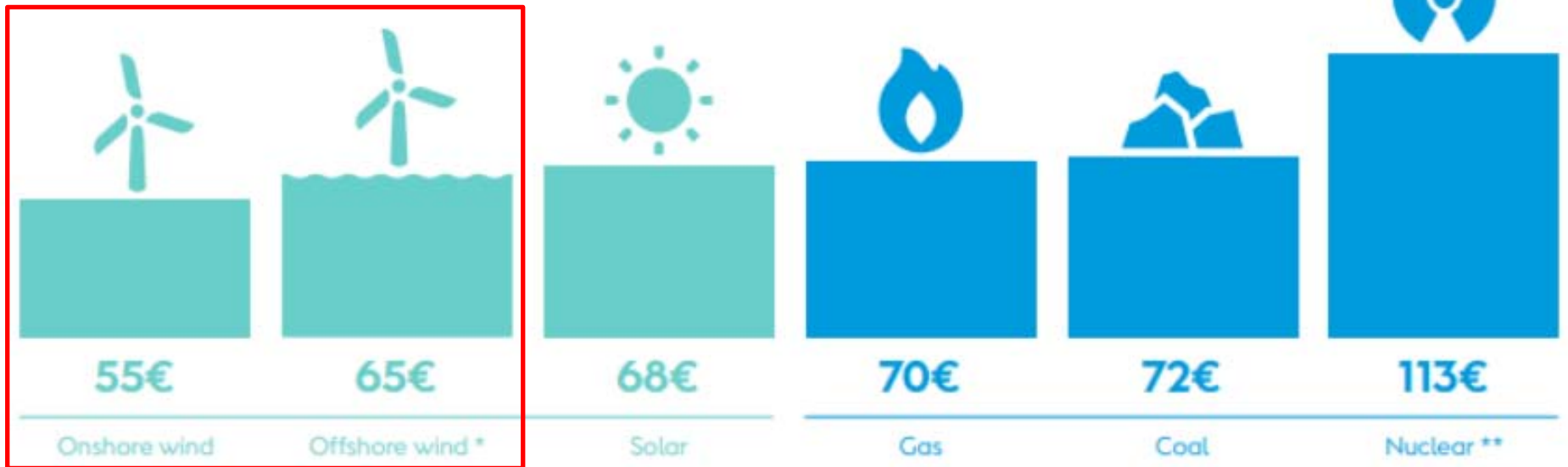
14%

of 2018 EU
power demand



Wind the cheapest form of new power generation

Levelised cost of electricity/MWh

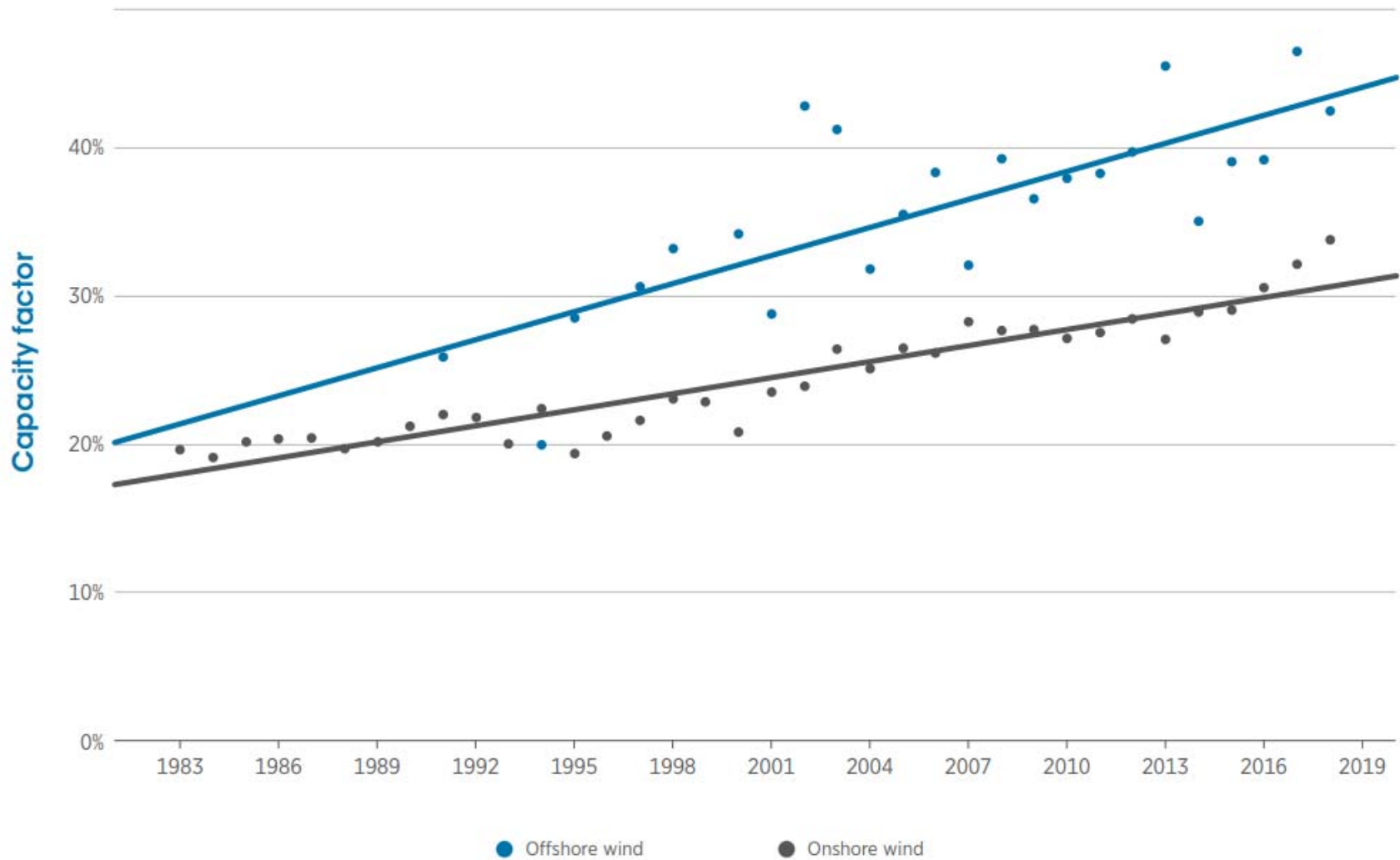


Source: Bloomberg New Finance (2016-prices), Year of FID.

Prices reflect North Western European market conditions, which express a global trend. Specific prices may vary across regions.

* Offshore: Hornsea 2, UK (cost including transmission) ** Nuclear: Hinkley Point, UK

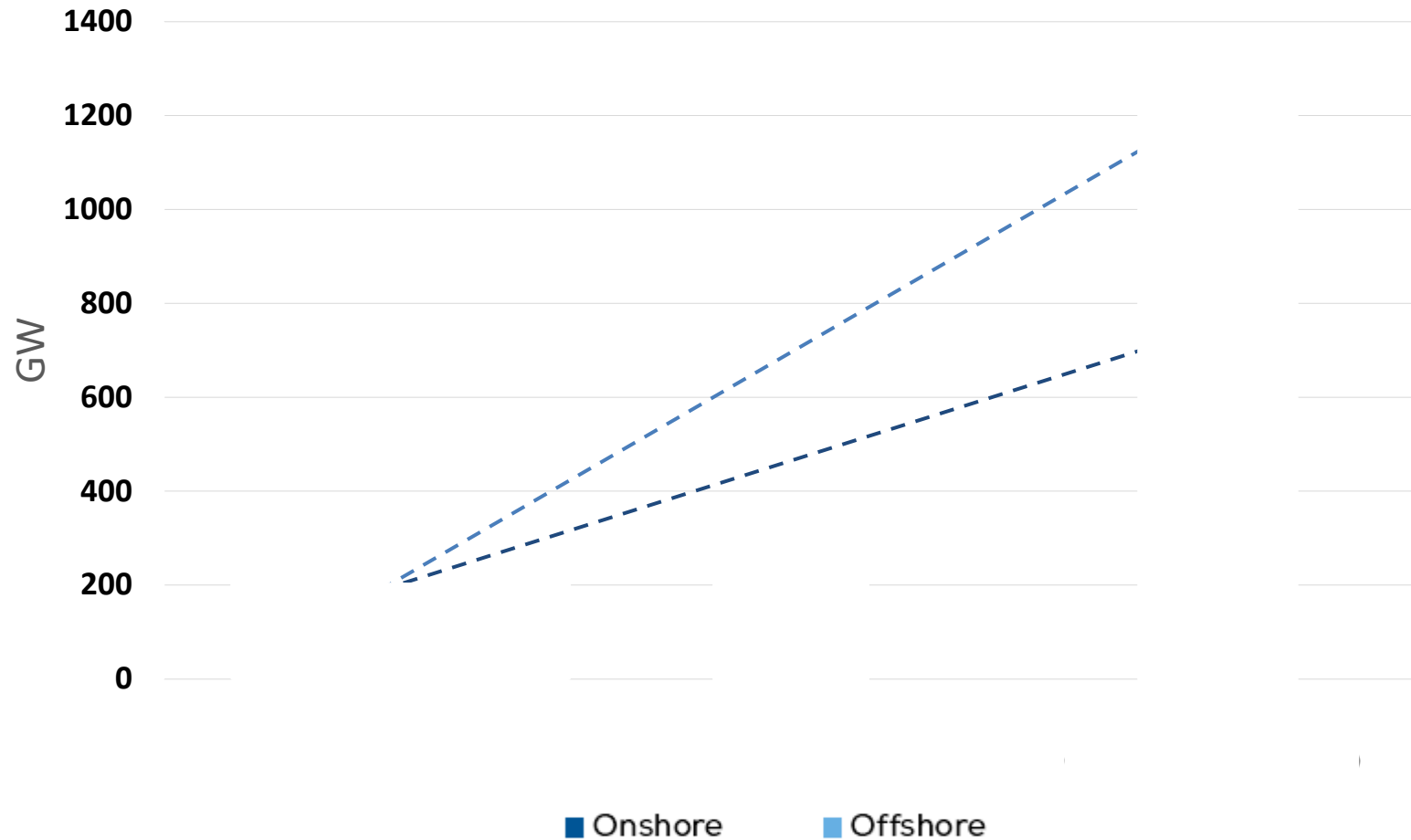
Capacity factors 1983 - 2018



Wind the no.1 power source in the EU by
2027

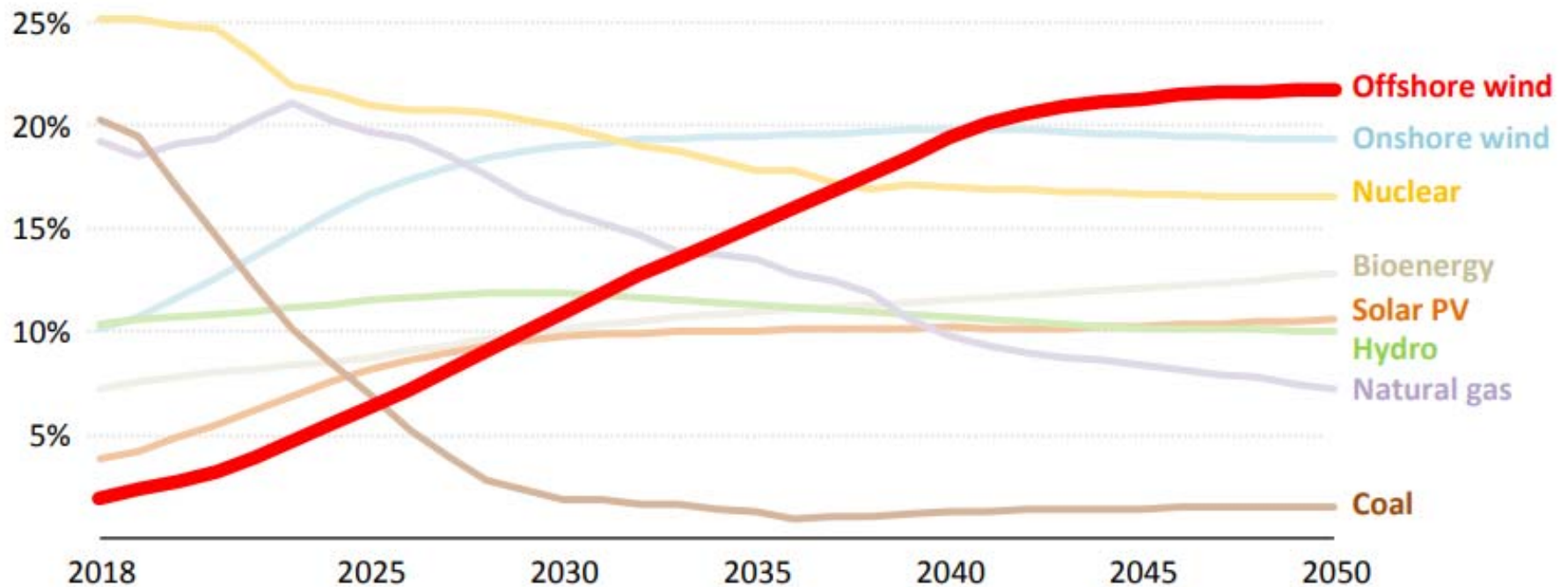
according to IEA

Wind capacity 2018 to 2050



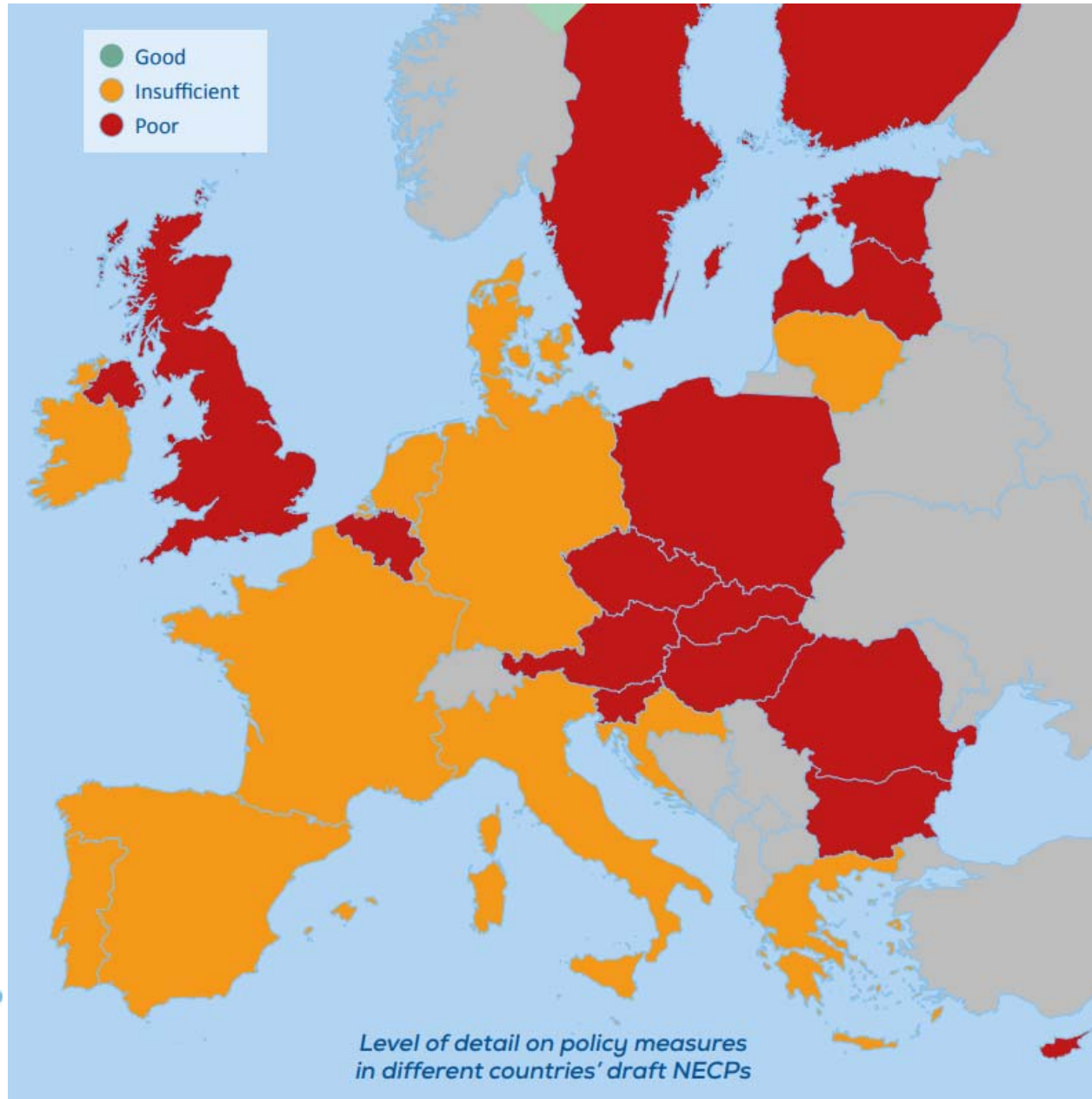
Offshore wind the no.1 power source in the EU by 2040

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



Offshore wind is set to become the largest source of electricity in the European Union by 2040, complementing other renewables towards a fully decarbonised power system

NECPs are not sufficient to reach targets



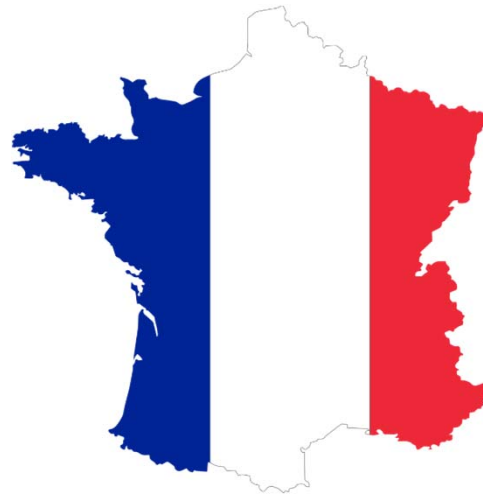
NECPs are not sufficient to reach targets

	AUCTION SCHEDULE	POWER GRID & MARKETS	PERMITTING & END-OF-LIFE OF WIND ASSETS	ELECTRIFICATION	CORPORATE RENEWABLE POWER PURCHASE AGREEMENTS	RESEARCH & INNOVATION
Austria	•	••		••		•
Belgium		•				•
Bulgaria		•				
Croatia	•	••		•••		•
Denmark	•••	•••	••	•••		••
Estonia	•	••		•		•
Finland	•	••		•••		•
France	•••	•••	••	•••		•••
Germany	•••	•••		•••		••
Greece	••	••	•	••		•••
Ireland	•	•••		••••		••
Italy	•	••	••	•••	•	••
Lithuania	•	•••	•			••
Netherlands	•	•		•••		••
Poland		•		•		
Portugal		••		••		•
Romania		•		•	••	•
Spain	•	••••		••		••
Sweden		••		••••		•
UK	•	•••		•••		••

A majority of people living close to wind farms are happy with them



75%



80%

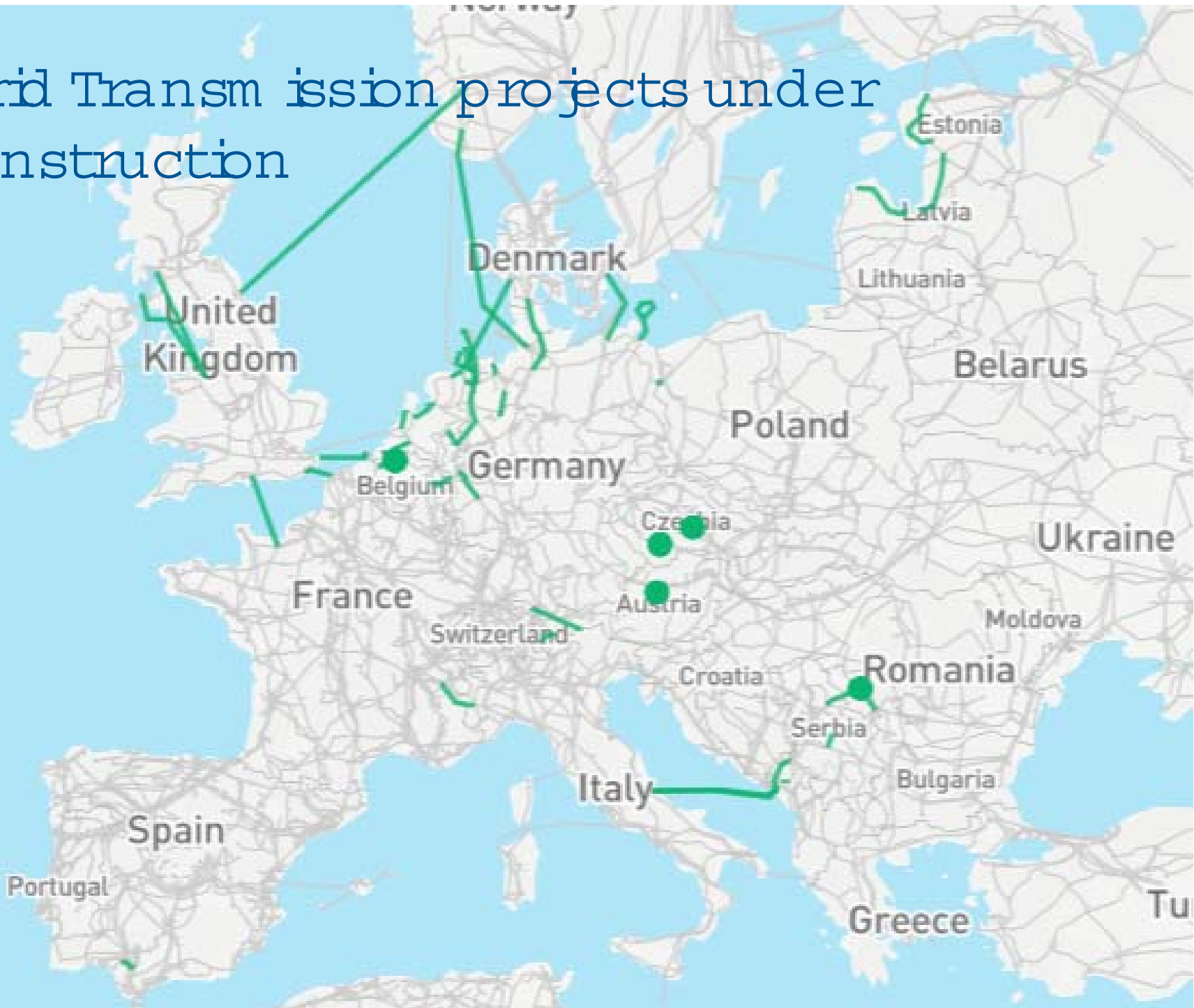


86%

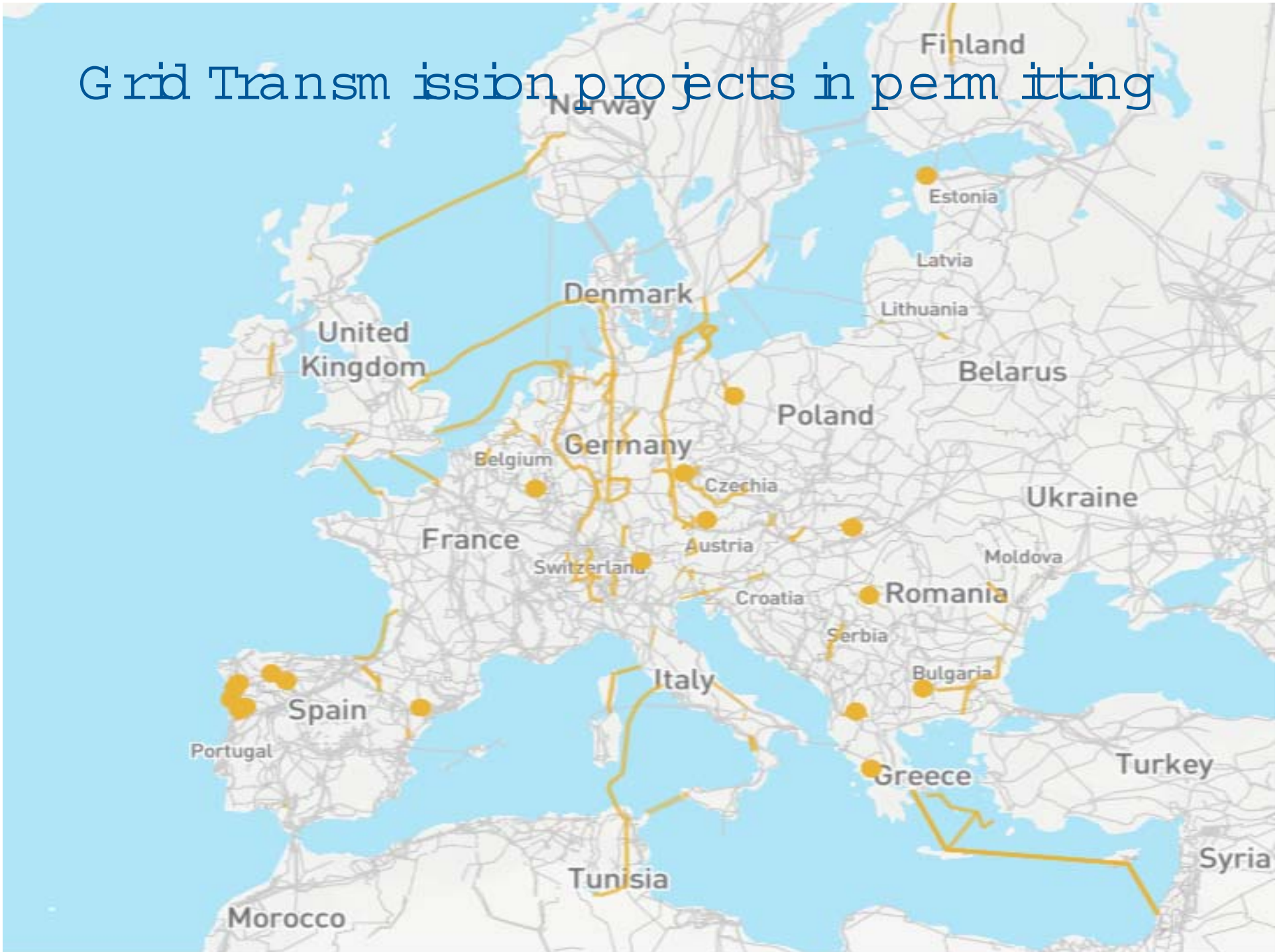
Engage communities



Grid Transmission projects under construction



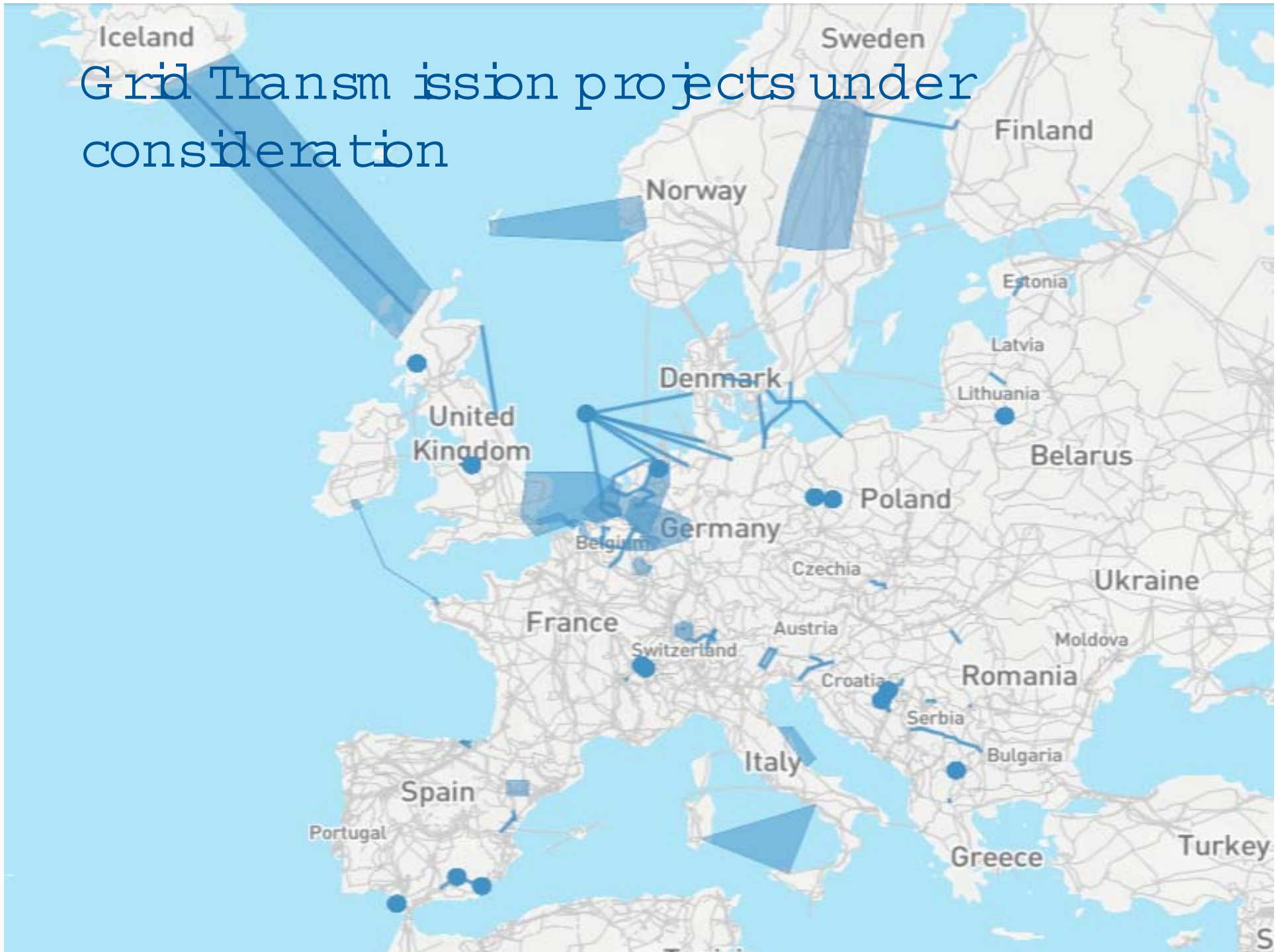
Grid Transmission projects in permitting



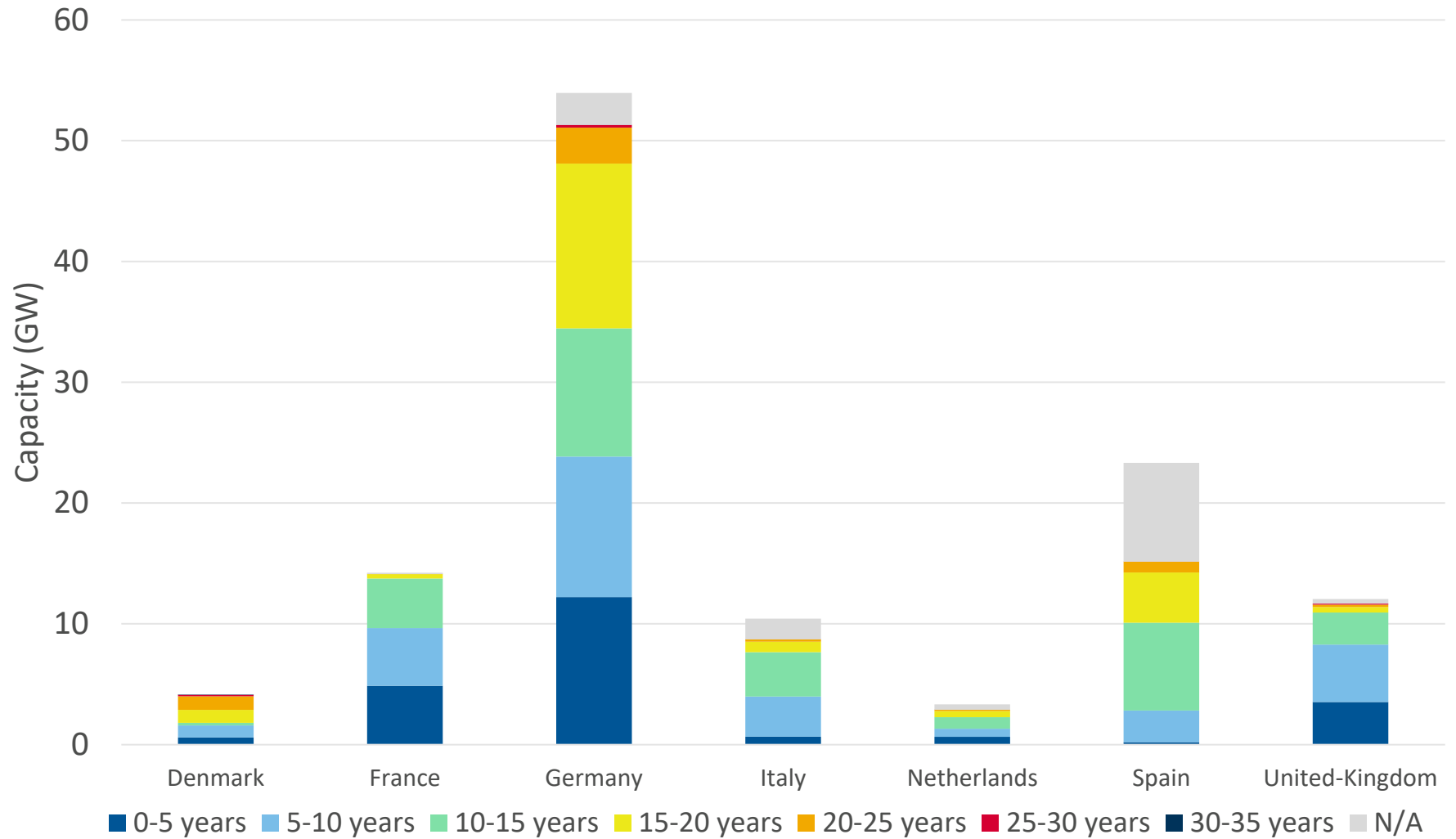
Grid Transmission projects planned but not yet permitted



Grid Transmission projects under consideration



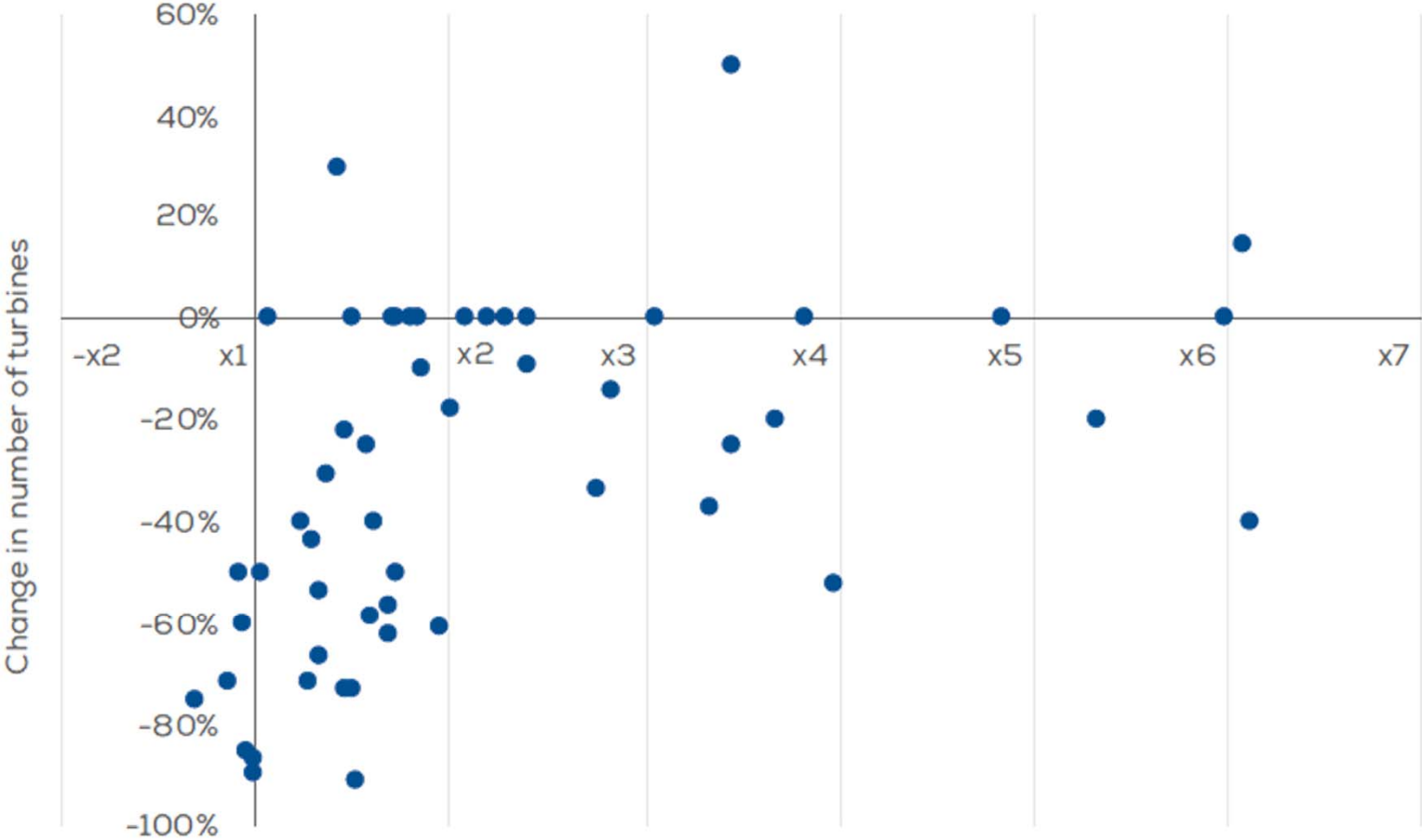
Wind farms ageing



The growth of onshore turbines

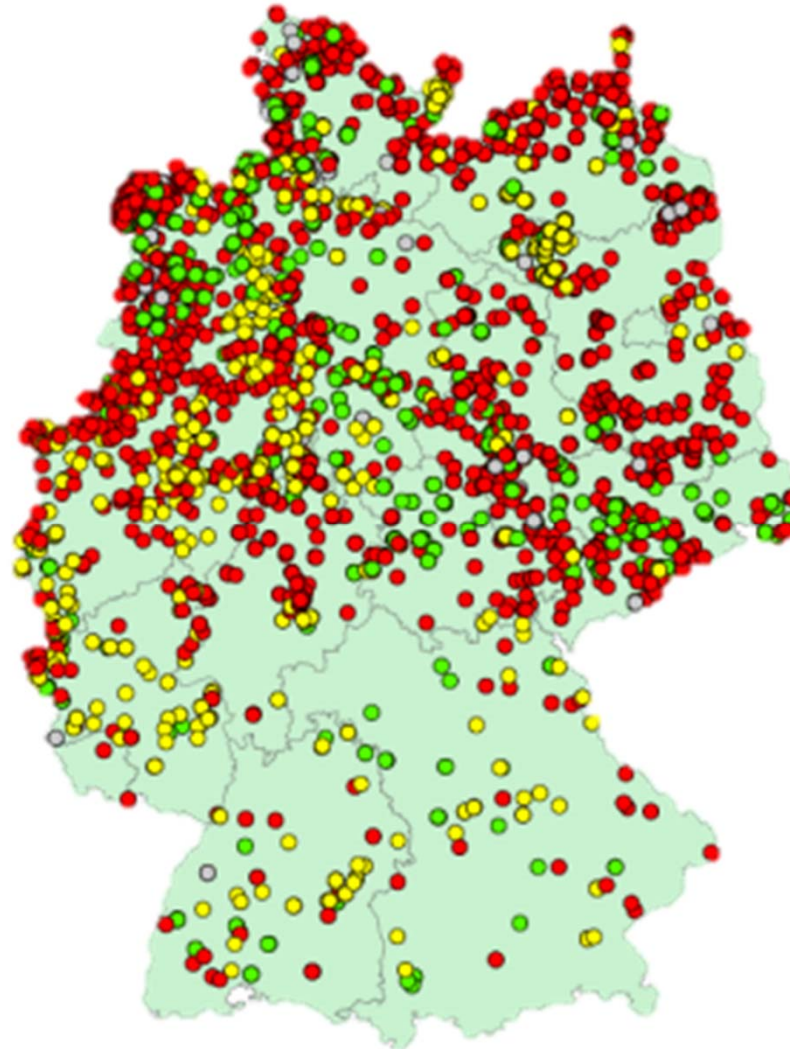


Repowering potential



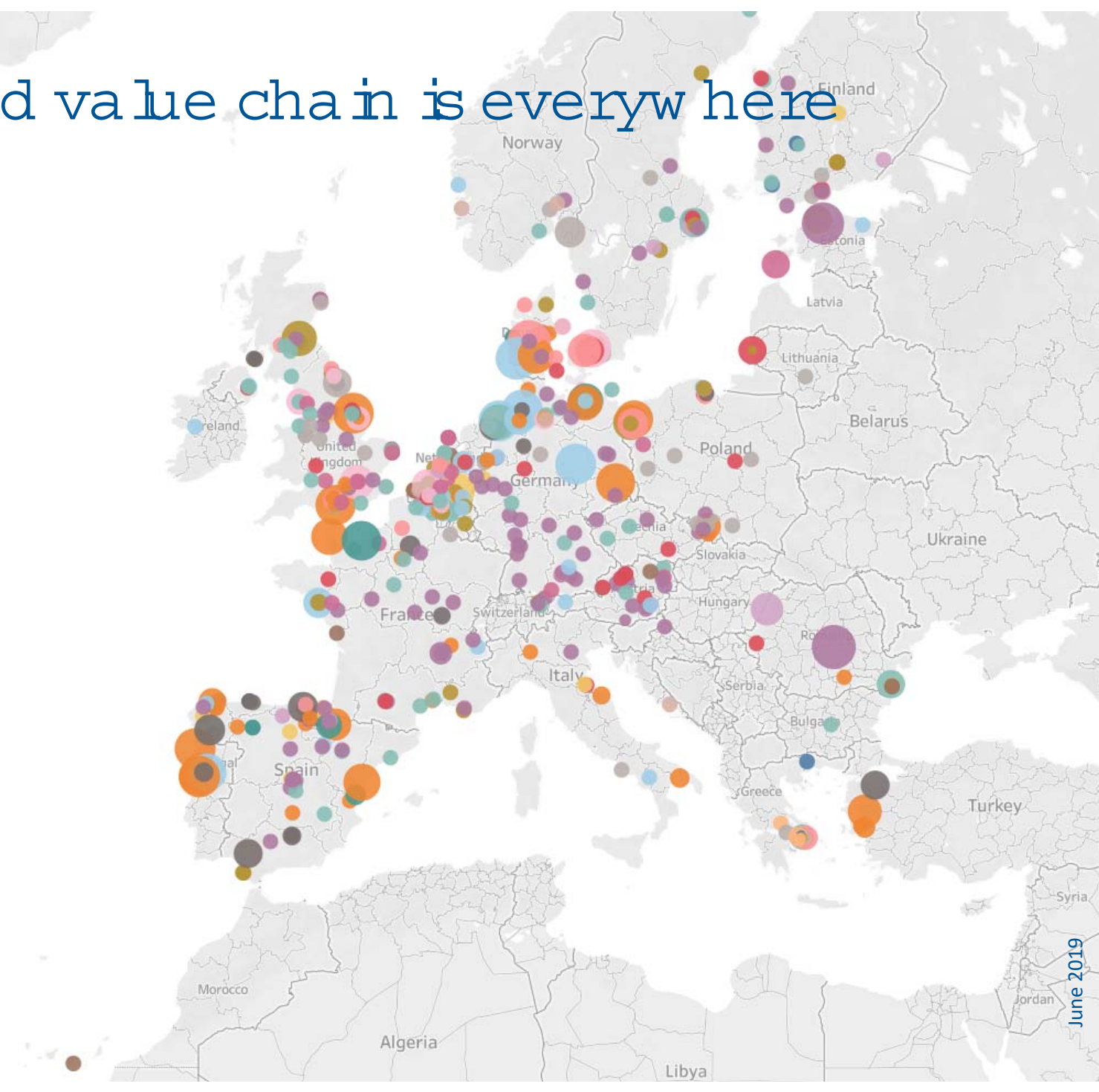
Where it's possible to repower wind farms in Germany, September 2019

- Repowering possible
- Repowering might be possible in the future
- Repowering not possible



The wind value chain is everywhere

- Components
- Assembly
- Blades
- Foundations
- Gearboxes
- Nacelles
- O&M
- Other
- R&D
- Towers
- Cables
- Generators
- Logistics
- Port



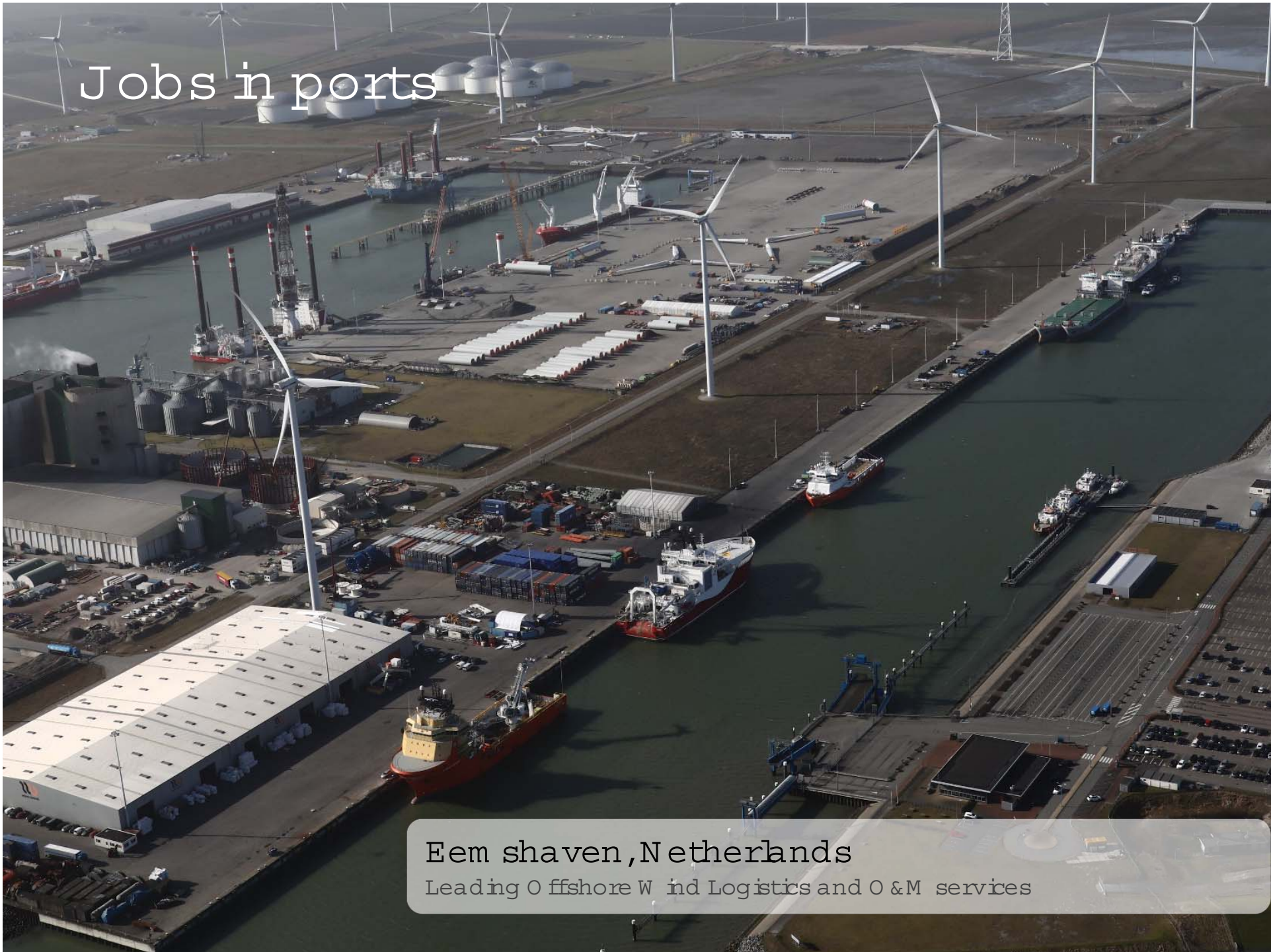
Jobs in construction



Jobs in ports

Eemshaven, Netherlands

Leading Offshore Wind Logistics and O&M services



Jobs in offshore installations



Jobs in logistics



Jobs in danger

>300,000

38,000

THANK YOU

Wind[•]
EUROPE

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