



# Offshore wind outlook

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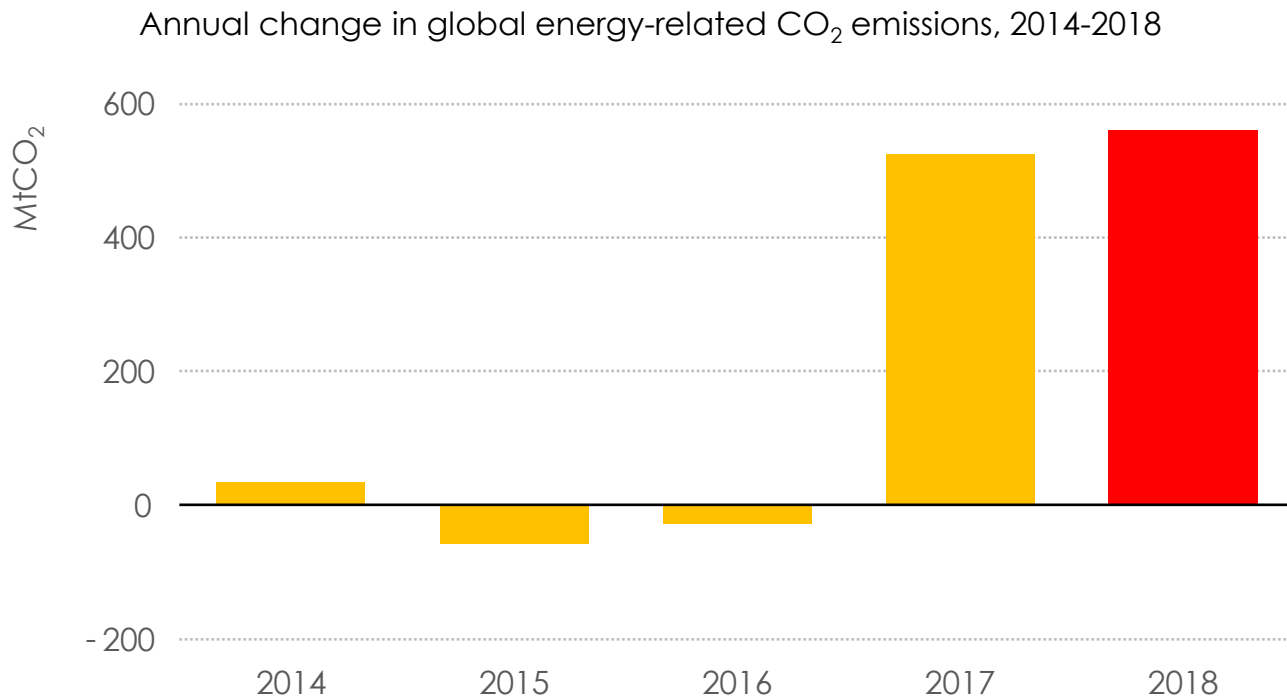
Copenhagen, 25 October

# Context

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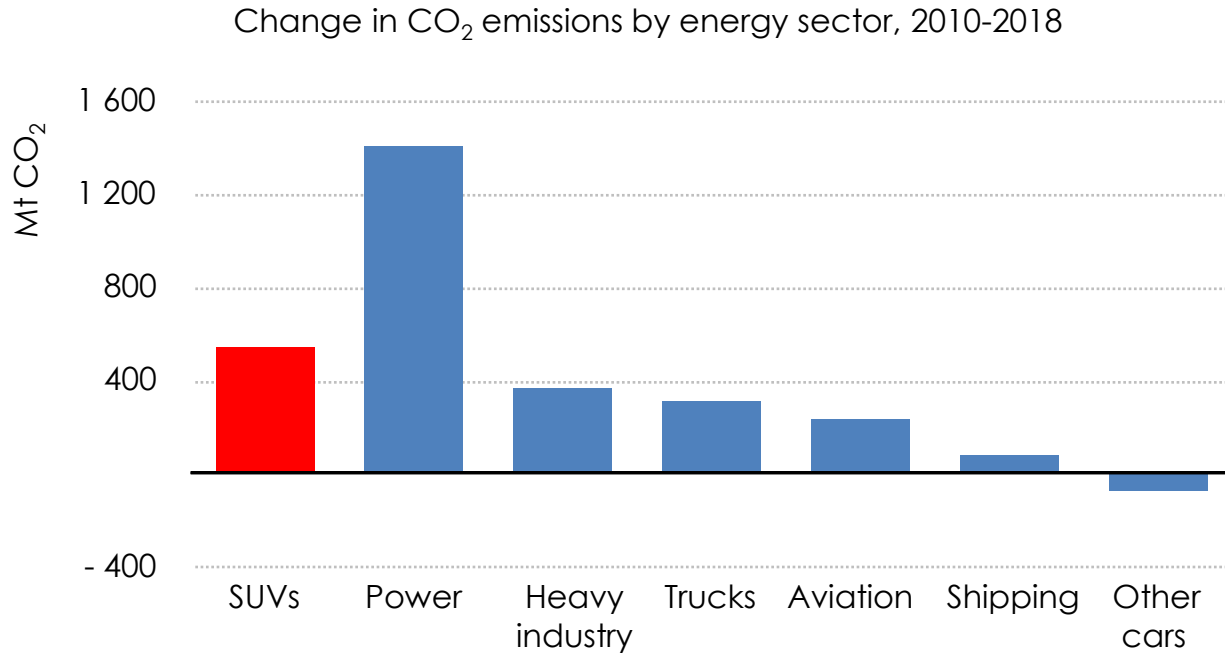
- There is a growing disconnect between climate ambitions and real-life energy and emission trends
- There is no single and simple solution to address environmental challenges: renewables, efficiency, CCUS & other technologies are all required, but most of them are off track
- Offshore wind power provided 0.3% of global electricity supply in 2018, but the market has grown by almost 30% per year since 2010, second only to solar
- This *World Energy Outlook* special report is the most comprehensive global study on offshore wind to date and includes:
  - New global assessment of offshore wind's potential, based on the latest satellite data and turbine designs
  - Country analysis of competitiveness with other sources of electricity
  - Its role within the entire energy system and global energy transitions

# Energy-related CO<sub>2</sub> emissions hit a record high...



The need to accelerate clean energy transitions is underscored by recent data: CO<sub>2</sub> emissions rose for a second year in a row in 2018 to reach a record high

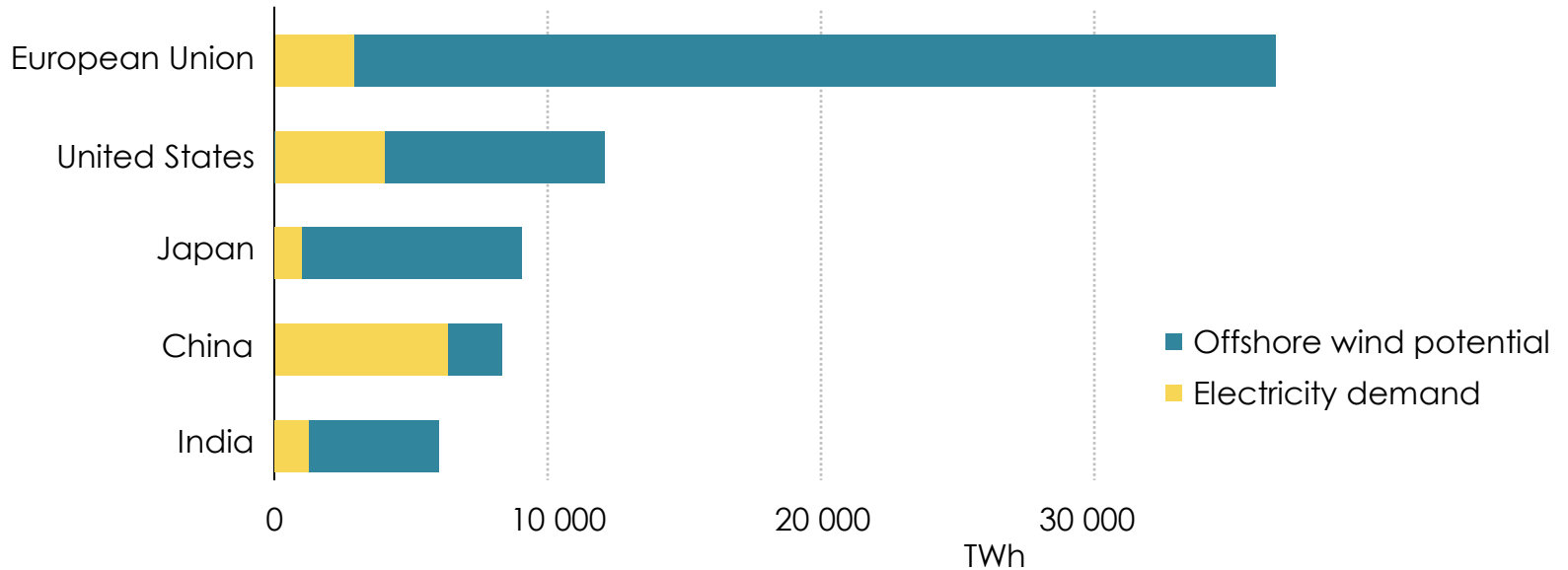
# The rise of SUVs challenges emissions reduction efforts



SUVs were the second-largest contributor to the increase in global CO<sub>2</sub> emissions since 2010. They are taking over the roads, as they have increased from 35 million in 2010 to over 200 million in 2018.

# Offshore wind has huge untapped potential

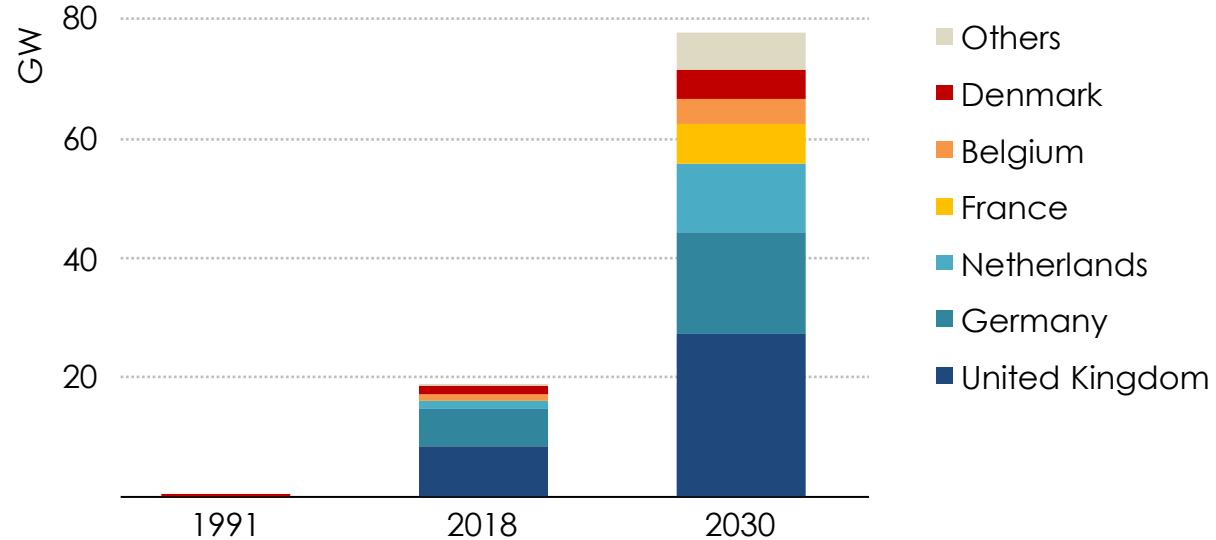
Offshore wind technical potential and electricity demand in 2018



Based on the latest satellite data on wind speed and new turbine designs, offshore wind has vast potential. It is capable of generating more than 18-times global electricity demand today.

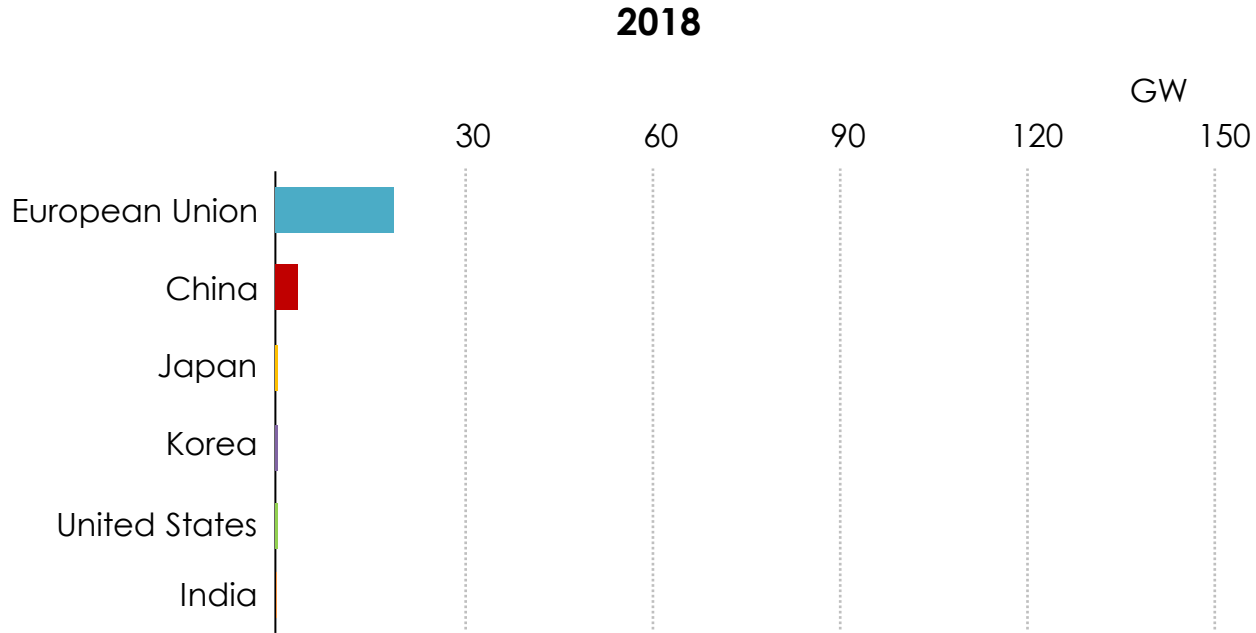
# Europe is the technology leader for offshore wind

Offshore wind capacity by country



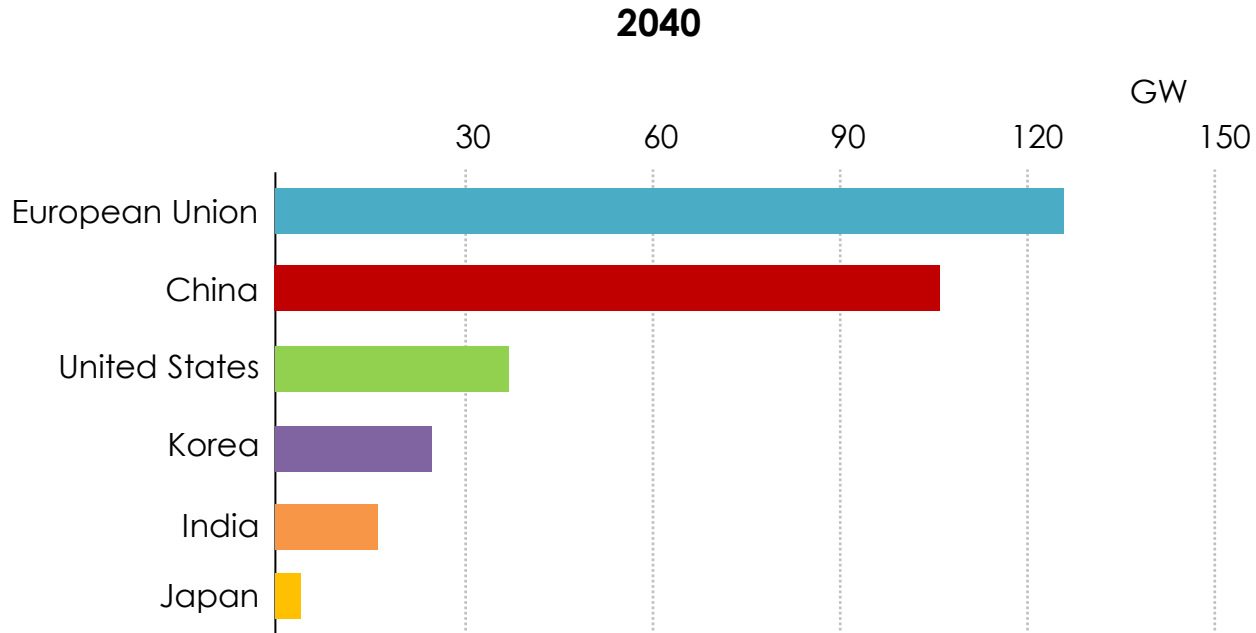
Europe has fostered the development of offshore wind technology over the past three decades and with current policies it is set to quadruple its capacity by 2030

# Offshore wind capacity is set to grow around the world



While European Union continues to be in the driver's seat through to 2040, China moves strongly forward and many new markets gain more than a foothold

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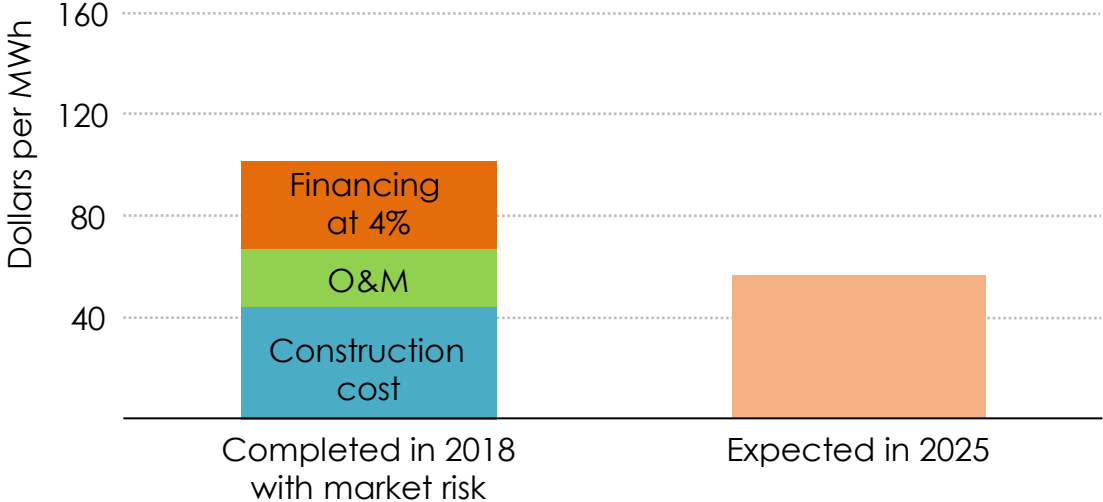


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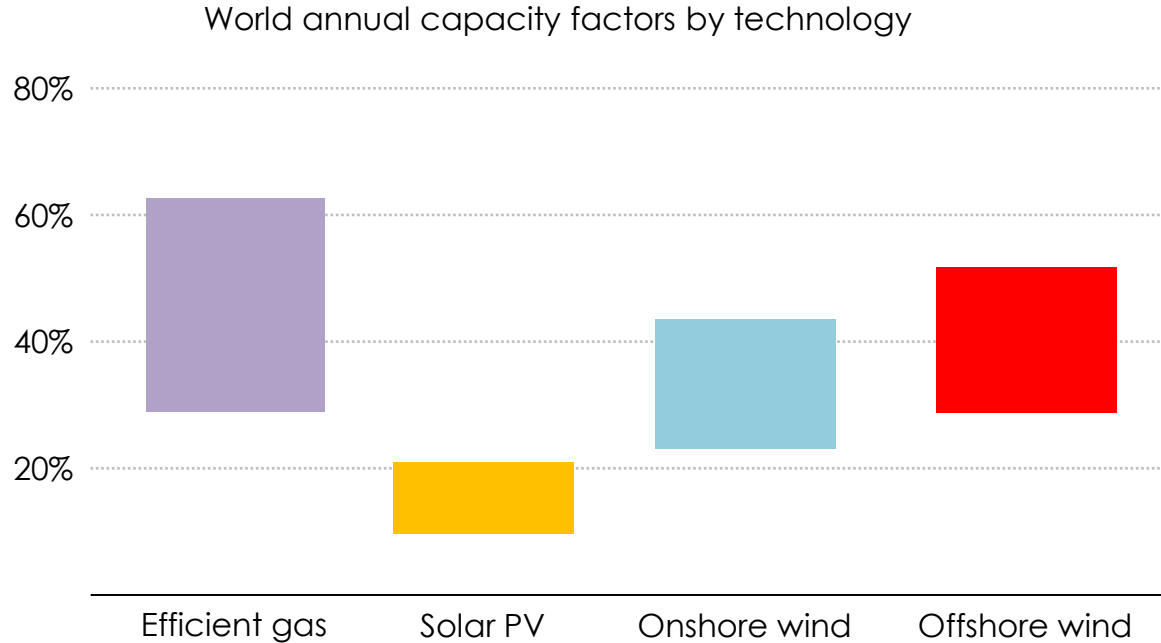
# Right policy frameworks support offshore wind's competitiveness

Global offshore wind average generation costs



Bigger turbines, technology learning and low financing costs are driving down costs of new projects. Policy frameworks enabling low-cost financing are essential to drive offshore wind towards competitiveness.

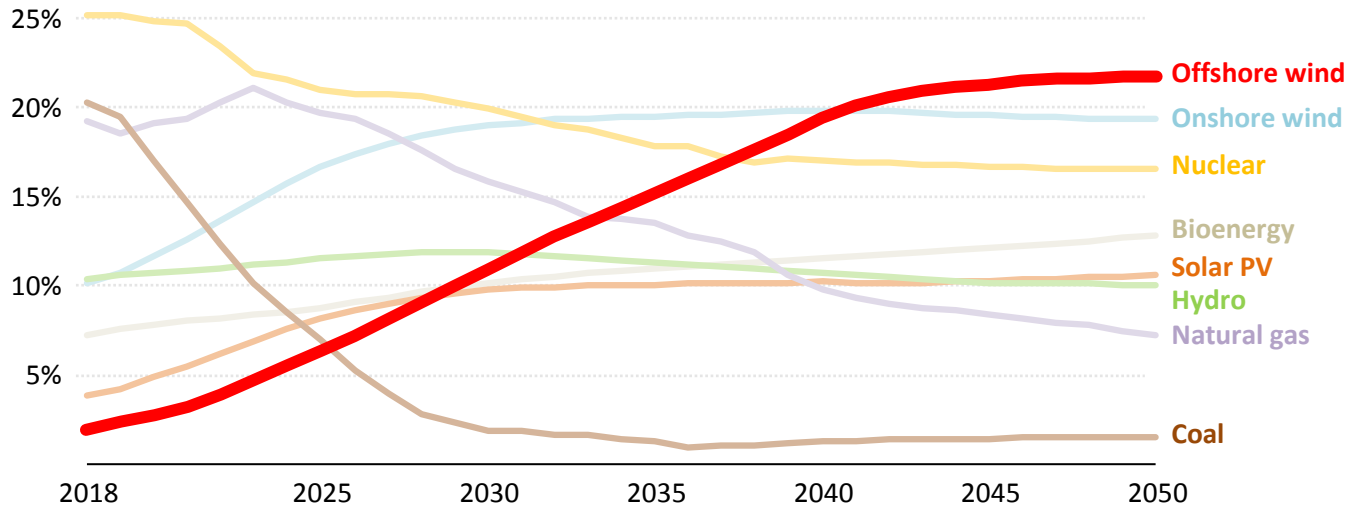
# Technology improvements are raising wind offshore's productivity



New offshore wind projects have high capacity factors that are on par with efficient gas in several regions, though offshore wind is not always available to meet demand.

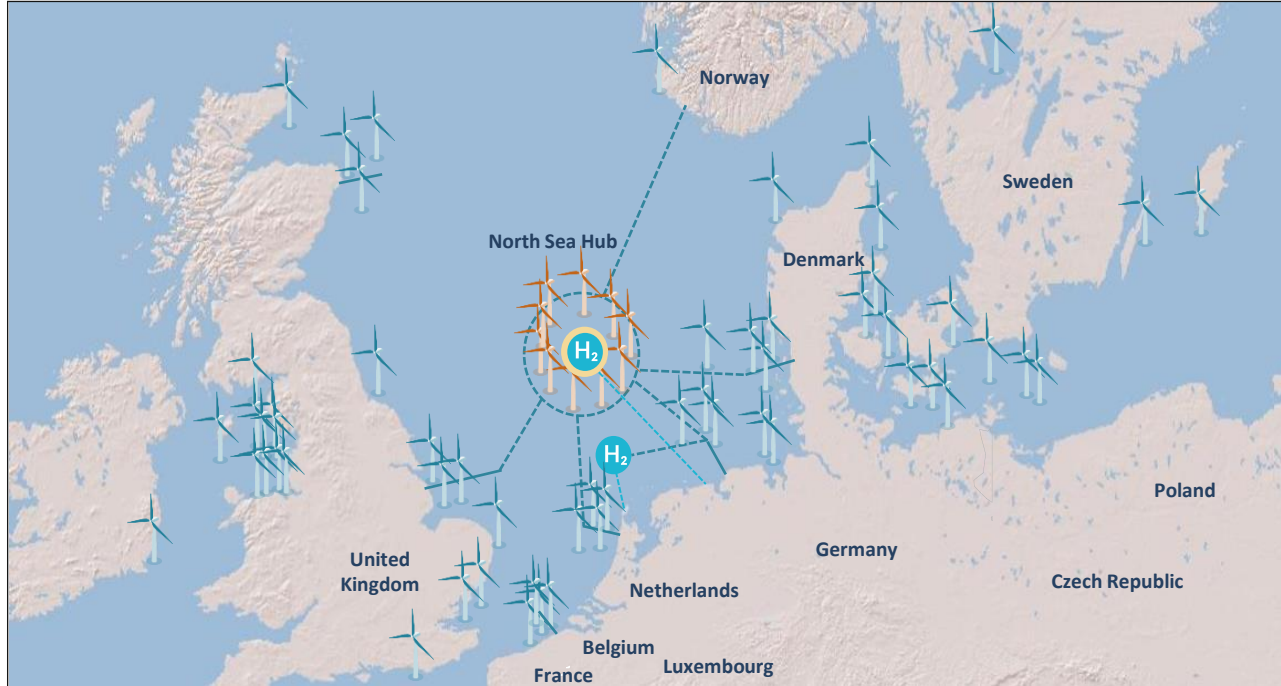
# A carbon neutral Europe puts offshore wind in front

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

# Offshore wind is well suited for hydrogen production



Decarbonisation of heat and transport could further increase demand for hydrogen, opening new market opportunities for offshore wind

# Conclusions

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- Offshore wind is set to be a \$1 trillion industry over the next two decades, but the promise of growth hinges on government policies and industry strategies
- Policy makers need to provide long-term visibility for supply chains to be efficient, and need to manage maritime planning and onshore grid development
- Offshore wind can become one of the most competitive sources of electricity if market conditions are right and technology cost reductions materialise
- Offshore wind contributes to electricity security and makes energy transitions more affordable. Hydrogen and further innovations, such as floating turbines, expand opportunities
- The IEA will continue to focus on “all fuels and all technologies” to provide the world’s best energy data, independent & rigorous analysis & real-world solutions

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