



Offshore wind outlook

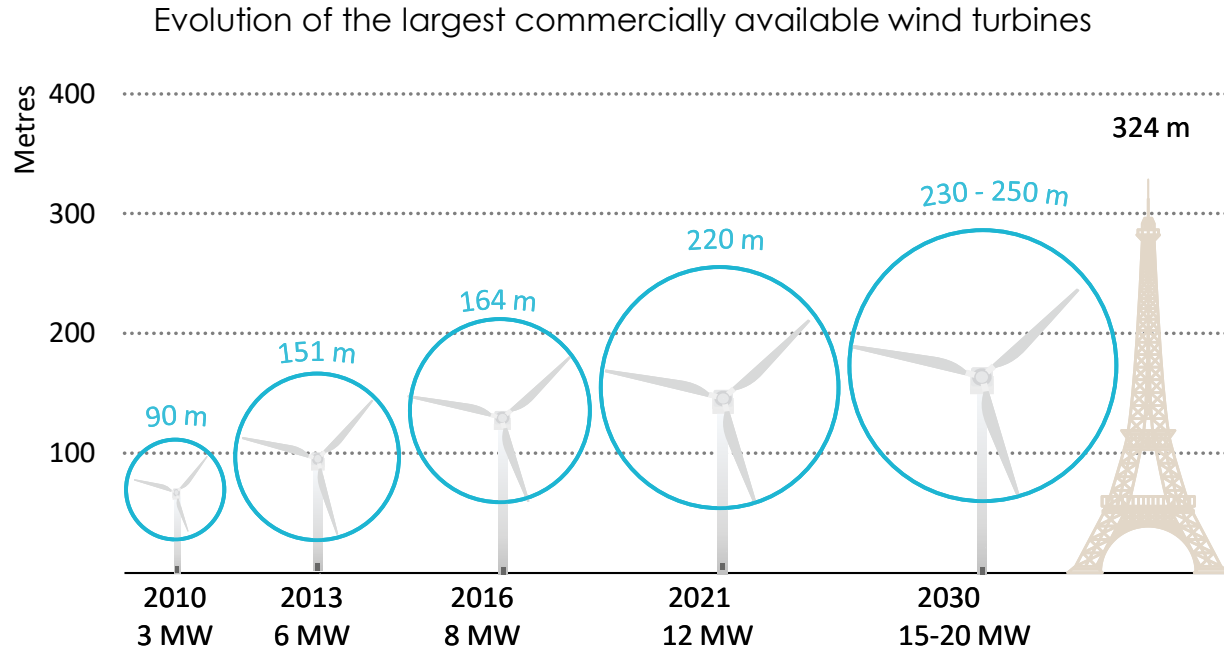
7 October 2020, OFATE | DFBEW Online Seminar

Brent Wanner, Lead of Power Sector Modelling and Analysis, World Energy Outlook

Context

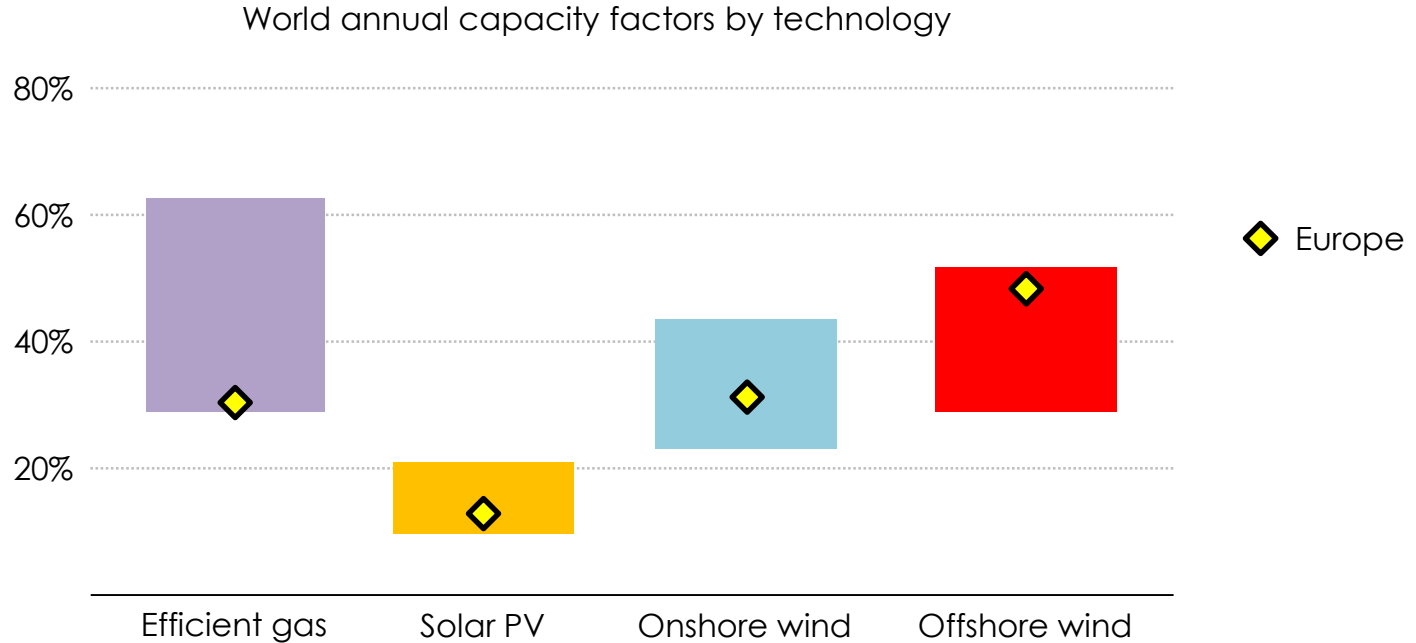
- Covid-19 is creating the largest economic crisis since the great depression, global GDP is expected to decline by at least 6% in 2020 and 300 million jobs are at risk.
- Global CO₂ emissions are set to fall by around 8% in 2020, but previous recoveries from economic crises have been accompanied by large jumps in emissions.
- There is no single and simple solution to address environmental challenges: renewables, efficiency, CCUS & other technologies have roles to play, but most of them are off track
- Offshore wind power provided 0.3% of global electricity supply in 2019, but the market has grown by almost 30% per year since 2010, second only to solar
- The IEA Offshore Wind Outlook is the most comprehensive global study to date and includes:
 - New global assessment of offshore wind's potential, including the latest satellite data and turbine designs
 - Offshore wind's competitiveness with other sources and its role in clean energy transitions

Offshore wind technology continues to mature



Technology advances enabled offshore wind turbines to become much bigger in just a few years and are supporting ongoing increases in scale.

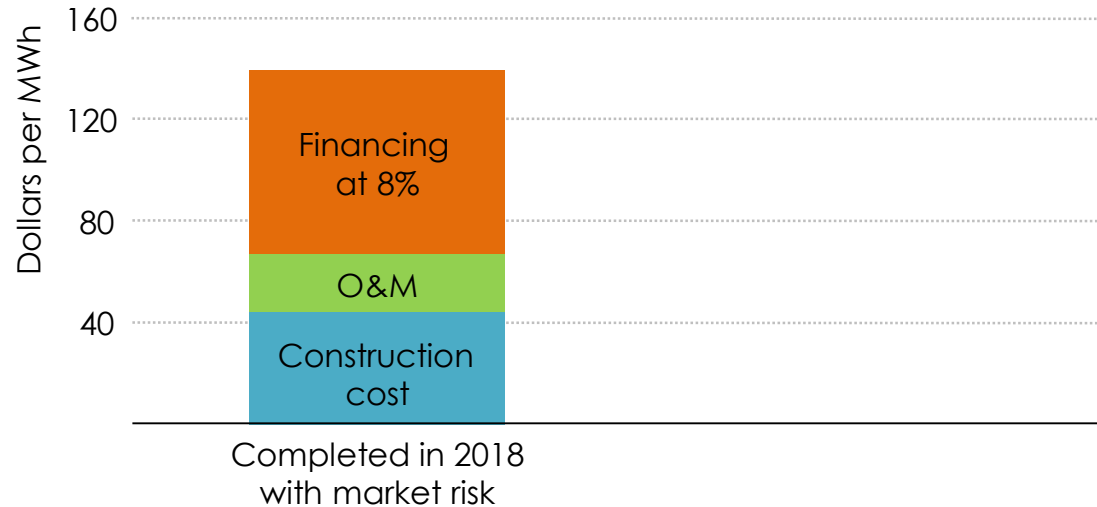
Technology improvements are raising wind offshore's productivity



New offshore wind projects have high capacity factors that are on par with efficient gas in several regions, and the seasonal patterns of offshore wind are complementary with solar PV.

Right policy frameworks support offshore wind's competitiveness

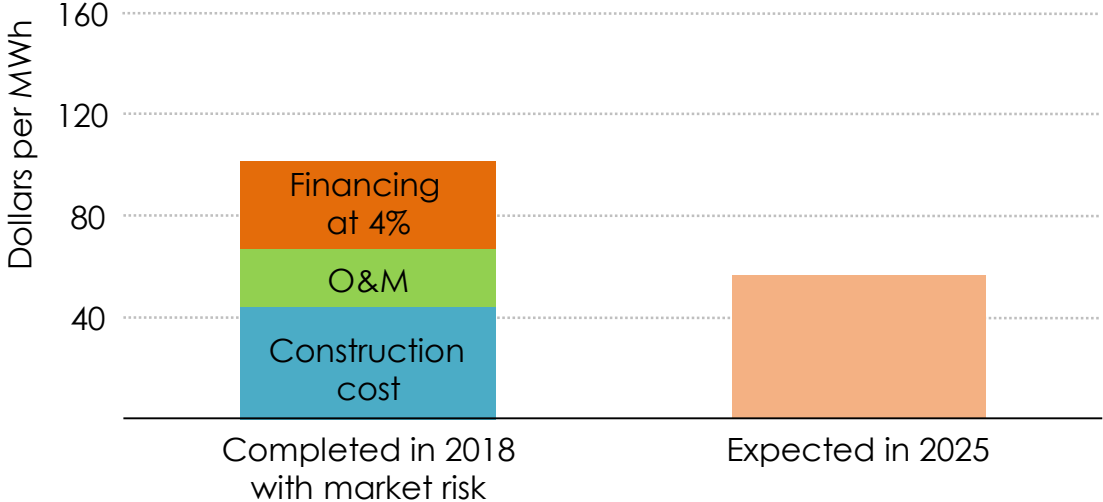
Global offshore wind average generation costs



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.

Right policy frameworks support offshore wind's competitiveness

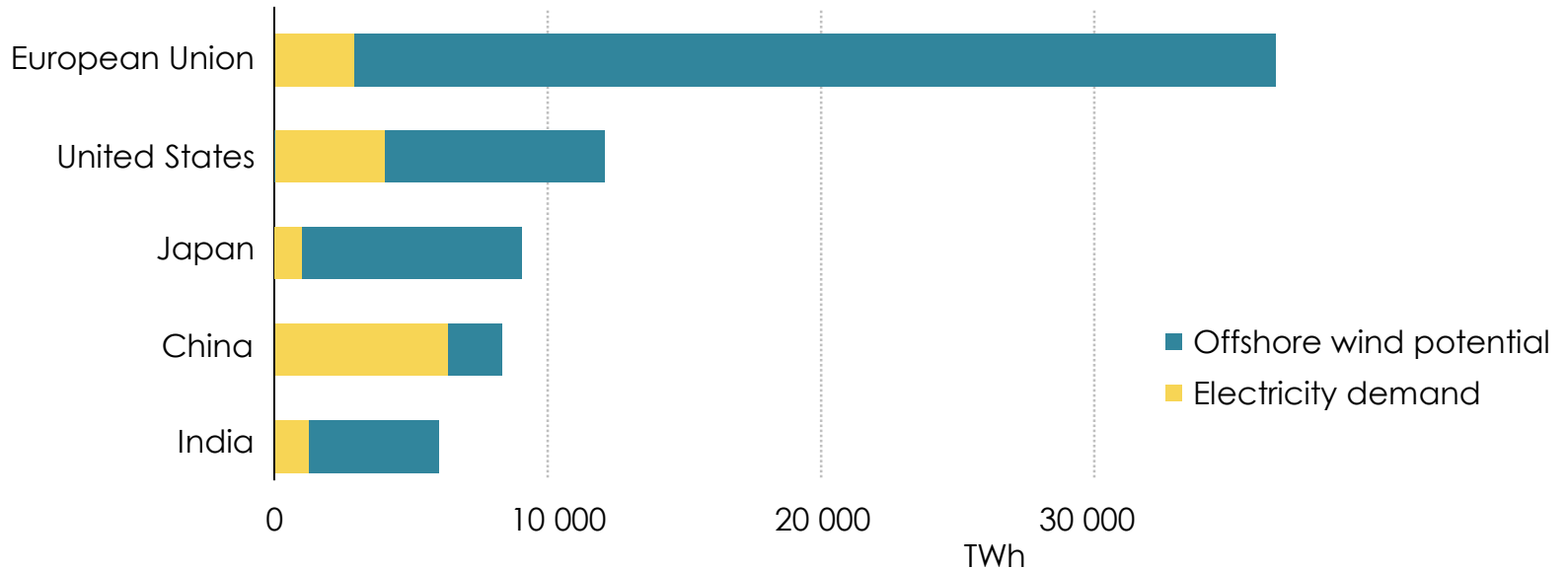
Global offshore wind average generation costs



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Offshore wind has huge untapped potential

Offshore wind technical potential and electricity demand in 2018



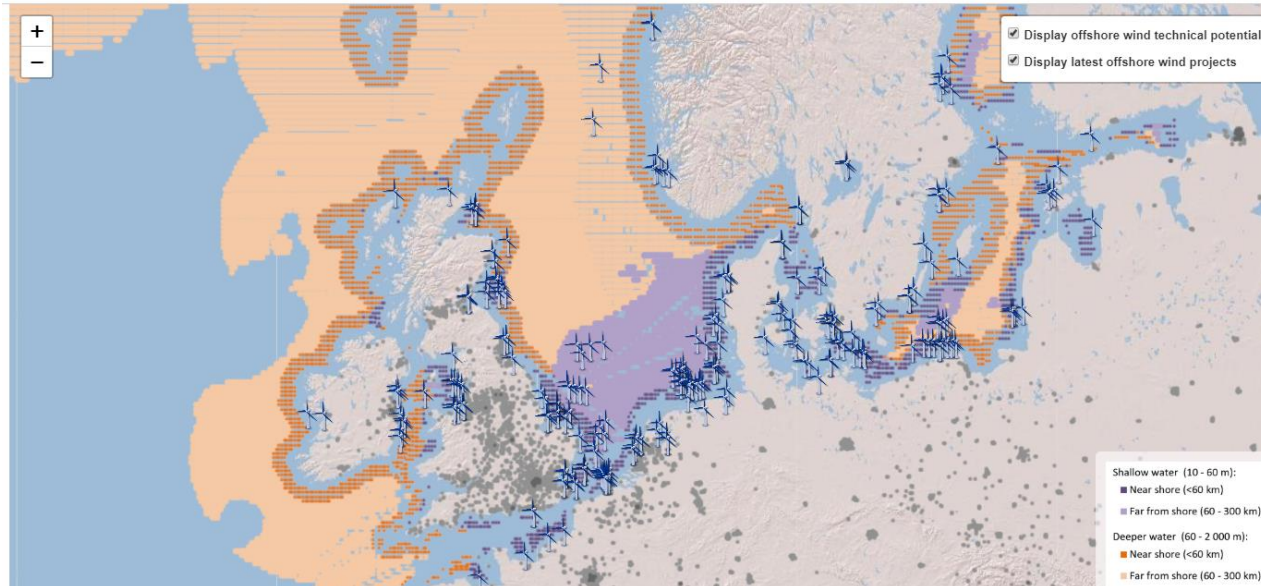
Based on the latest satellite data on wind speed and new turbine designs, offshore wind has vast potential. It is capable of generating more than 18-times global electricity demand today.

Offshore wind has huge untapped potential

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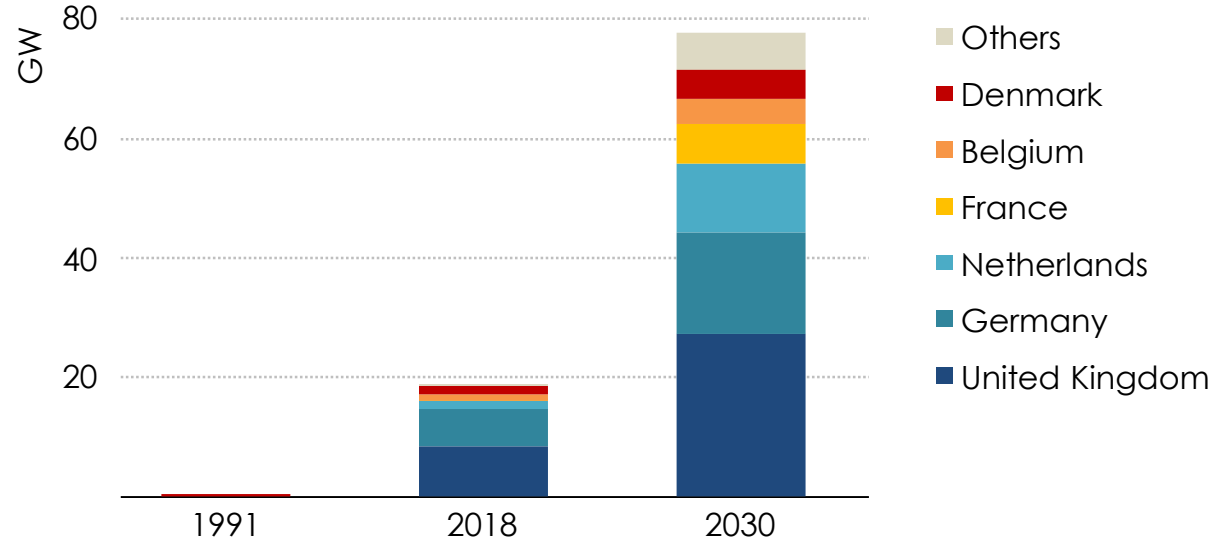
Geospatial analysis

The IEA has undertaken a detailed assessment of the technical potential for offshore wind development in collaboration with Imperial College London. Our interactive map features offshore wind technical potential, classified by water depth and distance from shore, the latest offshore wind projects, and population density. See below for a description of the methodology used to produce this unique online resource.



Europe is the technology leader for offshore wind

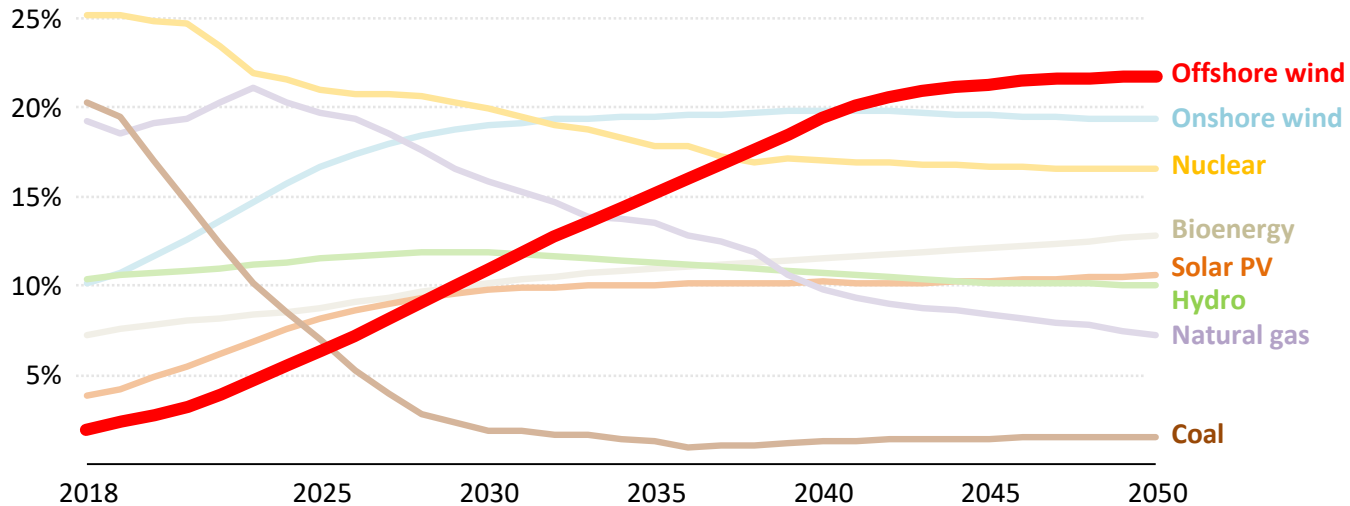
Offshore wind capacity by country



Europe has fostered the development of offshore wind technology over the past three decades and continues to lead the way to a \$1 trillion global industry to 2040

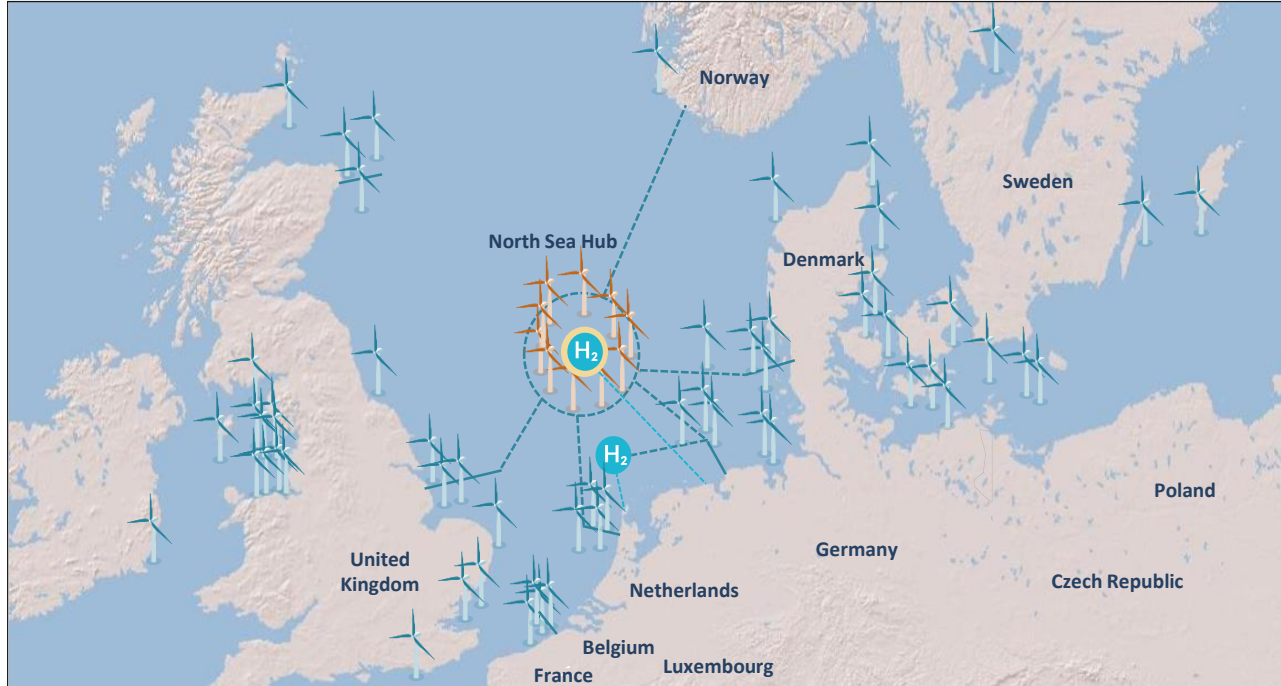
A carbon neutral Europe puts offshore wind in front

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

- 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 is fast becoming one of the most competitive sources of electricity, and has the potential to play a starring role in Europe's clean energy transition
- 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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