



WHEN TRUST MATTERS

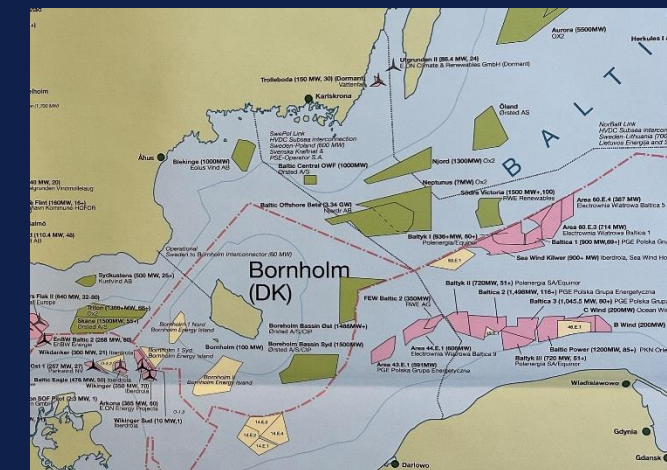
# No energy transition without energy transmission!

- An Outside-In perspective on the offshore wind sector and expectations for global growth in RE

Baltic Energy Island Summit 2024

Kim Sandgaard-Mørk

Global EVP for Renewables Certification  
Managing Director DNV Denmark



# Purpose to safeguard life, property and the environment

160  
years

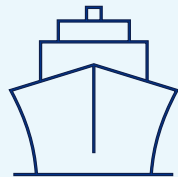
15,000  
employees

100,000  
customers

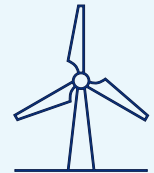
100+  
countries

5%+  
of revenue in R&D

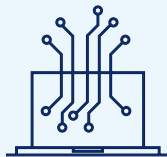
Ship and offshore  
classification and advisory



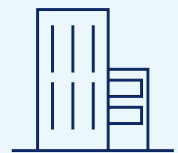
Energy advisory, certification,  
verification, inspection and  
monitoring



Software, cyber security,  
platforms and  
digital solutions



Management system  
certification, supply chain and  
product assurance



# The world's leading resource of independent energy experts and technical advisors

**5,000 experts**

provide local access to global best practice delivering safe and effective energy systems

**90+ years**

servicing the energy industry, including the wind, solar, power grids, hydrogen, storage and oil and gas sectors

**24**

laboratories and test centres including facilities for full-scale testing

**170**

industry standards, guidelines and recommended practises, and approx. 30 joint industry projects per year

**65%**

of offshore pipelines designed and installed to DNV standards

**60 GW**

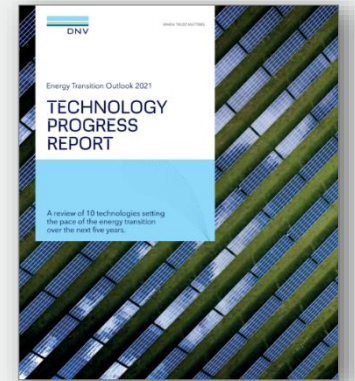
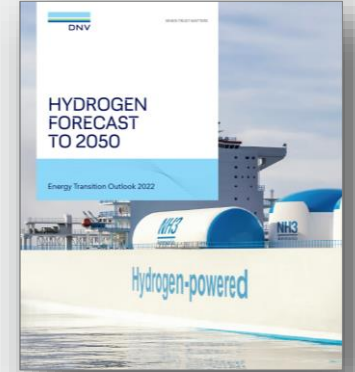
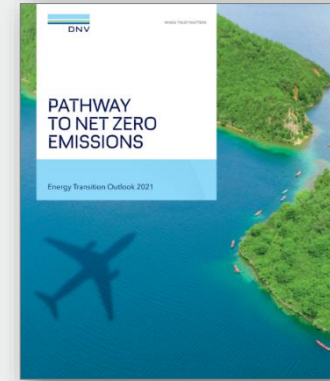
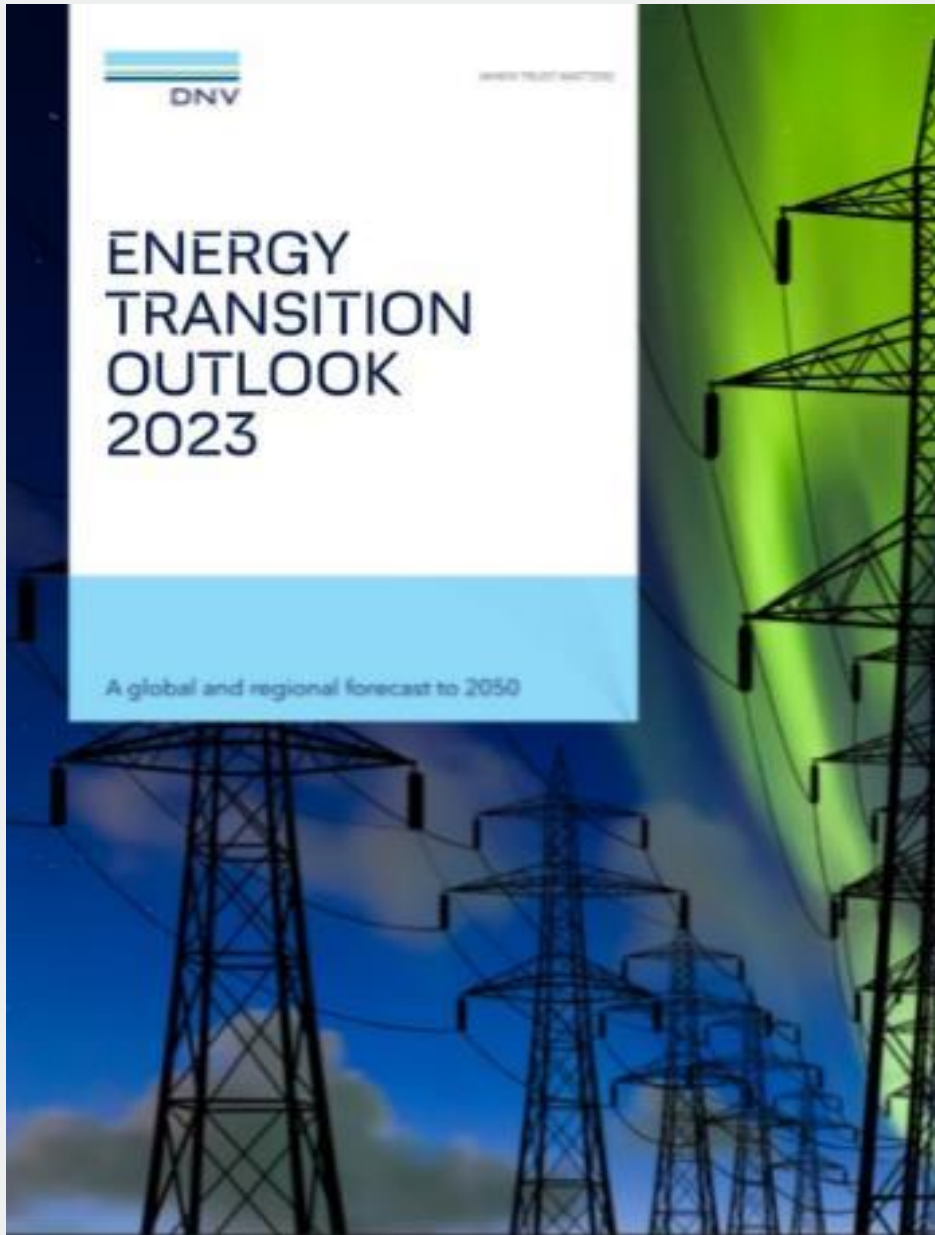
of real-time operational data from solar PV, wind and storage assets under management

**75%**

of the worlds Offshore Windfarms Certified by DNV

**World 1<sup>st</sup>**

hydrogen full-scale testing facility supporting safety, infrastructure and policy



Go to: [eto.dnv.com](https://eto.dnv.com)



**Dedicated research unit**  
focusing on researching,  
modelling and forecasting  
the energy transition

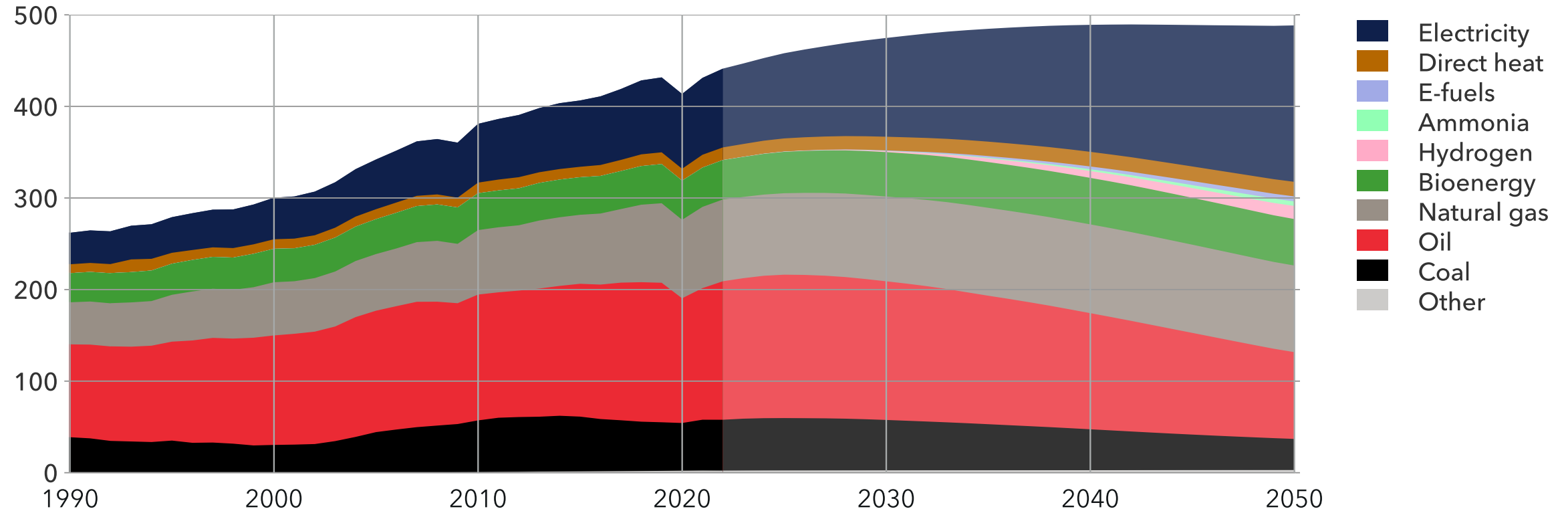
**100+ internal experts**  
from 20 different countries  
across supply and  
demand sectors and  
geographies

**External contributors**  
in business and academia  
and dialogue and  
exchange with a number  
of companies, institutes  
and organisations

# The share of electricity in final energy demand mix will double

## World final energy demand by carrier

Units: EJ/yr



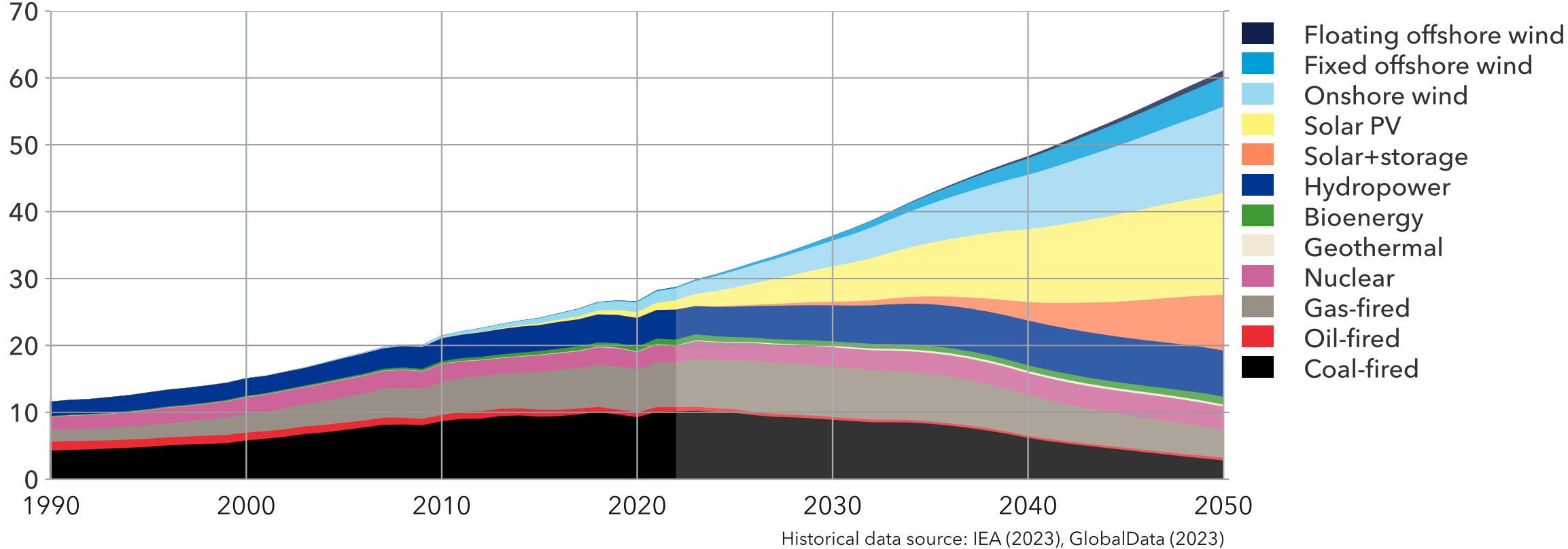
Historical data source: IEA WEB (2023)



# 68% of electricity will come from solar and wind in 2050

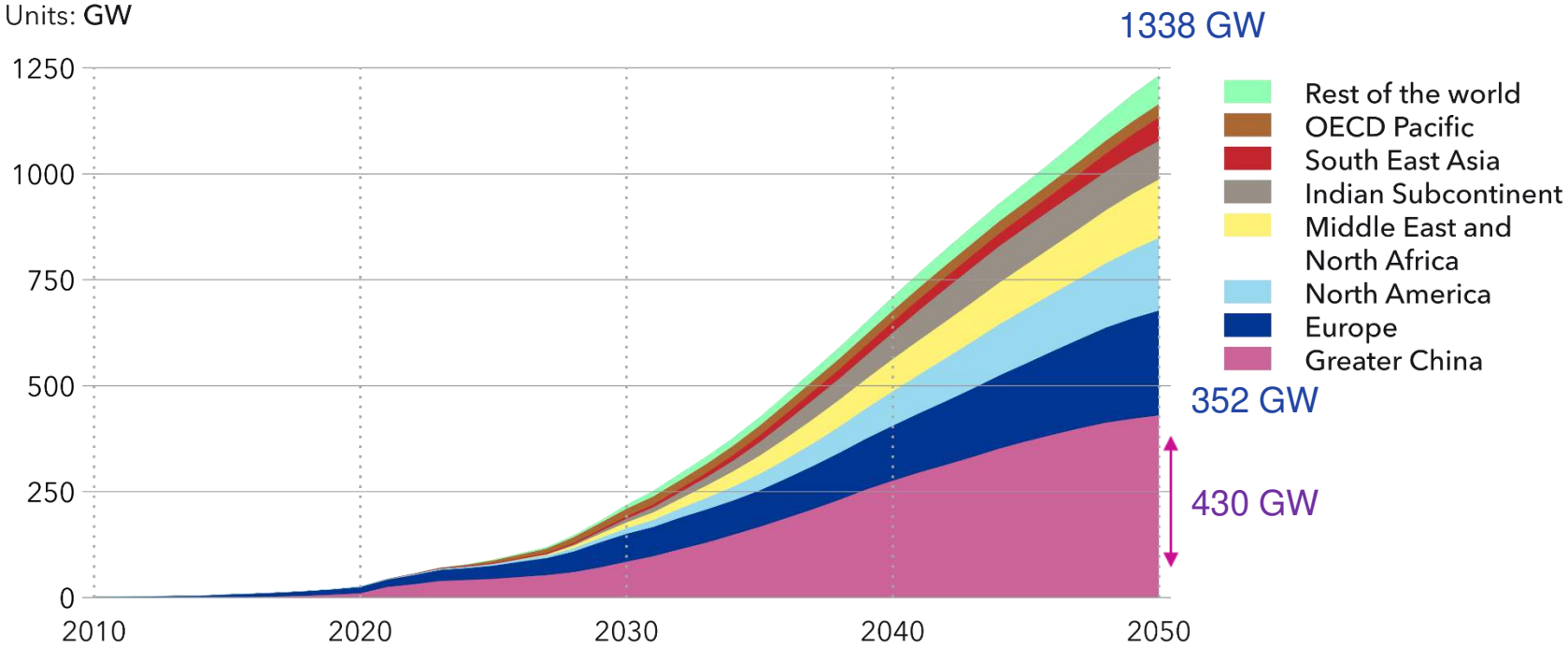
World grid-connected electricity generation by power station type

Units: PWh/yr



# Installed bottom fixed offshore wind capacity

World installed offshore wind capacity by region



©DNV 2023

Historical data source: GlobalData (2023), IRENA (2023)

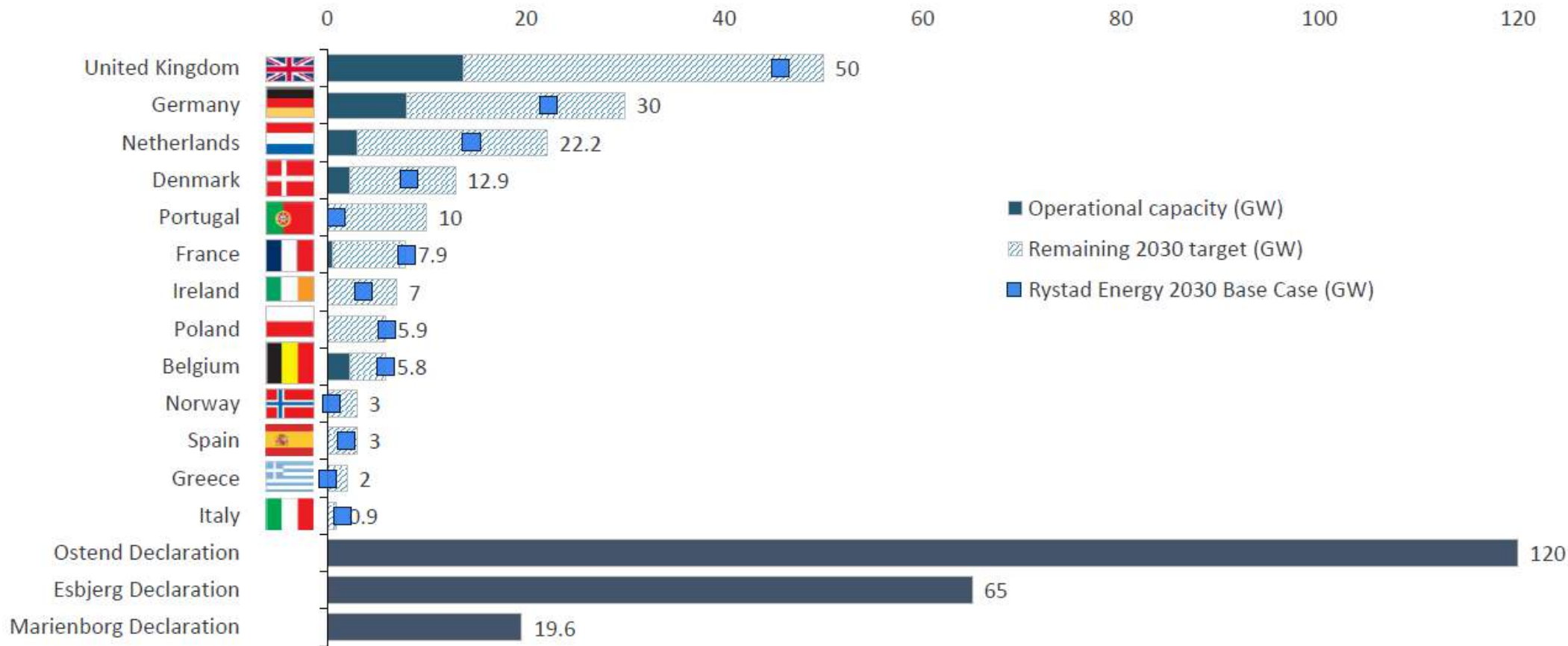


x 23 increases



# High ambitions for 2030 in Europe, but many nations expected to fall short of targets

## European operational offshore wind capacity, 2030 targets and Rystad Energy base case



\*Norway has pledged 3 GW by 2030 as part of the Ostend Declaration. France's target not official but based on their roadmap.

Source: Rystad Energy OffshoreWindCube, Rystad Energy research and analysis

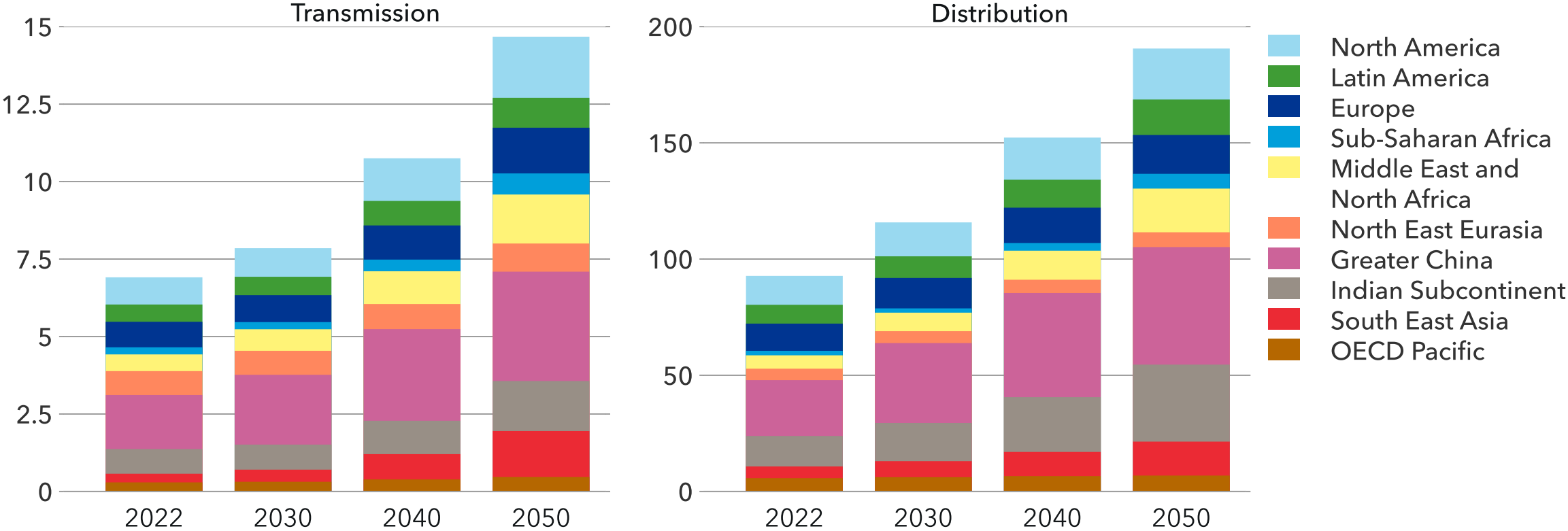
A Rystad Energy graphic



# Global grid, transmission and distribution, will have to double in length - no energy transition without energy transmission -

## Transmission and distribution power-line length by region

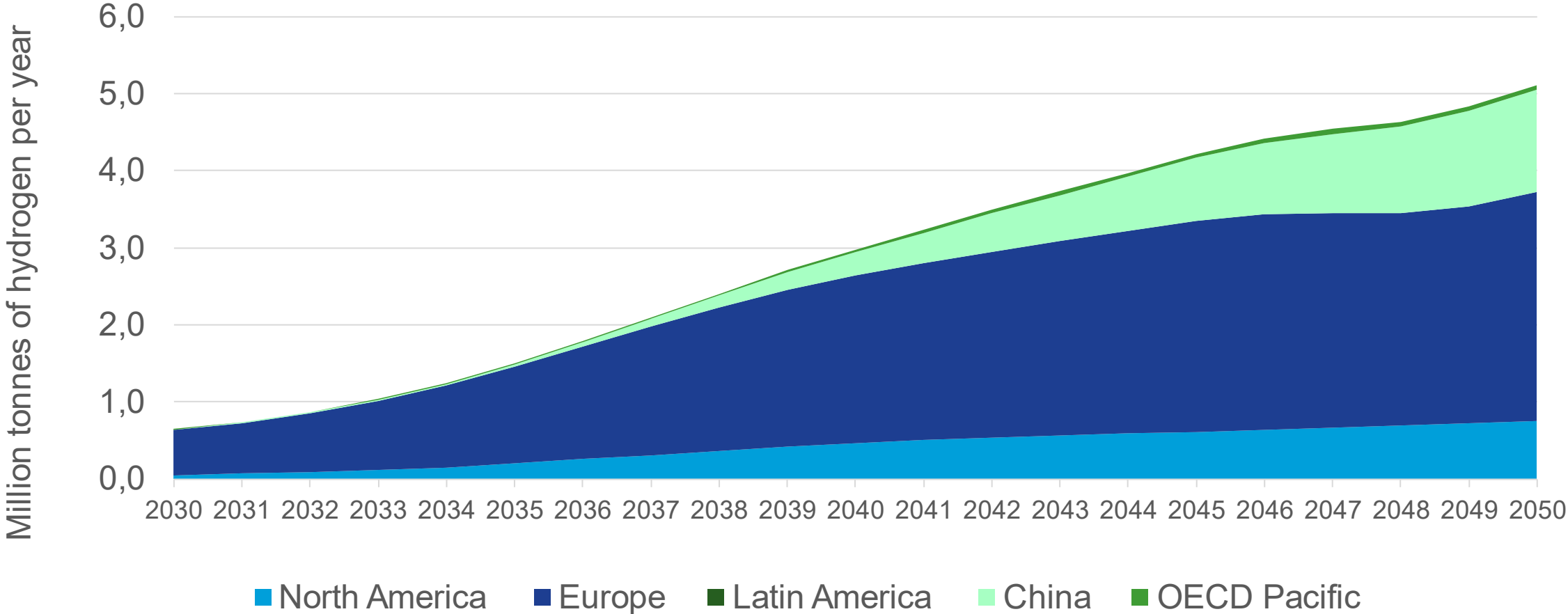
Units: Million circuit-km



Historical data source: GlobalData (2023), DNV analysis

# Forecast offshore wind to hydrogen

## Bottom Fixed Offshore Wind to Hydrogen



# Offshore renewable green hydrogen production

– Power and or gas grid connected, or off-grid?

**Centralized**

**De-centralized**

**Bottom fixed**

Energy island



Platform / Hub



Attached



Integrated



**Gas and/or power grid connected**

**Floating**

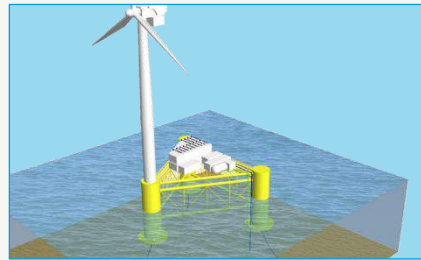
FPSO



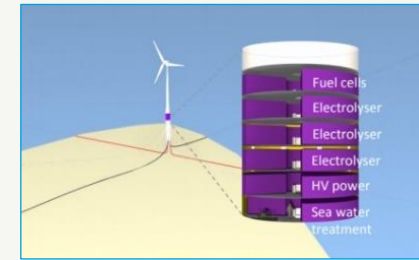
Platform / Hub



Attached



Integrated



Shipped to shore, secondary ship



Hydrogen carrier for global commodity trade



Direct use bunkering, with medium scale storage



**Off gas grid**

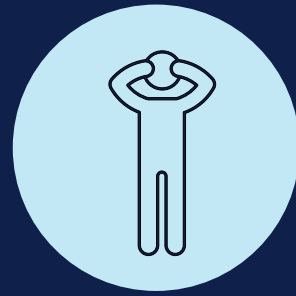
# Challenges to overcome



Cost of energy security is increasing. International collaboration is essential



Supply chain disruptions & delays in build-out of transmission lines



Battle btw turbine size and scaling. Technology and standardization is key



Make OW economically attractive. Link to H<sub>2</sub> and PtX essential

# Thank you

[ETO.DNV.COM](mailto:ETO.DNV.COM)

[Kim.Mork@dnv.com](mailto:Kim.Mork@dnv.com)

[www.dnv.com](http://www.dnv.com)

