



WHEN TRUST MATTERS

Supergen ORE: Panel Session

How do we accelerate learning and sharing of best practice in ORE through international collaboration and what is the role of the Supergen ORE Hub in providing research leadership for ORE to achieve targets for 2030, 2050 and beyond?

Ben Child, Floating Wind Business Manager UK&I

29 September 2022

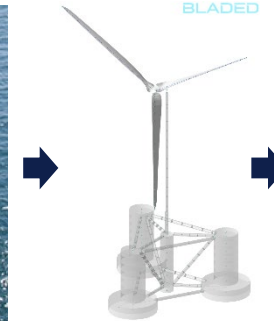
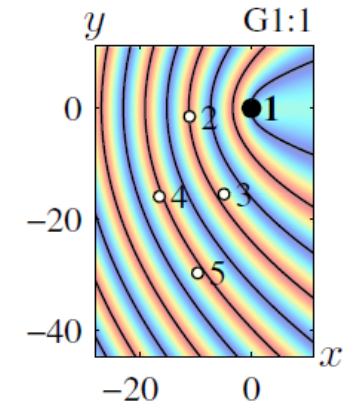
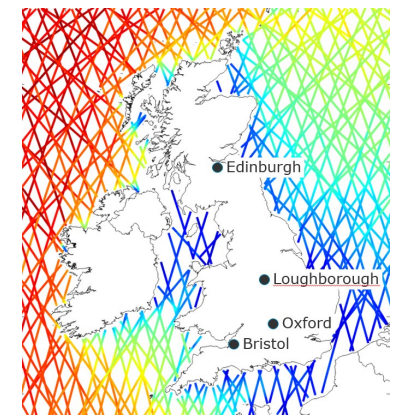
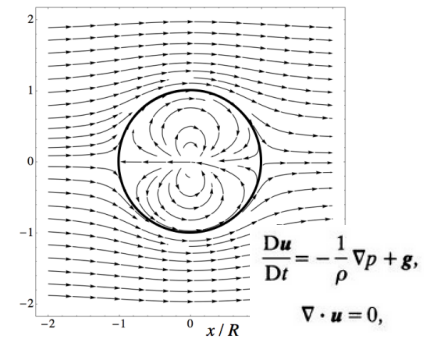


BEN CHILD

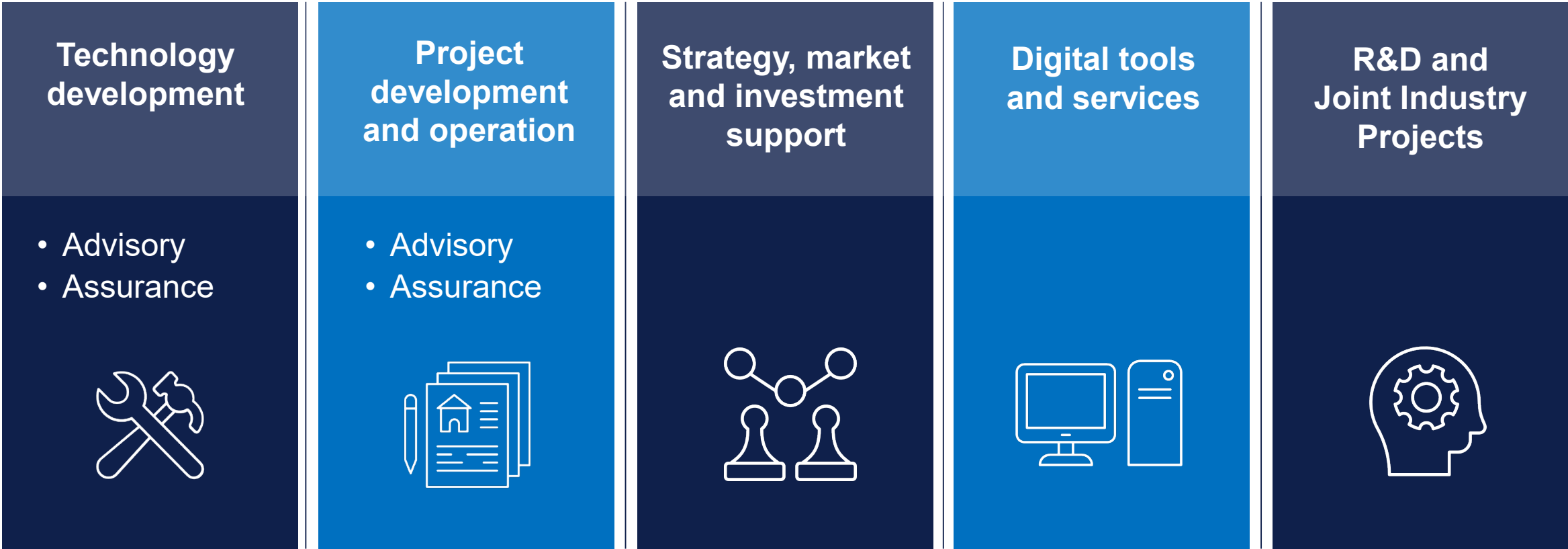
Floating Wind Business Manager, UK&I



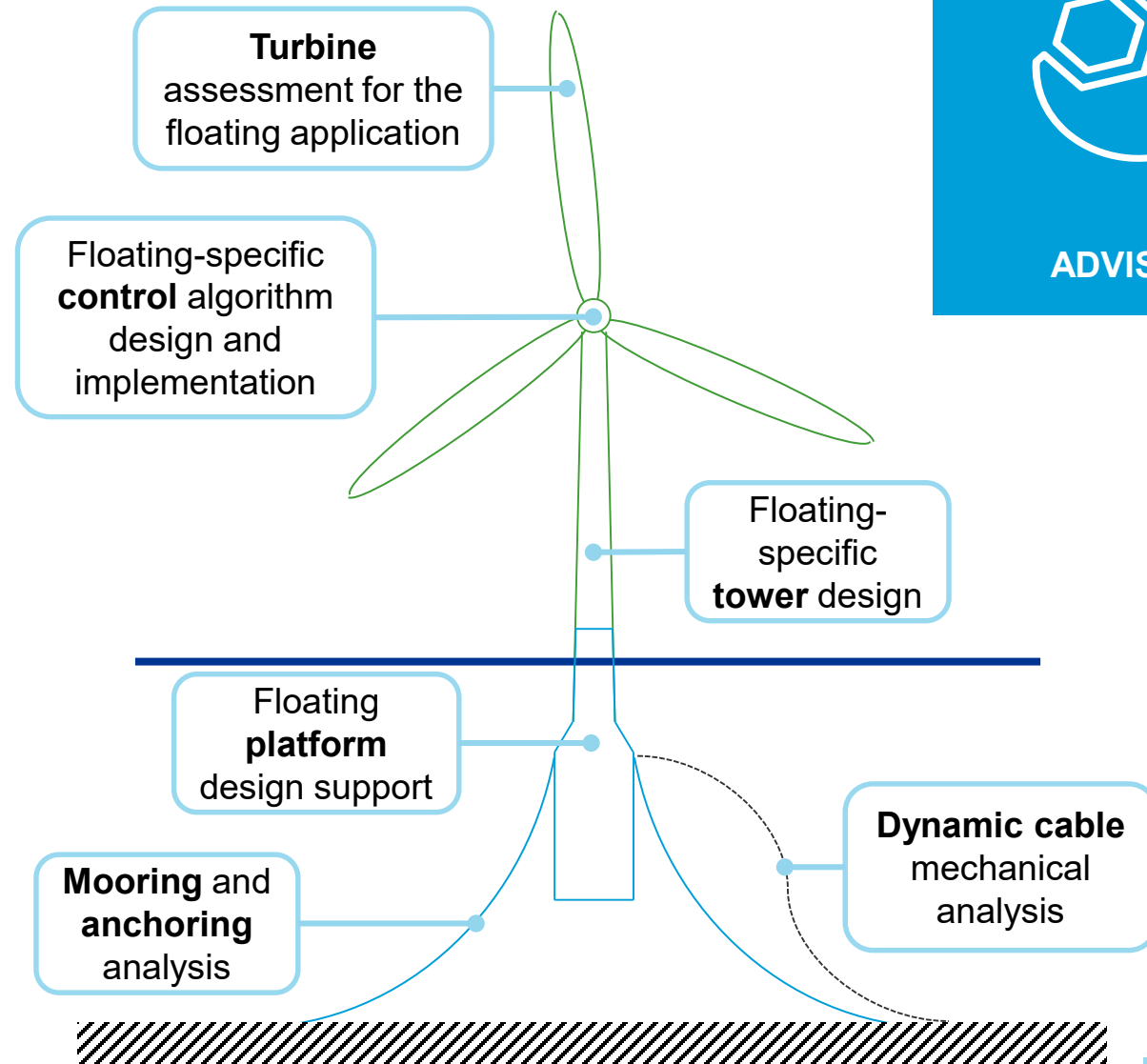
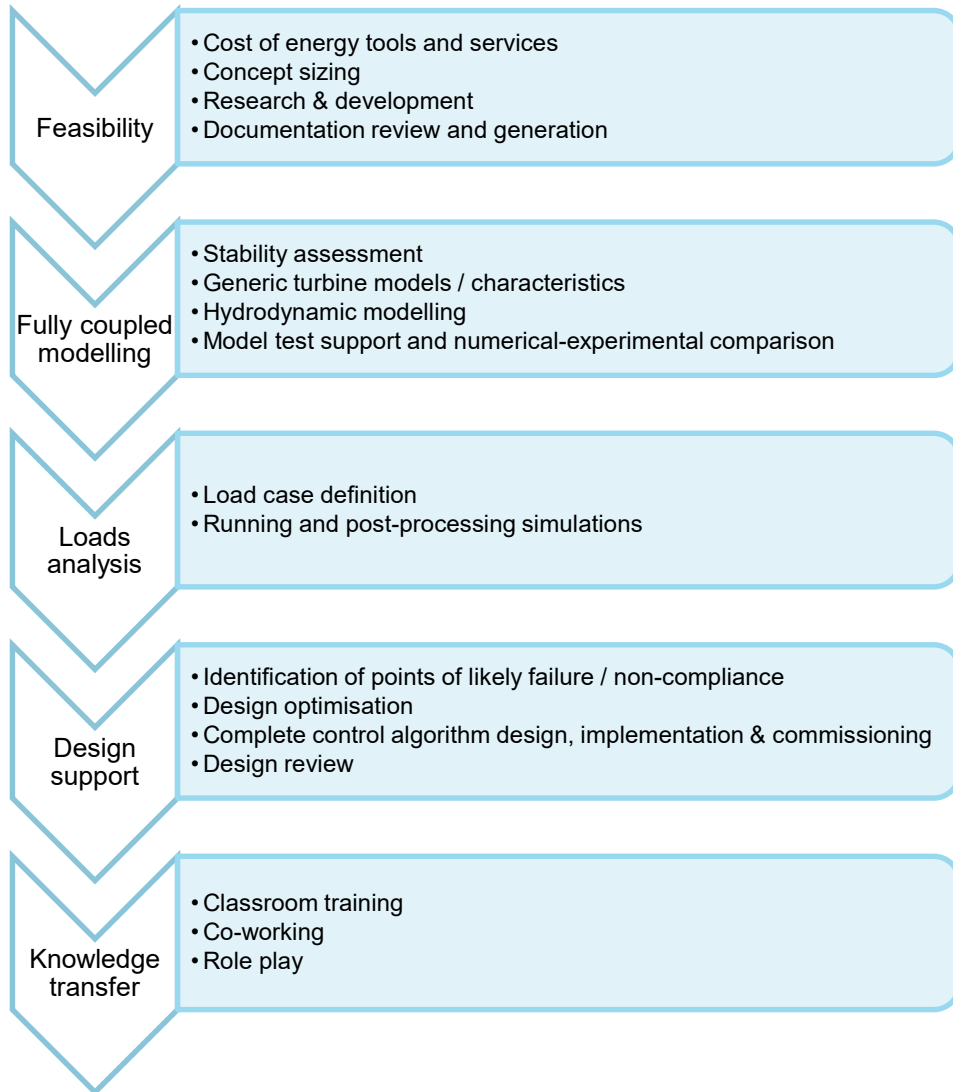
- Ben is a Principal Engineer with over 15 years' experience in the offshore renewables sector.
- Ben initially explored numerical modelling through an MSc dissertation project and later a PhD, where he established novel hydrodynamic analysis and optimisation techniques. After joining DNV (formerly Garrad Hassan), Ben applied his research to consultancy work as well as leading software development related to hydrodynamics and wave energy farms.
- Since then, he has continued to have deep involvement in research and development, addressing some of the key challenges facing floating wind energy system design. However, with a rapidly growing floating wind industry, his focus in recent years has primarily been on commercial projects, providing expert advice, analysis and design services to help get the first full-scale system concepts into the water and ensure that the next generation of concepts meet ambitious targets on performance and cost. During this time, Ben also held the role of Offshore Team Lead, managing a group of ten interdisciplinary engineers within the Turbine Engineering Section.
- He is currently Floating Wind Business Manager within the Offshore Technology Department, connecting up customers with bespoke solutions to their challenges using expertise from across the department in all of the major components of a floating wind system, as well as the wider company.



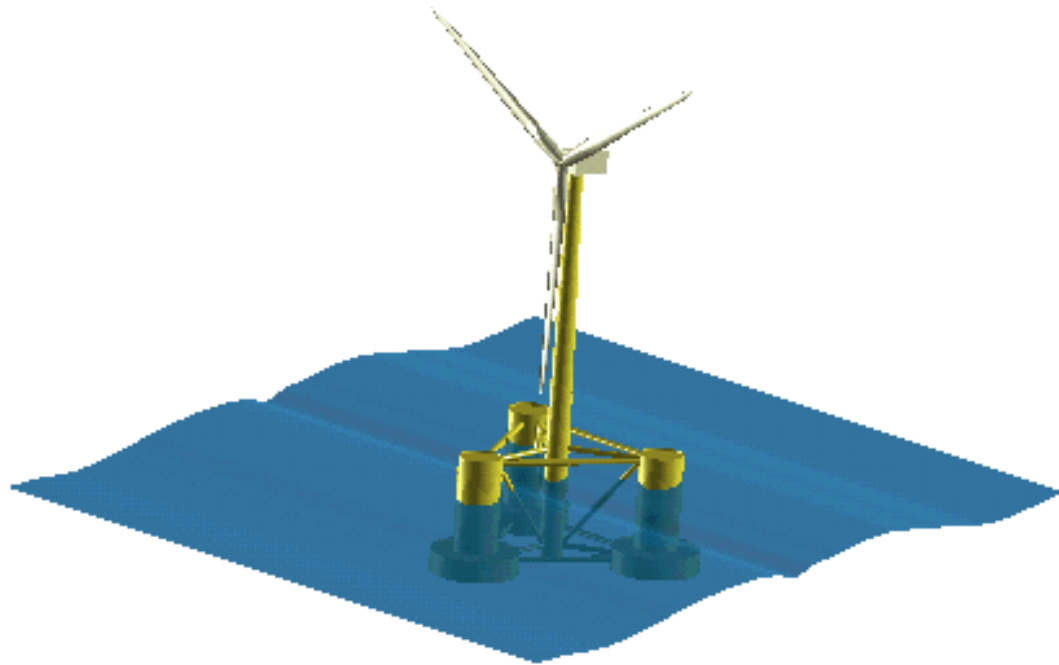
From feasibility to operation



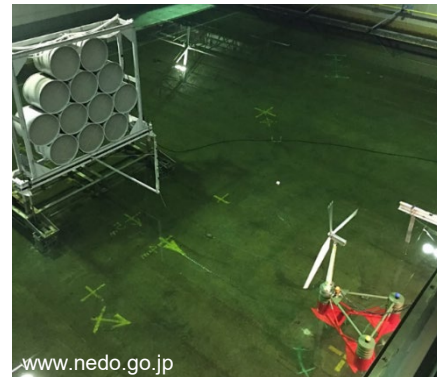
Design support from anchor to blade tip



Track Record



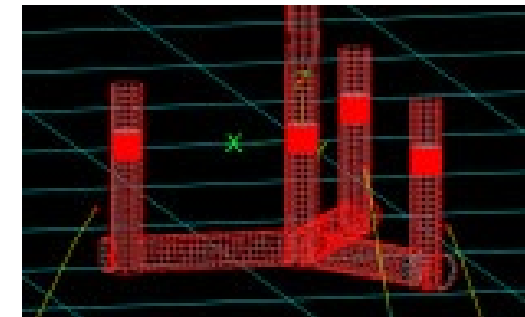
DNV has carried out 15 major floating offshore wind design projects since 2009, including design support to pioneering prototype deployments such as the FloatGen project.



DNV has completed 21 full wind turbine design projects for OEMs and provided mooring, anchoring and floating structure support to oil and gas customers over many years.



DNV has developed, tested and refined bespoke numerical models for a wide range of novel floating wind technologies based on industry leading software tools



Floating offshore wind developments in key regions

The future of floating offshore wind plays an important role in helping many regions in the world to meet their pressing climate and clean-energy goals, but which countries are moving fastest in the floating offshore wind race?



NORTH AMERICA

There are significant floating wind resources to be harnessed in US waters and floating wind can be key to the US energy transition. The U.S. Bureau of Ocean Energy Management recently unveiled its plans to hold a lease sale for Northern and Central California offshore wind capacity around September 2022. A lease sale in Oregon waters will follow in the second quarter of 2023, as part of a Biden administration program to install 30 GW of offshore wind by 2030. Floating wind development is also expected to happen on the east coast, especially in the Gulf of Maine where demonstration arrays are already under development and where commercial lease auctions are expected to be held in 2024. In the longer term, Bureau of Ocean Energy Management (BOEM) may lease additional areas further offshore in the New York Bight and in Massachusetts, which may require floating foundations.

NORWAY

Norway has had the first full-scale floating wind turbine, the Hywind demo, in operation since 2009 and currently has the world's largest floating wind farm, the 88 MW Hywind Tampen, under construction. Various floating wind technologies are also expected to be installed at the offshore deepwater testing facilities called METCentre in the next couple of years. The Norwegian government has approved offshore wind development in two coastal areas: Utsira Nord (1.5 GW) and Sørige Nordsjø II (3 GW). The average water depth at Utsira is 267 m and only suitable for floating wind. Sørige Nordsjø II has an average water depth of 60 m with areas suitable for both floating and bottom-fixed wind. More than eight companies and consortia have published their intentions to bid for Utsira Nord and more than 10 for Sørige Nordsjø II.

UNITED KINGDOM

The UK has two operational offshore floating wind farms, Hywind Scotland and Kincardine, both located off the eastern coast of Scotland. The market for floating wind is set to grow rapidly in the UK, out of a total of 25GW recently awarded in the ScotWind offshore wind leasing round. In addition, the Innovation and Targeted Oil and Gas (INTOG) leasing round, aimed at electrifying oil and gas assets in the Scottish North Sea area, could add up to a further 3 to 4 GW of floating wind projects. Alongside the ScotWind projects, this amounts to a total market for floating wind in Scotland of 15 to 20 GW, with further opportunities expected from the ScotWind 2 leasing round in the future. Further floating wind opportunities in England and Wales, are expected to yield initial projects in the 100-300 MW range with potential expansion in due course.

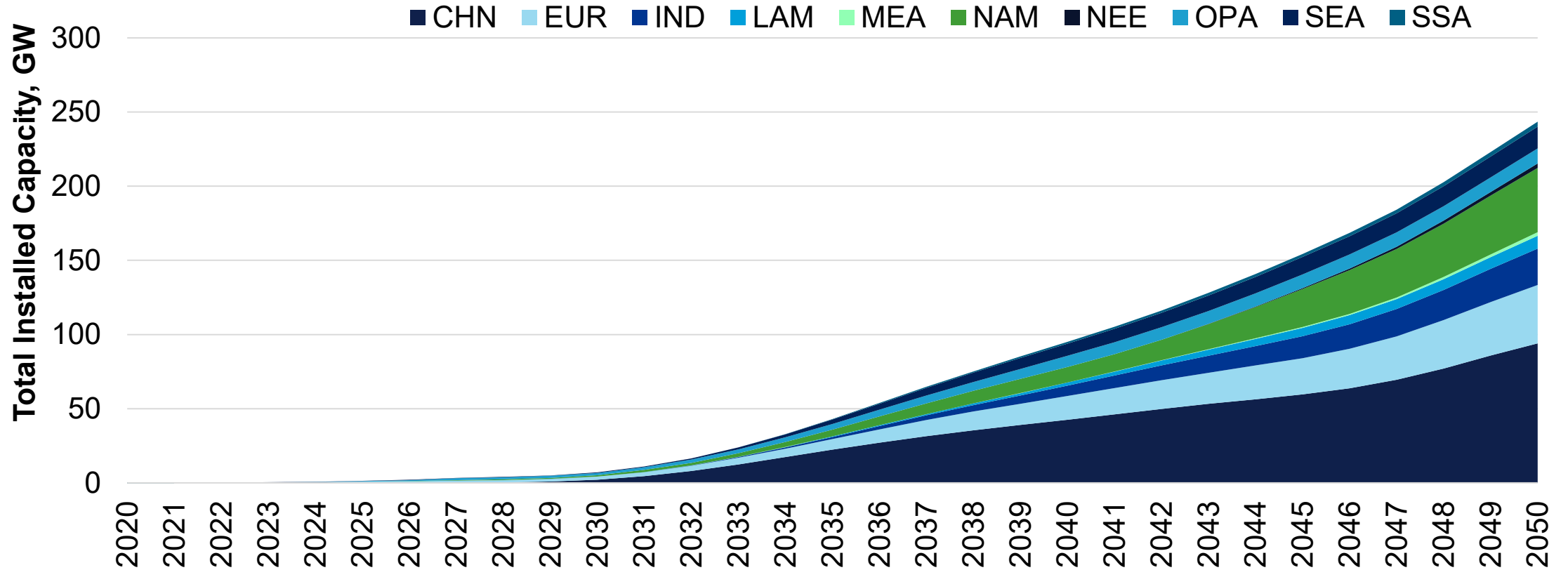
JAPAN

The Japanese government aims to make the country carbon neutral by 2050. Because areas of shallow water are limited in Japan, floating offshore wind is considered one of the most promising solutions. The Offshore Wind Promotional Law of 2018 has already set a legal framework for offshore wind development and auction process. Japan held the world's first floating offshore wind auction where a consortium made up of six companies was selected to develop a 16.8 megawatt floating offshore wind farm in waters off Goto City, Nagasaki Prefecture.

KOREA

Floating wind is a viable solution in South Korea, which currently has more than 40 offshore wind farm demonstration sites. The city of Ulsan is the centre of the floating wind business with six major overseas companies - Green Investment Group (GIG), Copenhagen Infrastructure Partners (CIP), Shell/CoensHexicon, KF Wind Korea, RWE and Equinor - who have signed a Memorandum of Understanding (MOU) with the city for 7.5 GW of expected capacity and more than 40 trillion Korean won (approx. 30 billion EUR) in investment. In May 2021 the country announced plans for up to 6 gigawatts of floating wind capacity by 2030. The oil major Shell is leading a joint venture to develop a 1.4 GW floating wind project in the country. In January 2022, KF Wind, a joint venture of Ocean Winds and Aker Offshore Wind, has secured an electric business license (EBL) for an 870 MW floating offshore wind project from the South Korean government.

Europe to lead the developments in most of the 2020s, but will be passed by Asia in 2030s and North America in 2040s



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