

CAN OFFSHORE WIND POWER THE AI BOOM?

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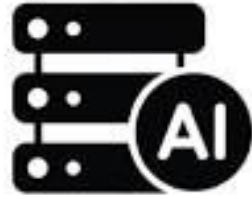
University of Southampton, UK

Green IO London
Convene Sancroft, St. Paul's
1 Oct 2026

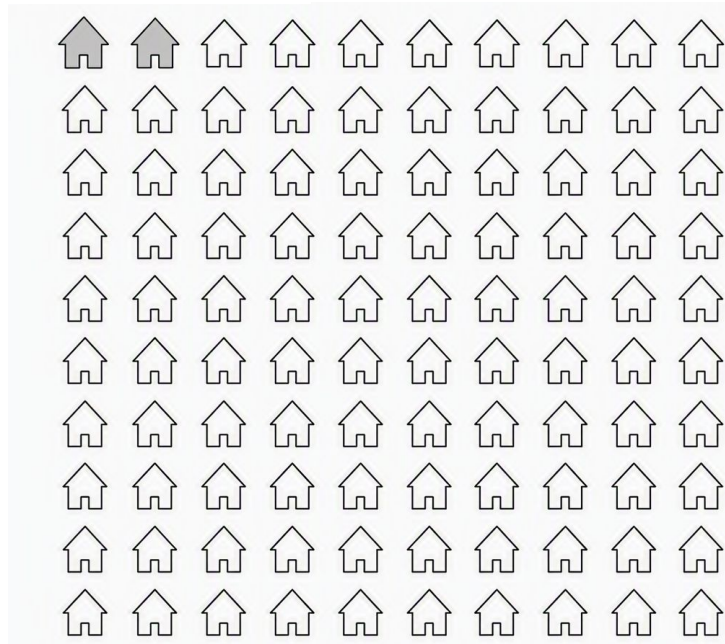
IROE
INTELLIGENT & RESILIENT
OCEAN ENGINEERING

 Royal Academy
of Engineering

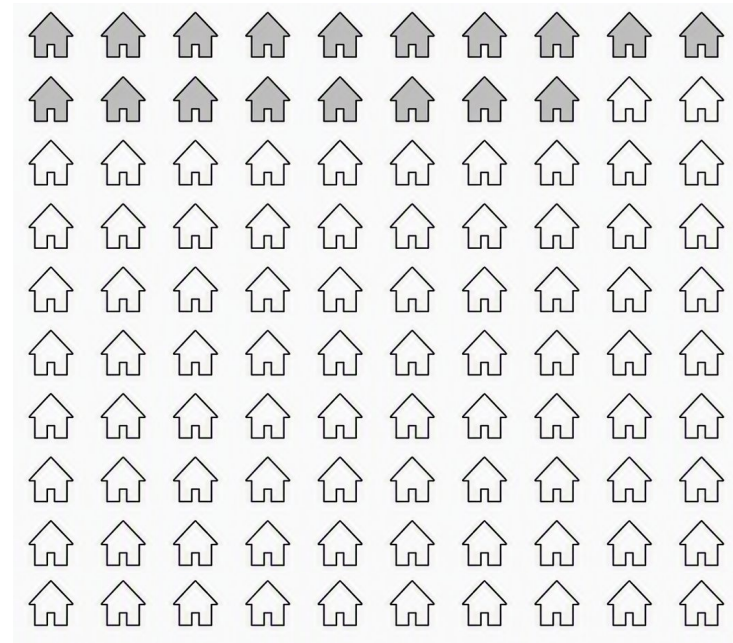
AI DATA CENTRE DEMAND & OW ELECTRICITY SUPPLY



6.4 TWh

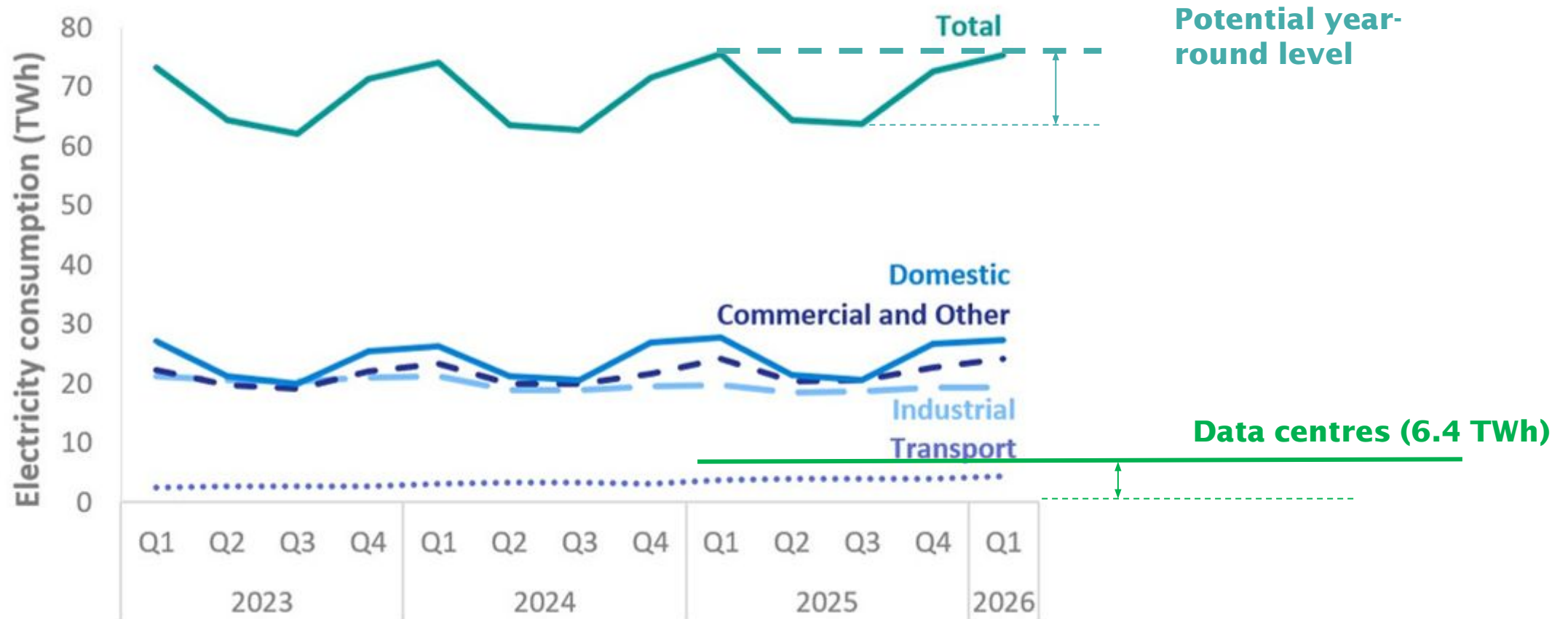


52 TWh



AI DATA CENTRES ++ FOR ELECTRICITY DEMAND IN UK

Chart 5.2 Electricity consumption by sector ([Energy Trends Table 5.2](#))



Statistical Release 30 June 2026



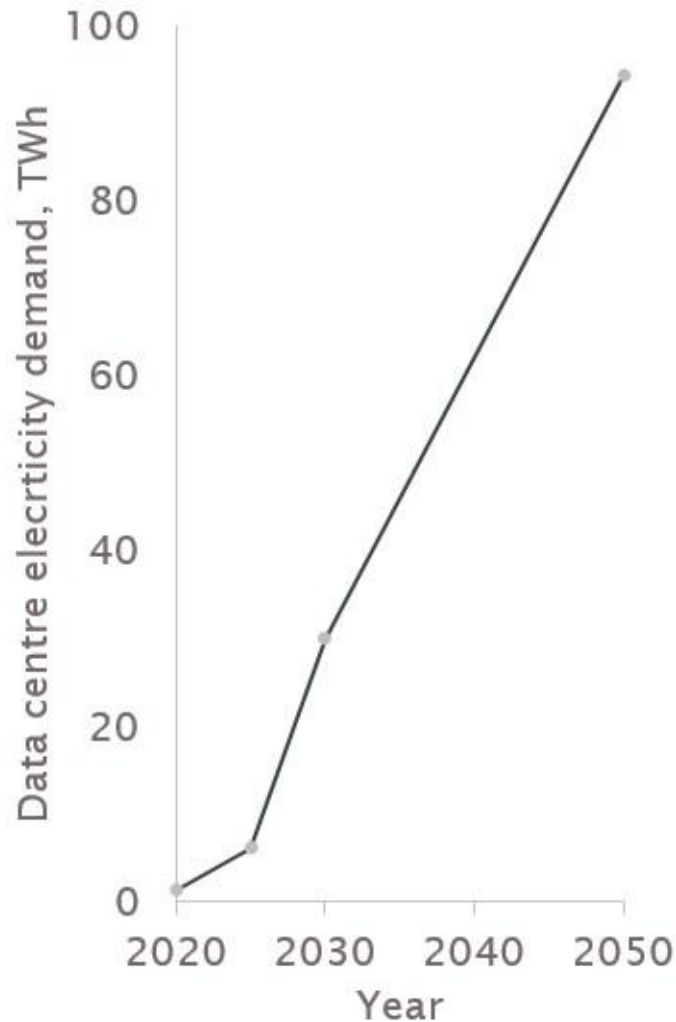
UK Government

Energy Trends

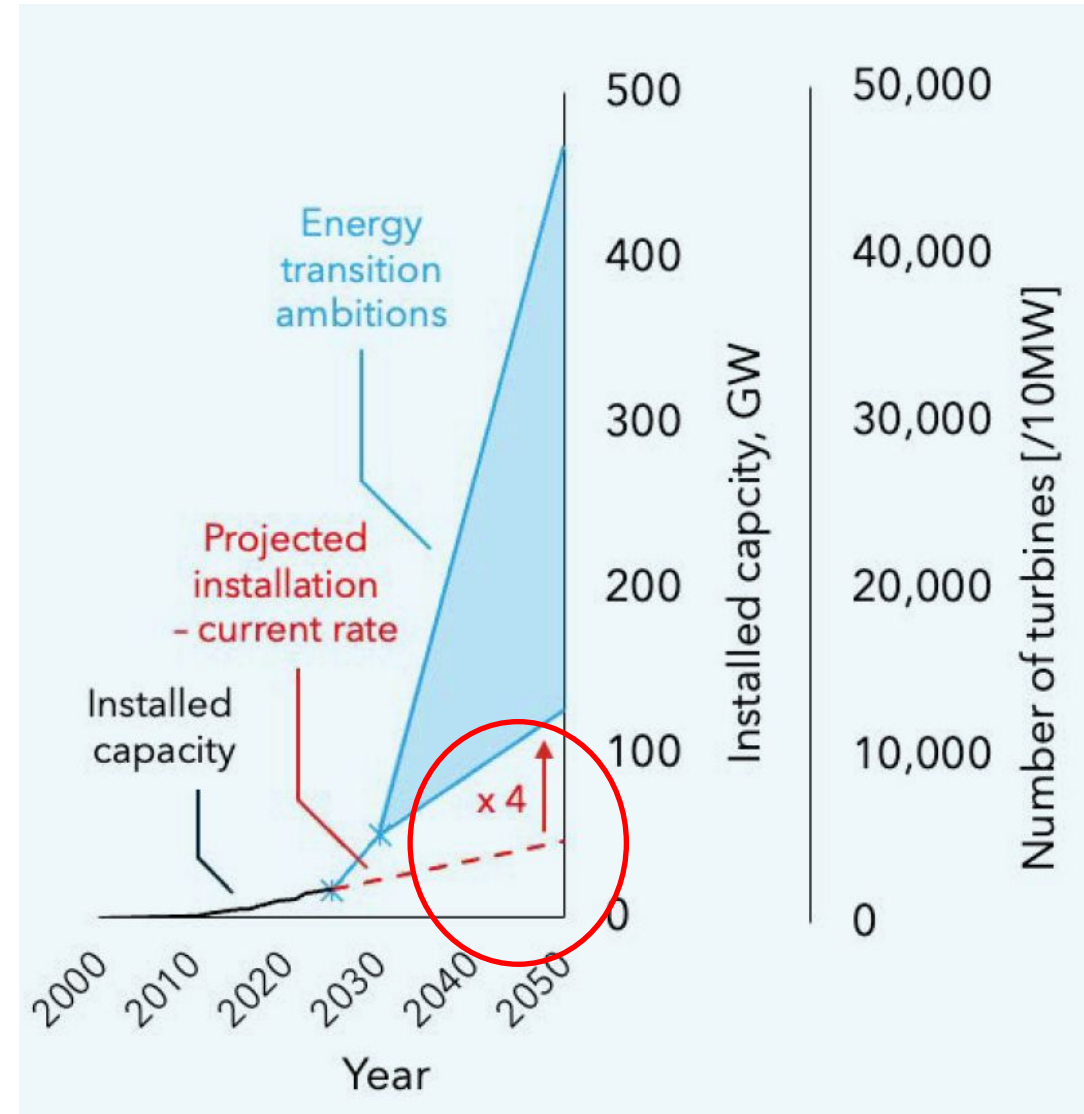
UK, January to March 2026

https://assets.publishing.service.gov.uk/media/6a423b65b9f58f0eb4c13f0a/Energy_Trends_June_2026.pdf

AI DATA CENTRE DEMAND & OW SUPPLY GROWTH



<https://www.energy-uk.org.uk/publications/energy-uk-response-to-risks-and-opportunities-to-the-sustainability-of-data-centres-in-the-uk/>



Gourvenec et al. (2026) <https://10.5258/SOTON/P1296>

ACCELERATION OF OW: NEEDS

**x3**
people by 2030

Final

100 G
Busi
achi

The Guardian UK

News Opinion Sport Culture Lifestyle

Environment Climate crisis Wildlife Energy Pollution

Greenhouse gas emissions

Andy Burnham: UK must fully commit to reaching net zero by 2050

Exclusive: PM, who is facing pressure over whether to approve North Sea oil and gasfields, makes strongest comments yet on issue

- British people understand the climate crisis threat. Today I'm empowering them to tackle it
- UK politics live - latest updates

Peter Walker Senior political correspondent
Thu 17 Sep 2026 13:00 BST

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Offshore Industrial Plan

on of the UK's Offshore

THE CROWN ESTATE

Green Estate Scotland

4

10

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**People**

**Planning and Consenting**

**Infrastructure and Grid**

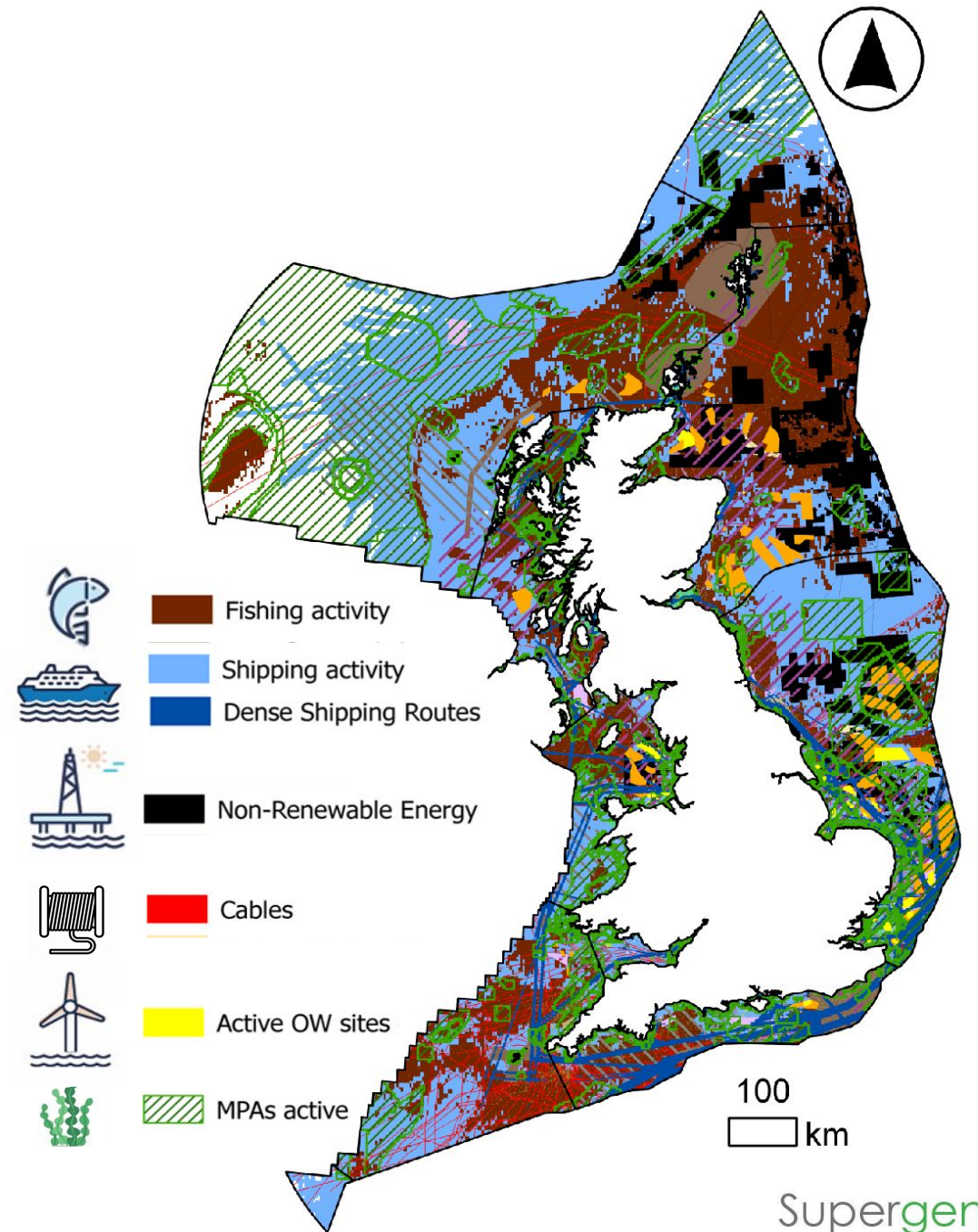
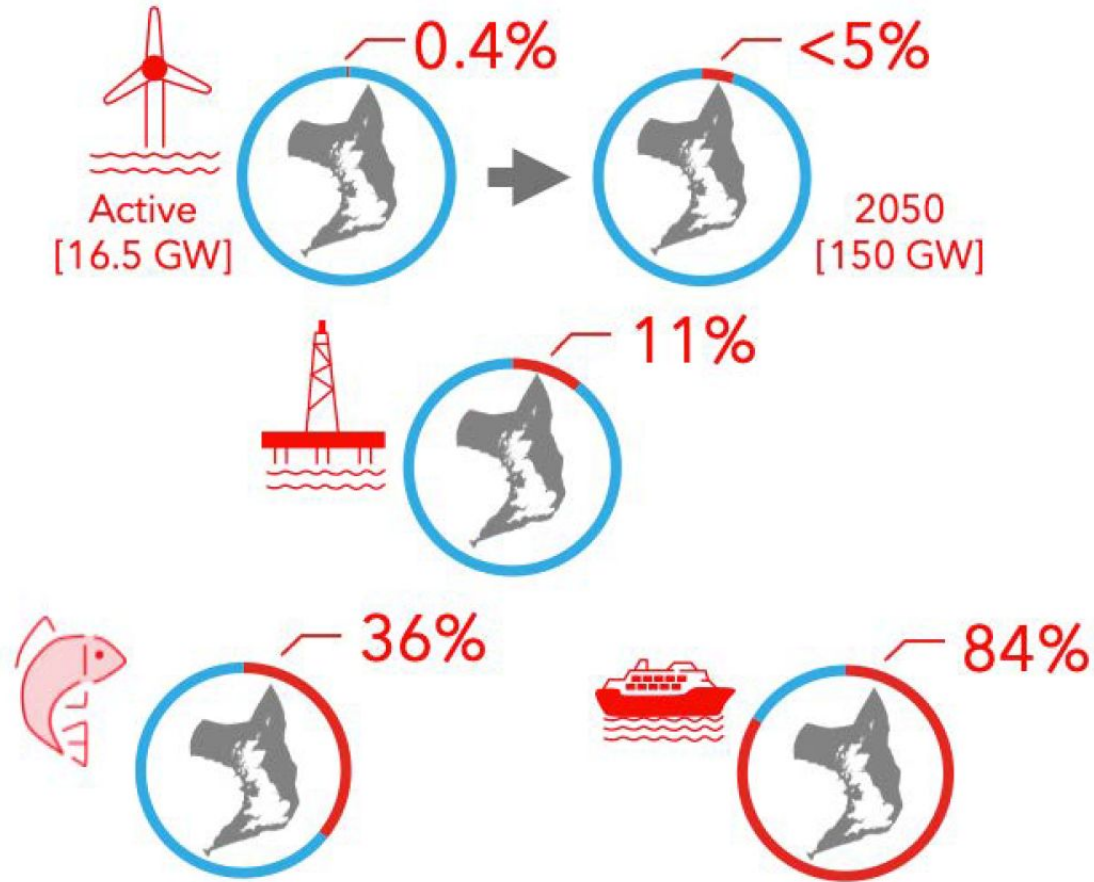
**Supply Chain**

Supergen
Offshore Renewable Energy

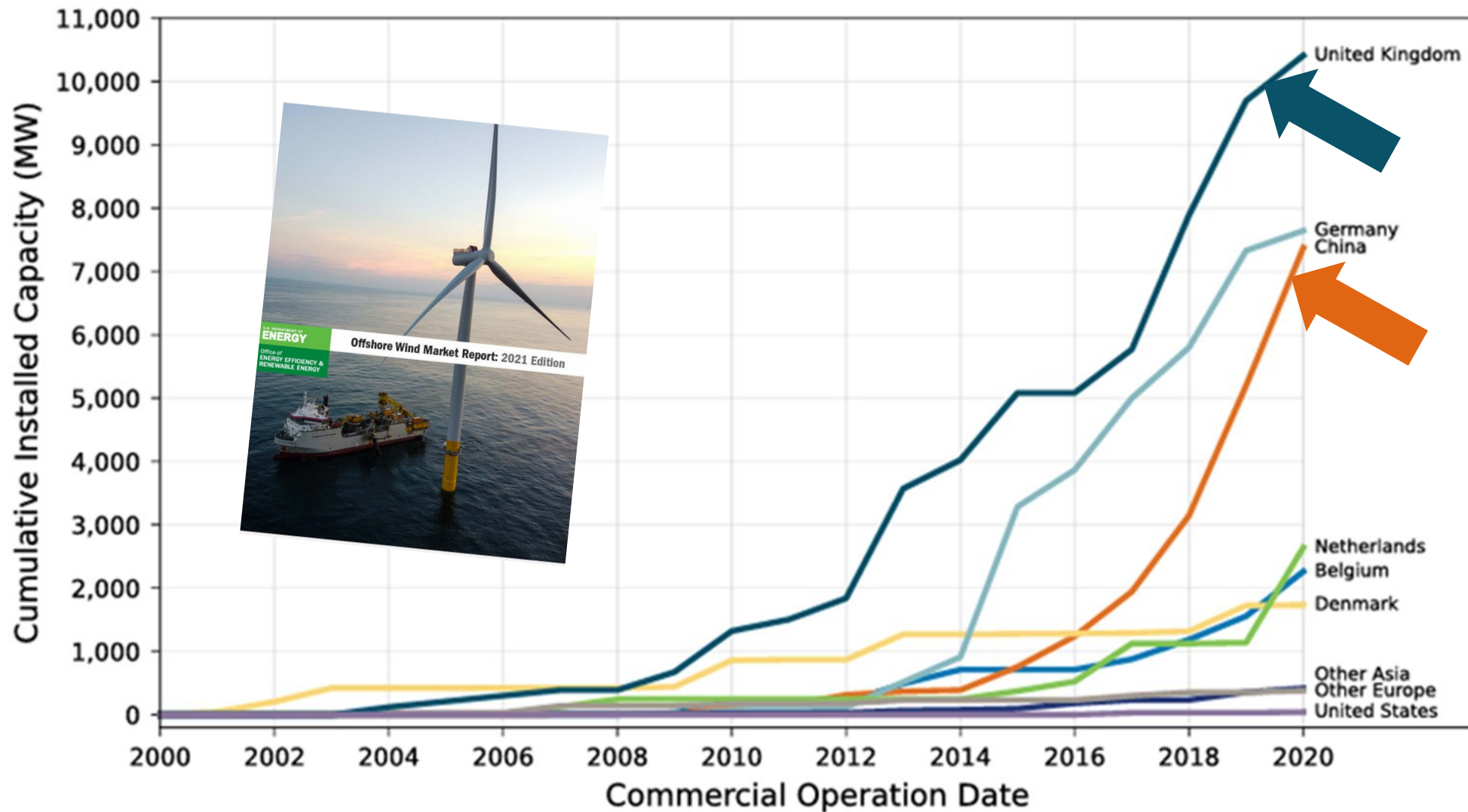
ACCELERATION OF OW: CONCERNS

- Demand on ocean space
- Effect on ocean environment
- Effect on birds
- Demand for materials

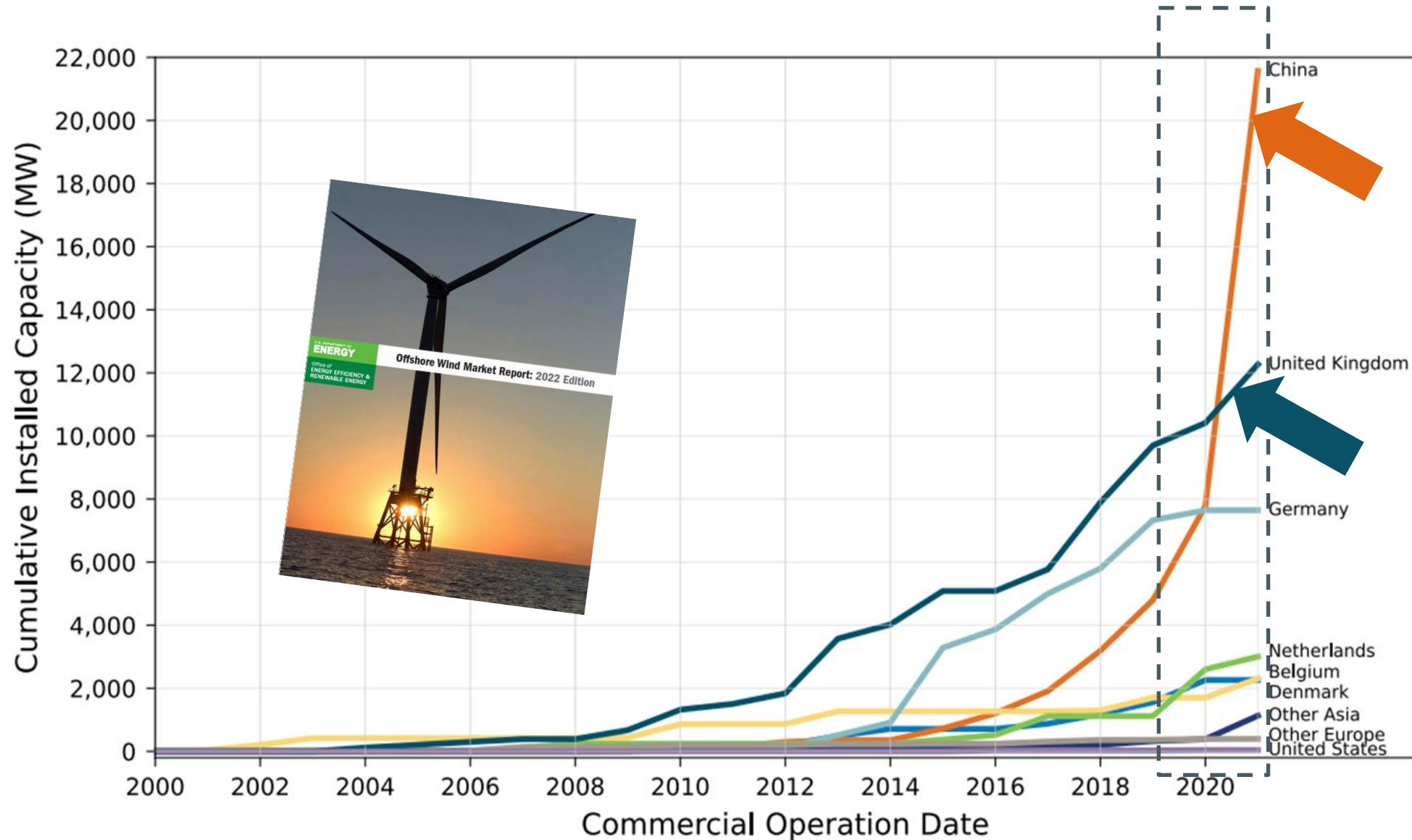
SPACE: HOW MUCH SPACE?



UK IS A GLOBAL LEADER IN OFFSHORE WIND

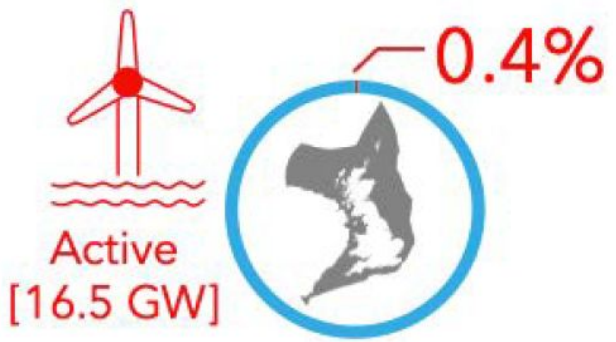
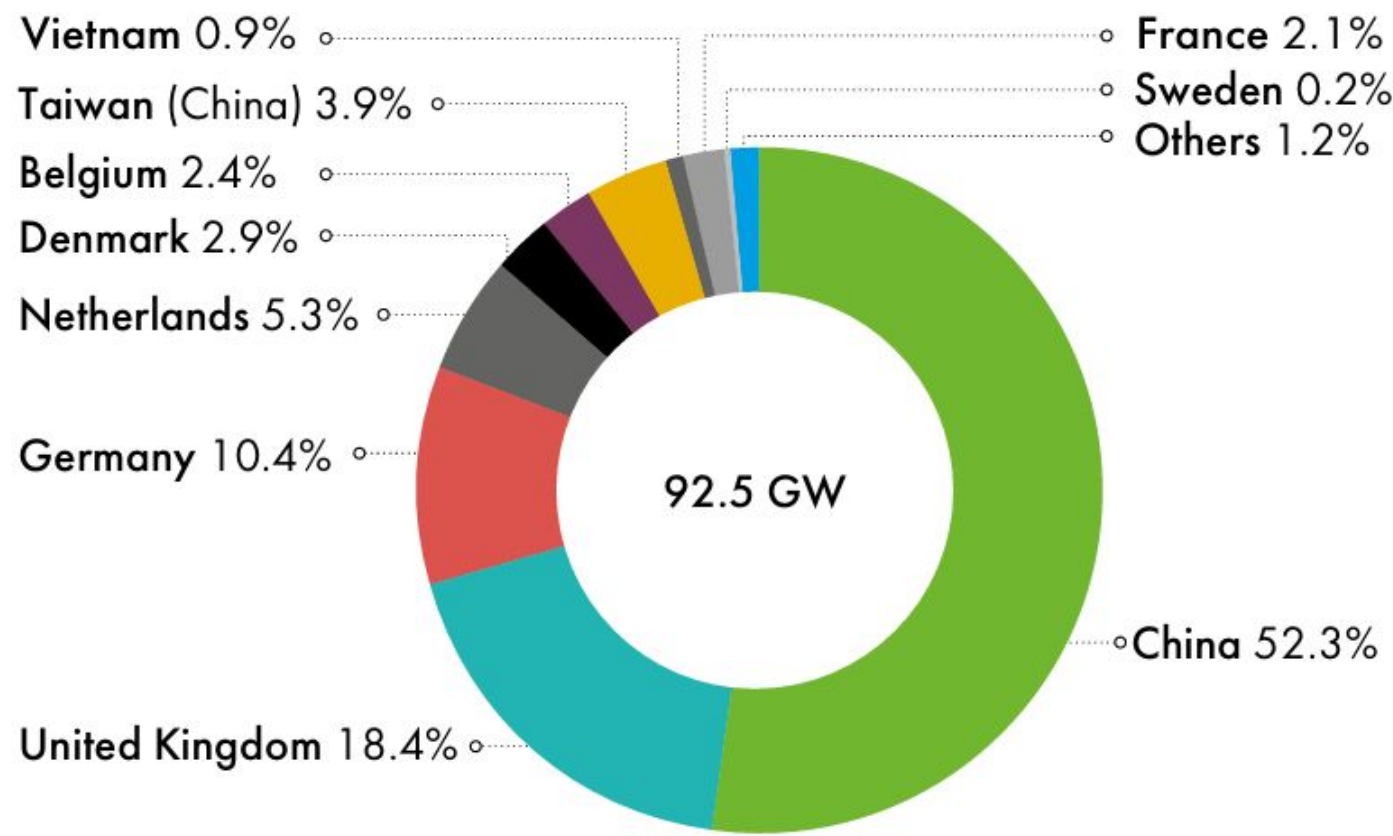


UK IS A GLOBAL LEADER IN OFFSHORE WIND

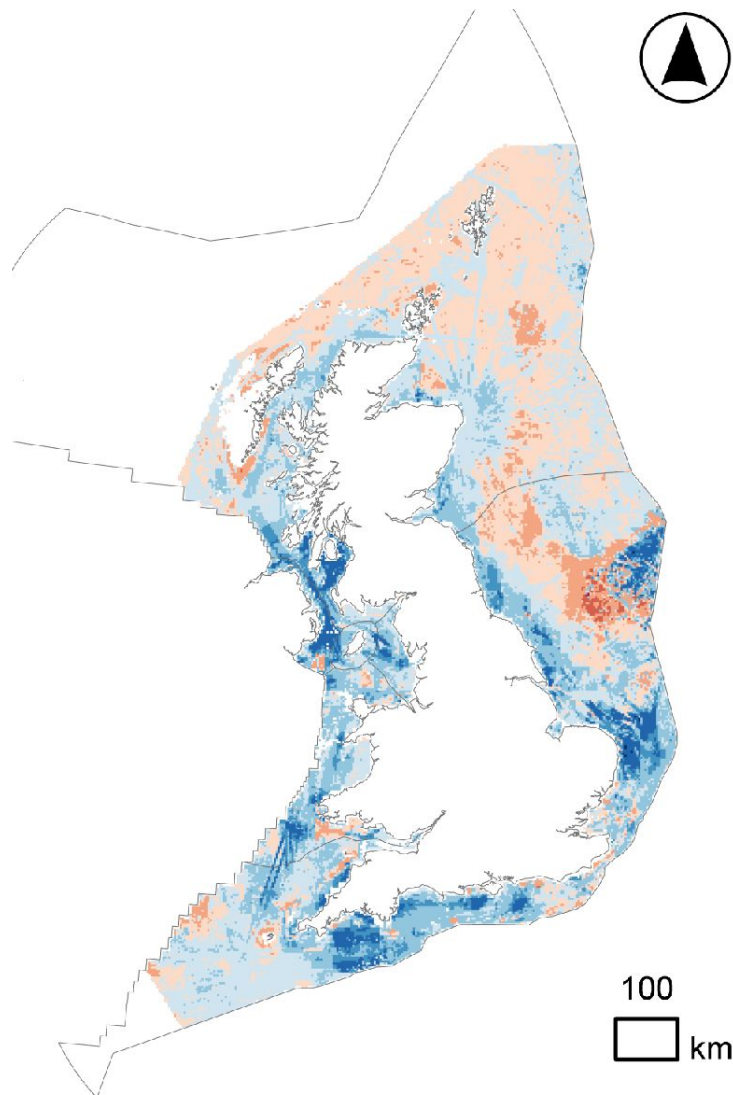


UK IS A GLOBAL LEADER IN OFFSHORE WIND

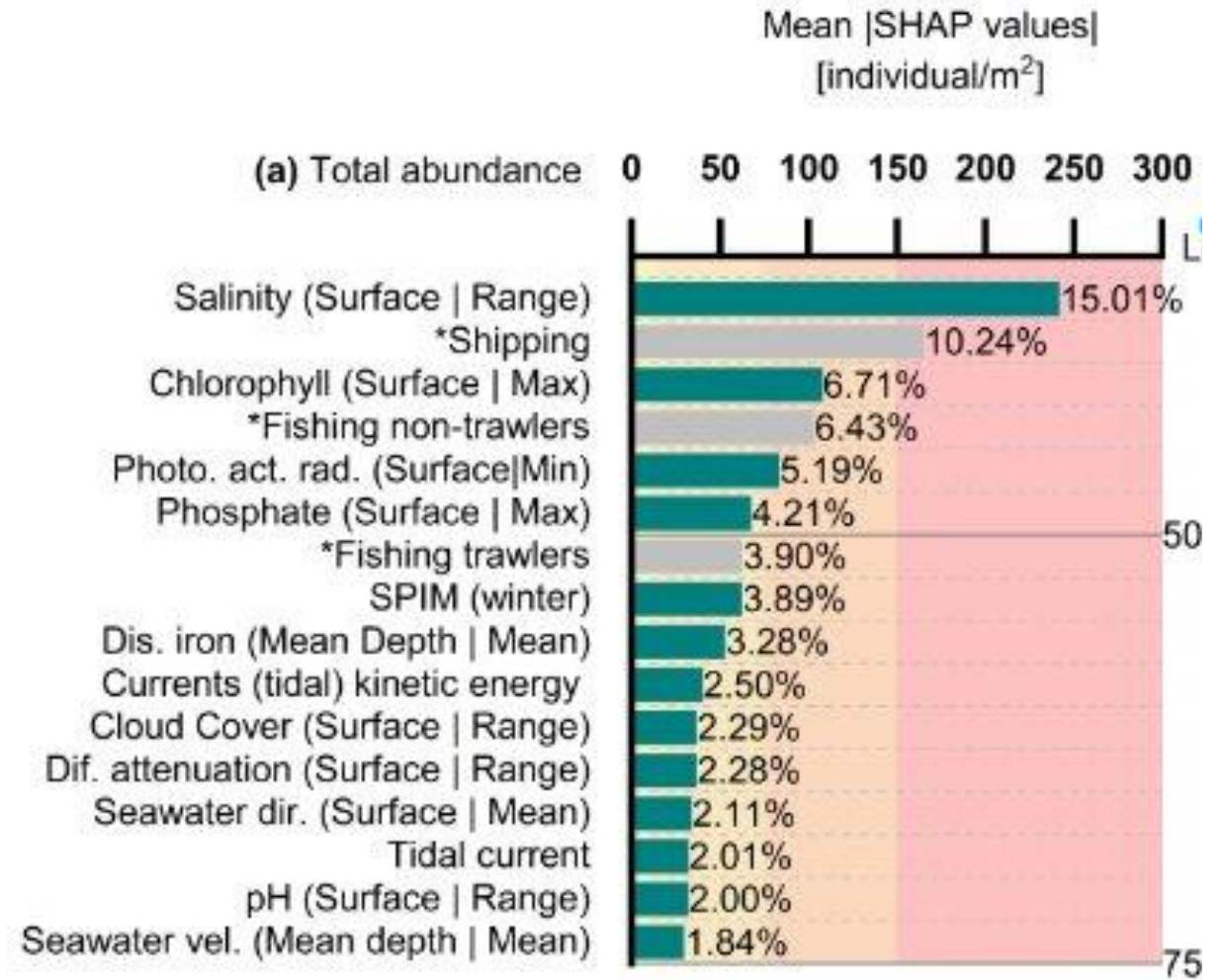
Total offshore wind installations by country by end of 2025



OCEAN ENVIRONMENT: WHAT IS THE IMPACT?

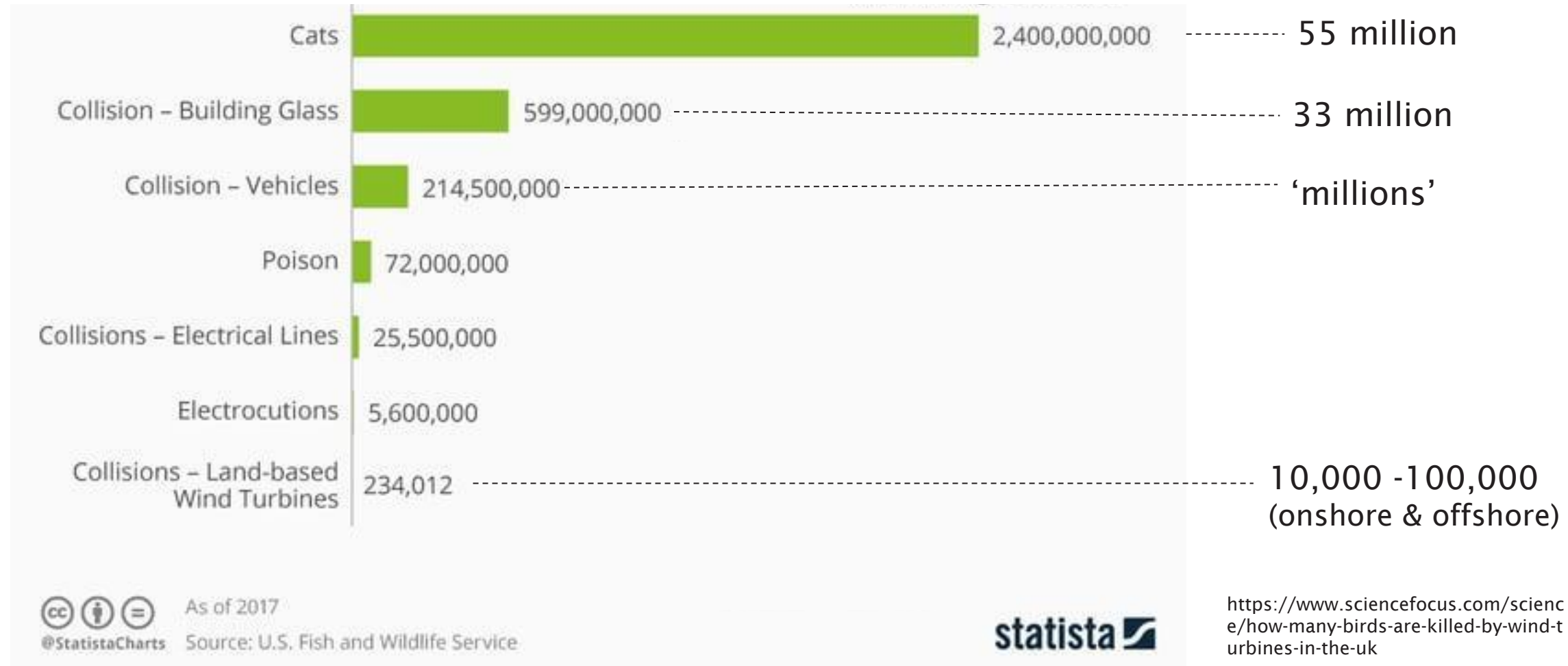


Putuhena et al. (in press)



Note: Offshore wind not governing factor

BIRDS: WHAT KILLS BIRDS?



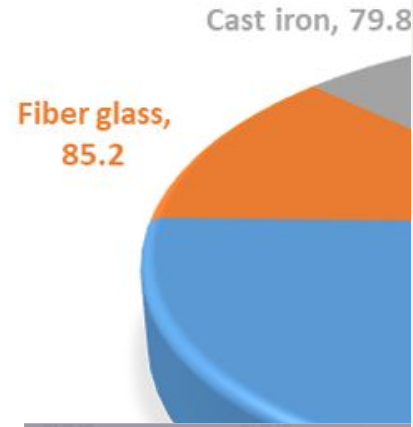
Climate change is greatest threat to bird populations

<https://www.rspb.org.uk/helping-nature/what-we-do/influence-government-and-business/nature-and-climate-emergency/climate-and-nature-crisis>

MATERIALS: CIRCULAR ECONOMY



<https://engineeringx.raeng.org.uk/programmes/safer-end-of-engineered-life/safer-end-of-life-of-offshore-infrastructure-and-ships/safer-end-of-engineered-life-for-offshore-wind-infrastructure/>





USGS
science for a changing world

PERIODIC TABLE

Wait. Aren't these elements?

The Energy Act of 2020 describes "critical minerals" that (1) are essential to the economic or national security of disruption, and (3) are vital for making a product.

Elements in RED are listed as critical mineral
Graphite (C), barite (BaSO₄), metallurgical (CoFe) are also listed as critical mineral

H Hydrogen																
Li Lithium	Be Beryllium															
Na Sodium	Mg Magnesium	Nb Niobium														
K Potassium	Ca Calcium	Sc Scandium	Ti Titanium	V Vanadium	Cr Chromium	Mn Manganese										
Rb Rubidium	Sr Strontium	Y Yttrium	Zr Zirconium	Nb Niobium	Mo Molybdenum	Tc Technetium										
Cs Cesium	Ba Barium	Lanthanides	Hf Hafnium	Ta Tantalum	W Tungsten	Re Rhenium										
Fr Francium	Ra Radium	Actinides	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium										
Lanthanides			La Lanthanum	Ce Cerium	Pr Praseodymium	Nd Neodymium										
Actinides			Ac Actinium	Th Thorium	Pa Protactinium	U Uranium										

<https://www.usgs.gov/media/images/periodic-table-2025-critical-minerals-full-color>

October 2024

Critical materials:

demand-side resource
efficiency measures for
sustainability and resilience

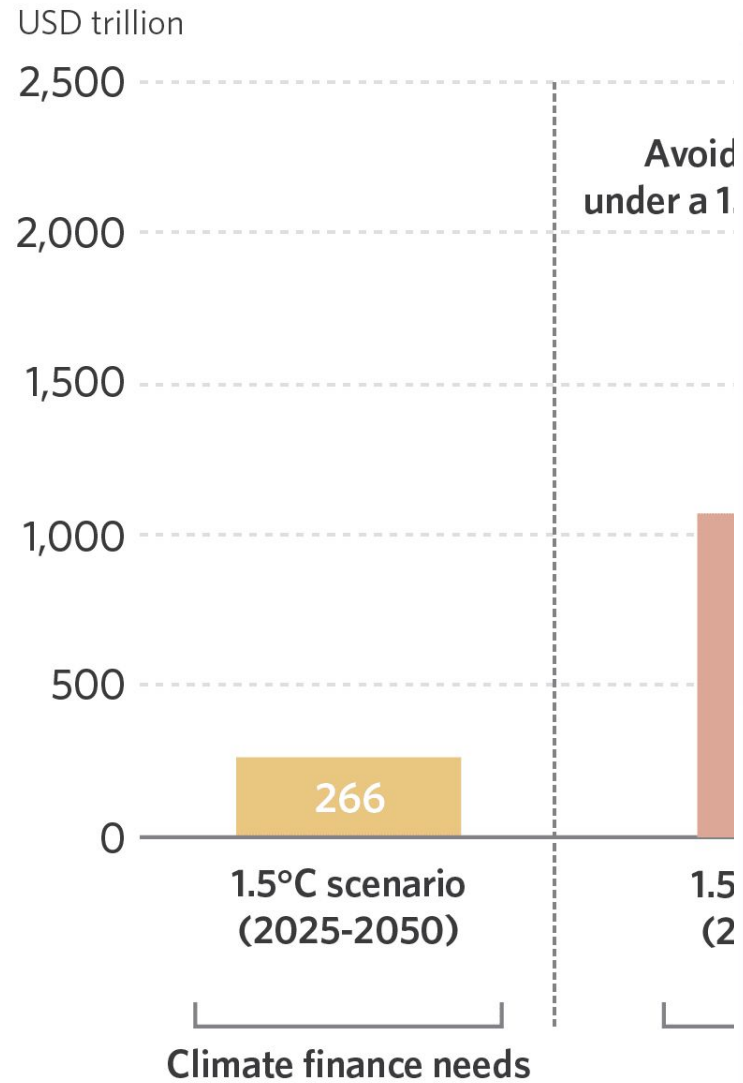
IChemE

I.M3
Institute of Materials,
Minerals & Mining

<https://nepc.raeng.org.uk/policy-work/reducing-demand-and-ensuring-sustainability-for-critical-materials/>



COST OF INACTION



Economic costs

Impacts on productivity



Damages to assets and capital



Disruptions to the global flow of currency



Social costs

Health and well-being



Loss of biodiversity and nature



Conflict and migration



Global and local inequalities

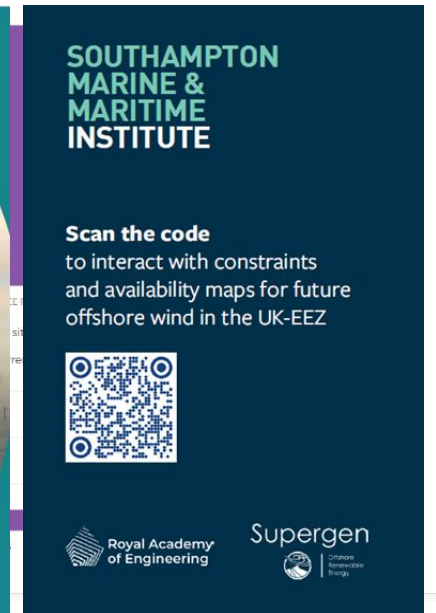
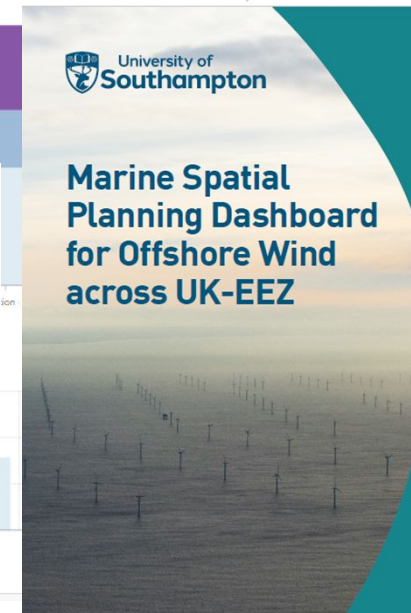
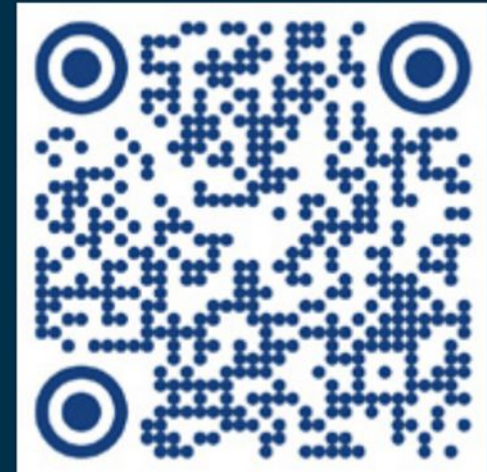
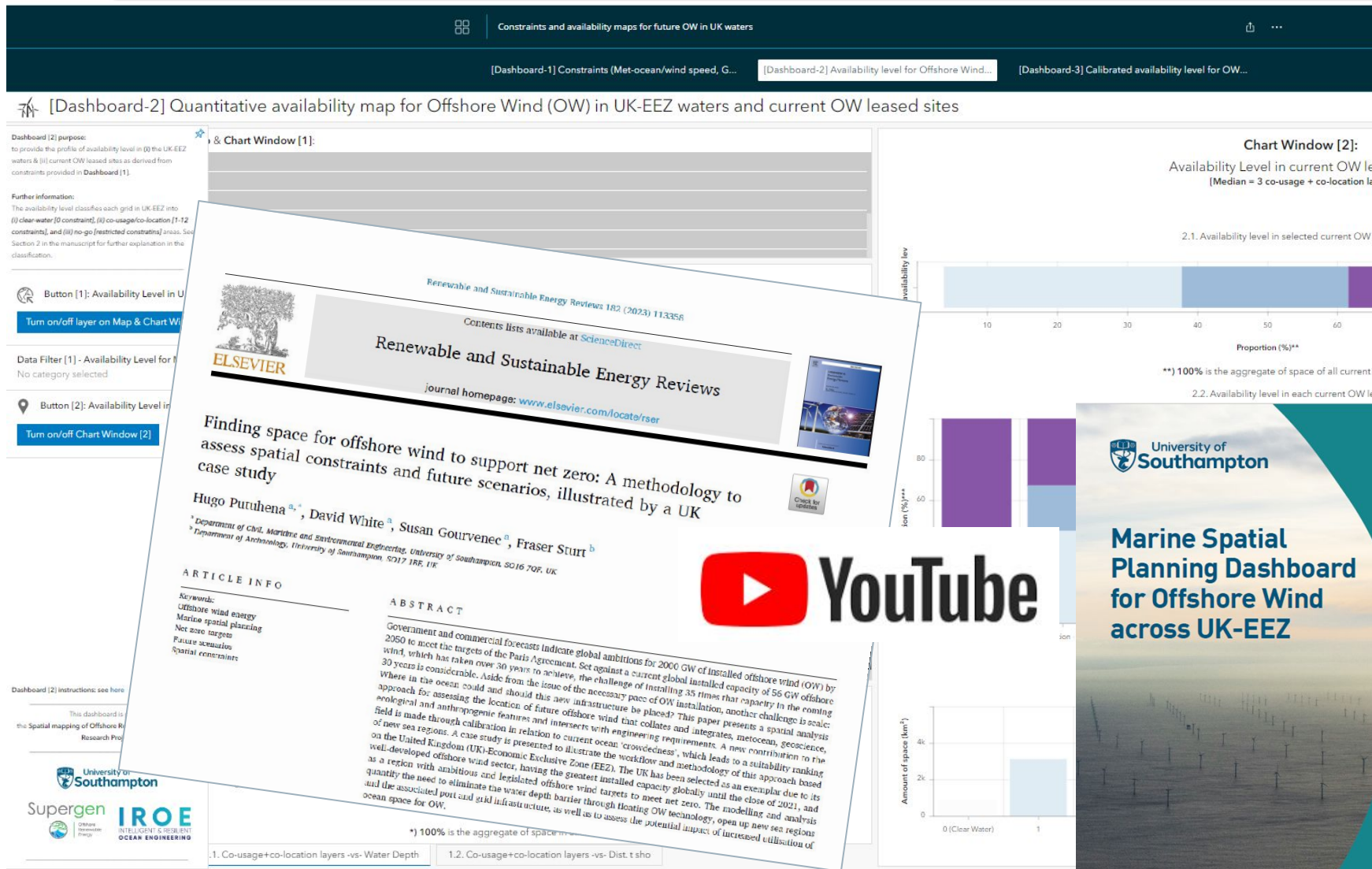


ACCELERATION OF OW: ENABLERS

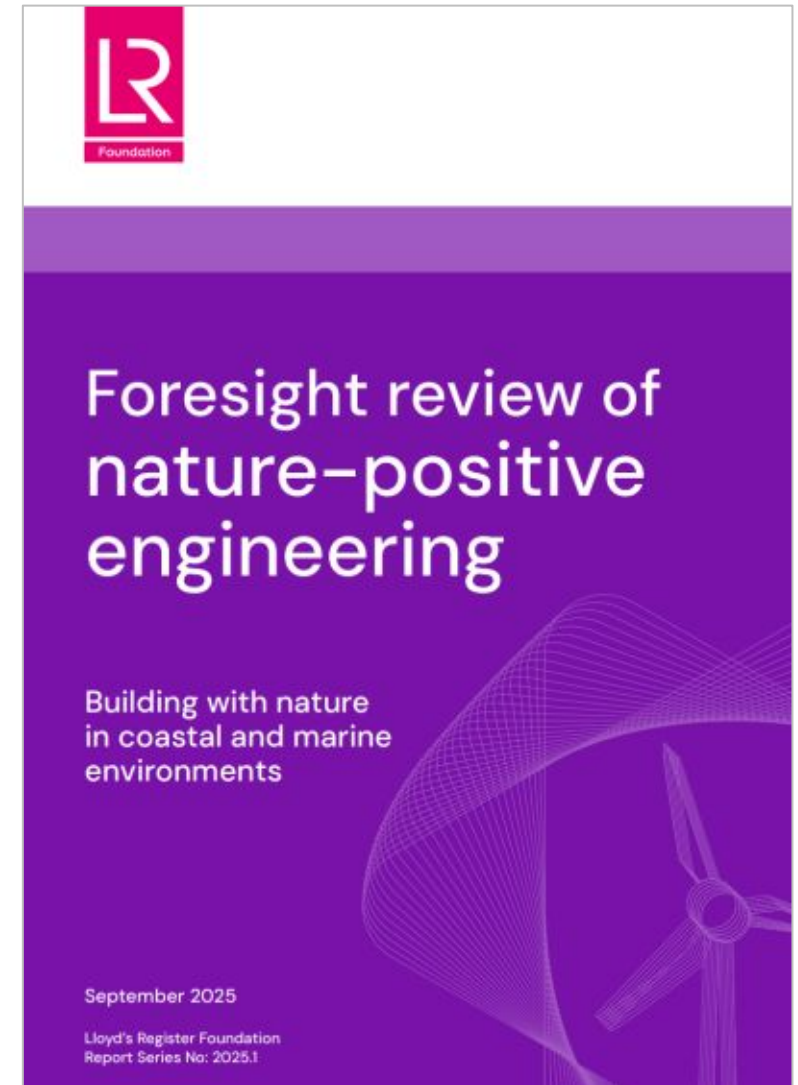
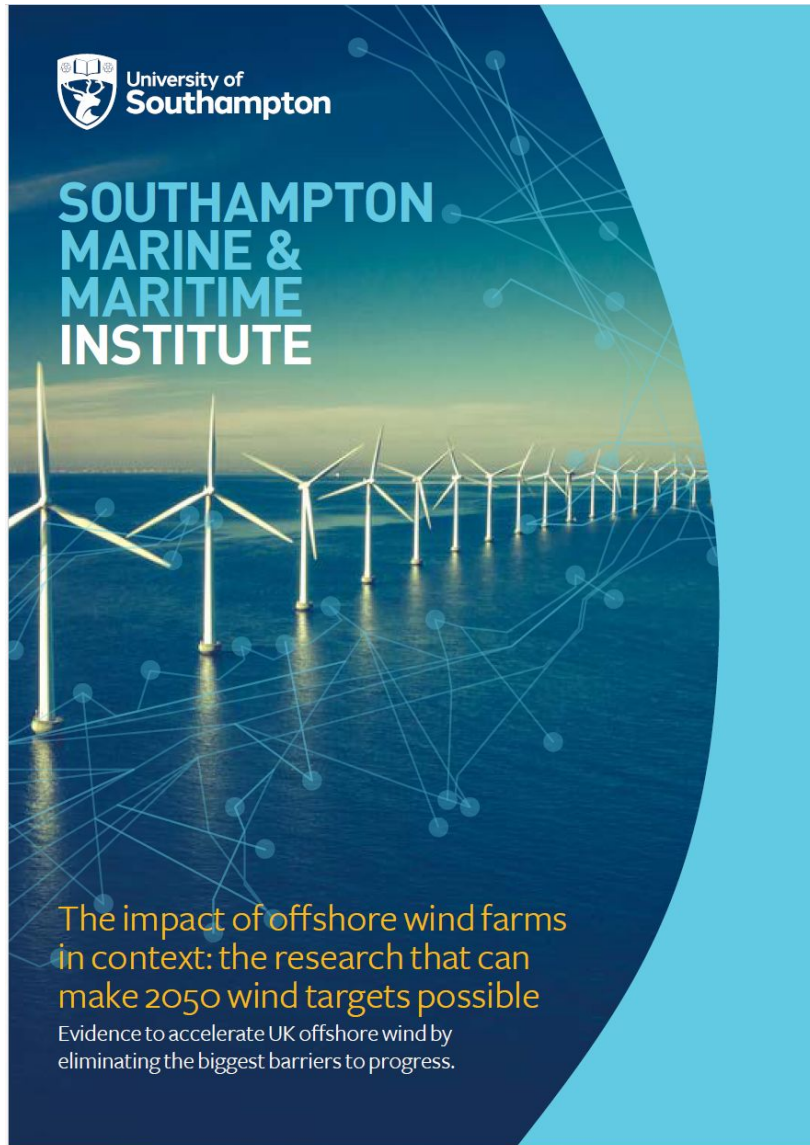
Accessible evidence for diverse stakeholders

- Marine spatial planning tools
- Policy advice
- Technology solutions

ACCESSIBLE EVIDENCE

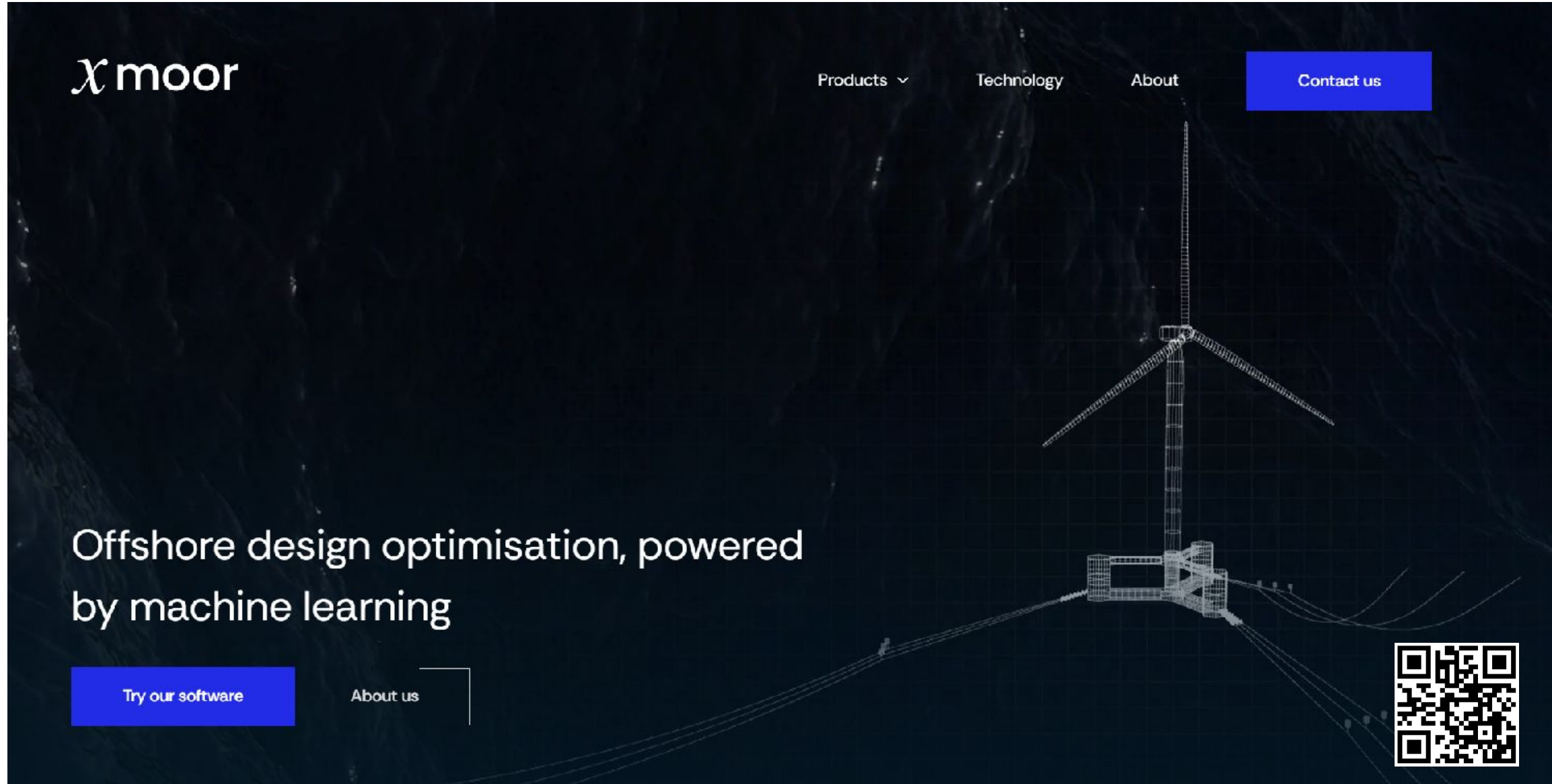


ACCESSIBLE EVIDENCE



[https://www.lrfoundation.org.uk/publications/foresight-review-7
of-nature-positive-engineering](https://www.lrfoundation.org.uk/publications/foresight-review-7-of-nature-positive-engineering)

TECHNOLOGY SOLUTIONS



TECHNOLOGY SOLUTIONS



Oscar Festa ✓ • 1st

Post-doctoral researcher | Developing ML-driven design software for floating wind
1d • Edited •

This time last year, we released the first demo of Xmoor, a machine learning-driven concept screening tool for floating offshore wind. A massive thank you to the 50+ engineers across 20+ companies who tested the demo!

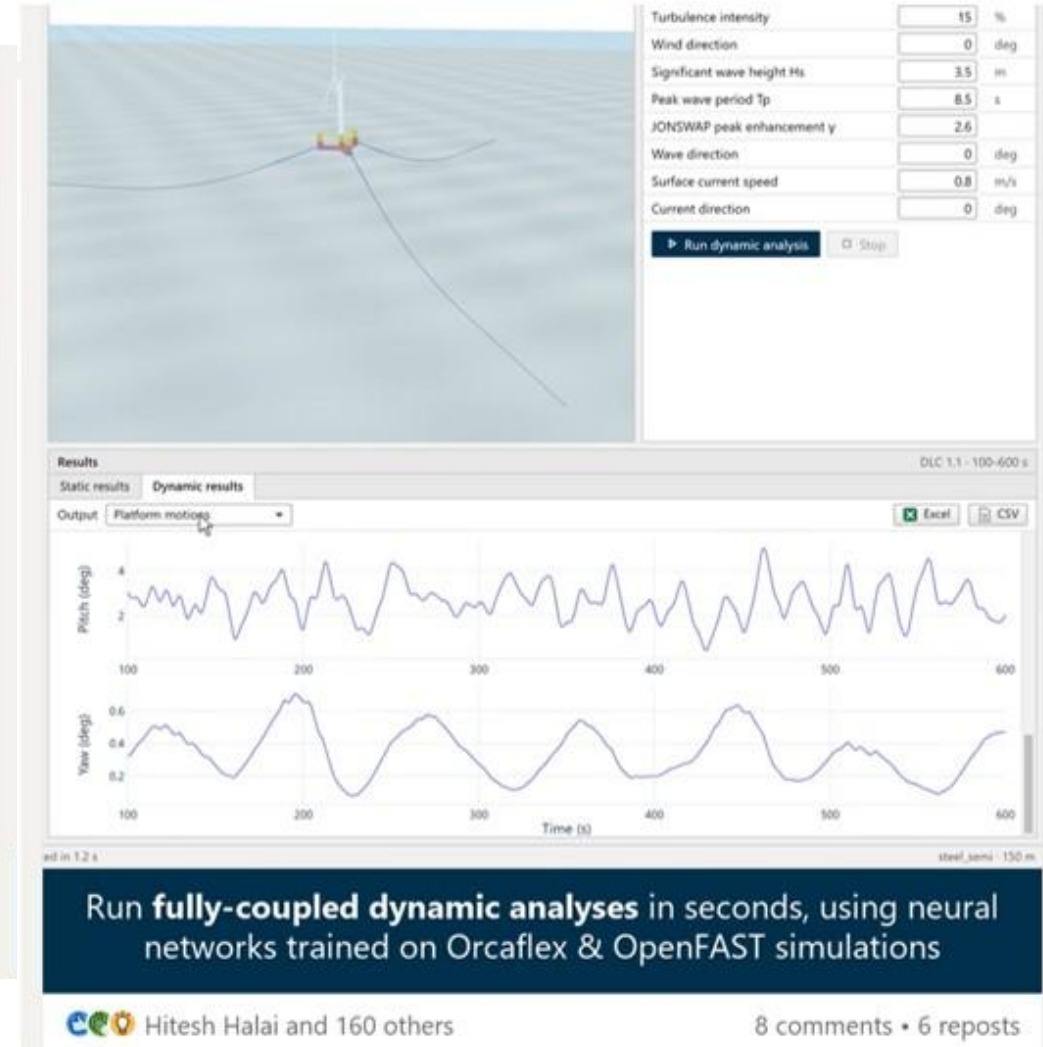
We have since been hard at work on the full version of Xmoor, which will include:

- ✚ Added floater concepts, including 3 semi-submersible and 3 barge designs
- ⚓ Mooring design expansions: clustered lines, clump weights, buoyancy modules
- 🌀 New load case inputs, including misaligned wind and wave conditions
- 📁 Exportable models to traditional solvers such as OrcaFlex and OpenFAST
- ⚡ Upgraded model physics, with second-order wave loads now in the dynamics
- ✅ Code-to-code validation of Xmoor against OrcaFlex on a range of designs & cases
- 📊 A new statics module combining NREL's MoorPy with our built-in eigenvalue analysis to provide fast insights into mooring, tower, and platform frequencies

If you're keen to try it out when it's ready, or want to find out more, get in touch!



<https://xmoor.co.uk/>



TECHNOLOGY SOLUTIONS



IROE

University of
Southampton

Developing responsible and sustainable
solutions *that benefit people and the planet*

Royal Academy
of Engineering

Centre of Excellence for Intelligent and Resilient Ocean Engineering
(IROE)



TECHNOLOGY SOLUTIONS

FLOATING DATA CENTERS: 50GW+ OF SITES READY TO BUILD

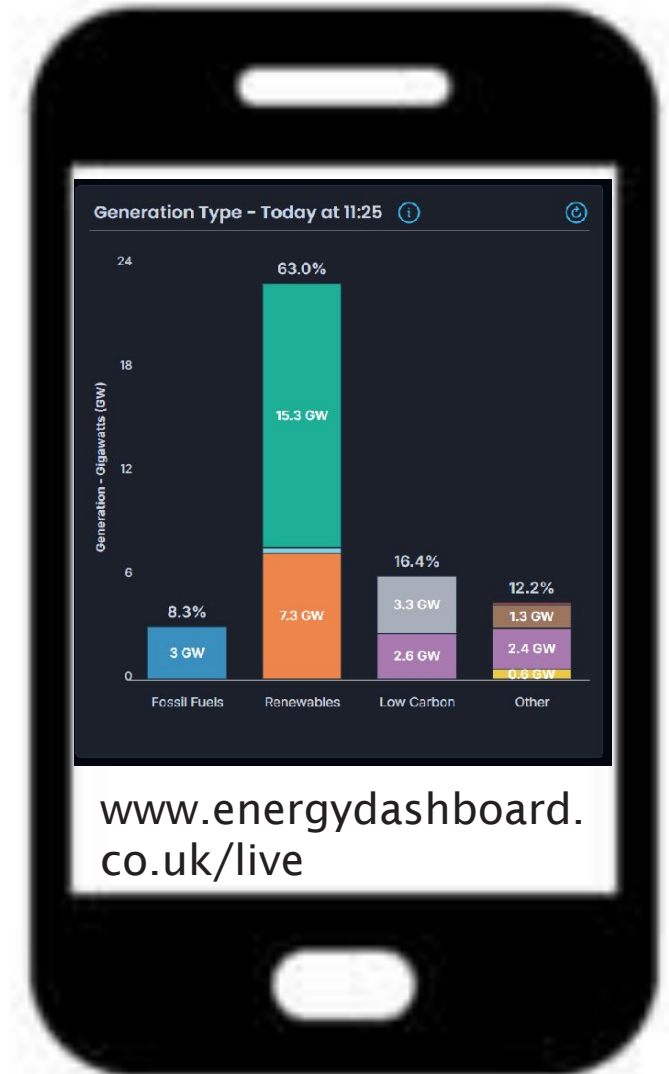
There are over 50GW of distressed floating wind sites globally that can be re-purposed immediately for sovereign datacenter deployment.

Aikido's proprietary 'flat-pack' technology allows AI-grade compute to be deployed at GW-scale with competitive pricing in less than 2 years, without any supply chain challenges.

BEFORE WE GO OFF-WORLD, WE OUGHT TO GO OFFSHORE.



AI ENERGY DEMAND AND OW AS PART OF BIG PICTURE



SO CAN OFFSHORE WIND POWER THE AI BOOM?

- Yes – OW can power the AI boom
- Risk of inaction or delayed action of decarbonisation
- Role of data centres to support energy transition
- Strive for efficiency and improvement in our respective sectors – but ...





<https://www.southampton.ac.uk/iroe>