

“Making Sense of Sustainable Energy Systems”

13th February 2019

Dr. George Crossley

Falmouth Bay Test Site (FaBTest) Manager

Renewable Energy, Penryn Campus, University of Exeter

Why sustainable energy?

Climate change



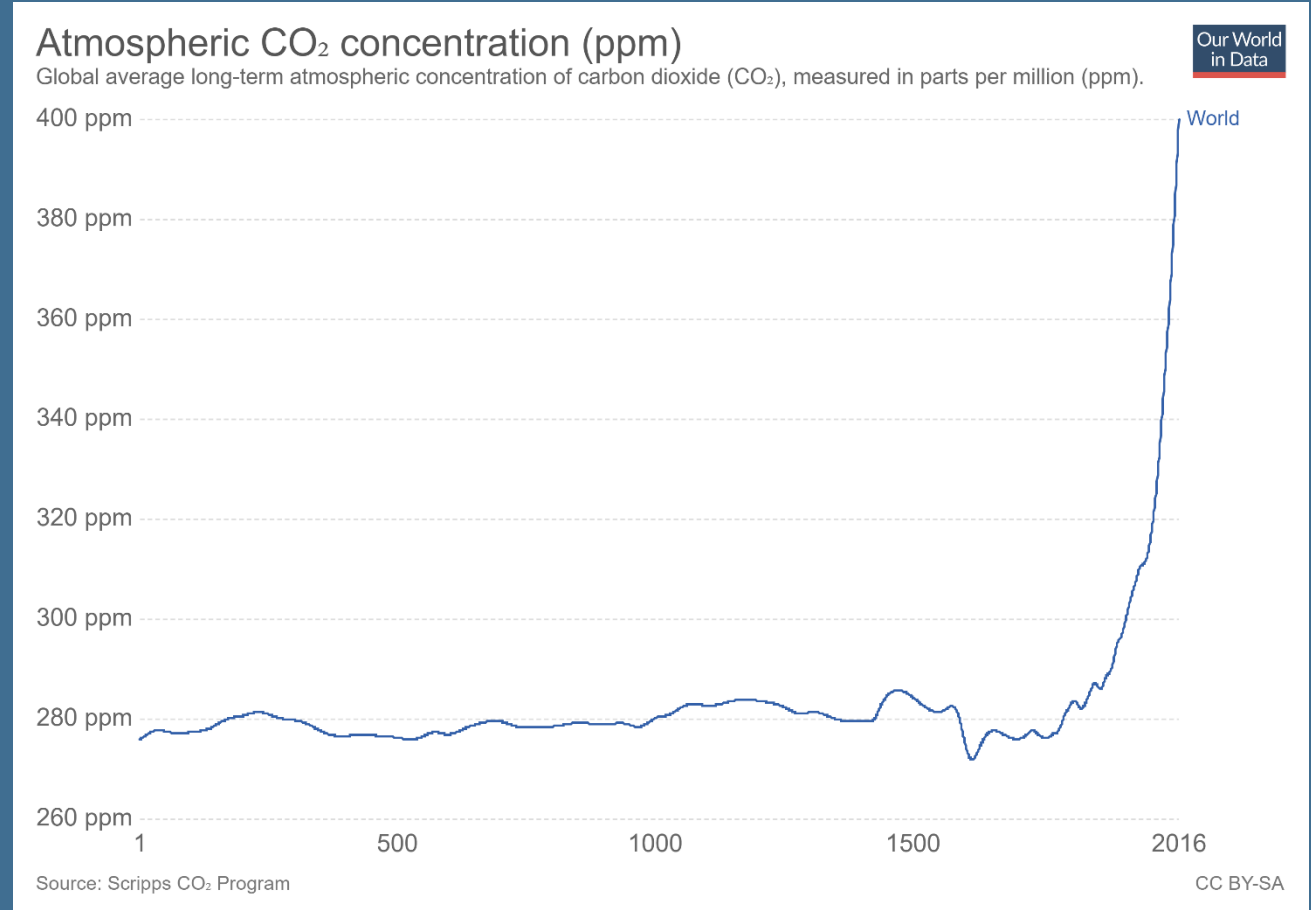
Energy security



Climate Change: Atmospheric CO₂

97% of climate scientists agree that climate change is being caused by greenhouse gas emissions.

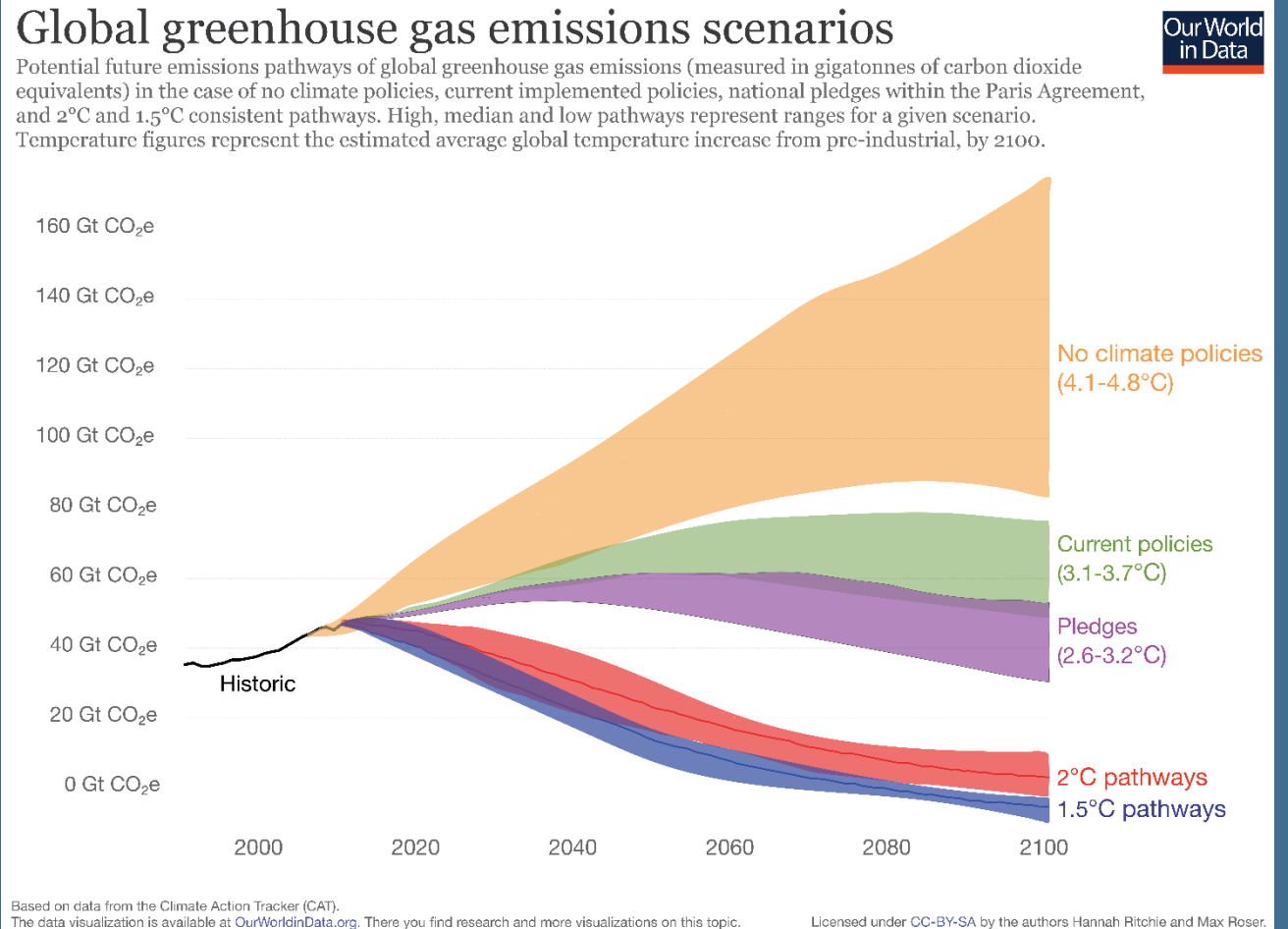
Direct correlation between carbon dioxide concentration in the atmosphere and global average temperature.



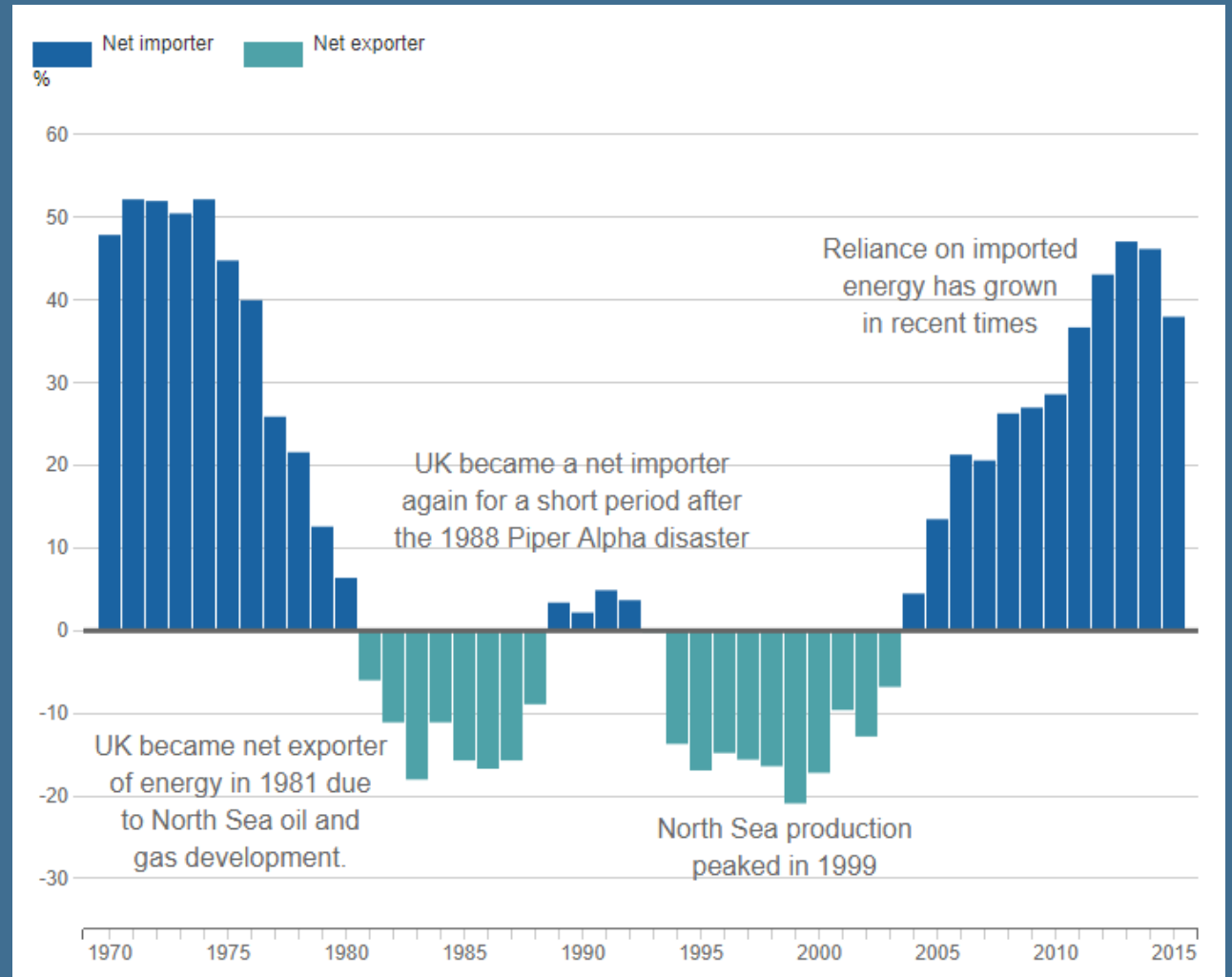
Climate Change: Pathways

+1°C now: already seeing more storms, flooding, heatwaves, drought, and island nations at risk of going underwater.

+2°C is going to mean a lot of human suffering, and tremendous damage to the planet, and a requirement for more energy.



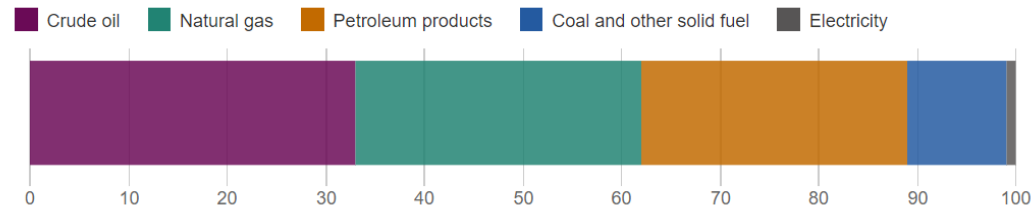
UK Energy Imports



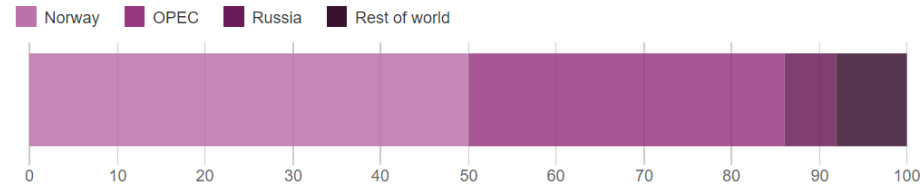
UK Energy imports

By fuel

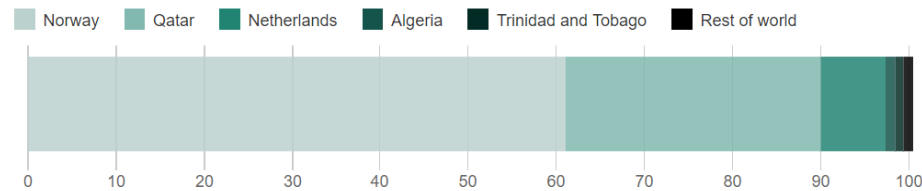
Energy imported into the UK by energy type, 2015



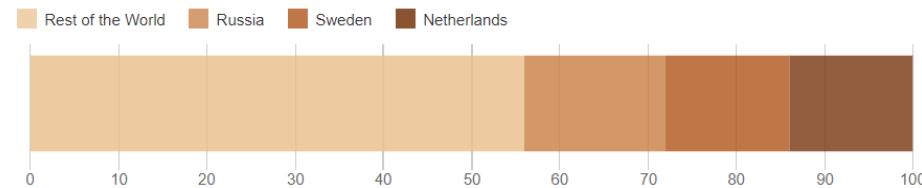
Countries the UK imported crude oil from, 2015



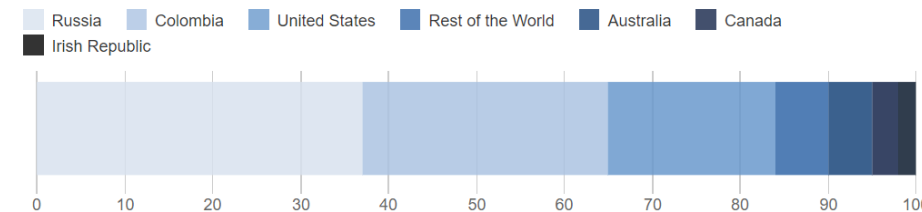
Countries the UK imported natural gas from, 2015



Countries the UK imported petroleum products from, 2015



Countries the UK imported coal and other solid fuels from, 2015



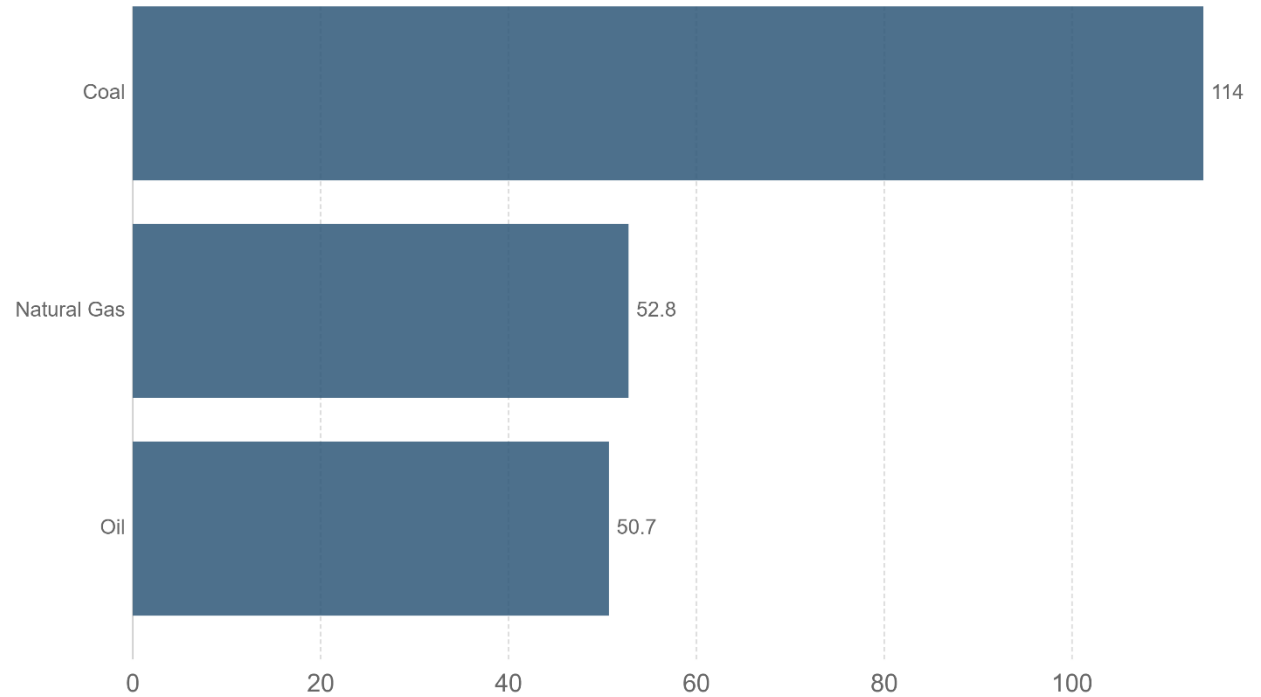
Global Reserves

Fossil Fuels

Years of fossil fuel reserves left

Years of global coal, oil and natural gas left, reported as the reserves-to-product (R/P) ratio which measures the number of years of production left based on known reserves and annual production levels in 2015. Note that these values can change with time based on the discovery of new reserves, and changes in annual production

Our World
in Data

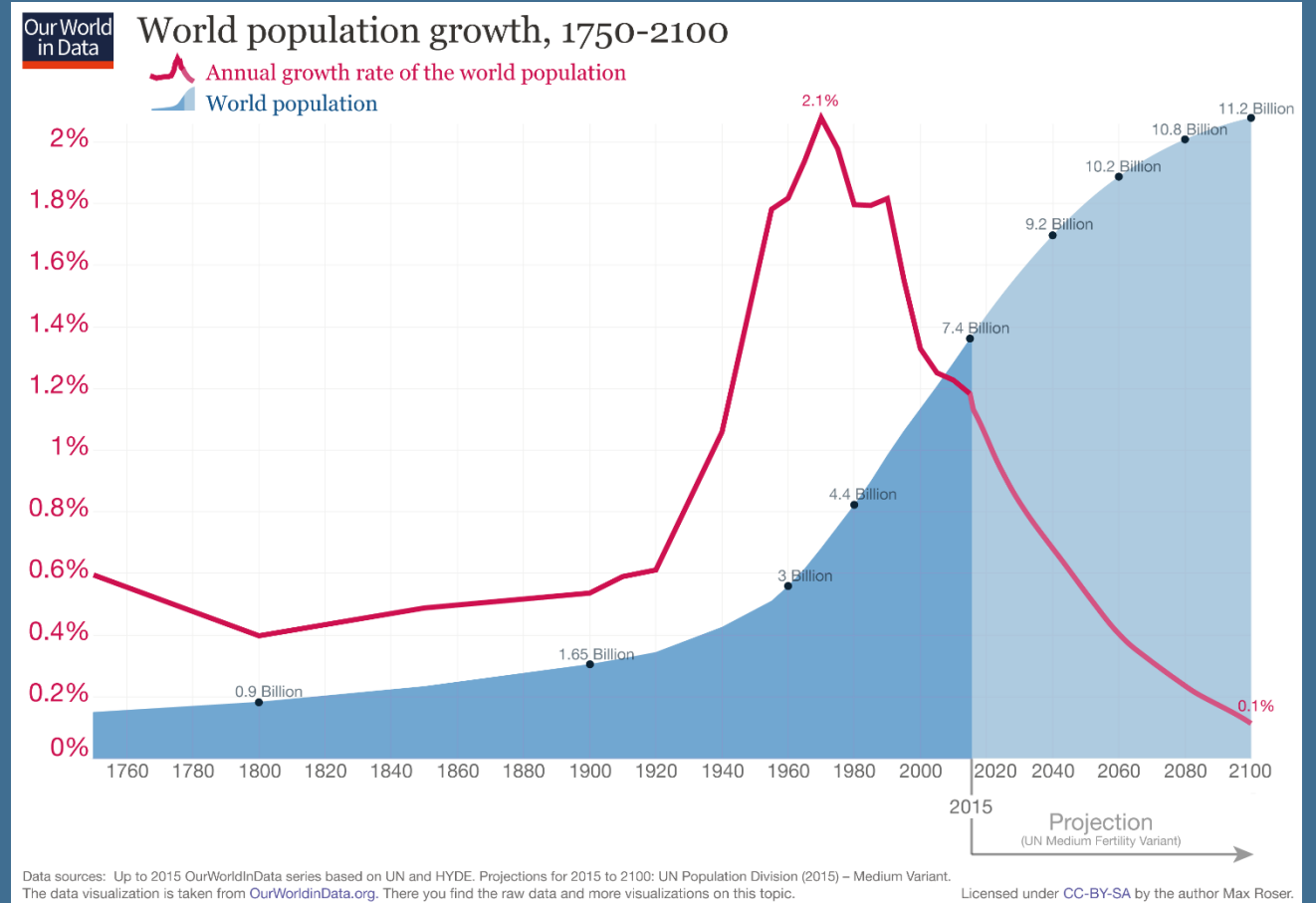


Source: BP Statistical Review of World Energy 2016

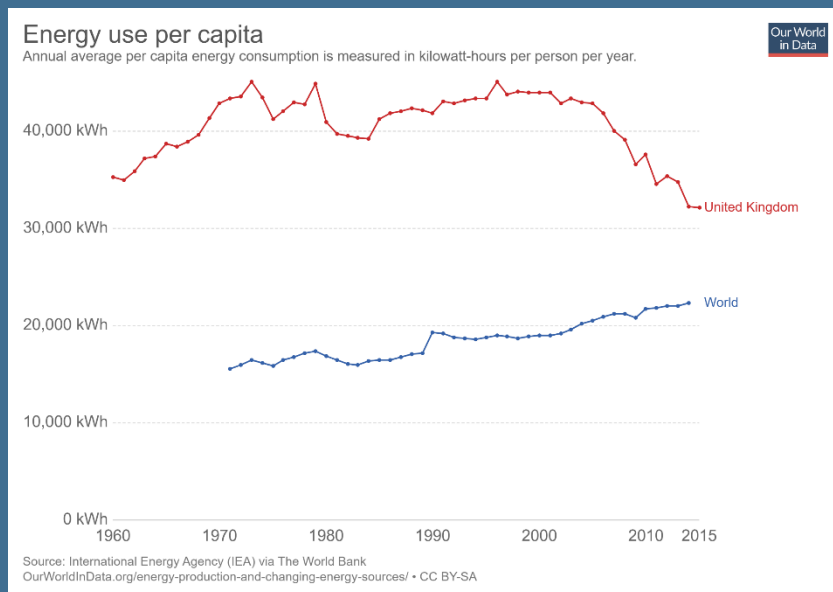
OurWorldInData.org/how-long-before-we-run-out-of-fossil-fuels/ • CC BY-SA

Population growth

& human displacement



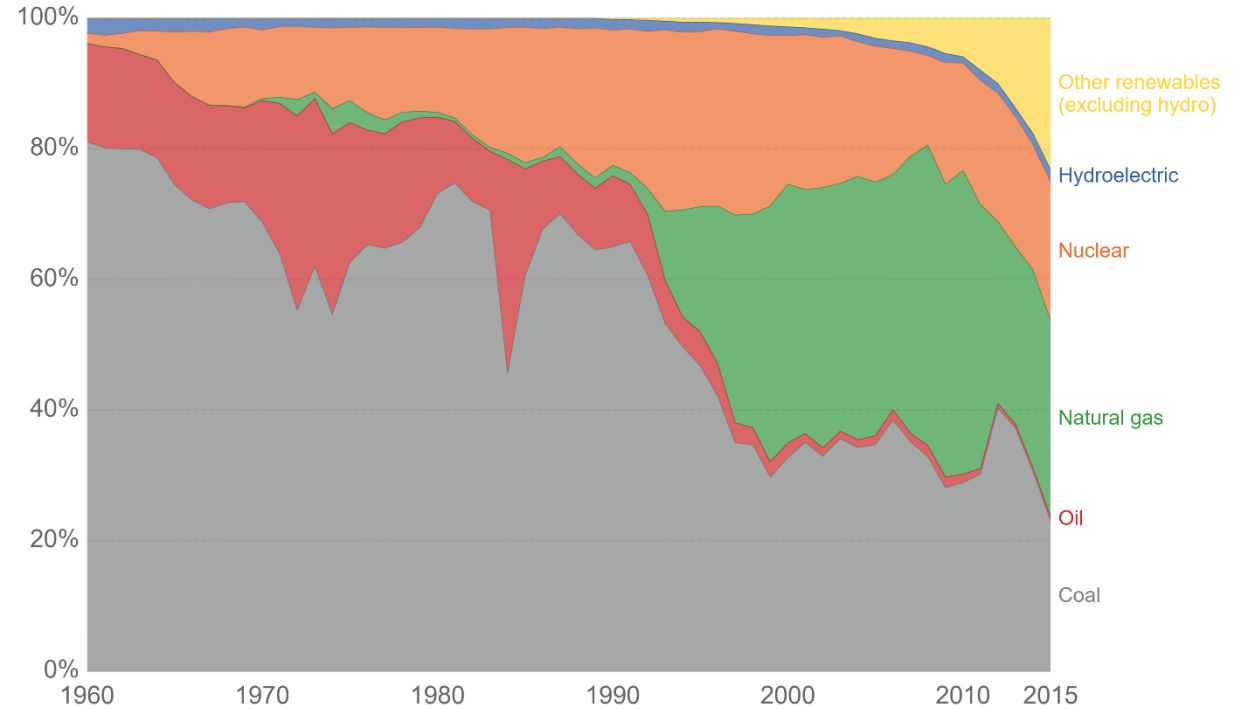
UK Energy



Electricity share by fuel source, United Kingdom

Electricity production (measured as the percentage of total electricity production) by source (coal, oil, gas, nuclear, hydroelectric power and other renewables). Other renewables in this definition includes biomass, wind, solar, geothermal, and marine power.

Our World
in Data



Source: International Energy Agency (IEA) via The World Bank

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Renewable Energy Penryn Campus

Energy Policy

Solar Energy

Energy Storage

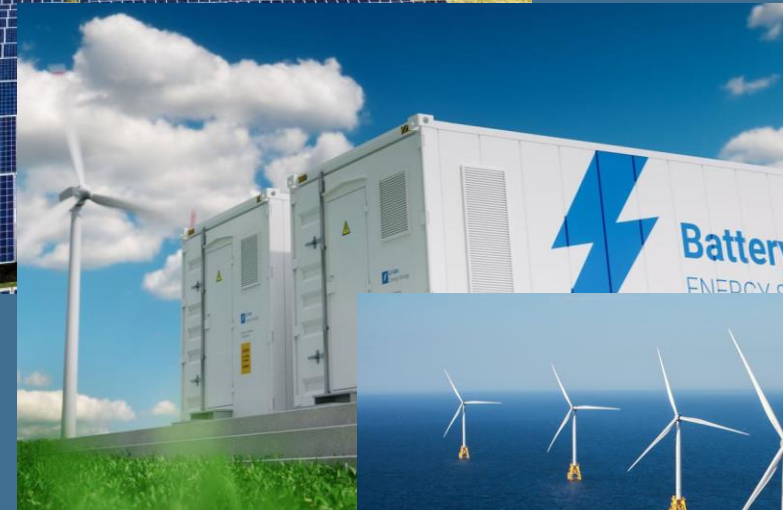
Electrical Power Systems

Marine Renewable Energy

Offshore wind energy

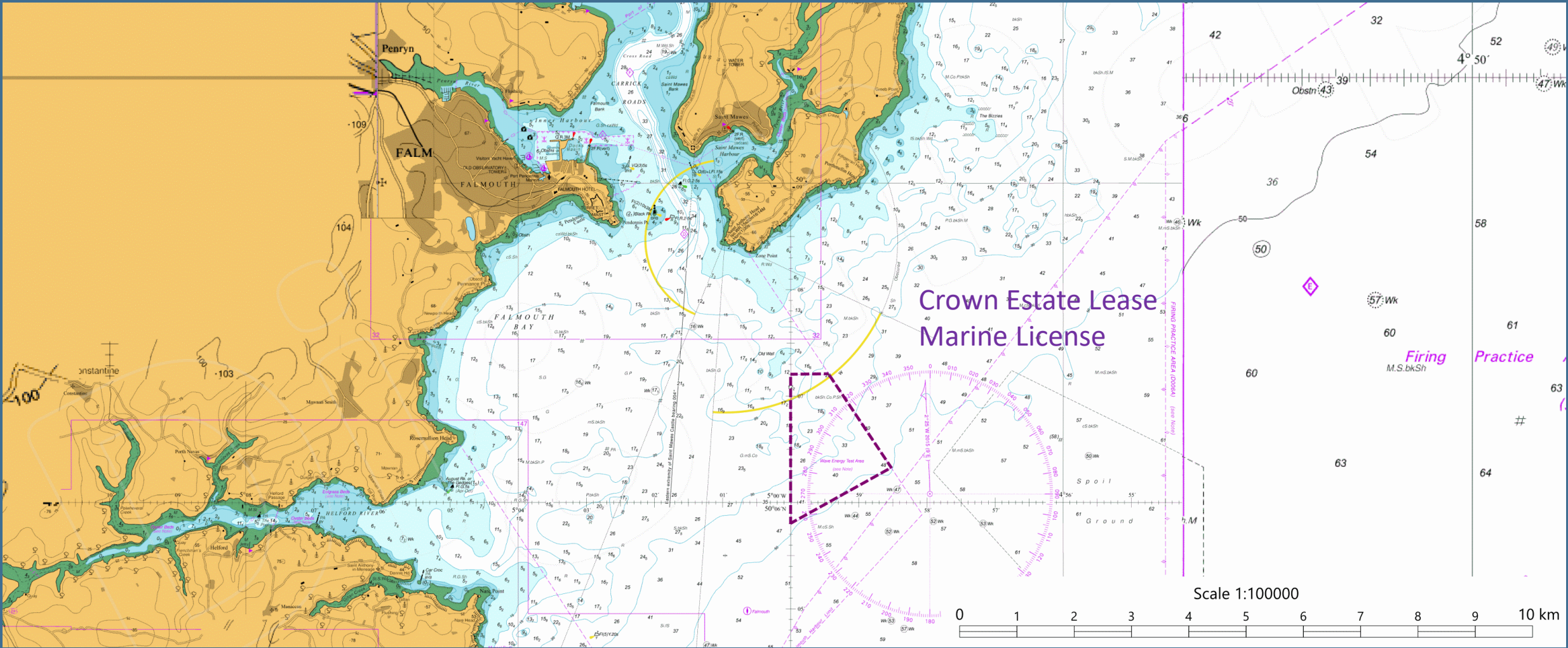
Tidal energy

Wave energy



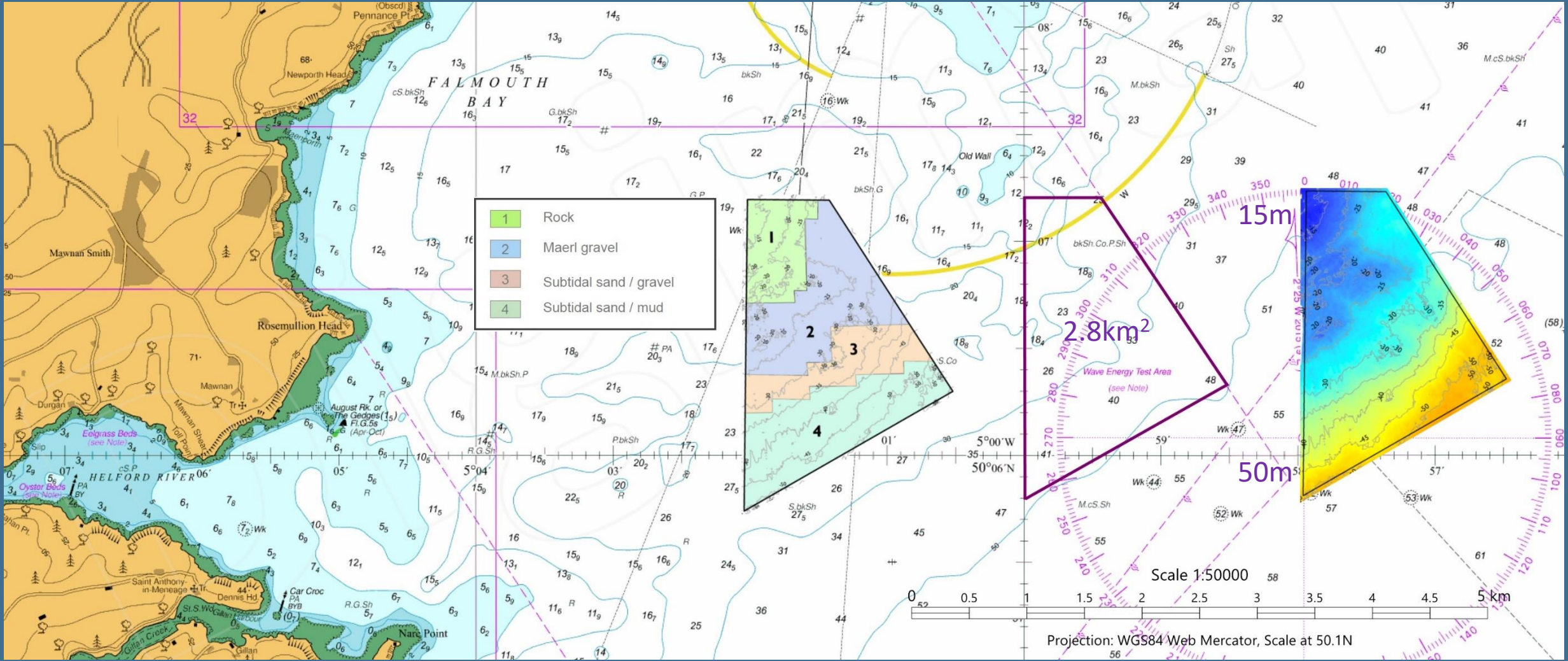
FaBTest

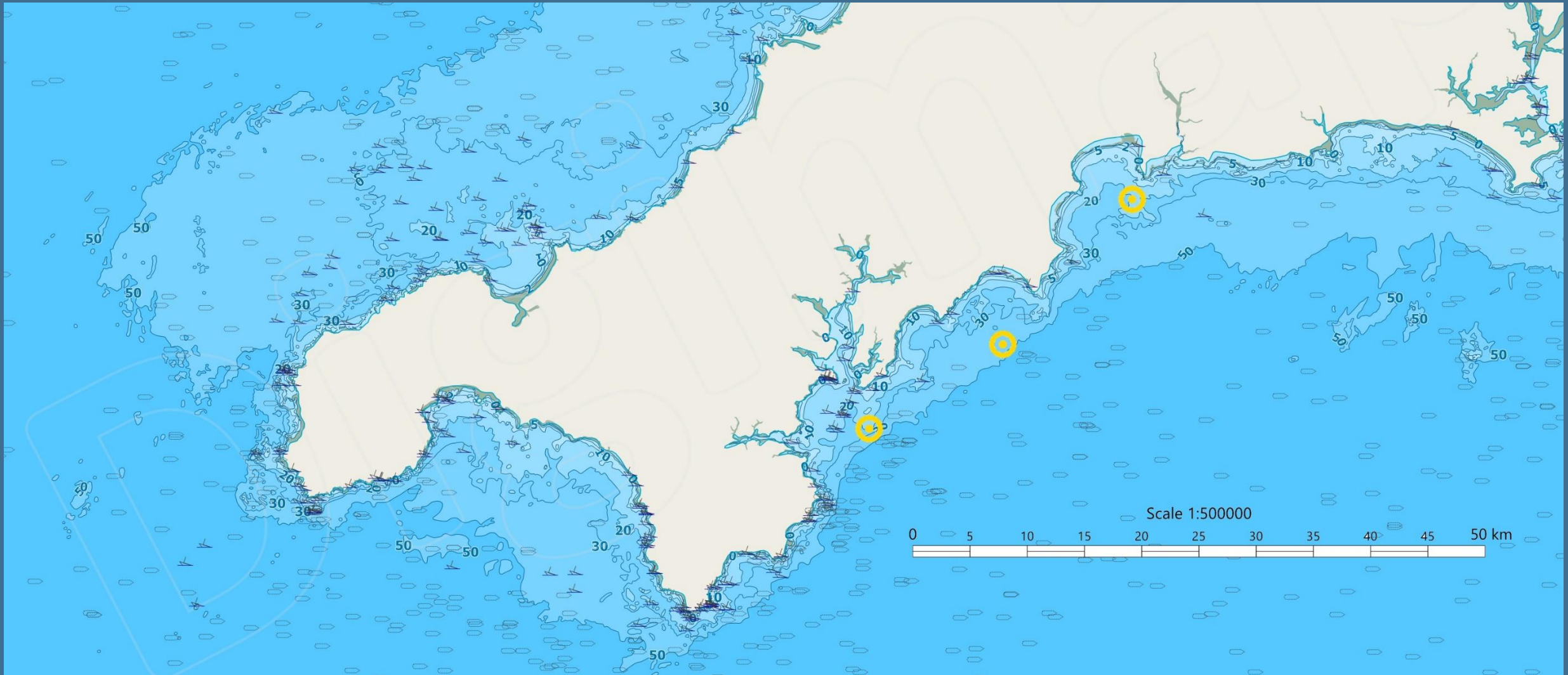




Crown Estate Lease
Marine License







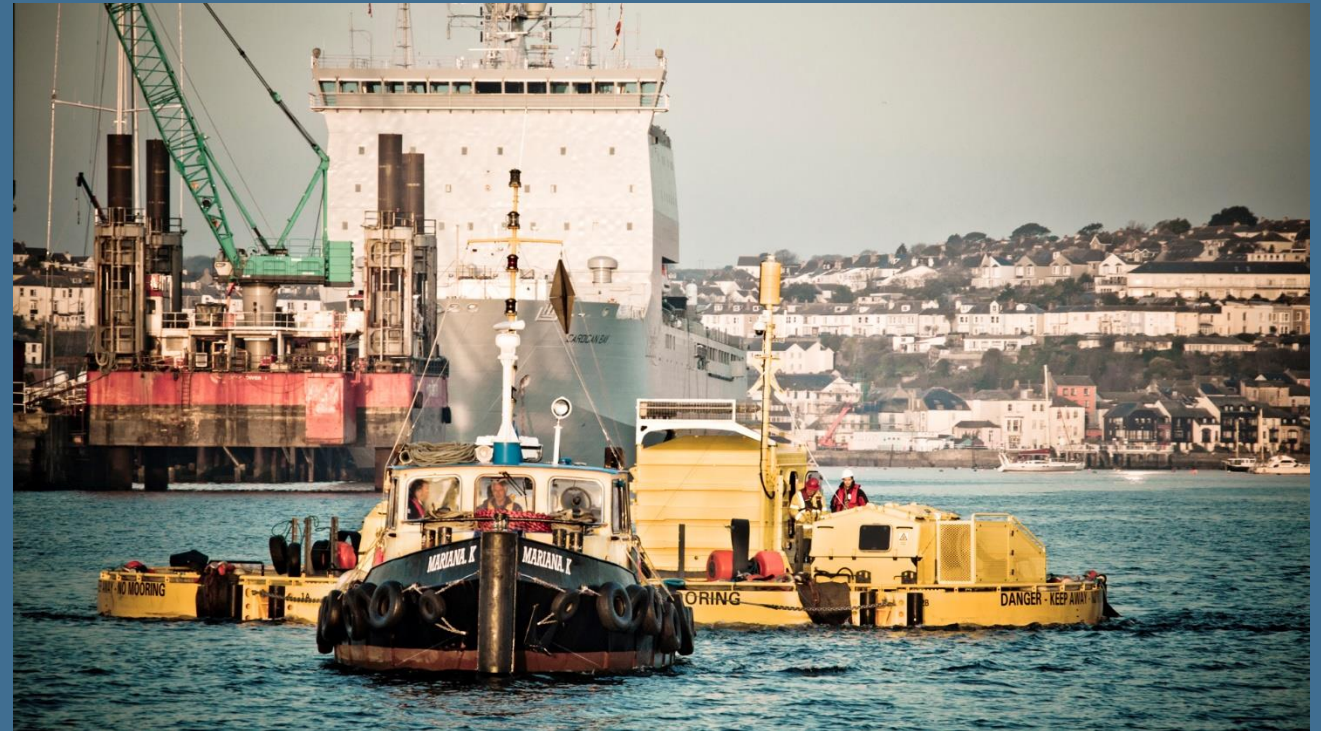
2016 BOLT Lifesaver Fred Olsen

26 month deployment at FabTest

- Proved robustness of design and construction
- Wide range of operational conditions including storm events
- Determined real world operating performance following numerical modelling and tank testing

“Proximity of site to technical support facilities in Falmouth and backing of Harbour Commissioners to manage regulatory interfaces has been a winning formula for the project”

Now deployed at a Hawaiian ‘commercial site’



Fred. Olsen



BOLT

WAVE ENERGY
STEERED BY EXPERIENCE



Lifesaver

2018 WaveSub MPS

Towed from Milford Haven

Installed at FaBTest

Submerged wave energy device

Undergone 3 months testing

Refitted and ready for redeployment

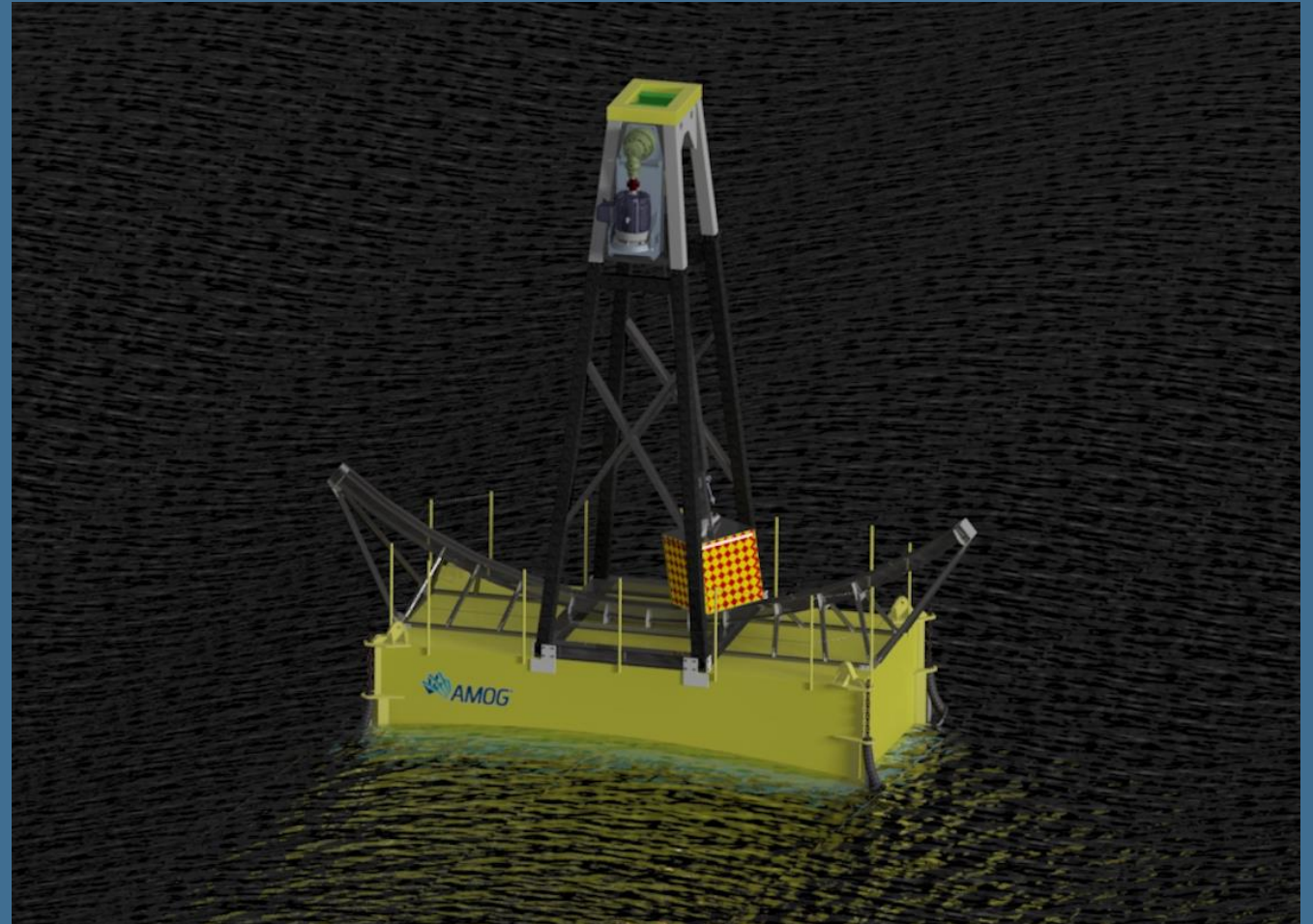


2019 AMOG

Floating wave energy converter

Fabrication commencing February 2019

Installation expected summer 2019



Make Sense?

“Making Sense of Sustainable Energy Systems”

g.crossley@exeter.ac.uk

www.fabtest.com