

Supporting the Offshore Renewable Energy Sector

David Findlay Senior Business Development Manager 26.02.2024

Credit: Equinor Hywind Floating Offshore Wind Farm

THE CATAPULT NETWORK – A NATIONAL CAPABILITY

- Network of 9 world-leading technology innovation centers
- Supporting businesses in transforming great ideas into valuable products and services
- Independent, not-for-profit
- Delivering impact across the UK economy, enabling businesses to thrive in global markets







THE OFFSHORE RENEWABLE ENERGY CATAPULT

- Over 200 engineering, research and sector experts
- World-leading test and demonstration facilities

8 UK Regional Centres

Aberdeen, Blyth, Fife, Glasgow, Hayle, The Humber, Lowestoft, Pembroke Dock

3 UK Academic Research Hubs

Universities of Manchester & Strathclyde – Electrical Infrastructure University of Bristol – Blades University of Sheffield – Power Trains

International Research and Innovation Centre

Yantai, China



OPERATING £1/4BN OF WORLD-LEADING TEST AND DEMONSTRATION FACILITIES IN SUPPORT OF UK INNOVATION



Salter's Duck – Wave Energy in the 1970s

Professor Stephen Salter (7 December 1938 - 23 February 2024)









REINEPOWER

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Evolution of wind turbine heights and output



32 September 19, 2017

Bloomberg New Energy Finance

Blyth Offshore Wind Farm

The UK's first Offshore Wind Turbines – Installed 2000

- Two Vestas V66 2 MW turbines
- Largest in the world at the time of installation





First UK Offshore Wind Farm to be fully Decommissioned – 2019



ACCELERATE TOMORROW'S TECHNOLOGY TODAY



ORE Catapult – Test & Validation

ORE Catapult owns and operates an extensive range of bespoke test, demonstration and verification equipment tailored to the needs of the offshore renewable energy sector.





Materials Lab



Extensive test site with dry docks



Quayside access for large items



7MW Operational Wind Turbine





15MW Grid Emulator





Drive Chain: 1MW; 3MW; 15MW



Dynamic Cable Test Rig



Levenmouth Demonstration Turbine

Since 2016...



7,050 tonnes of CO2 offset Equivalent to 10,545 return passengers on flights From London to

7 MW

rated capacity

22,986 MWh of electricity generated - 9,400 horsepower equivalent to 94 cars

800+ sensor outputs reporting from the turbine

- 5,282 million revolutions of the rotor

Levenmouth Demonstration Turbine Statistics

...enabling industry to accelerate technology to market



2019 – 107m blade



Cost reduction in the UK







Growing Pains?

What went wrong at UK government's offshore wind auction?

Industry sources say auction was 'catastrophic', after failure to secure any new offshore windfarms

• UK auction secures no offshore windfarms

Vattenfall halts project, warns UK offshore wind targets in doubt

U.S. offshore wind sector 'fundamentally broken' - BP exec

By **Ron Bousso** and **Shadia Nasralla** November 2, 2023 8:37 AM GMT · Updated 4 months ago

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ENERGY

THE EUROPEAN WIND SECTOR IS "STRUGGLING" IN THE FACE OF ESCALATING COSTS

The Telegraph News Sport Health Money Business Opinion Israel Ukraine Royals

Alex Economy Companies Markets Tech

Britain's offshore wind industry is running out of puff

Key projects are buckling under the weight of spiralling costs and rigid planning rules

GE scraps plans to make giant 18 MW offshore wind turbines

Michelle Lewis | Feb 23 2024 - 2:53 pm PT | 🦻 19 Comments

Orsted troubles show the wind sector might not grow as quickly as expected

Story by Rhodri Morgan • 1w



World ∨ Business ∨ Markets ∨ Sustainability ∨ Legal ∨ More ∨

Energy

Siemens Energy reviews wind unit set-up after \$5 billion loss

By Christoph Steitz and Alexander Hübner

November 15, 2023 2:09 PM GMT · Updated 3 months ago



SUPPORTING RESEARCH AND DISRUPTIVE INNOVATION

Accelerated Next Generation Technology

- Next generation turbines of 15MW+
- UK research, supply chain growth and IP creation



Energy System
Integration

- Establishing UK leadership
 Demonstration facilities
- Hydrogen economy



Floating Offshore Wind

- Accelerating commercialisation
- Developing first commercial scale floating offshore wind farm
- Developing core UK strengths

Smart & Sustainable O&M

- Providing next-gen facilities for development and testing
- Creating decommissioning capability
- Securing innovation and cost understanding / reduction







Digital, Autonomous and Robotics Engineering (DARE) Centre





£3m state-of-the-art national robotics centre comprising:

- Robotics assembly bay.
- > Drone test zone.
- Dry docks with circa 20,000m3 capacity.
- Command and control centre linked to the docks via a live environment monitoring system.



ORE Catapult Supported Clean Maritime Projects

ORE Catapult are providing support to a range of clean Maritime Projects



Artemis E-Foiler









Retrofit Electric CTV







Zero Emission Fuels Study





FLOATING OFFSHORE WIND CENTRE OF EXCELLENCE (FOW CoE)

- Accelerating the commercialisation of Floating Offshore
 Wind to deliver net zero and drive economic growth;
- **Collaborative programme** with industry, stakeholder, academic and supply chain partnerships;
- Developing and delivering a portfolio of collaborative project activity across four workstreams...
 - Technology Development;
 - Supply Chain, Infrastructure, Construction and Operations;
 - Development and Consent;
 - Delivering Net Zero (Policy);
- Working with existing industry programmes, initiatives and activities to augment and accelerate;

https://ore.catapult.org.uk/FOWCoE/





Floating Offshore Wind– Dynamics Cables and Moorings

- Understanding and designing for dynamic loads and interactions.
- Preventing premature fatigue failures.
- Best practice design and material selection for cost reduction. Operational and logistic constraints
- Dynamic models used to predict mechanical and electrical stress along the cable length.









NATIONAL FLOATING OFFSHORE WIND INNOVATION CENTRE (FLOWIC)

- Innovation centre based in Aberdeen, Scotland;
- Testing and demonstration facilities to support the development and qualification of "critical components" – dynamic cable systems, mooring and anchoring systems;
- Reducing risk and cost associated with critical components in advance of deployment in large scale projects;
- Global centre of excellence for dynamic cabling systems and mooring and anchoring systems;
- Provide technology developers with access to testing and demonstration infrastructure critical to the development and qualification of technology;
- Unique blend of world leading expertise, testing and demonstration facilities;



ge Credit: Oceaneering

mage Credit: Oceaneering



ENERGY TRANSITION ZONE







Image Credit: Ryder Geotechnical



ORE Catapults Reports and Dissemination

- ORE Catapult regularly publishes reports covering our activities and providing insight and guidance to the industry.
- Reports are publicly available at the following link:
- https://ore.catapult.org.uk/ourimpact/reports-and-resources/orecatapult-reports/





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GLASGOW BLYTH **LEVENMOUTH GRIMSBY ABERDEEN CHINA LOWESTOFT PEMBROKESHIRE CORNWALL**

