Celtic Sea Power - FLOW in the Celtic Sea

Neil Farrington
Strategic Offshore Development Manager

CELTICSEA**POWER**
NERTH**MOR**KELTEK

LEADING | INNOVATING | INSPIRING

A CORNWALL
COUNCIL COMPANY

Celtic Sea Power

Objective

We are working towards the sustainable development of Floating Offshore Wind (FLOW) to maximise the once-in-a-generation economic opportunity for Cornwall and the wider Celtic Sea region.

Aim

To maximise the social and economic benefits of FLOW and other low carbon energy opportunities for Cornwall and the Celtic Sea region.

CELTICSEAPOWER

A CORNWALL COUNCIL COMPANY

Grid Connection Considerations

## HNDFUE Celtic Sea Final Recommended design

3x new connection hubs bringing grid scale power to South Wales and Devon.

Deliverable by 2035 with two leasing areas possibly able to connect earlier.

No new overhead circuits triggered, onshore works mostly comprise of reconductoring & hotwiring.

400km of Offshore Network recommended, including 160km DC circuit connecting to the South Wales Connection Node.

Estimated offshore cost: £7.6bn
(from PDA to transmission interface point)
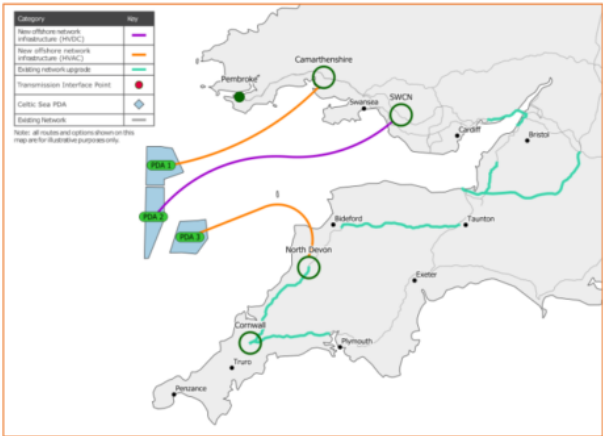
Design objective	C_011z	Offshore BRAG	On shore BRAG
Environment	3rd	A5	A4
Community	3rd	G4	A1
Deliverability and Operability	4th	G5	A3
Economic	5th	-1851	

Clean Energy Generation Potential

4.932GW FLOW in UKCSA

15MW turbines at 50% capacity figure

Annual total generation at a capacity factor of 50% = 21,602GWh/YR

Average UK household electricity consumption (Ofgem 2023) = 2,900KWh/yr (0.0029GWh/yr)

Therefore Annual generation from FLOW in the UK Celtic Sea could meet the **average annual electricity needs of 7,448,965 UK homes.**

Cornwall uses approx. 2,510GWh of electricity/yr – Therefore **UKCSA FLOW to 2035 could provide 8.6 times the electrical power Cornwall currently needs.**

Current UK grid CO2e value 2023 is 0.207074 kg/co2e/KWh

Therefore **Celtic Sea FLOW (4.932GW) could save 4,473,212 tonnes of CO2e/yr** based on 2023 UK grid mix figures.

CELTICSEAPOWER

A CORNWALL COUNCIL COMPANY

12GW Future Pipeline

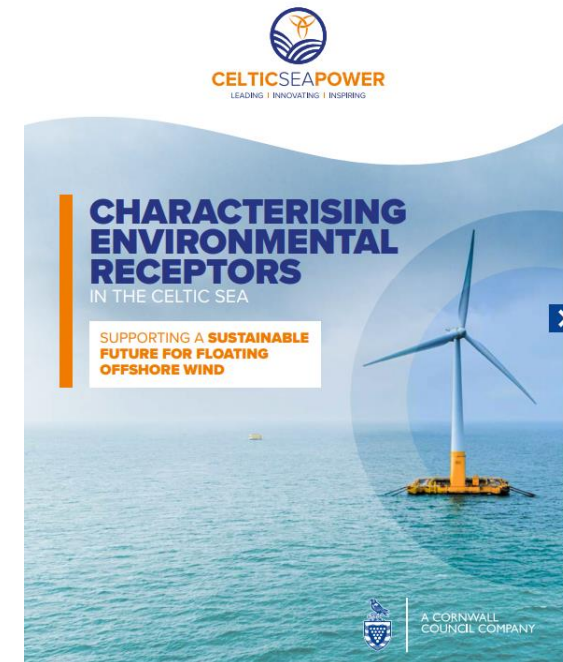# Evidence building to Support sustainable FLOW

- Celtic Sea Power's strategic Regional Environmental Characterisation activity includes new data collection campaigns to target existing gaps in data and support decision-making processes.

- Key aspirations include alignment with decision makers and the creation of a single agreed evidence base for efficient decision making.

- The goal is to develop single, high-confidence regional environmental characterization models for key sensitive environmental receptors.

- Collaborative data sharing and partnership working will maximize efficiency, minimize replication, and decrease conflict.

CELTICSEAPOWER

CELTICSEAPOWER
LEADING | INNOVATING | INSPIRING

CHARACTERISING ENVIRONMENTAL RECEPTORS
IN THE CELTIC SEA

SUPPORTING A SUSTAINABLE FUTURE FOR FLOATING OFFSHORE WIND

A CORNWALL COUNCIL COMPANY

Wind Resource and Metocean Data

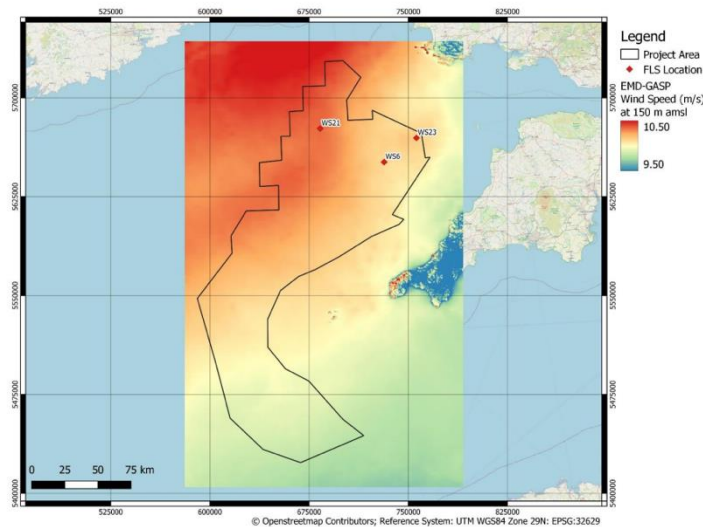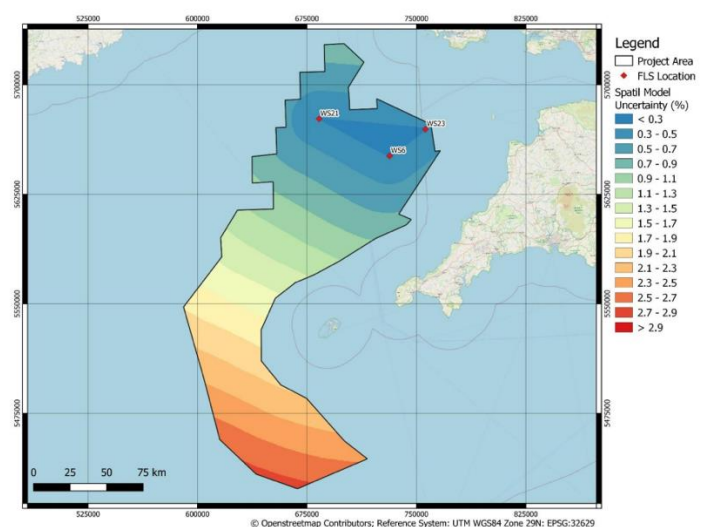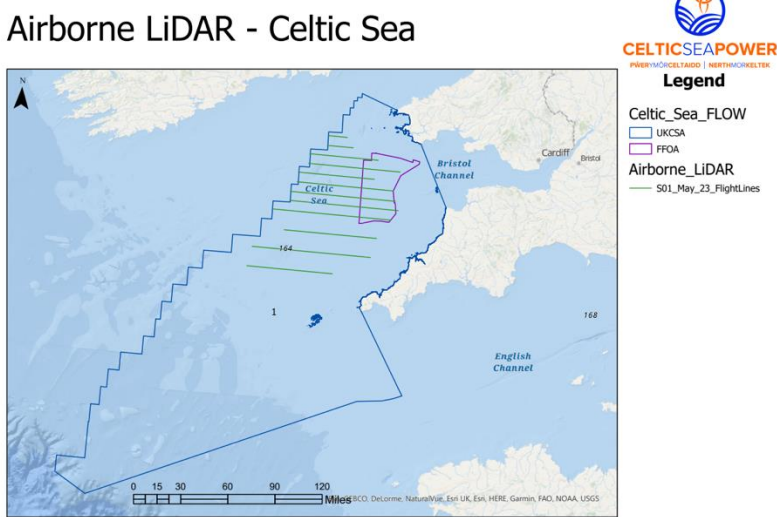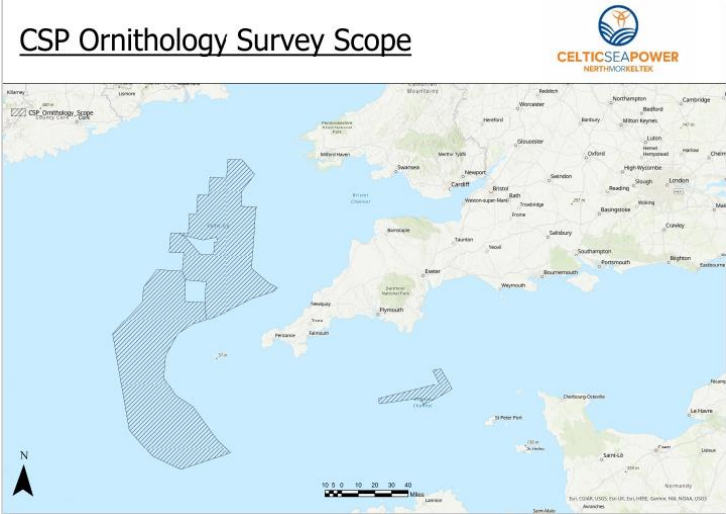| Data/Evidence set	CSP Collection Method	Purpose	Progress	Regional modelling partners
Wind Resource and Metocean data	2 x Floating LiDAR systems	Creation of a bankable regional wind resource model	Launched June 2022	Wood PLC
Wind Resource and Metocean data	Data sharing agreements = Additional FLS data sets	Increasing spatial and temporal coverage for the regional wind resource model	Ongoing	Wood PLC
Regional Wind Resource Model	MCP analysis utilising mesoscale wind resource models and measured point data	Creation of a bankable regional wind resource model. Utilization of physics models vs physical FLS deployments to streamline development	Released Jan. 2024. Later iterations to include TCE FLS	Wood PLC

Figure 4: EMD-GASP Wind Resource Map at 150 m

Figure 8: Spatial Model Wind Speed Uncertainty

CELTICSEAPOWER

A CORNWALL COUNCIL COMPANY

Ornithology

Data/Evidence set	CSP Collection Method	Purpose	Progress	Regional modelling partners
Ornithology	Digital Aerial Surveys	Increase evidence base to understand potential interactions. Creation of a Celtic sea bird distribution and density model.	Seasonal surveys complete May 2023.	POSEIDON project (Natural England, CEFAS ,JNCC & expert consultants).
Ornithology	Data Sharing agreements	Align survey plans. Maximise spatial and temporal coverage	On going	POSEIDON project
Ornithology	Airborne LiDAR	Development of a new flight height index for sea birds in the Celtic Sea	Single Survey complete May 2023.	POSEIDON project

CSP Ornithology Survey Scope

Airborne LiDAR - Celtic Sea

SubSea Soundscape

University of Exeter

MEECE — Delivered by **caTAPULT** Offshore Renewable Energy

Cronfa Datblygu Rhanbarthol Ewrop European Regional Development Fund

Funded by OWEC

CELTICSEAPOWER

1. Deploy a large-scale network of **21 acoustic monitoring** stations in the Celtic Sea.

2. Support a **new Marine mammal evidence base** for the Celtic Sea.

3. Create region wide **acoustic soundscape** model and **open-source** baseline acoustic data of the Celtic Sea integrating new S3 data and other secured acoustic data sources.

4. **Co-developing road maps with regulators (England and Wales)** for the use of acoustic soundscape models for consenting

5. **Compare S3 regional approach** to data gathering to industry standard data collection for EIA, to determine the difference in cost, time, carbon, safety.

6. **eDNA & water column physics** sampling at all stations will support new data outputs and help **cross validate** DAS, visual, satellite and acoustic techniques.
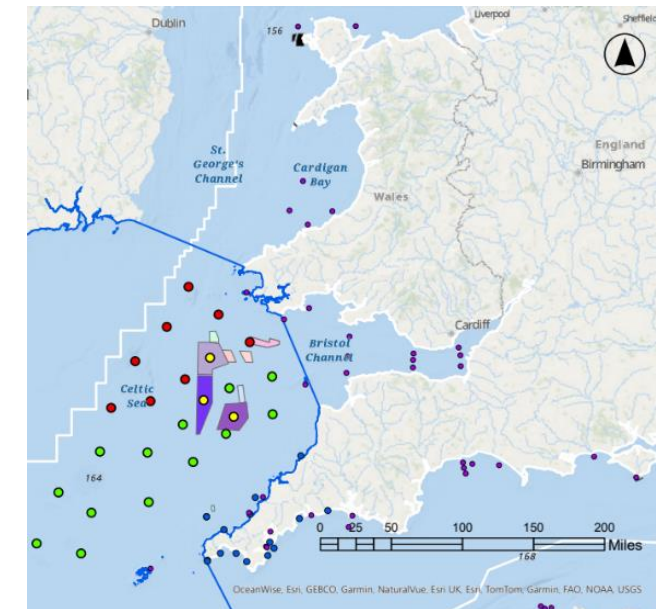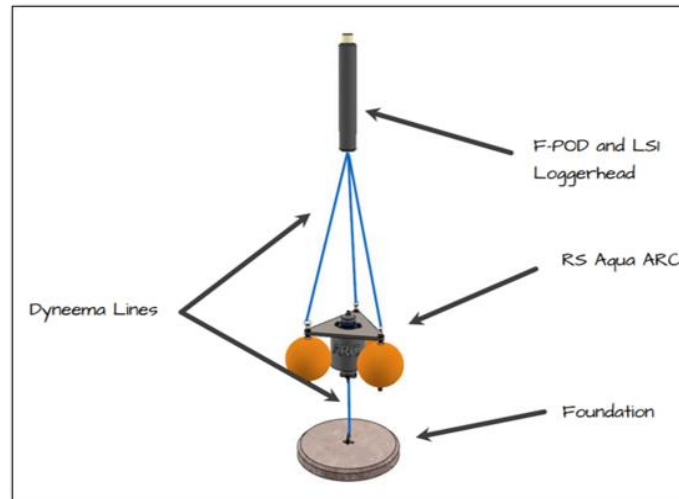
Seal Spy system

Machine learning techniques to automatically detect seals, and to redefine their vocal repertoire including Video footage to associate behaviour to call types … potential to ID seals … and investigate individual accents
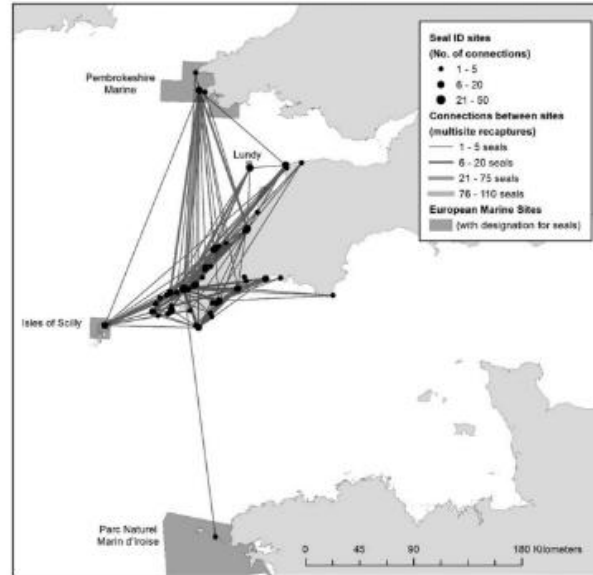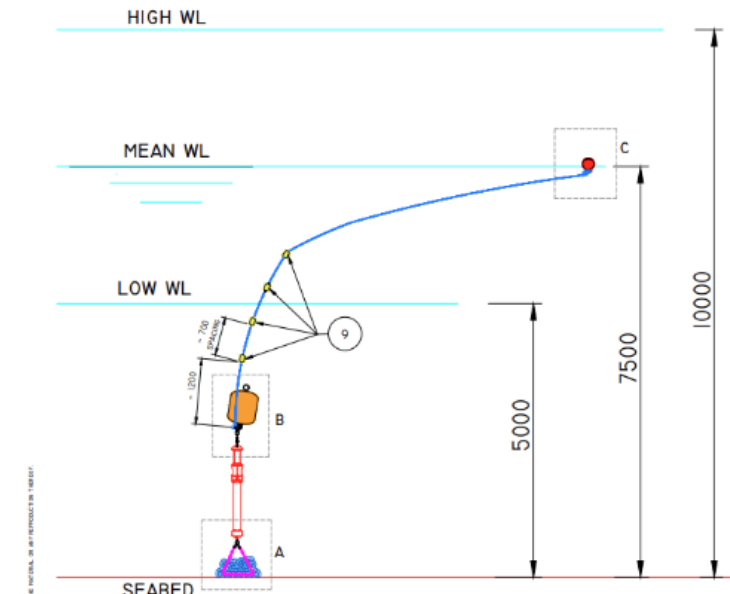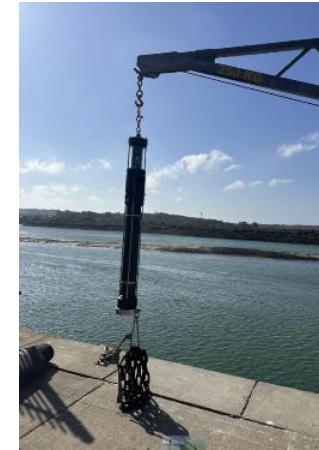

Fig. 3. All multisite recapture PID connections to/from the south-west UK. Circle size proportional to the number of PID connections per site. Line width represents the number of multisite recaptures between sites. Location of European Marine Sites (Special Areas of Conservation) with PID connections annotated.

CELTICSEA**POWER**

Workforce Development and FLOWmark®

CELTICSEA**POWER**

A FLOWmark is an industry recognised stamp of approval for a course which delivers skills relevant to the Floating Offshore Wind (FLOW) industry. The FLOWmark recognised the transferable skills delivered by core competencies.

GUIDE
- Targeted careers advice for the renewables sector facilitated through our NoTwoPaths App
- Train the trainer – Working with colleges and the Job Centre+ to deliver training to 80+ careers guidance practitioners and counting!

PROGRESS
- FLOWmark®, an industry endorsed stamp of approval for modules delivering skills for the sector
- CSP Learn – online courses co-developed with industry to build your knowledge

ADVANCE
- Delivering courses that enhance direct employability e.g. STCW, RYA PB Level 2, Working at Heights and H&S
- Connecting individuals to industry employers.

FLOWmark

Return on Investment

£6m — external revenue secured by CSP

1,000+ people attended CSP's four annual summits, including national stakeholders and international investors

200+ Over 200 people supported to start their journey into a career in green energy

Since 2021, **£1.7m** of investment from the Green Growth Reserve, has returned over **£20m** into Cornwall through the work of Celtic Sea Power.

225+ Over 225 businesses worked with

£10m At least £10m of investment into Cornish businesses with whom CSP have worked

£3.6m of additional investment into Cornwall as a direct result of our work

CELTICSEAPOWER

A CORNWALL COUNCIL COMPANY

Thank You

Neil Farrington, Strategic Offshore Development Manager, Celtic Sea Power

neil.farrington@celticseapower.co.uk