



# Celtic Sea Power - FLOW in the Celtic Sea

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NERTHMORKELTEK

LEADING | INNOVATING | INSPIRING



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# 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.**



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# Celtic Sea FLOW pipeline

2035/2045

12GW – c800 x 15MW Turbines

2029/35

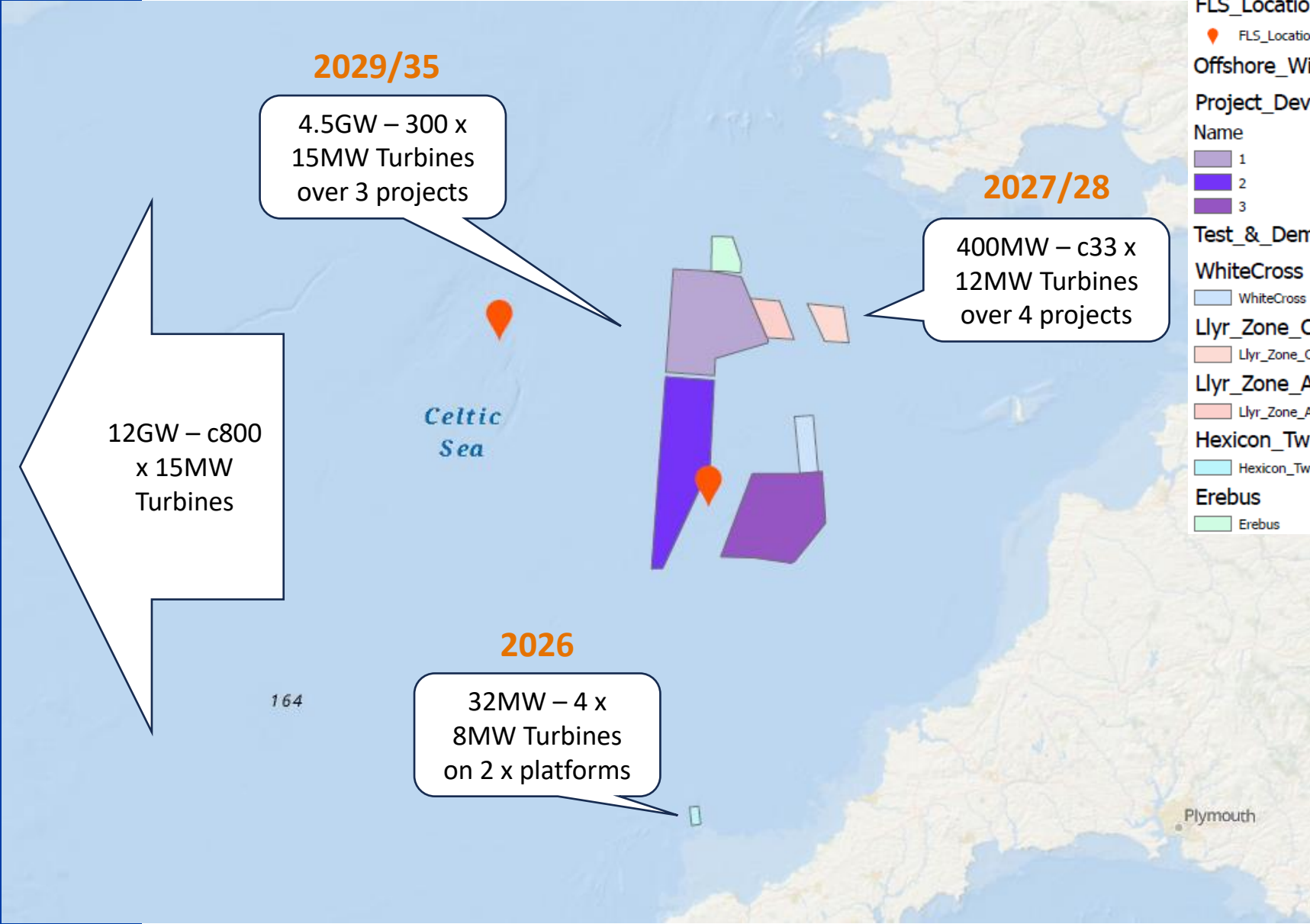
4.5GW – 300 x 15MW Turbines over 3 projects

2027/28

400MW – c33 x 12MW Turbines over 4 projects

2026

32MW – 4 x 8MW Turbines on 2 x platforms



Celtic\_Sea\_Power

FLS\_Location

FLS\_Location

Offshore\_Wind\_Leasing\_Round5

Project\_Development\_Areas

Name

- 1
- 2
- 3

Test\_&\_Demo\_Sites

WhiteCross

WhiteCross

Llyr\_Zone\_C

Llyr\_Zone\_C

Llyr\_Zone\_A

Llyr\_Zone\_A

Hexicon\_TwinHub

Hexicon\_TwinHub

Erebus

Erebus

# 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 CO<sub>2</sub>e value 2023 is 0.207074 kg/co<sub>2</sub>e/KWh*

Therefore **Celtic Sea FLOW (4.932GW) could save 4,473,212 tonnes of CO<sub>2</sub>e/yr** based on 2023 UK grid mix figures.



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# Grid Connection Considerations

## HNDFUE Celtic Sea Final Recommended design

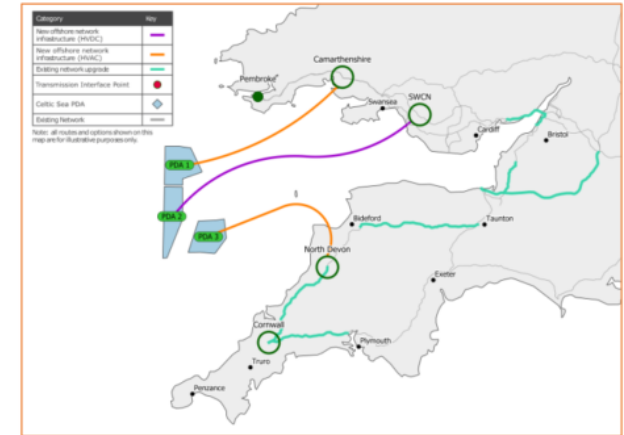
**3x new connection hubs** bringing grid scale power to South Wales and Devon.

**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	3 <sup>rd</sup>	A5	A4
Community	3 <sup>rd</sup>	G4	A1
Deliverability and Operability	4 <sup>th</sup>	G5	A3
Economic	5 <sup>th</sup>	-1851	



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# Celtic Sea Blueprint requirements

Minimum infrastructure required to deliver 4.5 GW (three x 1.5GW projects) of floating offshore wind capacity in the Celtic Sea

Capital expenditure on the Celtic Sea 4.5GW programme will deliver £1.4 bn GVA to the UK, and 5,300 jobs on average over five years



## 1.5+ ha per port

1 Integration port

**Capacity Risk = High**  
**Barrier to resolution = Medium**



## 8 ha per port

1 x Assembly port with 2 assembly lines

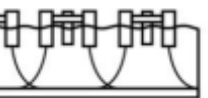
**CR = High**  
**B2R = Medium**



## 16 ha per port

1+ marshalling port  
12 ha (turbines)  
4 ha (mooring & anchors)

**CR = High**  
**B2R = Low**



## 4+

Wet storage sites

**CR = High**  
**B2R = Medium**



## 1+ bases

O&M bases, plus 1 MCR port

**CR = High**  
**B2R = Low**



## 264

Offshore Wind Turbines

**CR = Medium**  
**B2R = Medium**



## 264

Floating platforms

**CR = High**  
**B2R = Medium**



## 3+

Substations

**CR = Medium**  
**B2R = Medium**



## 41 km

Dynamic - interarray cables

**CR = Medium**  
**B2R = Medium**



## 515 km

Static - interarray cables

**CR = Low**  
**B2R = Medium**



## 1056

Anchors

**CR = Low**  
**B2R = Low**



## 12+

Transshipment vessels

**CR = Medium**  
**B2R = Medium**



## 3

Scour protection vessels

**CR = Medium**  
**B2R = Medium**



## 6+

Support vessels

**CR = Medium**  
**B2R = Low**



## 3+

Cable lay vessels

**CR = Medium**  
**B2R = High**



## 6+

Anchor handlers

**CR = Low**  
**B2R = Low**



## 3

Service operation vessels

**CR = High**  
**B2R = Medium**



## 317 km

Total mooring line length

**CR = Medium**  
**B2R = Low**

## 1056

Number of mooring lines



## 3+

Cable lay vessels

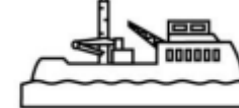
**CR = Medium**  
**B2R = High**



## 6+

Anchor handlers

**CR = Low**  
**B2R = Low**



## 3

Service operation vessels

**CR = High**  
**B2R = Medium**



## 326 km

Export cables

**CR = Medium**  
**B2R = High**

### Defining capacity risk (CR)

**High** = no existing capacity or high constraints in market  
**Medium** = some existing capacity and some constraints in market  
**Low** = sufficient existing capacity and limited constraints in market

### Defining barrier to resolution (B2R)

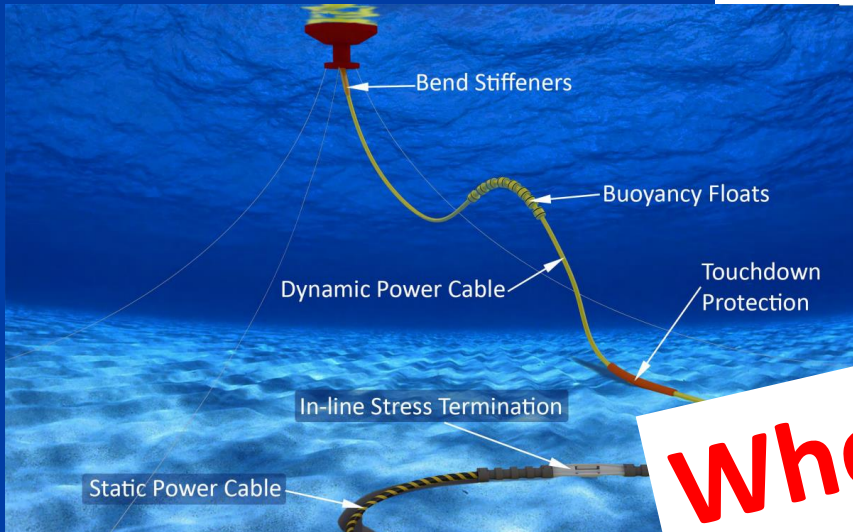
**High** = high inertia & low market influence or lack of options  
**Medium** = some market influence and potential alternatives  
**Low** = high sector control and/or solutions emerging

# Opportunities??

**Where can we build from strengths?**

**Export potential**

**"No Regret" Activity**



Ports	<ul style="list-style-type: none"> <li>Necessary to facilitate...</li> <li>Consenting...</li> </ul>
Grid	<ul style="list-style-type: none"> <li>...and provide national...</li> <li>...to mitigate</li> </ul>
...	<ul style="list-style-type: none"> <li>Initiate a STEM Generation, confident of jobs to follow...</li> <li>Higher value careers (not jobs) for people in... SW</li> </ul>
Turbine and towers	<ul style="list-style-type: none"> <li>New UK comp...</li> </ul>
Platforms	<ul style="list-style-type: none"> <li>...concrete. A and (secondary) steel.</li> <li>...can build?</li> </ul>
Ca	<ul style="list-style-type: none"> <li>Turn risk into opportunity, with new model?</li> <li>Factory in the region? UK owned?</li> </ul>
Anchors & Mooring	<ul style="list-style-type: none"> <li>Design solutions in our region?</li> <li>Build in UK?</li> <li>Turn risk in...</li> </ul>
Vessels	<ul style="list-style-type: none"> <li>...ative..</li> <li>...and high-end design</li> </ul>
O&M	<ul style="list-style-type: none"> <li>...ation developed and executed from within the region?</li> </ul>

# Thank You

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