



LEADING | INNOVATING | INSPIRING



# The next decade



Introduction to Celtic Sea Power
Ambition, pipeline and timelines
The opportunity

#### <u>About Celtic</u> <u>Sea Power</u>

- Autonomous subsidiary of Cornwall Council
- Staff of 17 and board of 5 with range of industry experiences and skills
- Co-founder and member of the Celtic Sea Developers Alliance
- Co-founder and board member of the Celtic Sea Cluster



Our purpose is to accelerate the industrialisation of floating offshore wind and maximize the socio-economic benefits for the people, businesses, and communities across the Celtic Sea Region that spans across South Wales and the Southwest.









Global Pipeline to 2030 and beyond



Floating wind outlook 2020's - GWEC market intelligence 2021

- By 2026 annual installation >1GW/yr
- 2030 FLOW forecast 3GW 19GW
- The global pipeline of floating offshore wind projects is 185GW over 230 projects, (RUK EnergyPulse insight report Nov 2022)
- Of the 185GW, 121MW are fully commissioned over nine projects in seven countries: 96MW are under construction; 288MW are consented or in the pre-construction phase; 31GW are in planning or have a lease agreement; and 153GW are in early development or the leasing process.



#### UK -Scotland



#### ScotWind Round

Total = 27,626MW Floating Wind = 17,871MW (65%)

ITE	DEVELOPERS	CAPACITY
	BP and EnBW	2,907MW
	SSE Renewables, CIP and Marubeni	2,610MW
	Falck Renewables and BlueFloat Energy	1,200MW
	ScottishPower Renewables and Shell	2,000MW
	Vattenfall and Fred Olsen Renewables	798MW
	Thistle Wind Partners	1,008MW
	Thistle Wind Partners	1,008MW
	Faick Renewables, Orsted and BlueFloat Energy	1,000MW
	Ocean Winds	1,000MW
0	Falck Renewables and BlueFloat Energy	500MW
1	ScottishPower Renewables and Shell	3,000MW
2	Floating Energy Allyance	960MW
3	RIDG, Corio Generation and TotalEnergies	2,000MW
4	Northland Power	1,500MW
5	Magnora Offshore Wind	495MW
6	Northland Power	840MW
7	ScottishPower Renewables	2,000MW
8	Ocean Winds	500MW
9	Mainstream RP and Ocean Winds	1,800MW
0	ESB Asset Management	500MW

ScotWind Round - Offshore wind Scotland 2023

• £700 million spend on option fees







Average production rate from 2030: 1x installed turbine every 10 days, for 6 years.







### **Celtic Sea – Latest News**

- The Crown Estate: Information Memorandum. Released December 14<sup>th</sup> 2023: <u>Offshore Wind Leasing Round 5 | The Crown Estate</u>
- The Crown Estate's "Bidders Day". Jan 31st 2024
- Round 5 PQQ process commenced week commencing 19<sup>th</sup> February
- <u>Missing Middle Report</u> On regional development for Celtic Sea FLOW featuring:
  - Recommendations on UK Govt policy
  - Modelled scenarios for regional capture of key supporting industries
- Cornwall FLOW Commission. Announced in UK Govt's Autumn statement, to be established in Spring 2024



#### Identified interventions

#### **Required port capacity**

Scotland 2030 – 2040: Industrialised scale: 3-5 Integration Ports

Celtic Sea 2030 – 2040: Industrialised scale 2 Integration Ports

Nationally 2030 – 2040: Industrialised scale 4-6 manufacturing / assembly ports

Royal



Manufacturing and fabrication Concrete manufacturing and steel assembly facilities	1
Assembly lines and pads iteel and concrete substructure assembly lines	2
ntegration area Construction and preparation of new or repurposed land	3
aydown-storage area Construction of new, reclaimed or repurposed land	4
Quayside New quayside or lengthen and strengthen existing	5
Cranes & equipment nstallation of ringer cranes, SPMT, rail systems and other equipment	6
<b>larbour area</b> Videning and deepening berth pocket and harbour area	7
aunch facilities Build facility, purchase launch equipment and lift systems	8
<b>Vet storage</b> dentification and installation of mooring systems	9
Access channel Videning & deepening	10
nstallation fleet wailability of installation and support vessels	11

RUK FLOW Industry Roadmap 2040, Final Version March 2023,

Floating Offshore Wind Taskforce Industry Roadmap 2040: Building UK Port Infrastructure to Unlock the Floating Wind Opportunity Renewable UK <a href="https://www.renewableuk.com/news/634701/Industry-Roadmap-2040-Building-UK-Port-Infrastructure-to-Unlock-the-Floating-Wind-Opportunity.htm">https://www.renewableuk.com/news/634701/Industry-Roadmap-2040-Building-UK-Port-Infrastructure-to-Unlock-the-Floating-Wind-Opportunity.htm</a>

Image source: COWI

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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



#### **Celtic Sea – Ports and Infrastructure**



Falmouth, Milford Haven, Port Talbot and others are in planning for development.





Regional grid and infrastructure will need major upgrade. Local experience from Hinkley-C could inform, especially if concrete foundations

<u>Grid</u> **HNDFUE** looking at grid connections for first 4.5GW. Coordination will be required











### **The Case for Concrete**

• Of the 35 floating substations currently operational/ in construction in Europe, 15 are concrete.

Project	Market	Floaters	Material	Installed Capacity (MW)	Status
Floatgen	France	1	Concrete	2	Operational
Tetraspar	Norway	1	Steel	3.6	Operational
WindFloat Atlantic	Portugal	3	Steel	25.2	Operational
Kincardine	Scotland	5	Steel	49.5	Operational
Hywind Scotland	Scotland	5	Steel	30	Operational
Hywind Tampen	Norway	11	Concrete	88	Operational
Eolmed	France	3	Concrete	30	Under Construction (2022-24)
EFGL	France	3	Steel	30	Under Construction (2022-24)
Provenece Grand Large	France	3	Steel	25	Under Construction (2022-24)
Total		35		283.3	

- In terms of opportunity, it is estimated that the direct lifetime spend for 4GW of FLOW is circa £19bn, with 18% of that coming from the sub-structure/ floater (£3.5bn)
- Reference Sub-structures (15MW) Concrete
   c. 20,000 t 8000 m3; Steel c. 4000 t

# Material Demand



Total UK aggregate supply, 2021 (MPA)



Constituent	1 x unit	4.5GW	24WG	
Mass concrete (t)	17,856	5,303,232	28,283,904	
Volume (m³)	8,000	2,376,000	12,672,000	
Mass Re-bar (t)	2,400	712,800	3,801,600	
Aggregate (t)	11,400	3,385,800	18,057,600	
Cement (t)	2,400	712,800	3,801,600	

Material requirements based on Activefloat concrete semi-sub 15MW Platform

Throughput for 1GW/Year (15MW Platform)						
	t/unit	kt/month	kt/year			
Sand	1800	10	119			
Aggregate type 1 (0/8)	3600	20	238			
Aggregate type 2 (8/14)	6000	33	396			
Cement	2400	13	158			
Total	13800	76	911			

Aggregate throughput based on 1GW/year serial production (66 units)







# So Why Concrete?

Potential serial production cost savings (industry advise that concrete more cost effective beyond 3 or 4 units)

Significantly lower carbon intensity throughout LCA of concrete floater than comparable steel structures (Cornwall FLOW Accelerator studies by OREC, DNV study)

Existing supply chains, capability, plant and expertise in key regions provide confidence in meeting required production rates.

Allows for maximum local content and value capture as substructures can be domestically produced Courtesy Ideol & V.Joncheray



Workforce modelling based on a: bottom-up analysis of requirement for medium sized FLOW array b: GVA study using supply chain model from 2020. Cornwall "essential" case – room to increase.

#### Potential Jobs in Cornwall from FLOW in UK Celtic Sea





# FLOW as a market pull for upskilling now





- Where can we build from strengths?
   Export potential
- Export potential.
- "No regrets" activity!



# CELTICSEAPOWER

#### Thank you

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