

ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



This session  
begins at  
1000



# Building an industry: offshore wind in Scotland

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER







**Claire Mack**  
Chief Executive  
Scottish Renewables

# WITH THANKS TO OUR SPONSORS & SUPPORTERS

IN ASSOCIATION WITH



EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



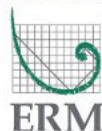
EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER





**Jim Smith**  
**Managing Director, SSE Renewables**

**Dr Carolyn Heeps**  
**Head of Offshore Wind, Fred. Olsen Renewables**

**Olivier Terneaud**  
**Vice President, Offshore Wind, Total**

**Dan Finch**  
**Managing Director, Ocean Winds UK**

**Michael Hannibal**  
**Partner, Copenhagen Infrastructure Partners**

ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER





This session  
begins at  
1200



# Barriers and opportunities to UK supply chain growth - organised by ORE Catapult





# **Andrew Macdonald**

Senior Innovation Manager and OWGP Lead  
ORE Catapult



**Myrtle Dawes**  
Solution Centre Director  
OGTC



Technology  
Driving  
Transition



**OGTC**

## Scottish Renewables Offshore Wind Conference

### Barriers and Opportunities to UK Supply Chain Growth

Myrtle Dawes, Solution Centre Director

21 April 2021





**1) Background OGTC**

**2) Roadmap**

**3) Integrated Energy Vision  
and Closing the Gap**



**4) Diversification**

**5) Technology Transfer**

**6) North Sea Transition Deal**



## Programme

## Theme

## Outcome

### EMISSIONS REDUCTION

Field development

Production, operations and logistics

Late life and decommissioning



Technology to help reduce  
UKCS operational emissions to net zero

### ENERGY SYSTEM INTEGRATION

Renewables and energy storage

Hydrogen and other clean fuels

Carbon capture, utilisation and  
storage



Technology to help create an  
integrated net zero offshore energy system

### OFFSHORE ENERGY 4.0

Smart assets

Field automation and remote control

Robotics and autonomous systems

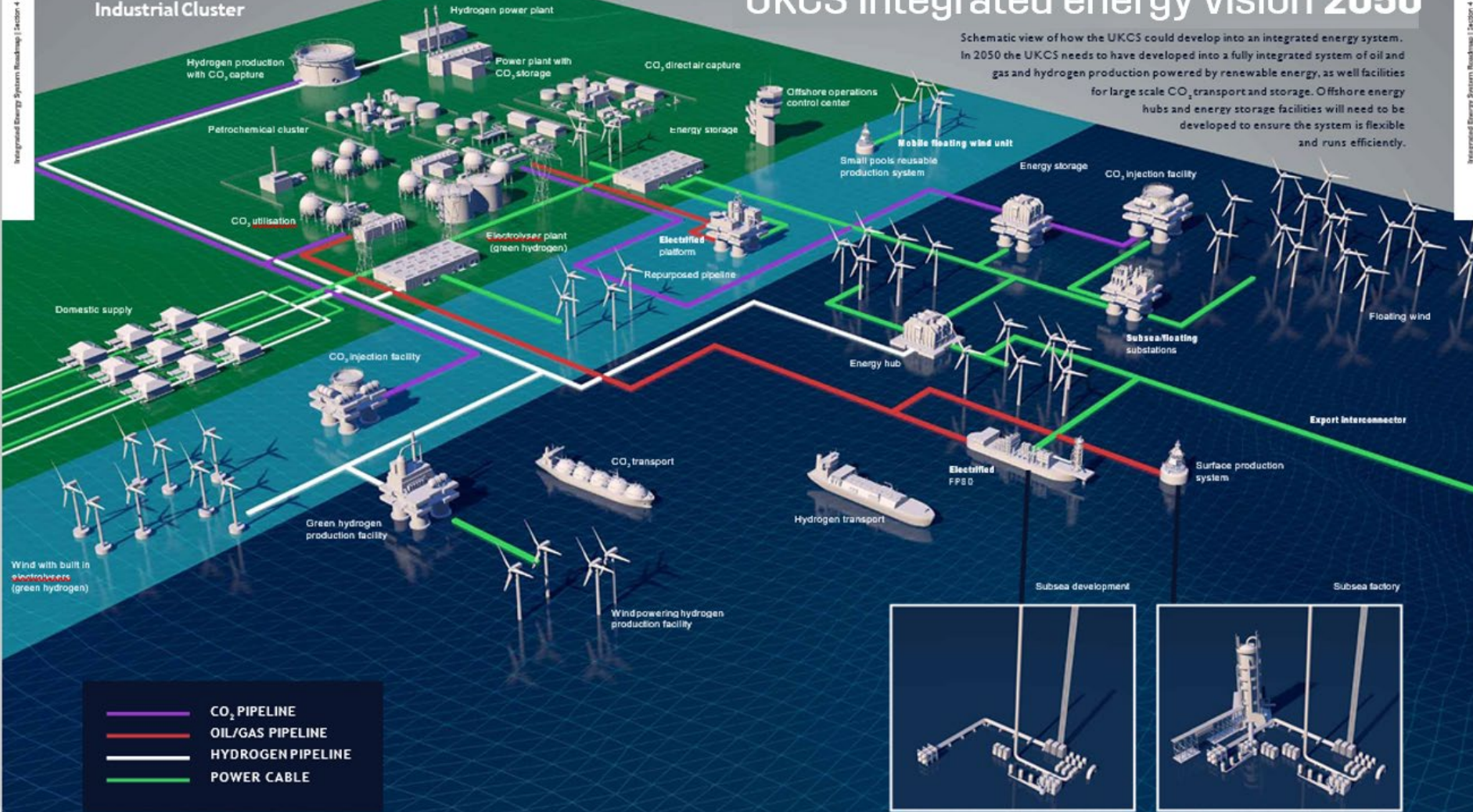


Technology to enable remotely controlled operations  
empowered by data, automation and robotics

# Industrial Cluster

# UKCS Integrated energy vision 2050

Schematic view of how the UKCS could develop into an integrated energy system. In 2050 the UKCS needs to have developed into a fully integrated system of oil and gas and hydrogen production powered by renewable energy, as well facilities for large scale CO<sub>2</sub> transport and storage. Offshore energy hubs and energy storage facilities will need to be developed to ensure the system is flexible and runs efficiently.




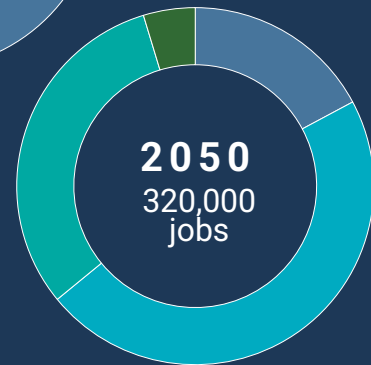
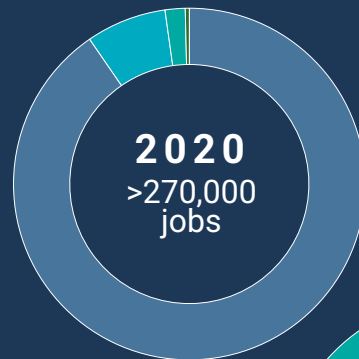
- CO<sub>2</sub> PIPELINE
- OIL/GAS PIPELINE
- HYDROGEN PIPELINE
- POWER CABLE



Over £430 billion of investment will be required for the UKCS to achieve net zero - spread across all four key sectors

## 2020 - 2050

	Total domestic investment required	Total investment required <sup>1</sup>	Domestic economic impact
	£80bn <sup>2</sup>	£123bn <sup>2</sup>	£0.9tr
	£60bn	£100bn	£0.6tr
	£70bn	£120bn	£0.8tr
	£60bn	£90bn	£0.2tr

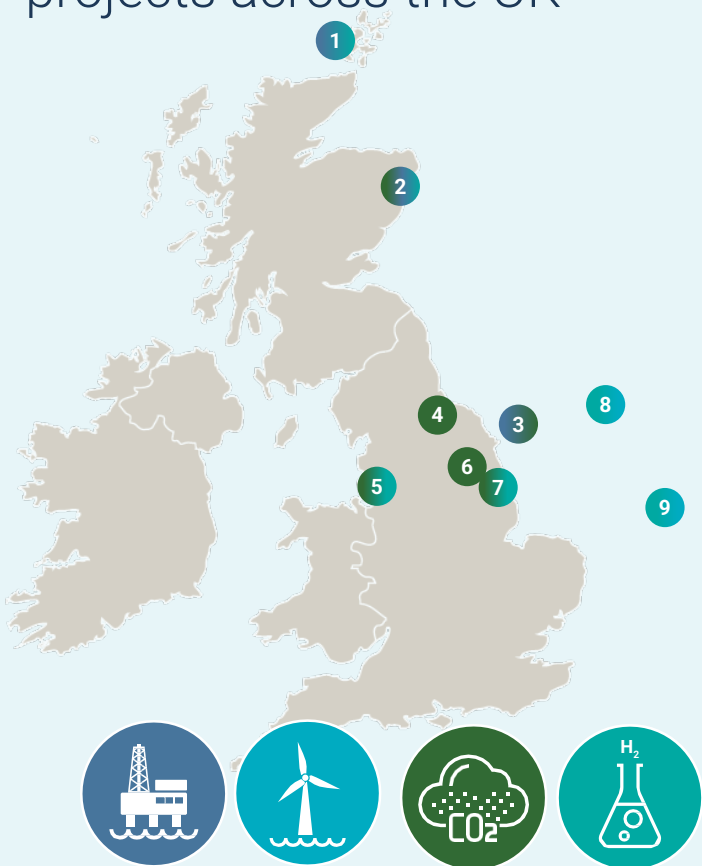


<sup>1</sup> Includes domestic and international spend

<sup>2</sup> Includes decommissioning spend



# Big energy players are getting involved in new CCUS and hydrogen projects across the UK



1	<b>Hydrogen Offshore Production (HOP)</b>	Aquatera, Doosan, Cranfield University, EMEC Hydrogen, NOV, OGTC	Repurpose offshore infrastructure for hydrogen production	Feasibility
2	<b>Project Acorn – CCS and Hydrogen</b>	Pale Blue Dot, Shell, Total, Chrysaor	Utilise existing oil and gas infrastructure for transportation and storage of CO <sub>2</sub> . Then produce blue H <sub>2</sub>	FEED
3	<b>Northern Endurance Partnership</b>	BP, Eni, Equinor, Shell, Total and National Grid	Capture CO <sub>2</sub> from natural gas-fired plant and store in depleted oil and gas fields in North Sea	Feasibility
4	<b>Net Zero Teesside</b>	BP, Eni, Equinor, Shell and Total	Develop CO <sub>2</sub> transport and storage infrastructure in the North Sea	Feasibility
5	<b>HyNet Northwest</b>	Jaguar, Land Rover, Essar, Unilever, Inovyn, Encirc, Cargill, CPW, Novelis, Prinovis, Pilkington, CF, Istock Brick, Essar, Solvay, North west, Hydrogen Alliance	Develop blue hydrogen production and industrial fuel switching alongside CCS	FEED
6	<b>Drax power station</b>	Drax group, National Grid Ventures, Equinor	Develop scalable bioenergy power production with CCUS	Pilot
7	<b>H2H Saltend</b>	Equinor	Develop blue hydrogen production with carbon capture and storage in the Southern North Sea	FEED
8	<b>Gigastack</b>	Ørsted, ITM Power and Element Energy	Develop green hydrogen production using offshore wind power	Feasibility
9	<b>Project Dolphyn</b>	ERM	Develop green hydrogen production using floating offshore wind power	FEED



We have identified a range of critical technologies, which include but are not limited to:



## Oil & Gas

Ammonia or other low-carbon fuelled turbines

Marine hydrogen transport solutions

Platform electrification (AC/DC cabling solutions)

Subsea electrification cost reduction



## Offshore Wind

UK-specific floating wind foundations

Innovative floating wind mooring systems

Dynamic cabling solutions to reduce wind downtime



## Carbon Capture & Storage

Modelling of geological behaviours of CO2

Modular, retrofittable carbon capture solutions

Direct air/seawater capture

CO2-compatible well plug and abandonment techniques

High-capacity sorbents durable at high temperatures



## Hydrogen

Seawater electrolysis

Electrolyser catalyst innovation

Subsea electrolyser systems incorporating compression

Improved efficiency of existing SMR and ATR technology

Enhanced SMR reactor membranes and catalysts

Alternative blue hydrogen production methods

Inter-seasonal hydrogen storage



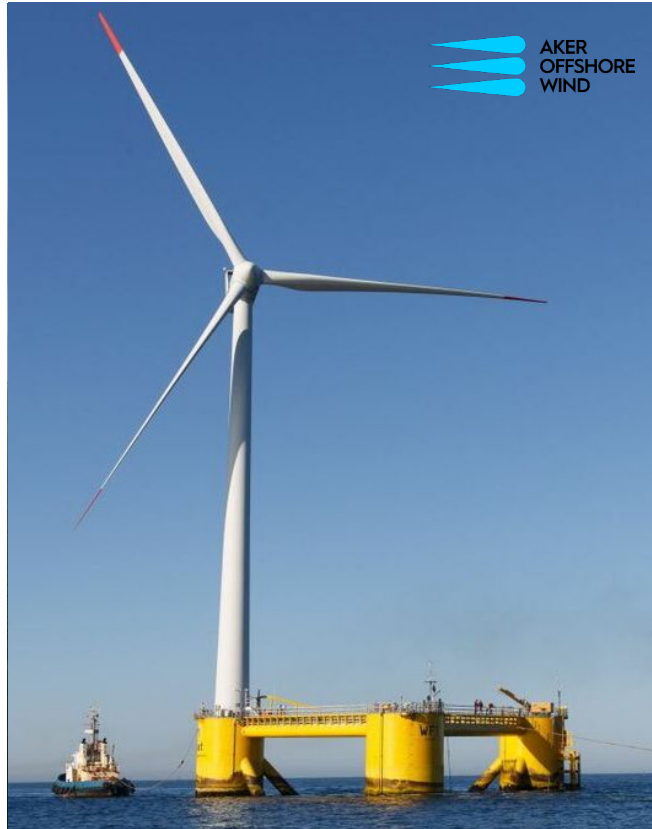
# Technology Transfer



## Spar



## Semi-Submersible



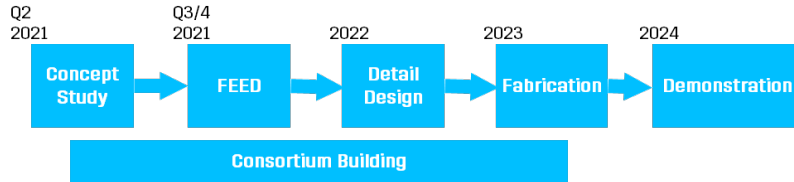
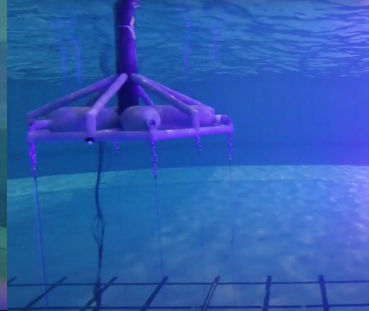
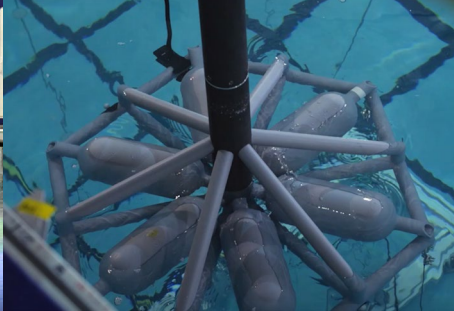
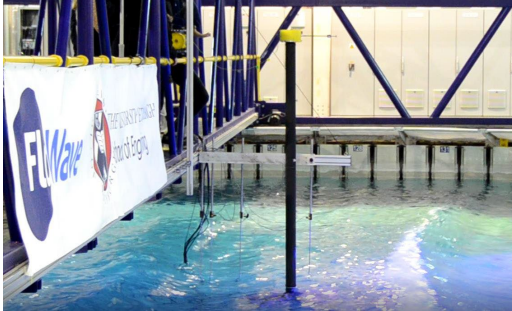
## TLP



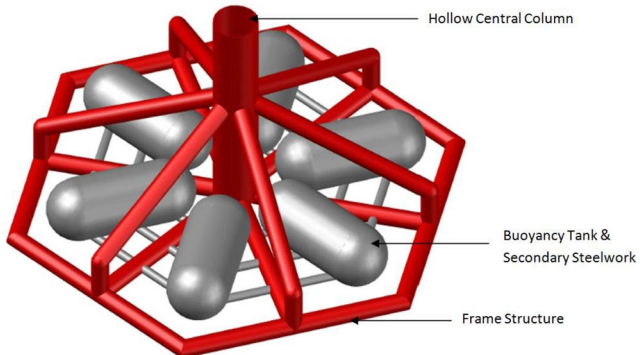
Partnering to develop and deliver technology for an affordable net zero North Sea



# Axis TLB



THE BUOYANCY UNIT





# North Sea Transition Deal – 30% local technology



## Optimisation

NEPTUNE  
ENERGY

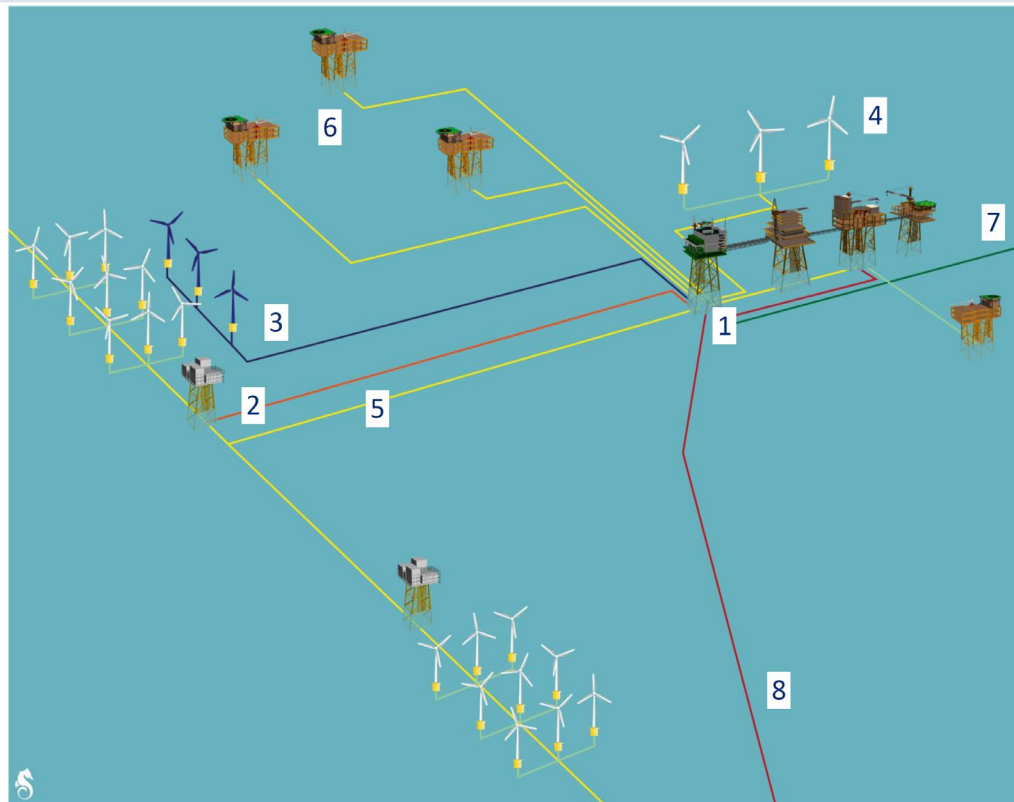


1. New bridge-linked platform to house equipment

2. Power from Offshore Wind Farm

3. Power from WTGs (overplanting)

4. Power from WTGs (dedicated)



5. Tie-in to ring main

6. Provide power to nearby O&G assets

7. Import & management of Hydrogen from NL

8. Export of blended Hydrogen / Gas to Bacton



**Technology  
Driving  
Transition**





**David Stevenson**  
Head of Energy Supply Chain  
Scottish Government

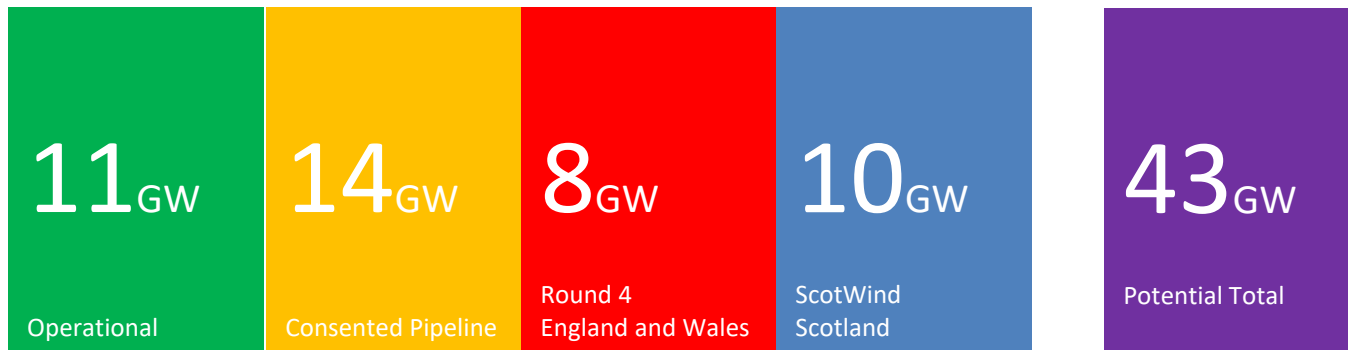


# Barriers and opportunities to UK supply chain growth

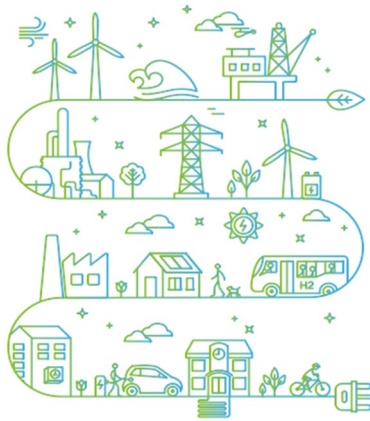
**David Stevenson**  
**Head of Offshore Wind Policy & Supply Chain**



# The Ambition



## Scotland's Energy Strategy Position Statement



 Scottish Government  
Riaghaltas na h-Alba  
gov.scot

## Offshore Wind Policy Statement



October 2020

 Scottish Government  
Riaghaltas na h-Alba  
gov.scot

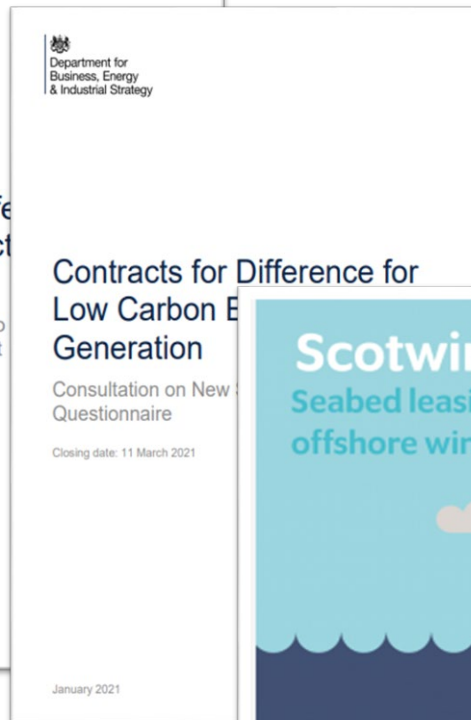
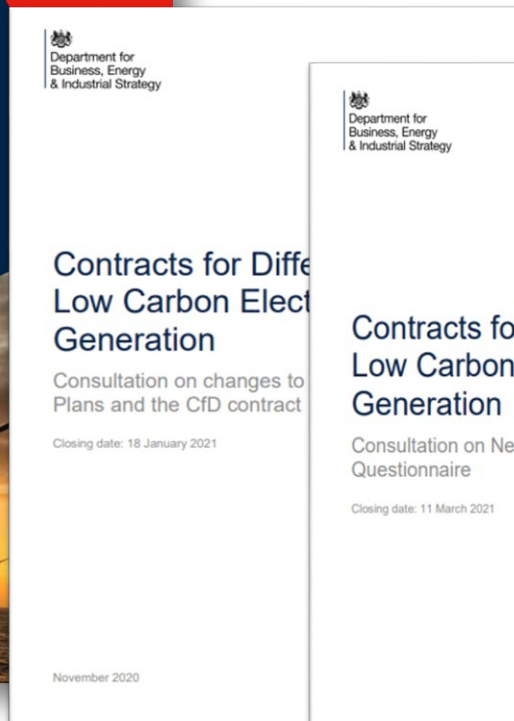
## Sectoral Marine Plan for Offshore Wind Energy

October 2020

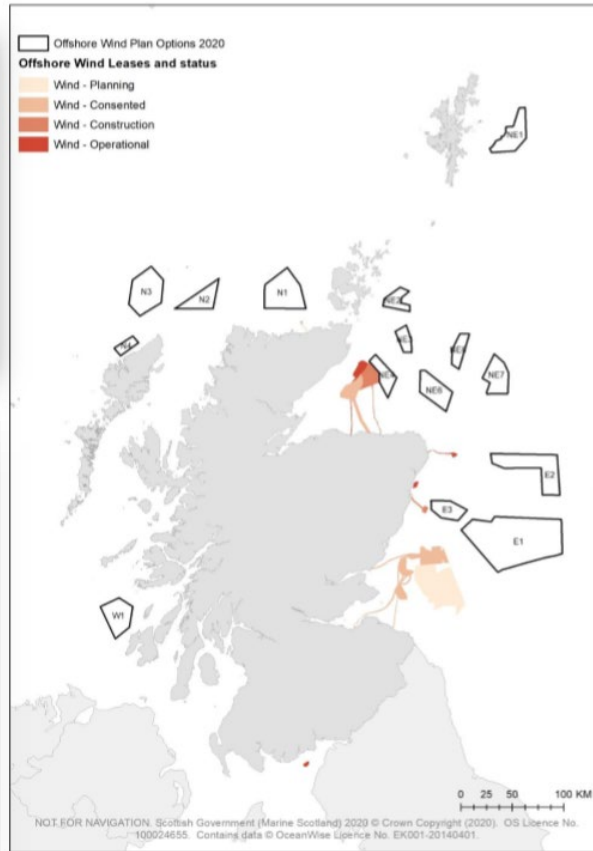
 Scottish Government  
Riaghaltas na h-Alba  
gov.scot







# The Opportunity in Scotland





# Thank you!

David Stevenson

Head of Offshore Wind Policy & Supply Chain

[david.stevenson@gov.scot](mailto:david.stevenson@gov.scot)



Scottish Government  
Riaghaltas na h-Alba  
gov.scot





**Dave Sweenie**  
Development Manager  
EDF Renewables





# EDF RENEWABLES

Scottish Renewables

April 2021



## EDF Renewables

We're one of the UK's leading renewable energy companies, specialising in wind and solar power as well as battery storage technology.

We develop, build, operate and maintain wind farms and other renewable technologies throughout their lifetime.

We have an operational portfolio of 36 wind farms – including two offshore wind farms and one of the largest operational battery storage units in Europe.

We are busy building the 450 MW Neart na Gaoithe offshore wind farm in the Firth of Forth and we continue to install roof mounted solar panels on a number of Tesco supermarkets.

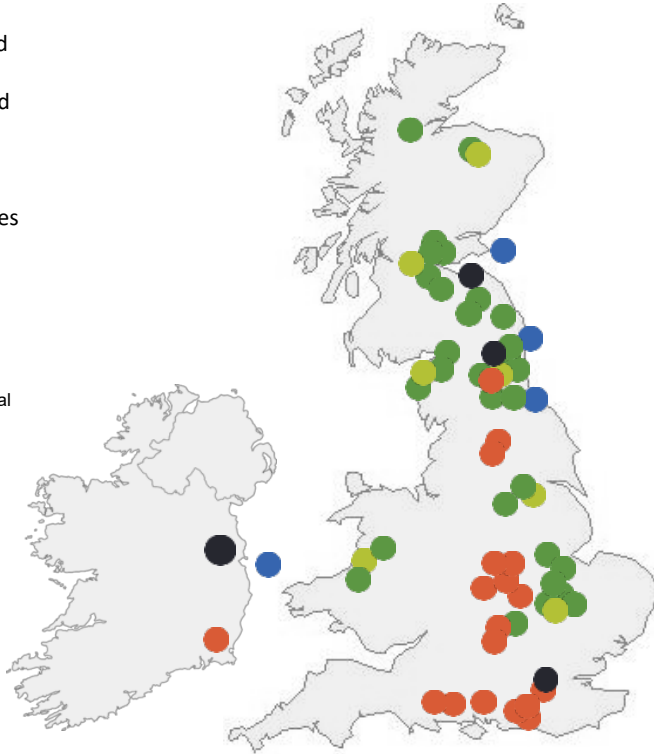
EDF Renewables has almost 1GW in operation and another 4 GW in our development pipeline.



# Key Figures

- Onshore wind
- Offshore wind
- PV solar\*
- Service centres
- Offices

\*are not all operational



Almost  
1GW  
in operation

4  
offices



Almost  
4GW  
Including Pivot  
Projects in  
planning and  
development



2  
offshore wind  
farms

36  
onshore wind  
farms

7  
services  
centres

## Codling Offshore



We bought a 50% interest in the Codling offshore wind farm project in Ireland from Hazel Shore in February 2020. EDF Renewables UK and Ireland, will now partner with Fred Olsen Renewables Ltd, which already owns 50% to develop and build the project.

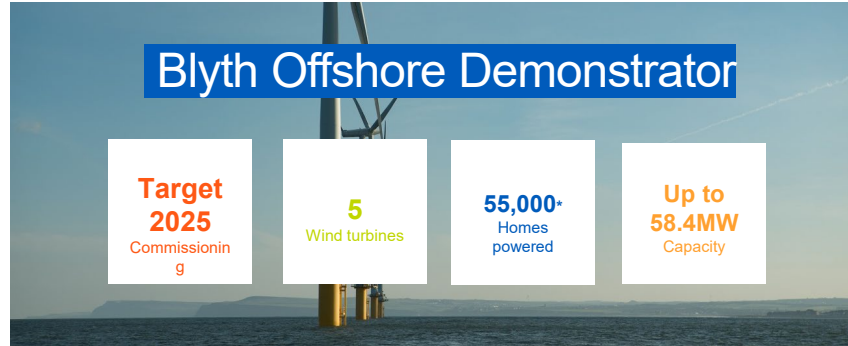
The project is located south of Dublin, 13 km off the coast of County Wicklow, and benefits from the favourable conditions for offshore wind off the east coast of Ireland.

The initial development work started in 2003. Codling is spread across two sites, one of which, Codling 1, is consented. As an indication, the capacity of the project will be up to 1.5 GW of installed capacity.

\*Load factors based on the five year rolling averages on unchanged configuration basis using Table 6.5 of 'Digest of UK Energy Statistics' - July 2019 Based upon the average domestic electricity consumption per home (temperature corrected) per the Energy Consumption in the UK.



## Blyth Offshore Demonstrator



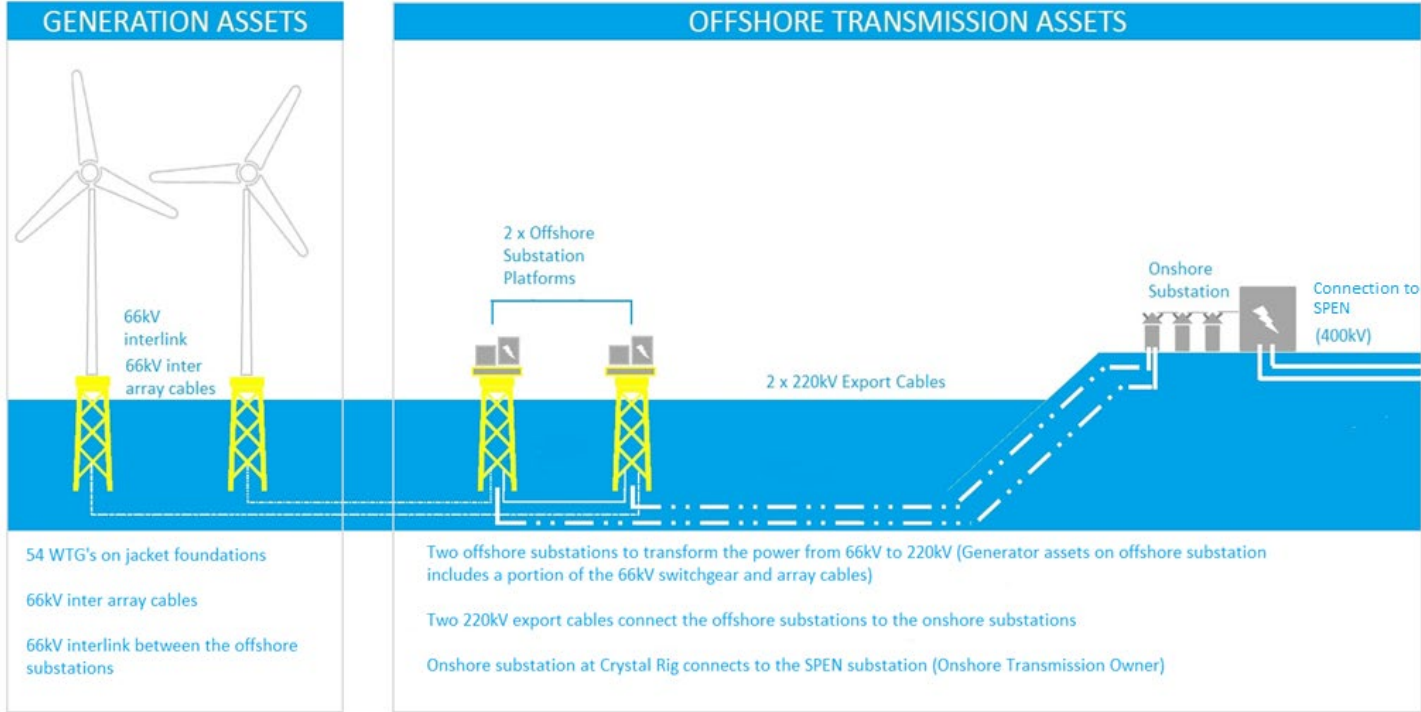
The BOD phase 2 work builds on the success of BOD 1, commissioned in 2017, which demonstrated a world first float out an sink gravity foundation and innovative 66kV cables. BOD 2 will demonstrate floating wind technology in shallow water depth using semisubmersible or barge type technology.

The project is located off the coasts of Northumberland, with the BOD 2 array 14 km offshore. The water depth at the site is 52-58m with a strong average wind conditions.

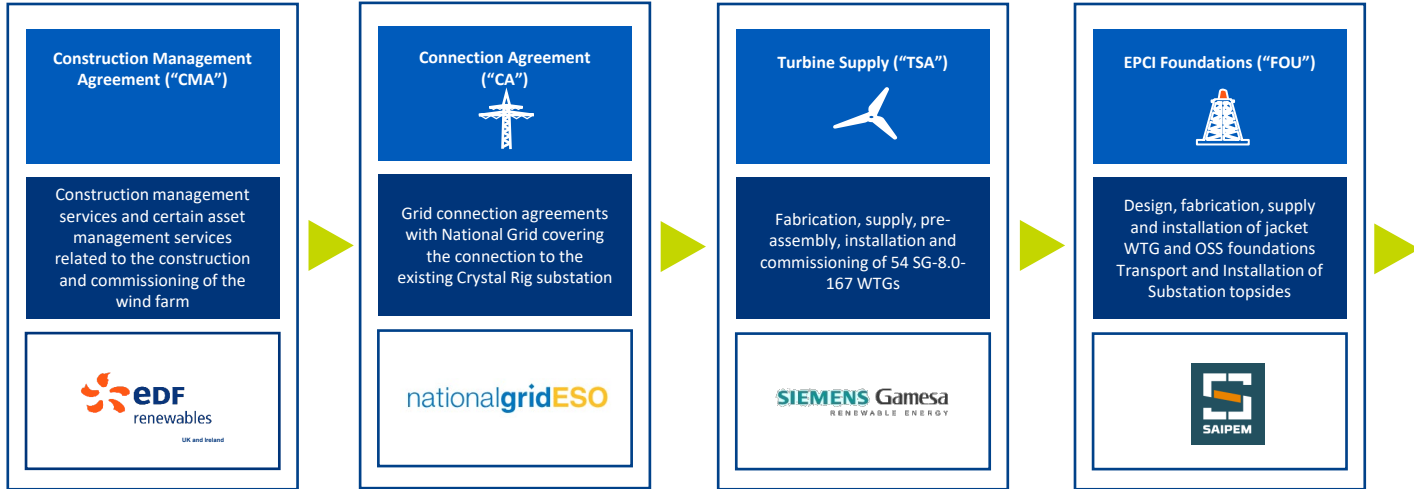
A consent variation is underway as is procurement for supply of main components. The project is targeting participation in the CfD AR4 due to be held in late 2021/22.

\*Load factors based on the five year rolling averages on unchanged configuration basis using Table 6.5 of 'Digest of UK Energy Statistics' - July 2019 Based upon the average domestic electricity consumption per home (temperature corrected) per the Energy Consumption in the UK.

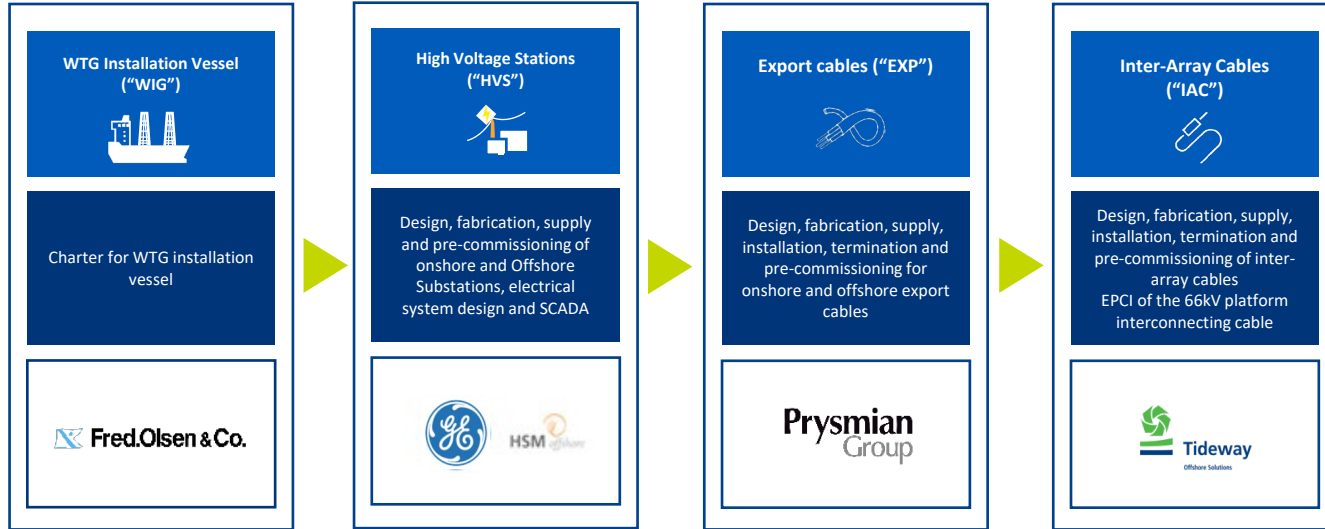
# Neart na Gaoithe



# Neart na Gaoithe Main Contracts

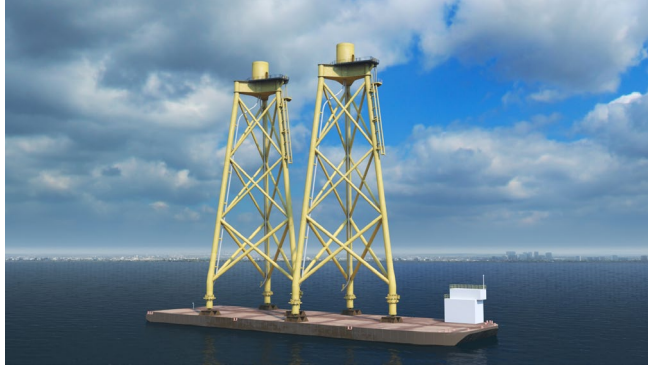


# Neart na Gaoithe Main Contracts





## Neart na Gaoithe Scottish Supply Chain



Jacket Fabrication – Saipem - Harland & Wolff Methil



Marine Hub – Siemens Gamesa – Port of Dundee



Pile Casing Marshalling – Saipem - Port of Leith



O&M Base – NnG - Eyemouth Harbour Trust

# Supply Chain Challenges

- The Developer is not the only buyer
- The Tier 1's
  - Main buyers of Tier 2's and Tier 3's
  - Multinational Organisations
  - Established supply chain
- Competition
  - Competition for sites (Round 4, Scotwind etc.)
  - Competition for consents
  - Competition for CfD
  - Not all projects get built
- Contracting
  - Cost perceived to be the main driver, but not the only one
  - Risk on delivery
  - Risk on quality

# Supply Chain Opportunities

- Government Initiatives
  - BEIS – Supply Chain Plan in Auction Round 4
  - CES – Supply Chain Design Statement in Scotwind
- Early Engagement
  - Early Engagement with Tier 1's
    - Limited number of Tier 1's
    - Understand the Tier 1's
    - Act project agnostic
  - Early Engagement with the developers
    - Understand the developers
    - Developers, and groups of developers, can engage more with supply chain
  - Early Engagement with Enterprise Agencies and Government

## Supply Chain Opportunities

- Clusters, Working Groups and Industry Bodies
  - Forth and Tay and Deepwind
  - OWGP, OWIC, SOWEC
  - ORE Catapult
- Collaboration and Innovation
  - Developers collaboration
    - Wind farms in close proximity
    - Developers global portfolios
  - Supply Chain collaboration
  - Innovation
    - Reduce risk in offshore deployment
    - Robust delivery
    - Reduce through life costs
- Ideas?

# Thank You





**Steve Chisholm**  
Operations Director  
Global Energy Group



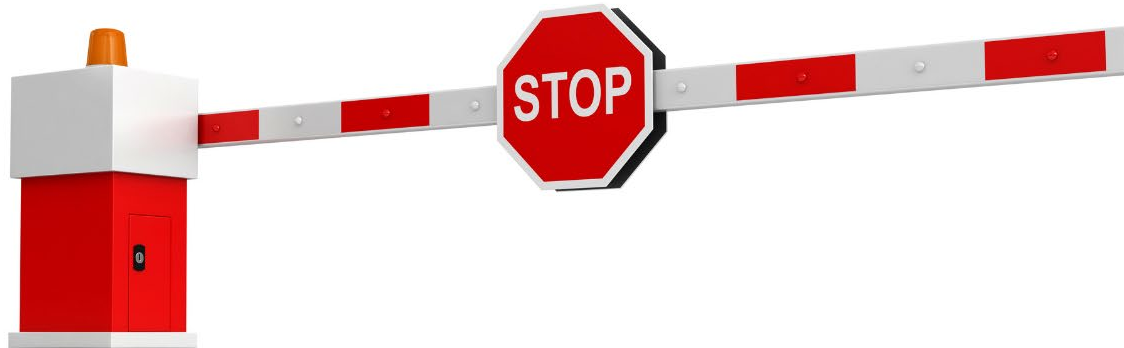
# OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES



## **OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES**

### **BARRIERS OR SIMPLY REQUIREMENTS OF ENTRY ?**

- Infrastructure, facilities and skilled resources**
- A clear market offering - you have to pick and choose**
- Commercial competitive goods or services**



## OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES

### INNOVATION - ESSENTIAL TO COMPETITIVENESS

- Now more R&D initiatives than ever before in Global's history
- The launch of the Global Incubator
- More collaboration and joint ventures than at any time previously

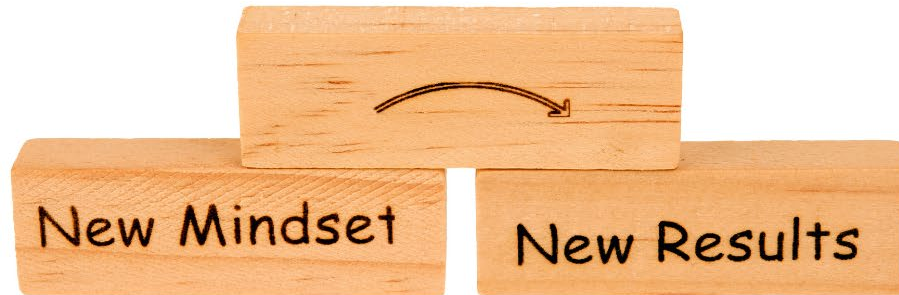




## OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES

### PEOPLE - NEW SKILLS, DIFFERENT MINDSET

- Move from project to production line culture
- Requirement for reskilling
- Quality jobs alongside automated solutions



## OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES

### WEIGHING COMMERCIAL RISK v OPPORTUNITY

- Quantities and therefore costs typically higher
- Contract terms more onerous - LD's, Bonds, Warranties
- Know your sweet spot - "Riches in Niches"



## OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES

### A SEA OF OPPORTUNITY

- Floating Wind - Manufacturing and Assembly
- The Rolled Steel Products of tomorrow
- A new era based on alliances, partnerships and collaboration







## OFFSHORE WIND - SUPPLY CHAIN BARRIERS AND OPPORTUNITIES



# Q & A

ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



This session  
begins at  
1415



# The transition two-step: powering a whole energy system with offshore wind





**Clare Lavelle**  
Head of Energy Consultancy  
Arup



# **Benj Sykes**

Head of Market Development,  
Consenting and External Affairs  
Ørsted



**Let's create a  
world that  
runs entirely on  
green energy**



# Ørsted's European hydrogen projects:

**Gigastack**  
FEED study, 100 MW



**Yara Sluiskil**  
100 MW



**SeaH2Land**  
100 MW



**Lingen Green Hydrogen**  
50 - 500 MW



**Europa Seaways**  
23 MW



**Green Fuels for Denmark**  
1.3 GW



**H2RES**  
2 MW



**Westküste 100**  
30 - 700 MW



INTERNATIONAL

# Green Fuels for Denmark



**Phase 1: Develop H<sub>2</sub> production**

**Phase 2: Introduce CO<sub>2</sub> to manufacture shipping and aviation fuel**

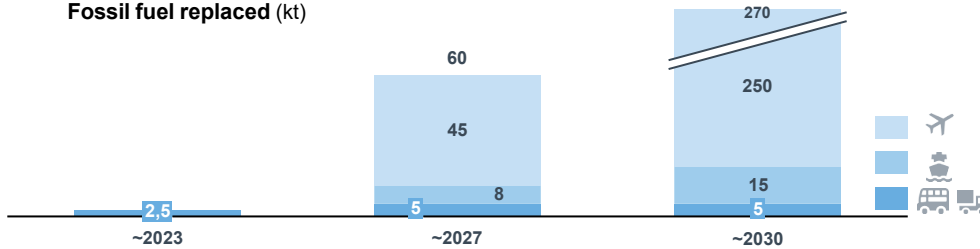
**Phase 3: Scale up based on demand for aviation fuel**

~10 MW

~250 MW

~1.3 GW

Fossil fuel replaced (kt)



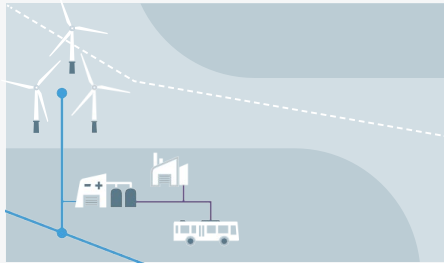
INTERNAL



# Offshore wind-to-hydrogen buildout timeline

## 2020-2025

### Co-located projects



Develop renewable hydrogen to replace fossil hydrogen



Gigastack FEED study



Yara Green Ammonia Project



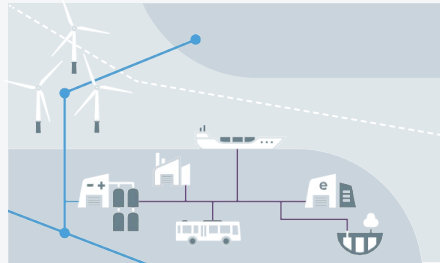
Lingen Refinery



1-1 link with refineries, marine transport fuel, chemical plants

## 2025-2030

### Hydrogen clusters



Optimise use of infrastructure, and storage



Green Fuel for Denmark



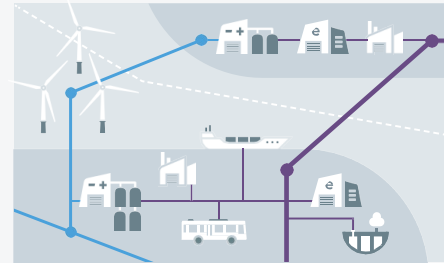
Westküste 100



- ❖ Hub at Grangemouth
- ❖ Hub linking airports and marine transport ports
- ❖ Fertiliser production

## 2030-2040

### Integrated hydrogen grid



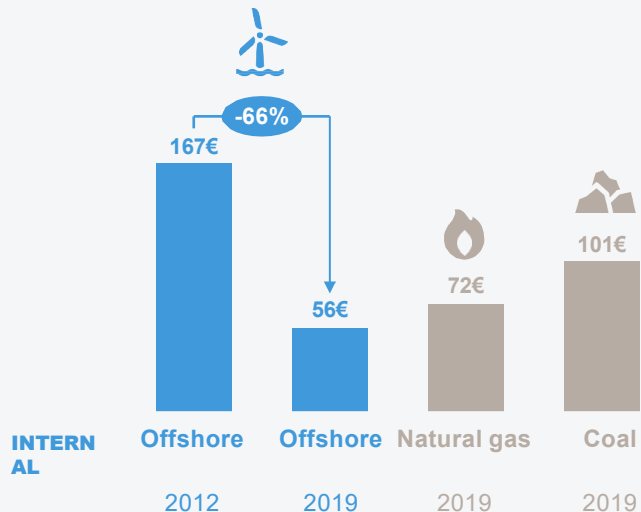
A transnational hydrogen grid and market



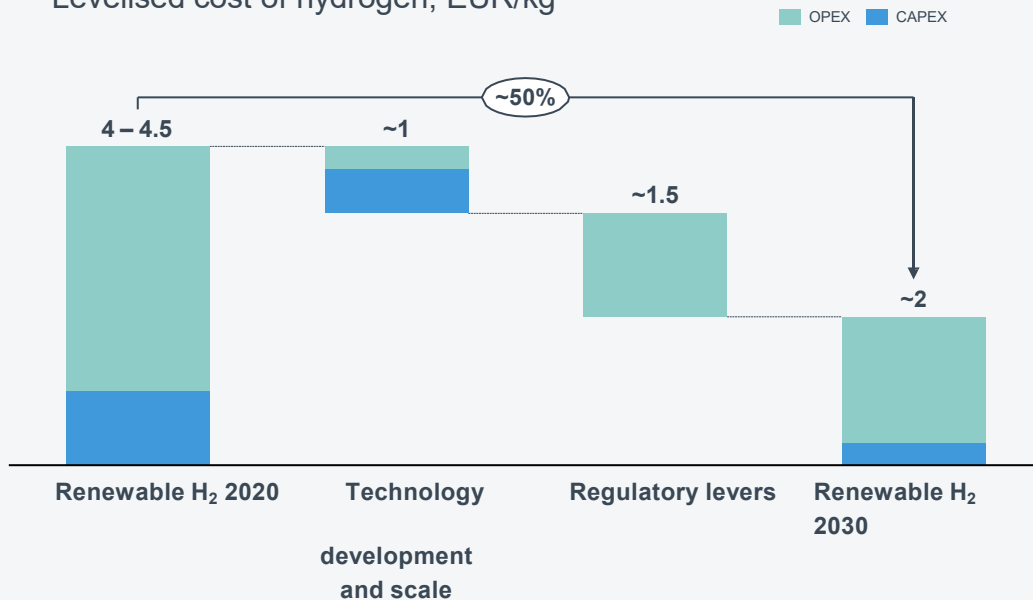
- ❖ Integrated hydrogen network
- ❖ Exports
- ❖ Aviation and marine fuel hub

# We see many similarities between our offshore wind journey and the required cost-out journey for hydrogen towards 2030

## Levelised cost of electricity<sup>1</sup> EUR/MWh, 2012<sup>2</sup> and 2019<sup>3</sup>



## Renewable hydrogen cost-out: Denmark<sup>1</sup> Levelised cost of hydrogen, EUR/kg



Calculations based on consistent sets of power, natural gas and CO<sub>2</sub> prices Source: Ørsted and IEA, BNEF and Hydrogen Europe

<sup>1</sup> BNEF H1 2019 LCOE Update, current LCOE and Ørsted Calculation. <sup>2</sup> 2012 generic offshore wind, Northwest Europe, FID 2012. <sup>3</sup> Offshore wind 2019: Ørsted calculations from UK CfD Round III. Onshore wind: average of DE, NL and UK mid-scenarios. Solar PV, Gas: average of DE, UK mid-scenarios. Coal: DE mid-scenario. Nuclear: UK mid-scenario. Exchange rate EUR:USD: 0.89, YoY inflation 2017-2018: 1.75%

# Ørsted's hydrogen vision

*With the right framework and timely investments, we believe renewable hydrogen can be cost-competitive by 2030. But the cost-*



INTERN  
AL





**Robin Watson CBE**  
Chief Executive  
Wood Group

wood.

## Scottish Renewables 2021 Offshore Conference

Purposeful Investment in  
Energy Transition





# Energy Transition

Wood is helping customers navigate towards a sustainable energy future through optimised operations, low carbon production systems and pioneering renewable projects.



# Hydrogen is poised to grow rapidly

- Ten-fold increase predicted by 2050
- Quarter of the global CO<sub>2</sub> reduction by 2050
- Investment of \$2.5tr
- Large capital projects already emerging, e.g. HyNet £920m
- Excellent potential to repurpose facilities and infrastructure
- Many governments are heavily investing in hydrogen studies
- The EU's Hydrogen Strategy plans to have renewable hydrogen technologies reach maturity and be deployed at large scale across all hard-to-decarbonise sectors by 2050



wood.

# Purposeful Investment

Collaboration on a new scale





**Molly Iliffe**  
Principal Consultant – Energy  
Transition and Hydrogen  
ERM





ERM *The business of sustainability*



Department for  
Business, Energy  
& Industrial Strategy

# ERM Dolphyn Project; Green Hydrogen at Scale from Floating Offshore Wind

Scottish Renewables Offshore  
Wind Conference

Molly Iliffe

21 April 2021

[www.erm.com](http://www.erm.com)  
[www.ermdolphyn.erm.com](http://www.ermdolphyn.erm.com)

# Agenda & ERM team

- The ERM Dolphyn concept
- Development timeline
- Procurement needs and connecting with the supply chain
- Context and background



Kevin Kinsella  
Project Director



David Caine  
Project Manager



Molly Iliffe  
Financial and Economics



Widya Wahyuni  
Engineering



Ben Pizii  
Consenting and Site



Brett Ryan  
Safety



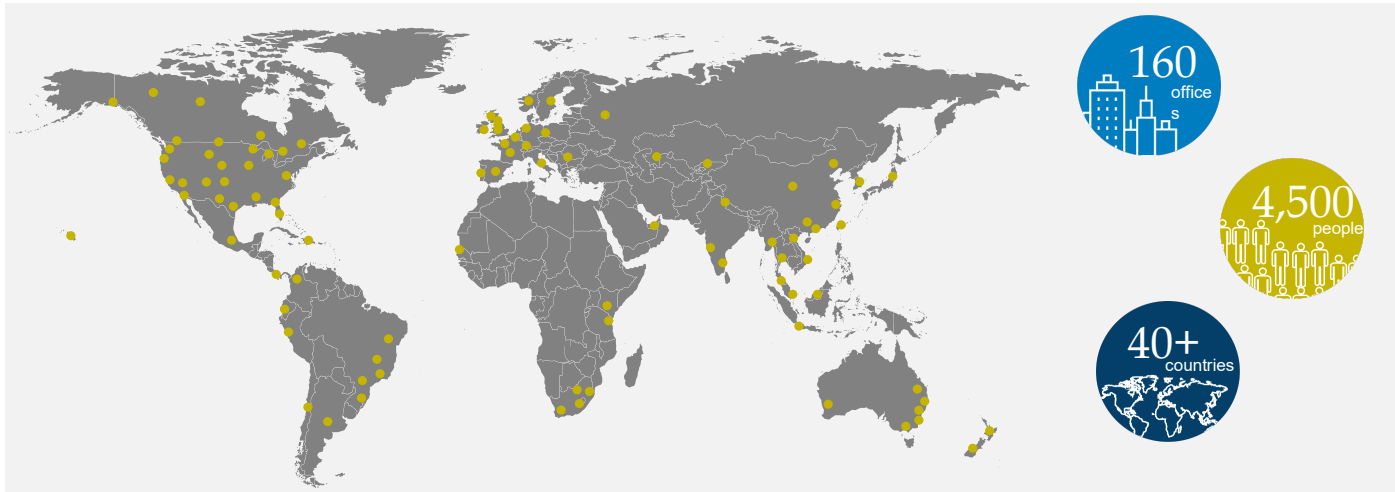
Laura Bond  
Doc Management & Quality Control



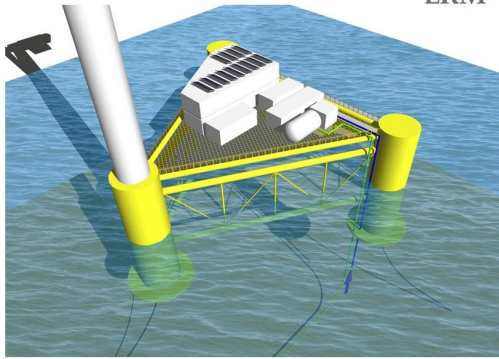
Zoe Whitlock  
Supply Chain

# About ERM

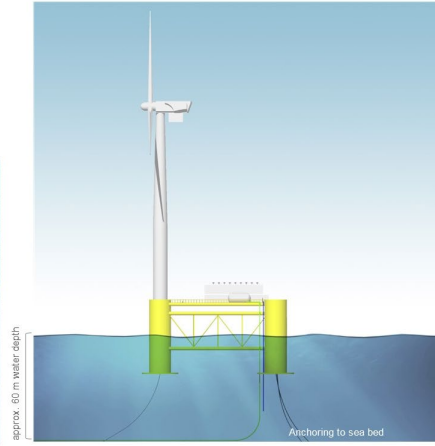
Environmental Resources Management (ERM) is a leading global provider of **environmental, health, safety, risk, social** consulting services and **sustainability** related services. ERM is committed to providing a service that is consistent, professional and of the highest quality to create value for our clients. We have worked with many of the Global Fortune 500 companies delivering innovative solutions for business and selected government clients helping them understand and manage the sustainability challenges that the world is increasingly facing.



# The ERM Dolphyn concept



Schematic - Deck Details



Schematic - Section

## Normally unmanned

- **Autonomous system, operations from shore**
- **High reliability and availability**
- **Low maintenance requirement**

## Additional project drivers

- **Cost drivers: modular system with potentials for optimisation**
- **Ease of construction and installation**
- **Minimisation of GHG**

Floating substructure and station keeping system

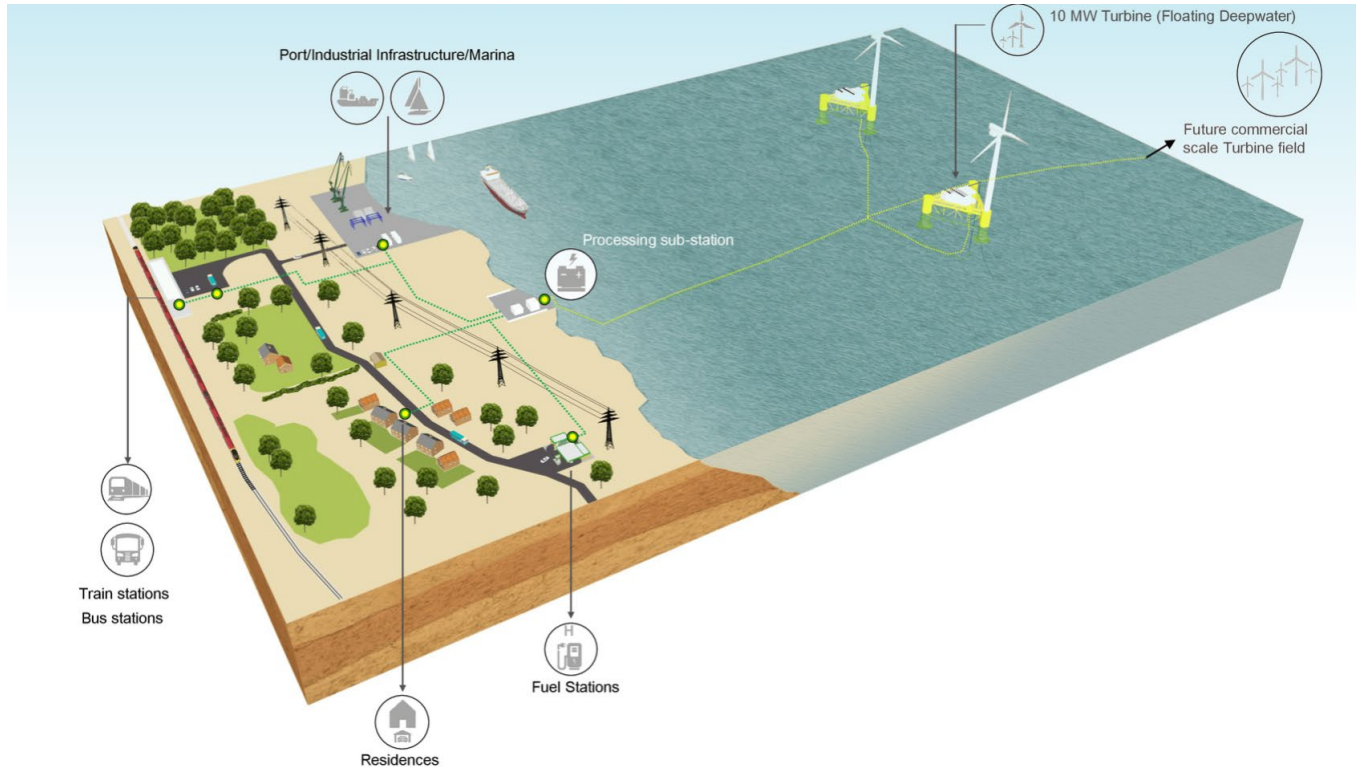
On-board freshwater production and hydrogen production and utilities

Integrated power generation system (off-grid)

Standby power generation system

Hydrogen export to shore

# Linking into local energy transition ambitions



# Long-term development plan

	Operational from	Location	Hydrogen production rate (tonnes/yr)	Hydrogen production rate (TWh/y)
Small scale hydrogen performance demonstration trials	2022	UK (near shore)	n/a – short duration performance trials	n/a
Commercial scale demonstrator unit (10MW)	2024	Aberdeen	900	0.03
Deployment of multiple commercial fields 100-300 MW	Late 2020s onwards	UK (North Sea and Celtic Sea) and global locations	9,000 – 27,000	0.30 – 0.90
GW scale large commercial projects	Early 2030s onwards	UK (North Sea and Celtic Sea), other sites globally	~360,000	12.0



# ERM Dolphyn – organisations helping make it happen



**Principle Power** – Designing the sub-structure based on the proven Wind Float Atlantic design



**NEL** – Europe's leading Electrolyser Technology company developing electrolysis requirements using their experience of electrolysis at sea (ships, submarines)



**Doosan** – Leading integration engineering for the PEM electrolyser working alongside NEL



**Tractebel** – Designing the sub-structure deck and turbine interface utilising their experience of working on the Wind Float Atlantic project

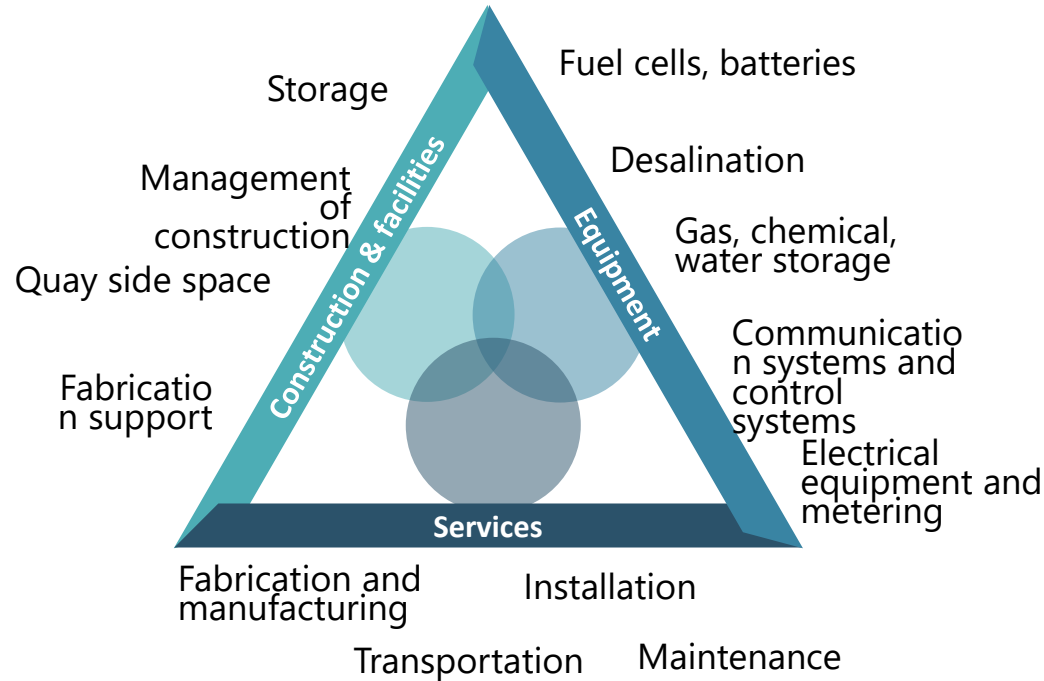


**Offshore Design Engineering** – Designing the top-sides including desalination unit, electrolyser interface, hydrogen storage, stand-by power unit and export pipeline



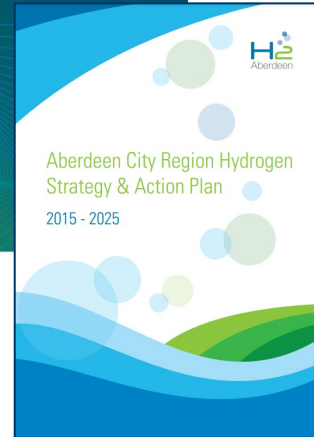
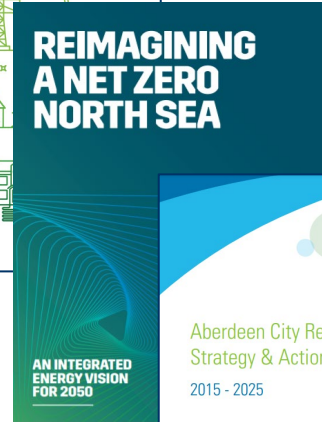
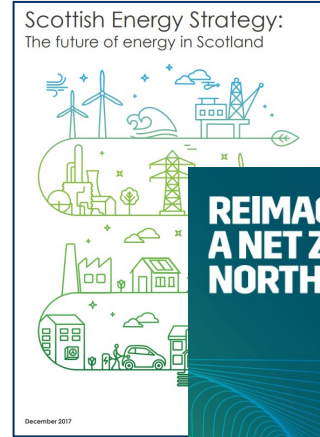
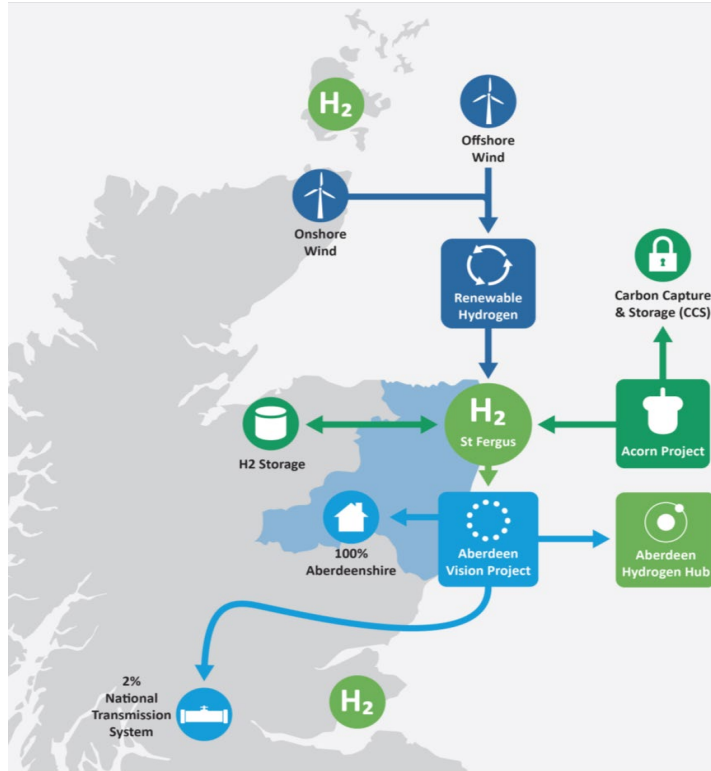
**Lloyd's Register** – Independent 3<sup>rd</sup> party certification of the design

# Supply chain needs



- Work safely
- Operate sustainably
- Bring innovation and help us reduce project risks
- Deliver contract requirements
- Are ready to help us take on challenges
- Want to come along the ERM Dolphyn journey with us

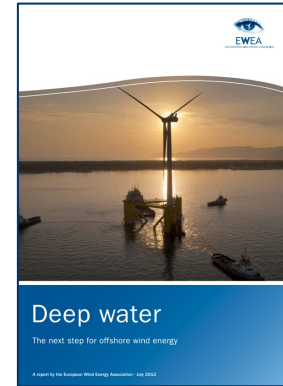
# ERM Dolphyn viewed as a core project for UK's Hydrogen coast strategy



# ERM Dolphyn global potential

Over **12,000 GW** Floating Wind Capacity of which majority in US, China, Japan and Europe (Equivalent potential for 1000m T<sub>e</sub> of hydrogen/yr)

■ Floating (more than 60m) ■ Traditional offshore

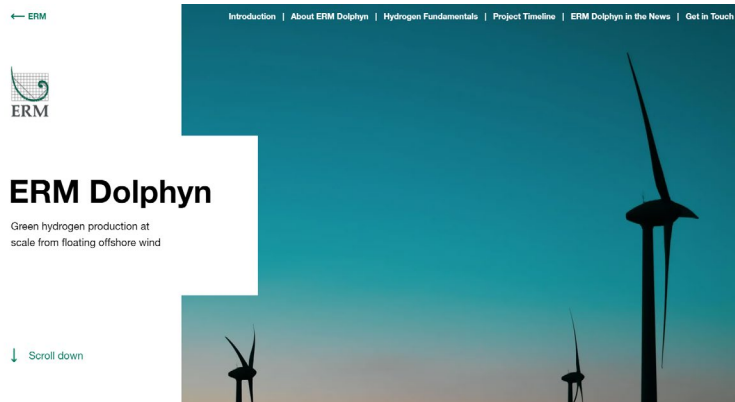


Note: Suitable Areas where wind exceeds 7m/s within 200km of shoreline  
Source: British Oceanographic Data Centre, Global Wind Atlas

# Get in touch

We are interested in hearing from anyone who is able to support the project now as well as connecting with you around what you are doing and where we might find innovation together.

Please get in touch directly at [connect\\_ermdolphyn@erm.com](mailto:connect_ermdolphyn@erm.com)  
[www.ermdolphyn.erm.com/](http://www.ermdolphyn.erm.com/)





**Thank you**

**Dolphyn Enquiries**  
[connect\\_ermdolphyn@erm.com](mailto:connect_ermdolphyn@erm.com)

**Molly Iliffe**  
Finance & Economics Manager – ERM Dolphyn  
[Molly.iliffe@erm.com](mailto:Molly.iliffe@erm.com)  
Edinburgh, UK





**Johan Sandberg**  
Head of Business Development  
Aker Offshore Wind



# Aker Offshore Wind

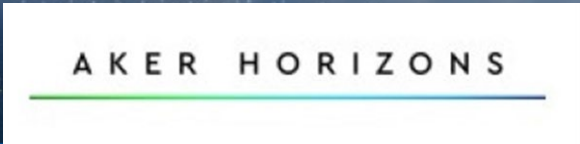
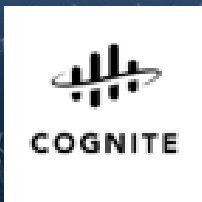
Johan Sandberg

Head of Business Development

20 April 2021



# The Aker Group





# Aker Offshore Wind in brief

A pure play deepwater wind IPP



**Pure play offshore wind developer**, headquartered in Norway, focusing on assets in deep waters. The company aims to source, develop and operate offshore wind projects



Aker Offshore Wind aims to deploy cost-effective solutions based on **decades of offshore experience**, in close cooperation with leading global partners



**> 1.5 GW portfolio of development projects** and prospects in South Korea (Ulsan), the US (California), Norway and the UK (Scotland)



# Position in four markets

## South Korea

Renewables to account for 20% by 2030  
12 GW offshore wind by 2030

## California, US

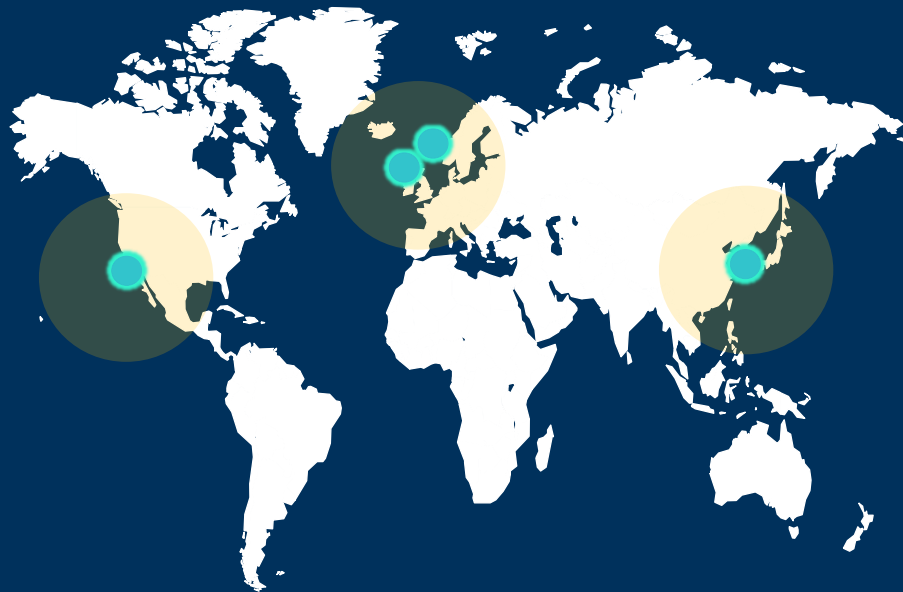
60% renewable electricity generation by 2030 and  
carbon neutrality by 2045

## Norway

Authorities preparing to open areas for offshore  
wind development from 2021

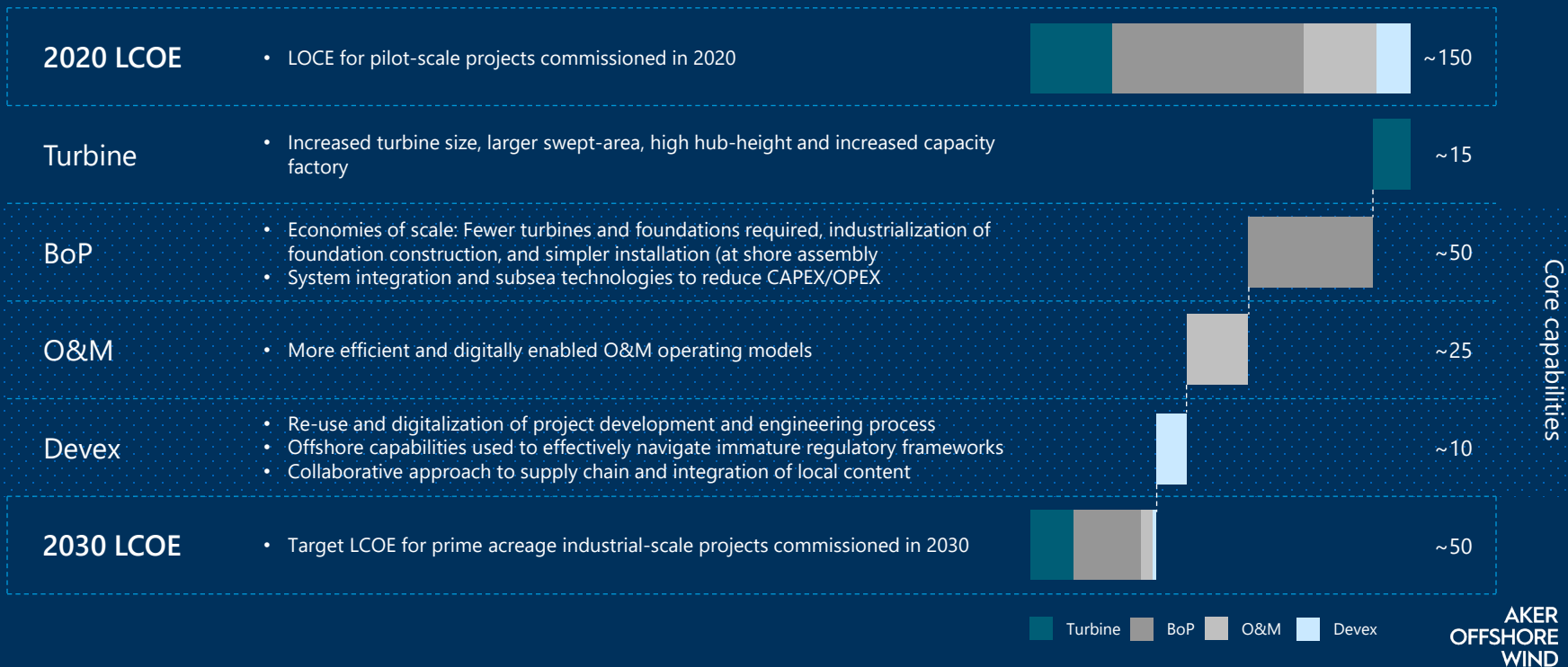
## Scotland

Targets net zero emissions by 2045  
11GW offshore wind by 2030





# Drive down cost (LCOE) to ~50 EUR / MWh by 2030







# WindFloat Atlantic and Kinkardine



The 25MW WindFloat Atlantic floating offshore wind farm is fully operational and supplying electricity to Portugal's electrical grid.

The project features three MHI Vestas 8.4 MW turbines mounted on Principle Power's semi-submersible floating foundations.



The 50 MW Windfloat Kinkardine is partly operational and will be fully operational in 2021.

The project features five 9.5MW MHI Vestas turbines on Principle Power's semi-submersible floating foundations.



# Cooperation agreement with Aker BP

Aker Offshore Wind and Aker BP enter cooperation agreement to accelerate the process of **decarbonizing** oil and gas assets and realize offshore wind in Norway at scale.

The companies will collaborate on concepts for efficient development of large offshore wind parks to enable effective offtake to oil and gas producing assets.

**Aker Offshore Wind** will develop and operate the wind parks.

**Aker BP** is a potential buyer of electricity from offshore wind along with **other operators**.





# Wind for Oil – Cases

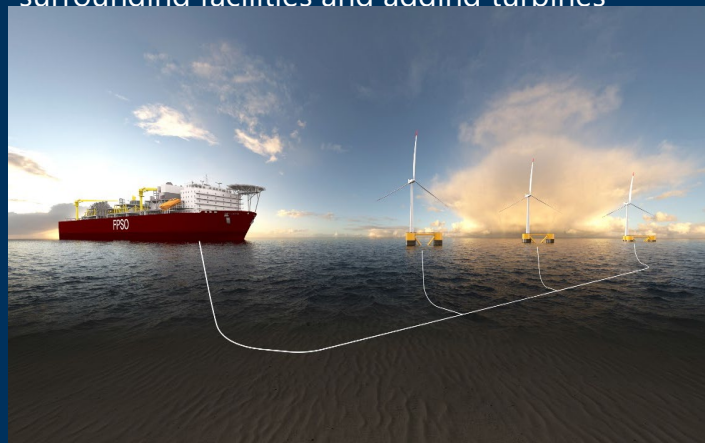
## Autonomous - Wind for Gas Compression

- Subsea compression powered by wind
- Two Manifolds and Separator, Two floating 10/12 MW wind turbines
- Two production lines - condensate and gas
- In case of “no wind” the gas is bypassing the compression at reduced rate



## Direct Feed - FPSO powered by wind

- FPSO powered by 3 floating 12 MW wind turbines
- Powering topside processing equipment and subsea separation / pumping system. Gas turbines kept in partial load to quickly step in if needed due to wind conditions.
- Potential of developing an offshore grid connecting surrounding facilities and adding turbines





# ZEEDS – Zero Emission Energy Distribution at Sea



ZEEDS - an open innovation project initiated by Wärtsilä, to explore the opportunities with zero emission shipping



WÄRTSILÄ



# New value chains for renewable fuels

**Deep water cranes**

**Hydrogen loading**

**Zero Emission Shipping**

**Semisub Ammonium plant**

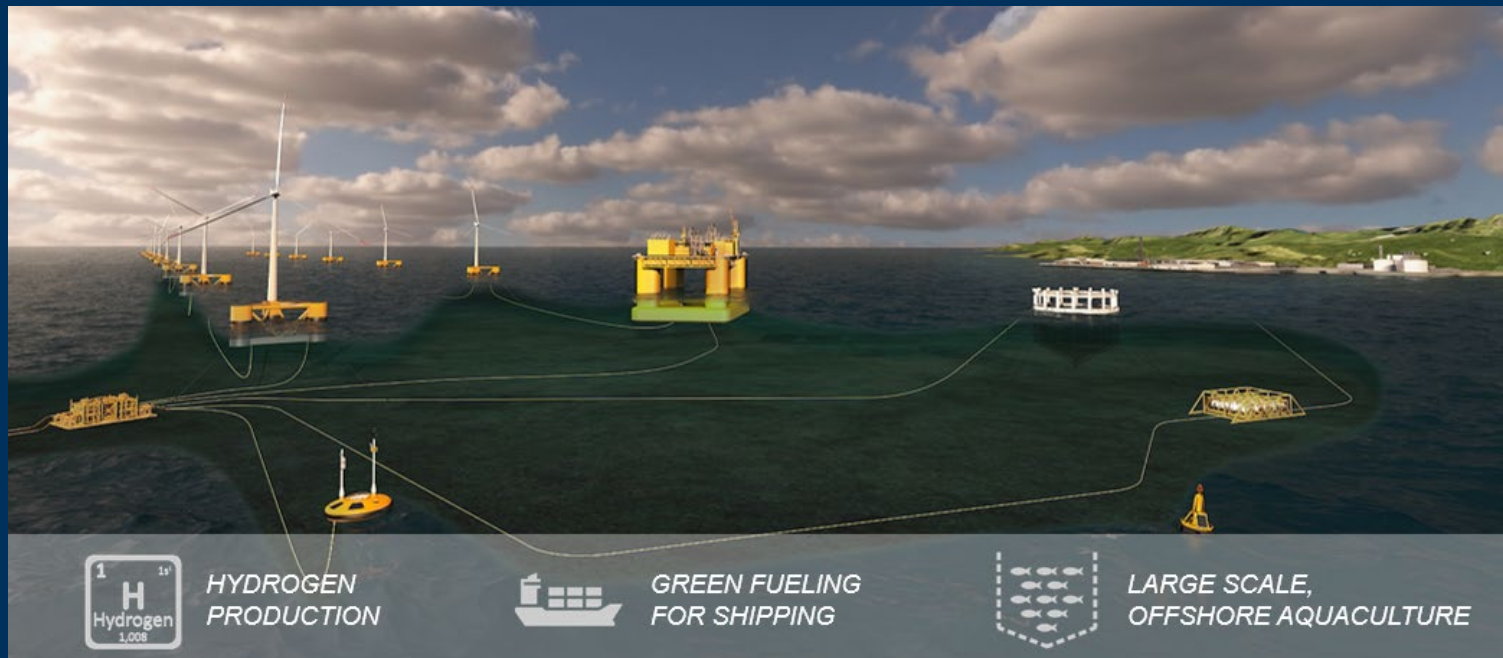
**Subsea Ammonium storage**

WÄRTSILÄ

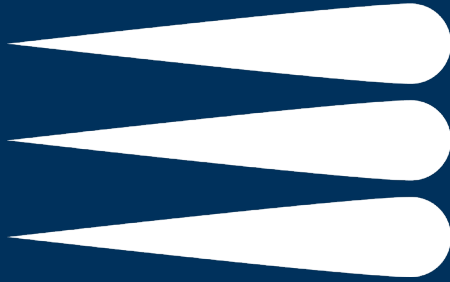




# Deep-water wind part of an emerging sustainable ocean economy







**AKER  
OFFSHORE  
WIND**



# Q & A

# WITH THANKS TO OUR SPONSORS & SUPPORTERS

IN ASSOCIATION WITH



EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



0845 tomorrow

# ScotWind: a co-ordinated approach to a 2030 grid

Sponsored by



---

TRANSMISSION

ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER





ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER





This session  
begins at  
0845



# ScotWind: a co-ordinated approach to a 2030 grid

Sponsored by Scottish & Southern Electricity  
Networks Transmission






**Ben Miller**  
Senior Policy Manager  
Scottish Renewables



**Greg Clarke**  
Head of Corporate Affairs  
Transmission  
Scottish & Southern Electricity  
Networks Transmission



**Lauren Logan**  
Strategy Officer and Offshore  
Coordination Lead  
Scottish & Southern Electricity  
Networks Transmission

# ScotWind: a co-ordinated approach to a 2030 grid

Scottish Renewables Offshore Wind Conference  
22 April 2021

nationalgridESO



TRANSMISSION

# Agenda

---

Introduction & tackling grid barriers

Greg Clarke - Head of Corporate Affairs, SSEN Transmission

---

Pathway to 2030

Lauren Logan - Strategy Manager and Offshore lead, SSEN Transmission

A co-ordinated approach to a 2030 grid

---

Next steps

Greg Clarke - Head of Corporate Affairs, SSEN Transmission

---

Panel Q&A

As above, joined by

Eric Leavy - Head of Transmission Networks, SP Energy Networks

Alice Etheridge - Offshore Coordination Senior Manager, National Grid ESO

Dr. Biljana Stojkovska - Technical Manager Offshore Coordination, National Grid ESO

---

nationalgridESO



TRANSMISSION

# Introduction and tackling grid barriers

---

Greg Clarke

Head of Corporate Affairs, SSEN Transmission

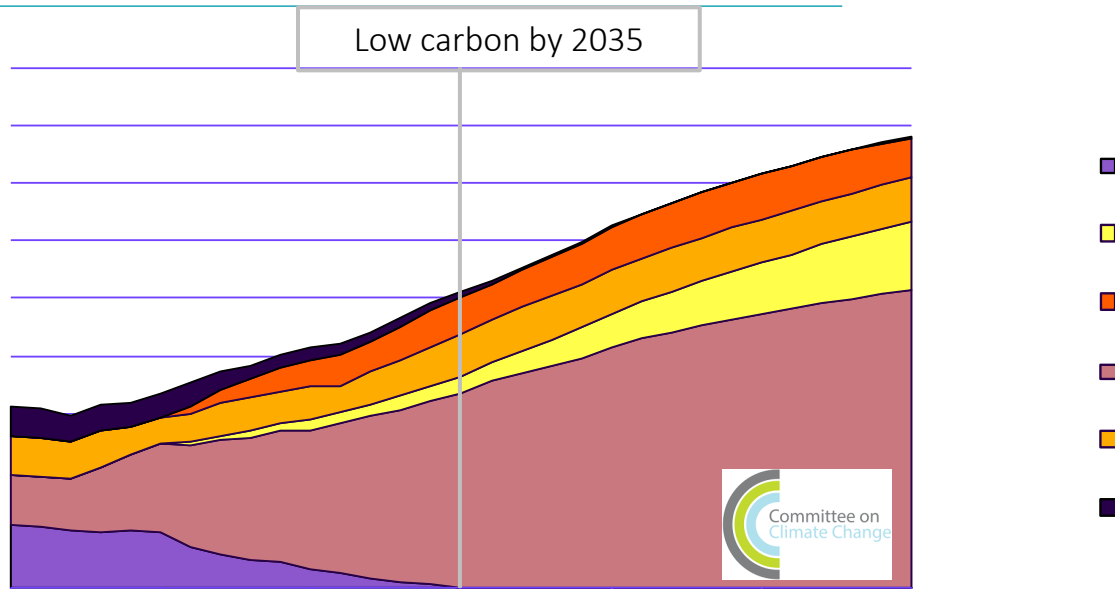
nationalgridESO



TRANSMISSION



# Net Zero and offshore wind

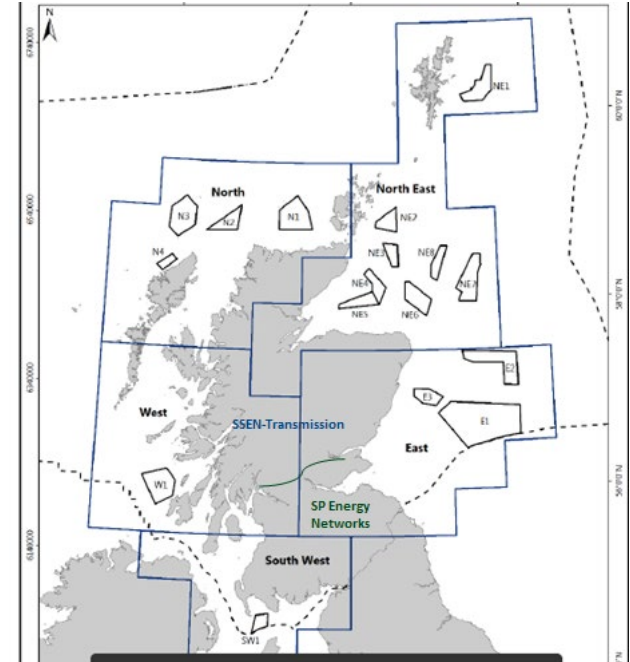


Source: Figure 3.4c of the Committee on Climate Change, The Sixth Carbon Budget: The UK's path to Net Zero. December 2020. Accessed 29 March 2021.

Note: Chart reflects UK electricity generation. Additional capacity is available through interconnection. Unabated fossil fuel generation includes coal and gas. Variable renewables include wind and solar. Firm power includes nuclear. Dispatchable low-carbon generation includes gas CCS, BECCS and hydrogen.

# ScotWind and the OTNR

- The Offshore Transmission Network Review (OTNR) ran by BEIS, looks into the way that the offshore transmission network is designed and delivered, consistent with the ambition to deliver net zero emissions by 2050
- Pathway to 2030's objective: *Enabling achievement of 40GW target for 2030 by increasing central coordination and accelerating delivering of the required onshore and offshore grid infrastructure*
- The Transmission Owners and Electricity System Operator, with stakeholders, have a significant role to in achieving this outcome



# ScotWind Roundtable: tackling grid barriers

- **Shared ambition:** identify tangible and deliverable solutions to the grid barriers to ScotWind development that ensure long-term benefit to consumers, the environment, local communities and other legitimate users of the sea
- Working together to ensure the grid infrastructure is in place for ScotWind to connect by 2030
- Supporting Scottish and UK Government 2030 offshore targets of 11 GW and 40 GW



# Pathway to 2030: A co-ordinated approach to a 2030 grid

---

Lauren Logan

Strategy Manager and Offshore Lead, SSEN Transmission

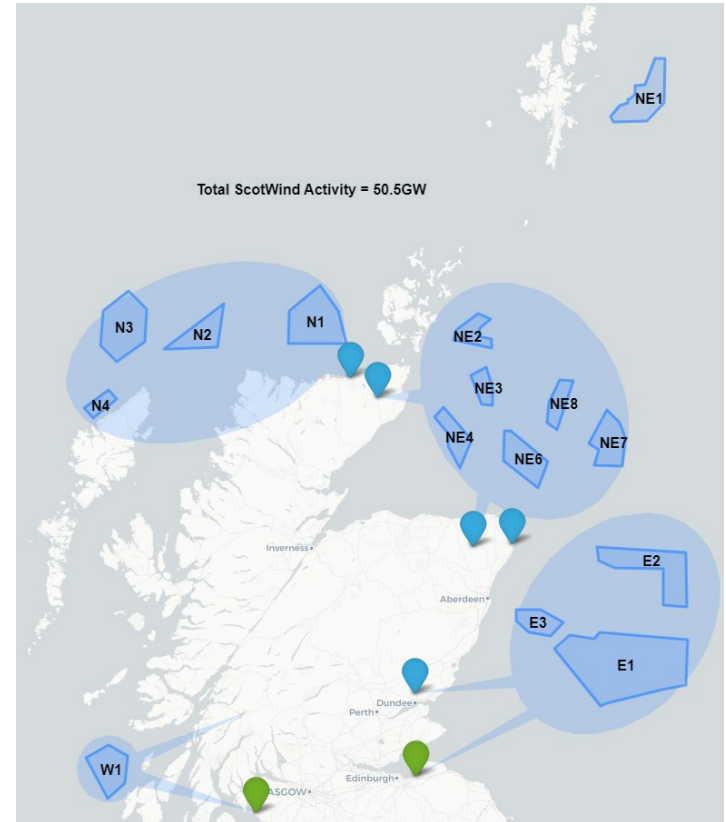
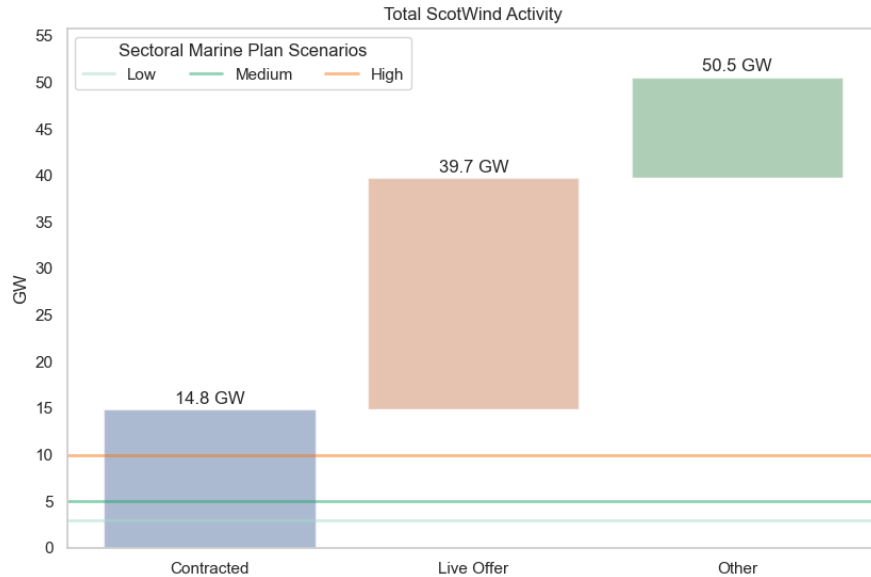
nationalgridESO



TRANSMISSION

# Offshore wind pipeline

- ScotWind leasing round capped at 10 GW
- To date, almost 50GW of generator interest at most option sites



# Pathway to 2030: a co-ordinated approach to a 2030 grid

- Long lead time for electricity transmission investment - design, development, consent, procurement and construction
- Aligned with offshore developers' timelines, **means action is required now to achieve 2030 targets**
- The ESO and TOs agree that a Central Design Team including both the ESO and TOs, led and chaired by the ESO, combining both onshore and offshore activities is the most collaborative and efficient approach towards a holistic network design for 2030
- This approach was encouraged at a BEIS/Ofgem led workshop and will be confirmed via OTNR governance

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High-level design	Validate offshore conn. works*	Development		Consenting		Construction			TARGET
				Ofgem approvals Early procurement CfD and FID					

*\*following estimates timeline for leasing round announcement*

**S** Does this timeline align with your plans?

nationalgridESO



TRANSMISSION



# A co-ordinated 2030 grid

Co-ordinated approach will provide certainty on the timely development and delivery of strategic infrastructure and landing hubs

## Providing developers:

- Certainty of grid connection offer
- Certainty of connection date
- Timeline in line with Crown Estate Scotland

## Providing wider benefits over the long term too including:

- Minimising the impact to the environment and local communities where infrastructure will be situated
- Likely to be most economic delivery option for GB consumers
- Connecting renewable generation quicker and cheaper than current process
- Offering certainty to supply chain and manufacturers



**S** Are there any additional opportunities or challenges?

nationalgridESO



Scottish & Southern  
Electricity Networks

TRANSMISSION

# Next Steps

---

Greg Clarke

Head of Corporate Affairs, SSEN Transmission

nationalgridESO



TRANSMISSION

# Next Steps

- Delivering ScotWind in the most co-ordinated and efficient way is critical to meeting 2030 targets and the pathway to net-zero
- The ESO and TOs will establish a central design team, following OTNR governance, with the output of a high-level design focusing on the strategic network infrastructure (Autumn 2021)
- Further development of this approach plus engagement with developers ongoing

S

What do you think of the proposed approach for a co-ordinated 2030 grid?



nationalgridESO

SP ENERGY NETWORKS

Scottish & Southern Electricity Networks

TRANSMISSION

# Panel Q&A

---

Greg Clarke - Head of Corporate Affairs, SSEN Transmission

Lauren Logan - Strategy Manager and Offshore lead, SSEN Transmission

Eric Leavy - Head of Transmission Networks, SP Energy Networks

Alice Etheridge - Offshore Coordination Senior Manager, National Grid ESO

Dr. Biljana Stojkovska - Technical Manager Offshore Coordination, National Grid ESO



S

Ask the panel a question using the Slido tab

nationalgridESO



TRANSMISSION

# Thank you for joining us

---

For any follow up discussions, or to join our stakeholder engagement distribution list for email updates and details of future engagement sessions please contact [transmission.stakeholder.engagement@sse.com](mailto:transmission.stakeholder.engagement@sse.com)

nationalgridESO



TRANSMISSION

**Greg Clarke**

**Head of Corporate Affairs Transmission, Scottish & Southern Electricity  
Networks Transmission**

**Lauren Logan**

**Strategy Officer and Offshore Coordination Lead, Scottish & Southern  
Electricity Networks Transmission**

**Eric Leavy**

**Head of Transmission Networks, SP Energy Networks**

**Alice Etheridge**

**Offshore Coordination Senior Manager, National Grid ESO**

**Dr. Biljana Stojkovska**

**Technical Manager Offshore Coordination and Innovation Manager,  
National Grid ESO**



ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



This session  
begins at  
0945



# Breaking down barriers to deployment





**Morag Watson**  
Director of Policy  
Scottish Renewables

# WITH THANKS TO OUR SPONSORS & SUPPORTERS

IN ASSOCIATION WITH



EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER





**Nancy McLean**  
Offshore Development Manager  
EDF Renewables



**Dr Monica Fundingsland**  
Advisor Sustainability  
Equinor



# Consenting Challenges Floating Offshore Wind

Dr Monica Fundingsland  
Sustainability Advisor, Equinor  
April 2021



## Contents

- Some aspects of floating technology which give rise to floating-specific consenting challenges
- Evidence gaps for floating offshore wind and what Equinor is trying to learn from our Hywind Scotland Pilot Park



# Floating offshore wind foundations

## Onshore wind

Smaller turbines  
40 years of experience

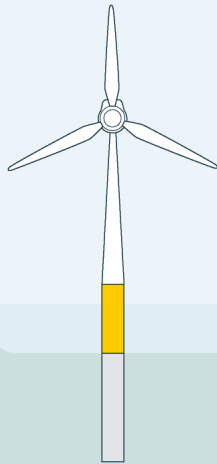
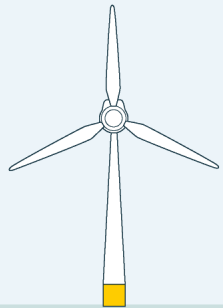
## Bottom-fixed offshore wind

Larger turbines, stronger winds  
20 years of experience

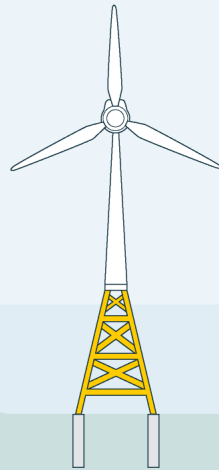
## Floating offshore wind

80% of wind resource is in waters deeper than 50 m

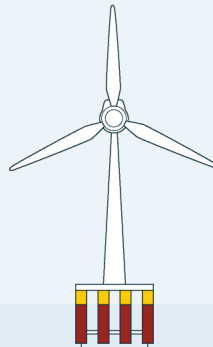
Technological maturity improving – expected to be cost competitive with bottom fixed by 2030



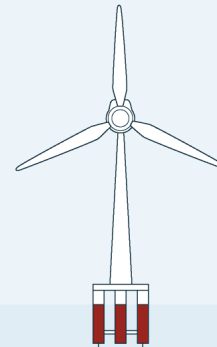
Monopile



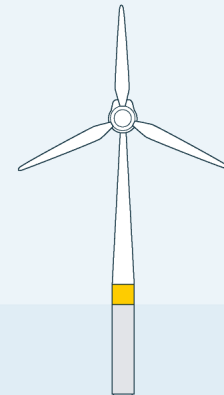
Jacket



Tension-Leg Platform (TLP)

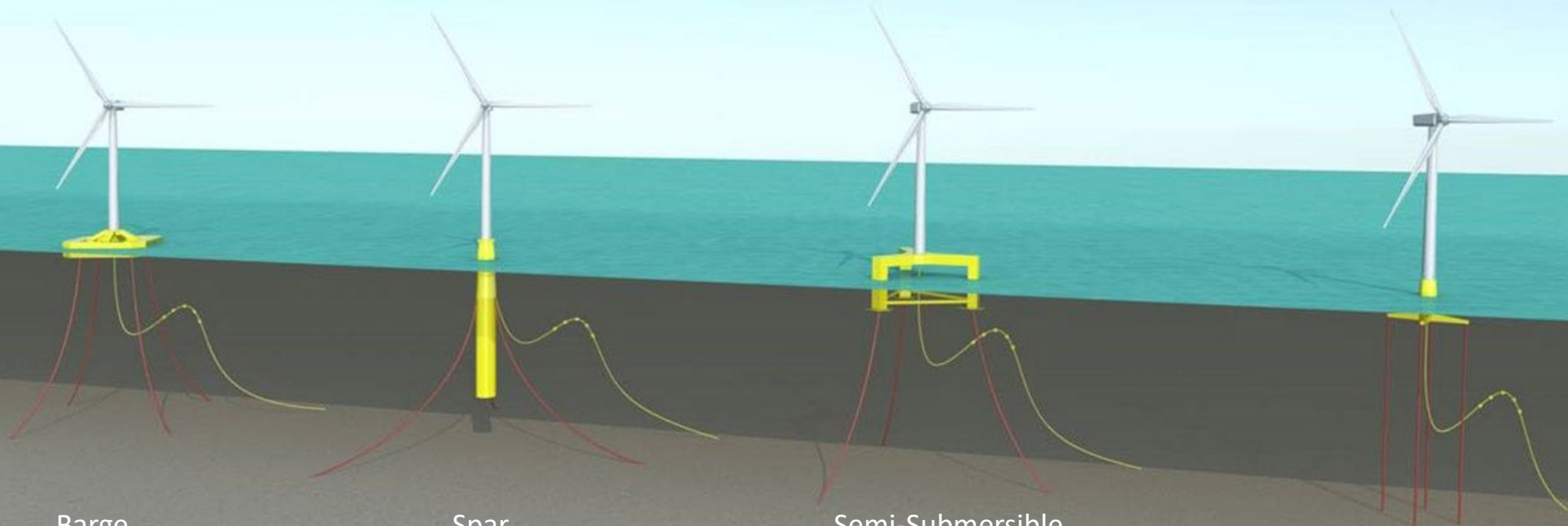


Semi-Submersible



Spar

# Interconnecting array cables



Barge

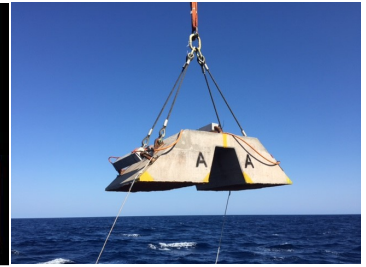
Spar

Semi-Submersible

Tension-Leg  
Platform (TLP)

# Anchors

**Drag and suction** anchors typically considered the most common and cost-effective solutions, where soil conditions are suitable



	Drag Anchors	Suction Anchors	Driven Pile Anchors	Gravity Anchors
<b>Industry experience</b>	Extensive (Hywind Demo)	Extensive (HYS, HYT)	Extensive	Extensive
<b>Seabed</b>	Sand and soft conditions (soft clay)	Sand, soft clay to stiff clay	Harder soil conditions (not bedrock)	Harder soil conditions (also bedrock)
<b>Noise impacts</b>	Low	Low	Yes (but lower than monopile)	Low
<b>Other</b>	Cheapest anchor type	Enables shared anchors	Enables shared anchors	Very large volume and weight, seabed prep

125

## Some of the evidence gaps for floating offshore wind consenting

- Marine mammal entanglement
- Understanding fish aggregation
- Displacement of fishing effort/fisheries exclusion
- Commercial fisheries coexistence
- EMF from dynamic cables suspended in water column
- Underwater noise and vibration
- Benthic disturbance from cables and mooring chains
- Ghost fishing – marine mammals, birds, fish
- Underwater barrier effects
- Spatial and temporal use of FOW area by fish, marine mammals, birds

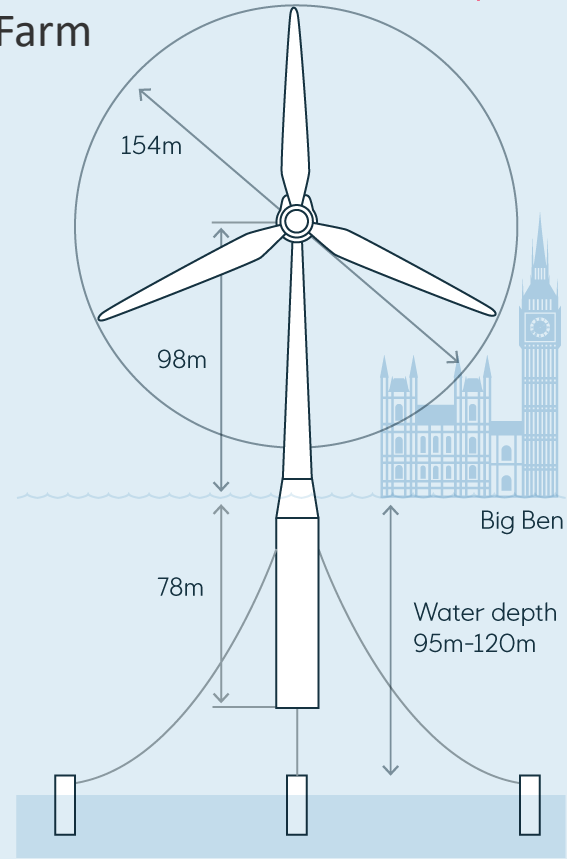
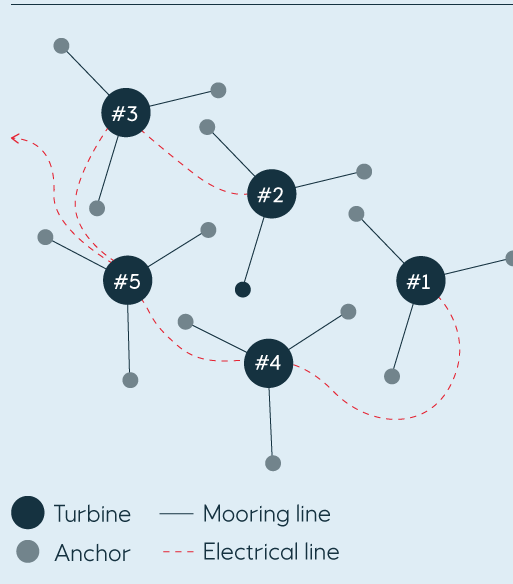
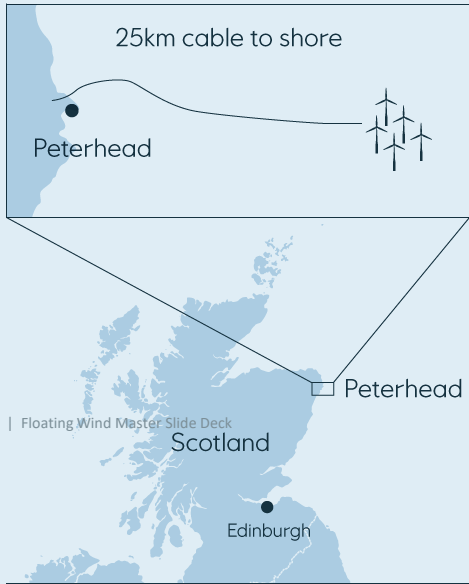


### Entanglement of marine mammals/fish

- Disconnect between risk of entanglement and perception for HYS mooring lines
- May need consideration for other types of mooring or dynamic cables
- Entanglement in ghost fishing gear could be a bigger issue

# Learning from Hywind Scotland Floating Offshore Wind Farm

The world's first floating wind park (Sep'17)  
 Installed Capacity 30MW





## Trials at Hywind Scotland 2020/21 to increase the evidence base for floating

Marine sound	Artificial reef effect/ colonisation	Static fishing trials	Fish diversity
<ul style="list-style-type: none"> <li>Installation for HyS/HyT low noise impact but «snapping» sound on Hywind Demo</li> </ul>	<ul style="list-style-type: none"> <li>Artificial reef effect/marine colonization of substructures could increase biodiversity</li> <li>Could conversely create location for invasive species</li> </ul>	<ul style="list-style-type: none"> <li>Floating wind may present greater conflict with commercial fishing than bottom fixed due to anchor chains, anchors, array cables</li> </ul>	<ul style="list-style-type: none"> <li>Turbines and substructures may have fish aggregation effects</li> </ul>
<ul style="list-style-type: none"> <li>Operational noise study, deployment of 2 moored hydrophones for 3 months</li> <li>Output will be used to model implications for marine mammals and fish</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection of marine growth on substructures 6th – 15th June 2020 (combined with operational survey)</li> </ul>	<ul style="list-style-type: none"> <li>Test whether some fishing gear can be used safely within a floating offshore wind farm (fish traps, creels, jigging lines)</li> </ul>	<ul style="list-style-type: none"> <li>Environmental knowledge on potential effects of floating offshore windfarms on fish and benthic diversity (fish aggregation, reef effect, spill-over effect)</li> </ul>
<ul style="list-style-type: none"> <li>Late 2020 – early 2021</li> </ul>	<ul style="list-style-type: none"> <li>2020 survey completed</li> <li>Comparative data collected during operational survey '18</li> </ul>	<ul style="list-style-type: none"> <li>4 days/month for 5 months</li> <li>Postponed due to COVID19</li> <li>May-Sept 2021</li> </ul>	<ul style="list-style-type: none"> <li>May-Sept 2021 (combined with fishing trials)</li> <li>Sailbouy glider with mapping sensors and e-DNA from water samples (summer 2021)</li> </ul>



© Equinor ASA

This presentation, including the contents and arrangement of the contents of each individual page or the collection of the pages, is owned by Equinor. Copyright to all material including, but not limited to, written material, photographs, drawings, images, tables and data remains the property of Equinor. All rights reserved. Any other use, reproduction, translation, adaption, arrangement, alteration, distribution or storage of this presentation, in whole or in part, without the prior written permission of Equinor is prohibited. The information contained in this presentation may not be accurate, up to date or applicable to the circumstances of any particular case, despite our efforts. Equinor cannot accept any liability for any inaccuracies or omissions.



**Heather Donald**  
Head of Project Consents  
SSE Renewables

# THE MAIN BARRIERS TO CONSENTING OFFSHORE WIND PROJECTS AND HOW THESE ARE BEING TACKLED FROM A DEVELOPERS PERSPECTIVE

Heather Donald, Head  
of Project Consents

April 2021



# || OVERVIEW OF PRESENTATION

*‘The main barriers to consenting offshore wind projects and how these are being tackled from a developers perspective’*

- **SSER’s offshore wind portfolio in Scotland**
- **Summary of current consenting issues**
- **Focus on key areas of ornithology and other sea users**
- **How SSE are tackling the key issues**



# DELIVERING OFFSHORE WIND

## SSE Renewables Offshore Wind Portfolio

### OPERATIONAL

- Greater Gabbard (504MW, 50%)
- Beatrice (588MW, 49%)

### IN CONSTRUCTION

- Seagreen 1 (1,075MW, 49%)
- Dogger Bank (3,600MW, 50%)

### IN DEVELOPMENT

- Arklow Bank 2 (520MW)
- Berwick Bank (up to 2,300MW)
- Marr Bank (up to 1,850MW)
- North Falls (up to 504MW, 50%)
- Braymore (c. 800MW)
- Seagreen 1A 360MW (49% SSE 51% Total)

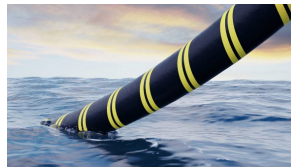
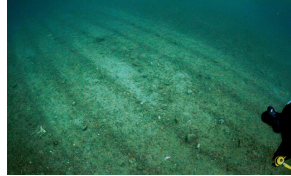
### LICENCE APPLICATION

- Celtic Sea Array (c. 800MW)





# || KEY CONSENTING ISSUES FOR SSE RENEWABLES



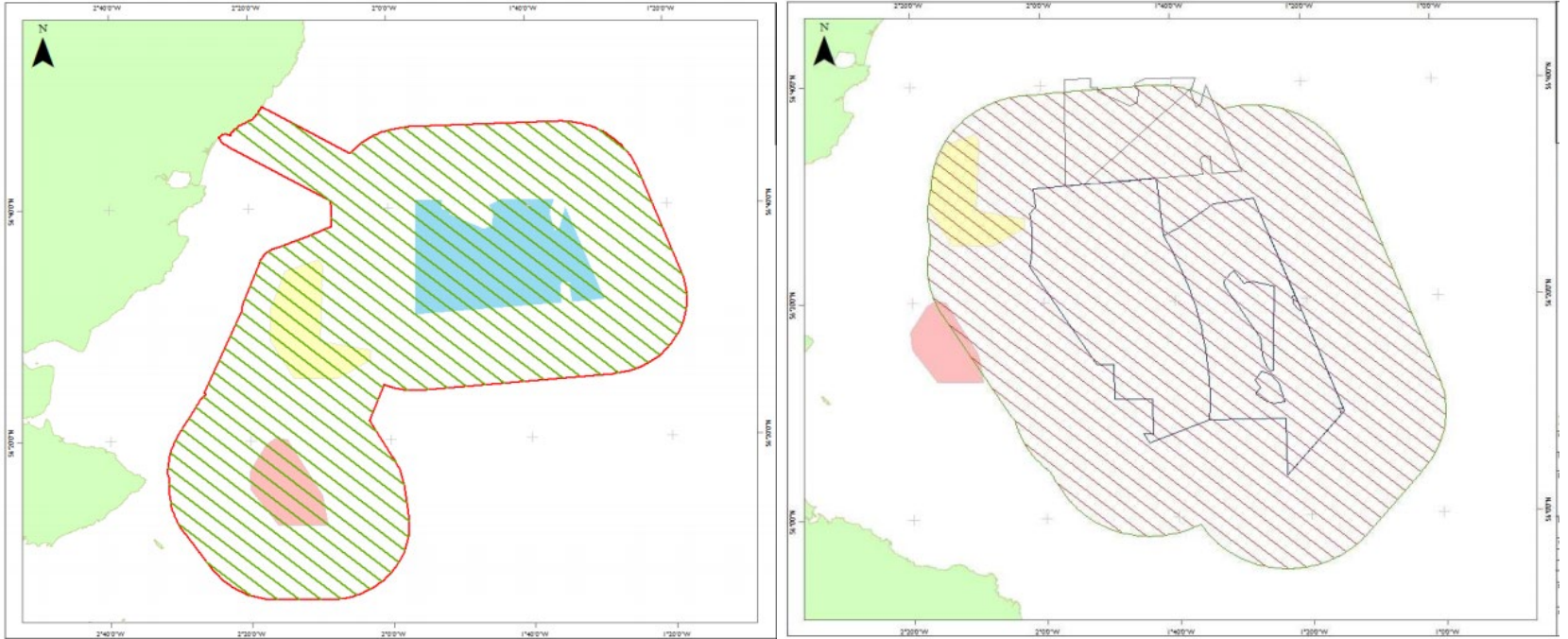
# || ORNITHOLOGY AND UNCERTAINTY

- Evidence based CRM parameters
- Mitigation by design
- How much data is enough data?
- What is an acceptable threshold of effects?
- Project level derogation and compensation
- Collaboration, monitoring and research



# || F&T MONITORING COLLABORATION

## Digital Aerial Survey



# || OFFSHORE WIND AND OTHER SEA USERS

- Different stages in projects brings different challenges with fisheries interactions
- Increased cabling on the seabed and moor lines associated with floating wind will result in more interactions over time
- Co existence with fisheries is possible and there are examples of this working
- Over trawl trials
- Decommissioning plans
- Climate emergency and priorities





## || INCREASING RESOURCES

- Resource for updating guidance, advice, strategic marine planning and consenting process
- Improving efficiencies
- Digitisation



## SSE PARTICIPATION IN GROUPS RESOLVING THESE ISSUES

- Sector Deal P2G- via OCLG and RUK
- SOWEC Barriers to Deployment Group (2021 Roadmap)
- ORJIP
- OWSMRF
- FTRAG
- MFRAG
- OWEC- via RUK
- SMEEF

Heather.Donald@sse.com



**Kirsty MacArthur**  
Director  
MacArthur Green

**Ross McGregor**  
Principal Ornithologist  
MacArthur Green







**Scottish Renewables Offshore Wind Conference**  
**Breaking down barriers to deployment**

**Crown Estate Scotland and SOWEC:**  
**HRA Derogation - Review of seabird strategic compensation options**

**Kirsty MacArthur – Director**  
**Dr Ross McGregor – Principal Ornithologist**

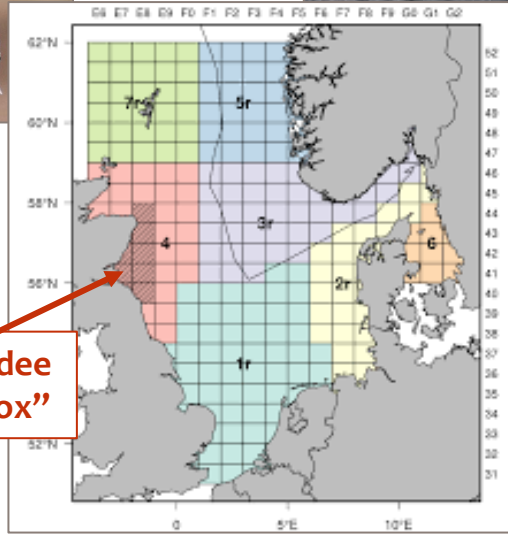
# Overview

- Two scopes
  - Scope A – Legal Review (CMS)
  - Scope B – Seabird strategic compensation (MacArthur Green)
- Legal review
  - Habitats Regulations
  - No Alternative Solutions Test
  - Imperative Reasons of Overriding Public Interest (IROPI) Test
  - Compensation Duty

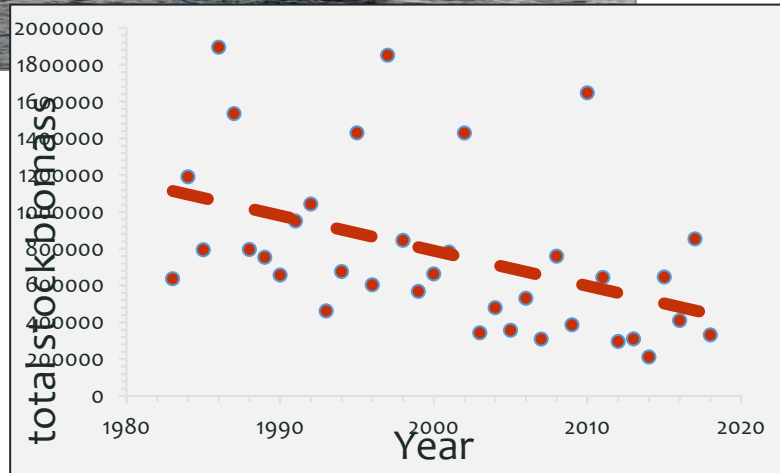
# Seabird strategic compensation



# No take zones for forage fish



Sandeel  
I "box"



# No take zones for forage fish

Summary tables

Importance of small forage fish to seabirds

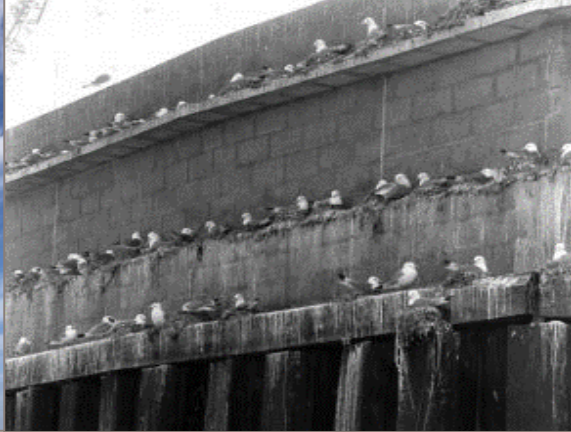
Evidence of affects on:  
Breeding success  
Overwinter survival

Species	Sandeels etc. in diet	Breeding success affected	Breeding success constrained	Sandeels etc. in winter diet	Overwinter survival constrained
Kittiwake	Green	Green	Green	White	White
Arctic skua	Green	Green	Green	White	White
Sandwich tern	Green	Green	Green	White	White
Arctic tern	Green	Green	Green	White	White
Common tern	Green	Green	Green	White	White
Puffin	Green	Green	Green	Green	Yellow
Shag	Green	Green	Green	Green	Yellow
Red-throated diver	Green	Yellow	Yellow	Green	White
Common guillemot	Green	White	White	Green	Yellow
Razorbill	Green	White	White	Green	Yellow
Great skua	Yellow	Yellow	Yellow	White	White
Fulmar	Yellow	Yellow	White	White	White
Lesser black-backed gull	Yellow	White	White	White	White
Manx shearwater	Yellow	White	White	White	White
Great northern diver	White	White	White	Yellow	White
Great black-backed gull	Yellow	White	White	White	White
Herring gull	White	White	White	White	White
European storm-petrel	White	White	White	White	White
Leach's petrel	White	White	White	White	White
Gannet	White	White	White	White	White

High confidence  
Low confidence



# Artificial colonies for kittiwakes





# Invasive terrestrial mammals



# Invasive terrestrial mammals

Summary tables

Importance of  
invasive mammals  
to breeding  
seabirds

Evidence of  
conservation gains  
from eradication

Species	Breeding or survival affected by mammals	Evidence that eradication results in conservation gains
Manx shearwater	High confidence	High confidence
European storm-petrel	High confidence	High confidence
Leach's petrel	High confidence	High confidence
Black guillemot	High confidence	High confidence
Puffin	High confidence	High confidence
Razorbill	High confidence	High confidence
Common guillemot	Low confidence	Low confidence
Shag	High confidence	Low confidence
Arctic tern	High confidence	Low confidence
Common tern	High confidence	Low confidence
Common gull	Low confidence	Low confidence
Sandwich tern	Low confidence	Low confidence

**High confidence**  
**Low confidence**

# Recommendations

- Strategic framework overseen by Government
  - Management under the UK Government's and Scottish Government's Seabird Conservation Strategies
- Project-based compensation closely aligned with UK and Scottish Government Seabird Conservation Strategies
- **Closure of UK waters to directed fishing for sandeels**
- **Eradicating invasive mammal populations**
  - highly effective for limited set of species
  - sustained long-term support for biosecurity measures



CO<sub>2</sub>e  
Assessed



Carbon  
Neutral  
Organisation <sup>+</sup>





**Colin Maciver**  
Senior Development Manager  
(Offshore Wind)  
Crown Estate Scotland

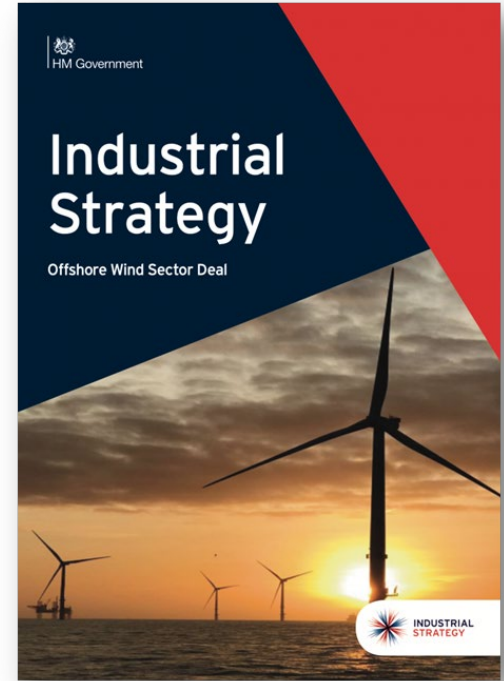
# Breaking down barriers to deployment

Colin Maciver



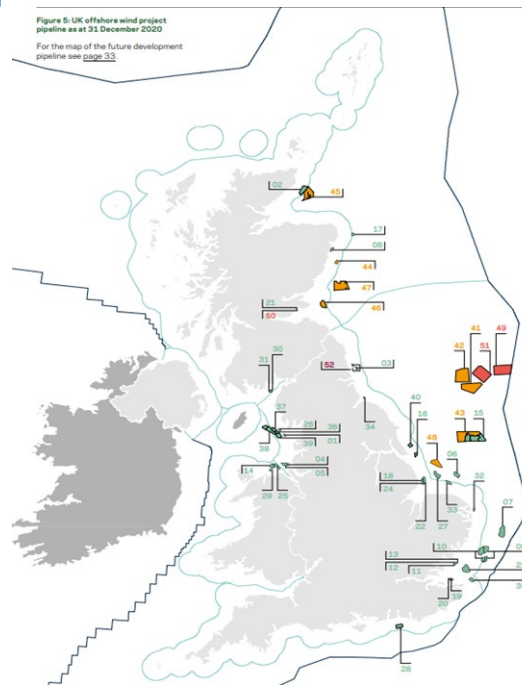
# Government and Industry Aspirations

- Deliver Net Zero commitments
- Just Transition and Green Recovery
- Maintain UK/ Scotland as an attractive destination for projects and suppliers
- Delivery of shared objectives will require aligned effort.
- 2030 is the next milestone not the last one.



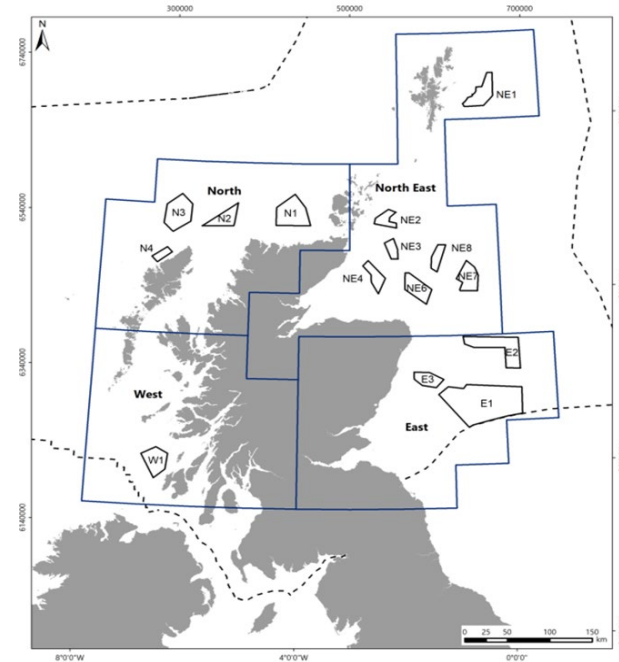
# Sector Deal and SOWEC ambition

- Volume of capacity is the primary driver for growth of the industry in Scotland.
- Delivery timing and foreseeability is essential to secure wider benefits.
- Recent cost reduction and industry success has firmly established OSW at the forefront of a renewable-led electricity system.



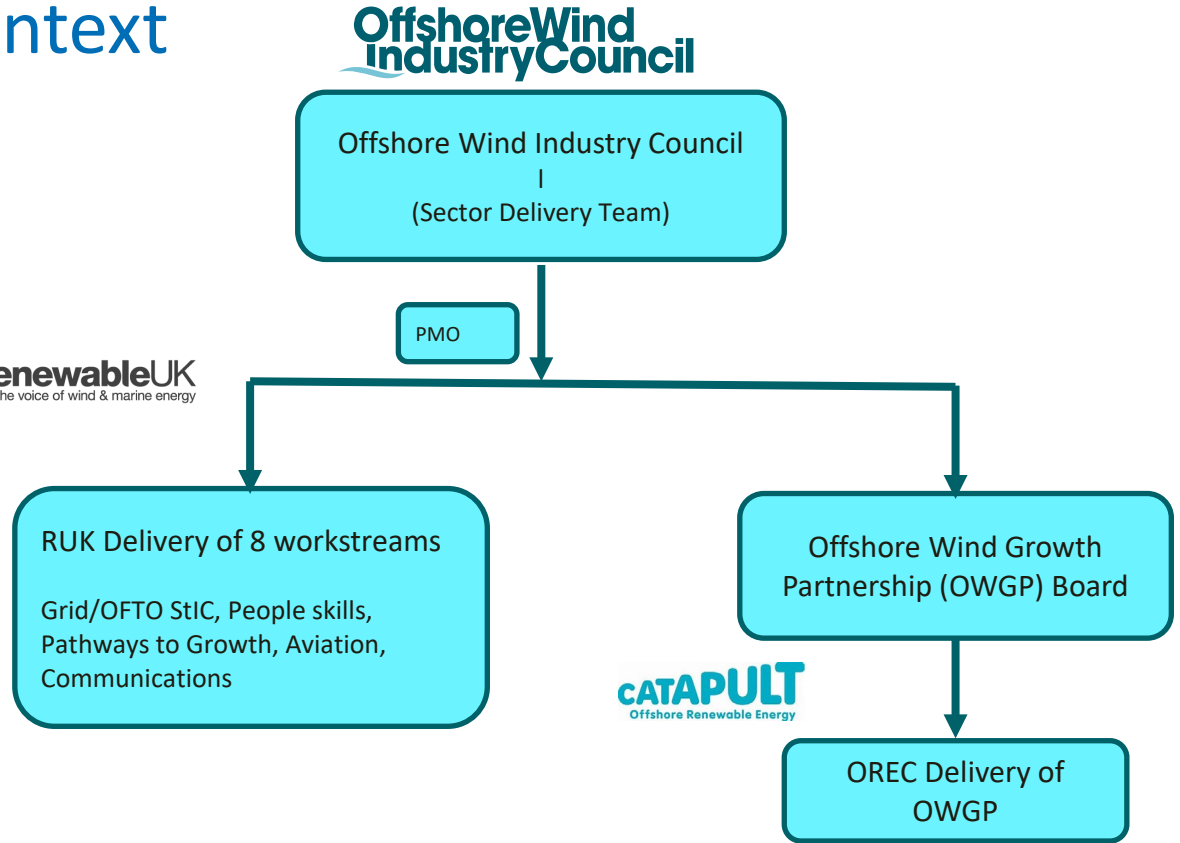
# Marine Planning and ScotWind Leasing

- Sectoral Marine Plan for Offshore Wind
- Target outcomes from ScotWind Leasing (SWL):
  - Maximise the contribution offshore wind can make to Scotland's Net Zero ambition
  - Deliver large capital projects which will help to power an energy transition for Scotland's economy
- Projects will be developed during the 2020s and are expected to be operational around 2030.



# OWIC Role and Context

- A partnership between the sector and the UK government which is an ambitious, long-term strategy, in which offshore wind will become the backbone of the UK's power system
- Offshore Wind Industry Council (OWIC) - senior level government and industry interface forum.
- Co-chaired by BEIS minister and industry leader. Formed 2013, with 17 leading companies.



# SOWEC Overview

## Scottish Offshore Wind Energy Council (SOWEC)

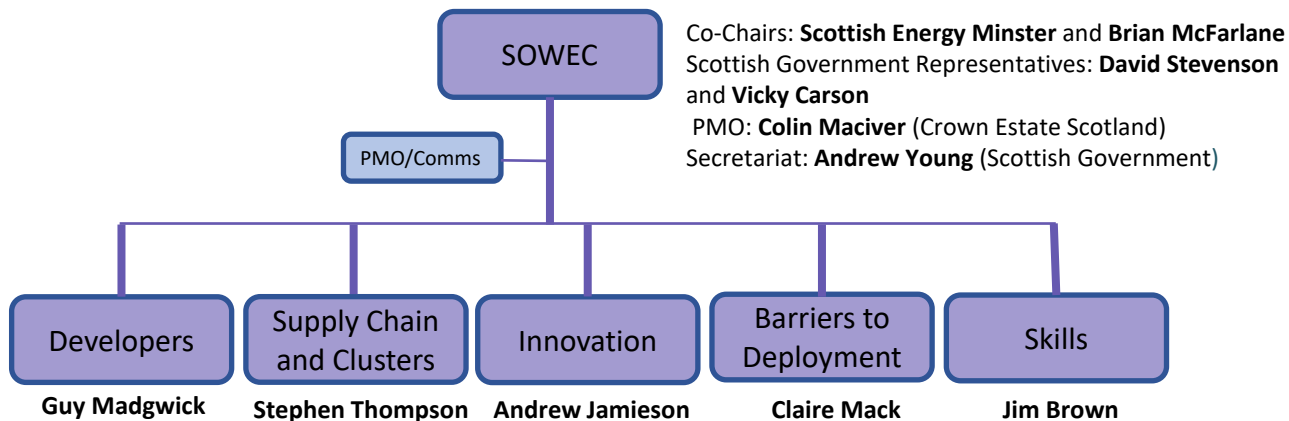
SOWEC is an agreed working group within the SLG landscape. Operating independently, directed by the Chair and Co-Chair, adhering to the terms of reference as agreed and supported by the project management office (PMO) and Scottish Government secretariat.

## Its Vision and Goals co-ordinated the Scottish response to the Offshore Wind Sector Deal

With a clear and ambitious Vision and Goals its aim is to co-ordinate a Scotland wide response to the Offshore Wind Sector Deal and to compliment the work of the OWIC workstreams in the UK by tackling any issues that have Scotland only focus.

## SOWEC Structure

It comprises of 5 Groups led by key offshore wind experts.



# Infrastructure



Department for  
Business, Energy  
& Industrial Strategy

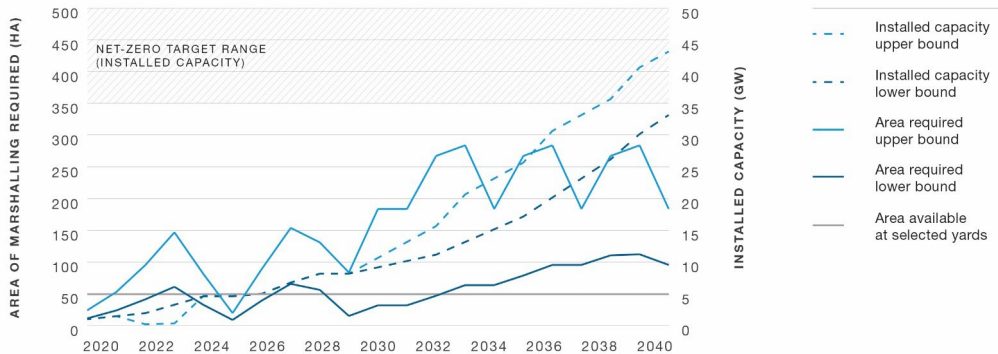
- Offshore Transmission Network Review
  - *“To ensure that the transmission connections for offshore wind generation are delivered in the most appropriate way, considering the increased ambition for offshore wind to achieve net zero. This will be done with a view to finding the appropriate balance between environmental, social and economic costs.”*
- Ports and Harbor Capability and Capacity
  - A study led by Crown Estate Scotland and undertaken by ARUP.



**Crown Estate  
Scotland**  
Oighreachd a' Chrùin Alba



‘Scotland has good technical capability to support offshore wind port functions in some, but not all locations. However, we believe that there is a significant risk that existing **port capacity will be insufficient to support the offshore wind** build-out rates required in Scottish waters to meet the UK-wide net-zero target. There are **multiple port locations which are likely to be suitable for development of additional capacity** to address this risk. This is true for both the large construction phase uses of ports, and operations and maintenance (O&M).’



### Recommendation Themes:



# Delivery

- Governments and industry are working together to identify and resolve barriers to deployment.
- Targets are very ambitious and the Sector Deal provides a mechanism for delivery and framework to assess success.
- The industry has come a long way in a short time, but there is still (based on the previous presentations) lots to do.





# Q & A

ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



This session  
begins at  
1145



# Practical programmes to drive successful supply chain development - organised by ORE Catapult





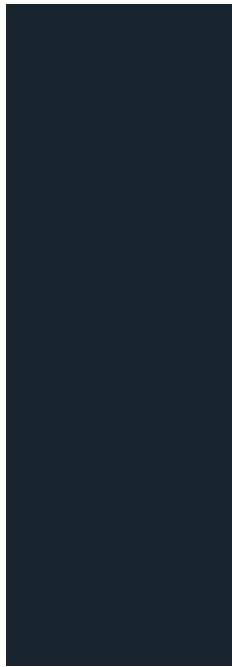
# **Isla Robb**

**Founder, EC20 and Supply Chain and  
Skills Associate Director  
RIDG**



**Claire Canning**  
Offshore Wind Growth Partnership  
Programme Manager  
ORE Catapult





## ORE Catapult Supply Chain Programmes

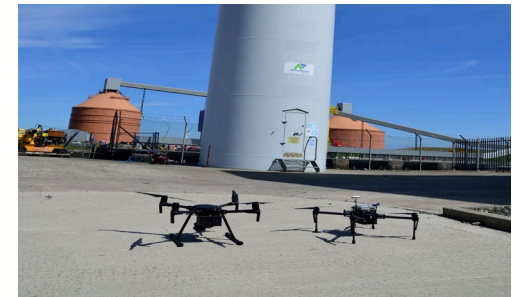
22<sup>nd</sup> April 2021

Claire Canning, OWGP Programme Manager

## The UK's leading technology innovation and research centre for offshore renewable energy

**Mission:** to accelerate the creation & growth of UK companies in the offshore renewable energy sector.

- Unique facilities, research & engineering capabilities
- Bringing together innovators, industry and academia
- Accelerating creation and growth of UK companies
- Reducing cost and risk in renewable technologies
- Growing UK economic value
- Enabling the transition to a low carbon economy





## Launch Academy

The Launch Academy is a national technology accelerator programme for the offshore wind industry, focusing on near to market solutions. It is designed to enhance the UK's offshore wind supply chain, enable greater UK content and support cost reduction through innovation. Launch Academy also runs targeted, regional programmes to support local companies in their development journeys. Launch Academy North East was established alongside the national programme with further regions to follow.



## Fit for Offshore Renewables

F4OR is a unique service to help the UK supply chain get ready to bid for work in the offshore renewable energy sector. We work with capable, competent and competitive UK supply chain companies to support their entry and growth in the offshore renewable energy industry. The objective of the programme is to support the development of an increasingly competent, capable and competitive UK offshore renewable energy supply chain – maximising opportunity for the UK supply chain, both domestically and globally.



## Offshore Wind Growth Partnership

The Offshore Wind Growth Partnership (OWGP) is a long-term business transformation programme that has been established as part of the UK Offshore Wind Sector Deal. It will promote closer collaboration across the supply chain, implement structured productivity improvement programmes and facilitate shared growth opportunities between developers and the supply chain.

# Launch Academy

Filtering best solutions

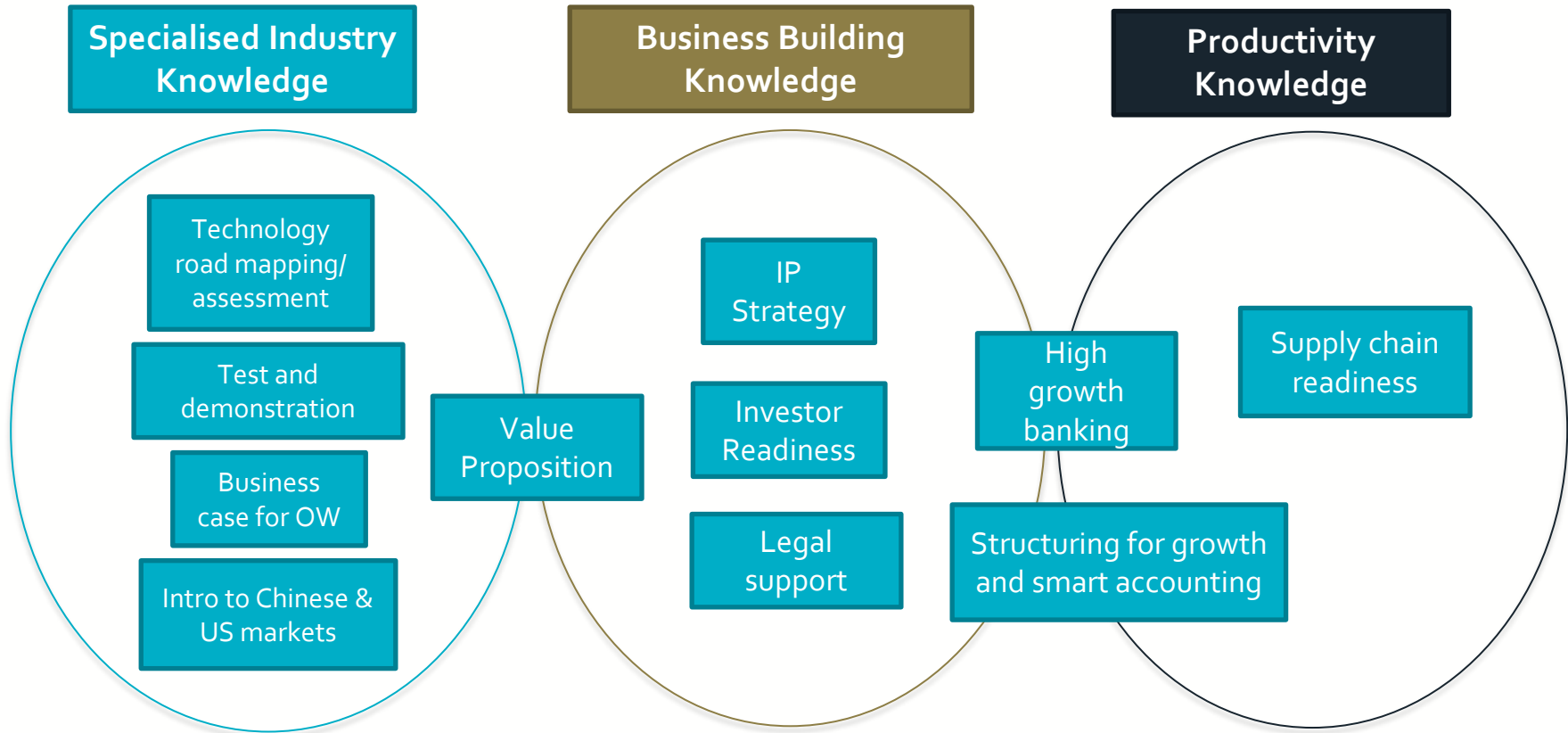
Equipping for growth

New solutions entering the market

Outcomes



- Enables companies to launch new technologies and services into the offshore wind market.
- Bespoke 9-month programme that takes on 1 cohort per year (up to 10 companies)
- Innovators can select from a menu of generalist business support and bespoke sector specific modules.
- Facilitates engagement with private investors via pitches



## Investment and R&D Grants raised



**£1.9M** R&D  
GRANTS

were secured for technology  
development projects

**> £13M** PRIVATE  
INVESTMENT

currently being raised by cohort companies  
to commercialise their technologies

## Impact

Inward investment and  
job created



VENTUS ENGINEERING ARE  
MOVING PART OF THEIR OPERATIONS  
**TO THE UK**

having already hired their first  
technical role in scotland



**9 NEW**  
HIGHLY SKILLED JOBS

have already been created since  
the start of the programme

## Collaboration



**OVER**  
**25 MEETINGS**

have been arranged between the  
companies and end users



two companies have  
secured commercial  
contracts with an end  
user/industry sponsor



# Fit 4 Offshore Renewables

- F4OR aimed at addressing barriers to entry for UK supply chain companies, and increasing UK content by providing sector specific support underpinned by business excellence
- Identifying “high potential” supply chain organisations, with a strategic interest in the Offshore Wind industry;
  - **Growing the Supply Chain** - supporting the transition of companies from other sectors into offshore wind, by developing sector specific capability and competence;
  - **Increasing Competitiveness** - supporting companies to improve competitiveness through innovation and continuous improvement;
  - **Raising Awareness** – promoting “high potential” supply chain organisations within the industry;



- Developed from the F4Nuclear Programme framework from the Nuclear Advanced Manufacturing Research Centre (NAMRC)
- ORE Catapult have adjusted the programme since its inception to be aligned to offshore renewables supply chain characteristics and business content – including **manufacturing, fabrication and assembly, service, O&M, engineering design and construction**
- ORE Catapult, NAMRC and Opergy have recently further improved the programme with enhancement to the sector specific modules focusing on offshore wind
- Industrial insight and feedback provided by Industrial Advisory Group to continuously improve and govern the standard of the programme

## Two parts to the programme:

- **Part 1** - Business Excellence – Scope, content and standard set with reference to business management best practice;
- **Part 2** – Sector Specific – Scope, content and standard set with reference to barriers to successful entry and growth in offshore renewable energy supply chain



NUCLEAR AMRC

Powered by

**CATAPULT**  
Offshore Renewable Energy



## Phase 1 – Business Excellence

## Phase 2 – Sector Specific

Key Driver of Success in Sector	<b>People</b> – employee culture, development and accountability, communication, change management;	<b>Sector Knowledge</b> – growth, projects, technology, supply chain;	Key Driver of Success in Sector
Key Driver of Competitiveness	<b>Strategy and Leadership</b> – strategic awareness, planning, and deployment, management leadership; <b>Process and Operations</b> – continuous improvement culture, KPI setting, measurement and benchmarking, supply chain management; <b>Design and Project Delivery</b> – design systems and control, project planning, management and delivery performance;	<b>Cost Reduction and Competitiveness</b> – value proposition (costed), benchmarking; <b>Capacity and Capability</b> – capacity and capability planning; <b>Sector Specific HSE</b> – offshore specific competence and planning; <b>Technical Risk Management</b> – technology development planning and validation, operational technical support / management; <b>Commercial Risk Management</b> – commercial planning and risk allocation in contracts, warranties, service level agreements, guarantees and bonds;	Key Driver of Competitiveness
Tender Qualification, Effective Risk Management	<b>Health, Safety and Environment</b> – HSE management, responsibility and accountability, competence, planning and audit; <b>Quality</b> – management systems, responsibility and accountability, continuous improvement;		Key Sector Competence

- F4OR North East Scotland Programme (2021/22) with Opportunity North East
- TIGGOR Business Support F4OR (2021/22) in North East England delivered in partnership with OWGP, North of Tyne Combined Authority and North East LEP.
- New Anglia F4OR Programme (2021/22) in Norfolk and Suffolk with New Anglia LEP.

# Offshore Wind Growth Partnership

# A long-term business transformation programme for the UK offshore wind supply chain

## Objectives

- Increased UK content in UK projects.
- Increased exports to global markets.
- Increased economic value (jobs and GVA).
- Increased UK IP embedded in supply chain.

## Funding

- OWIC (offshore wind developers) are funding OWGP.
- OWGP will leverage regional and national public funding

## Delivery

Budget of £100m over ten years to provide:

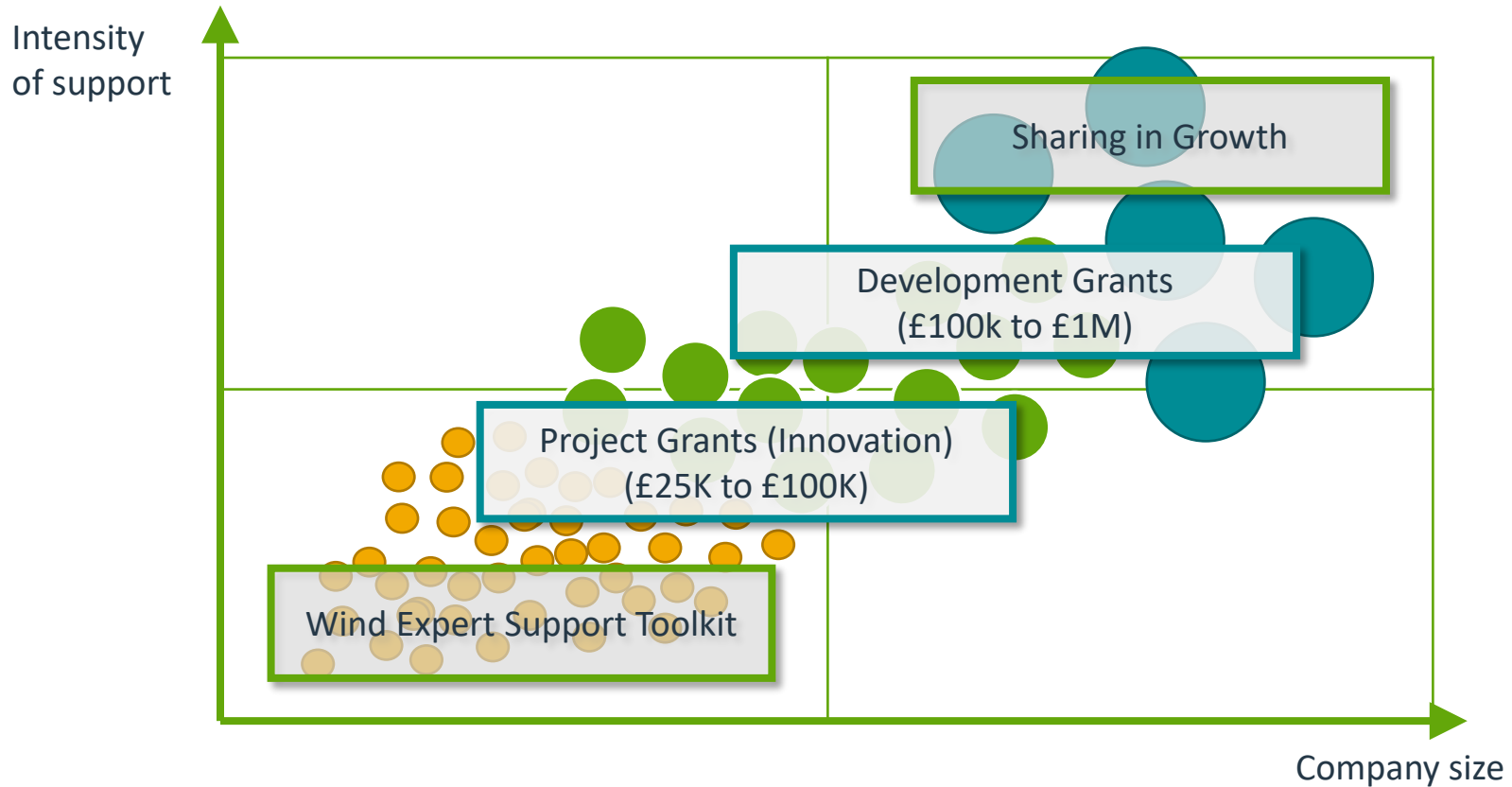
- **Business Transformation** – structured programmes to help companies grow.
- **Grant Funding** – for developing new products, services, capacity and capability

*OWGP provides efficient and effective delivery of business transformation programmes for the UK offshore wind supply chain.*

**Efficient** – keeping programme management as simple as possible, we maximise the support that reaches companies.

**Effective** – all supported companies must provide growth forecasts and we will continue to track and report on the impact over the lifetime of the programme.

# OWGP provides support to all sizes of supply chain companies with potential to grow



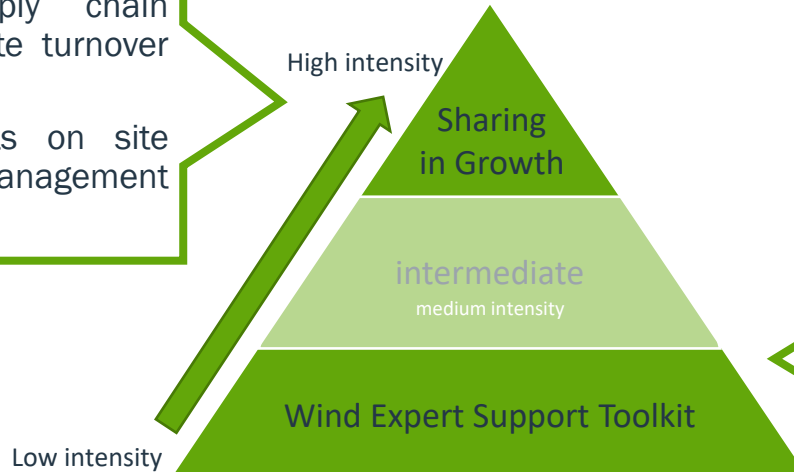


# Business Transformation Programmes

The **Sharing in Growth** Offshore Wind (SiG OW) Programme is a high intensity intervention and aims to support increased productivity and growth of supply chain companies in the UK offshore wind sector.

Offshore Wind Supply chain companies with UK site turnover £5m+.

Delivered with experts on site supporting senior management team.



**Wind Expert Support Toolkit** is a low intensity intervention and aims to support growth of supply chain companies entering or already embedded in the offshore wind sector.

Delivered as two to ten days specialist support from framework of delivery partners.

# Current/Upcoming Opportunities

## Sharing in Growth – Open NOW

- Programme to support supply chain company leadership teams to improve competitiveness. OWGP is seeking companies with ambitions for growth in offshore wind with turnovers (or expected turnovers) of between £5m and £100m.
- *Flyer with more information:* <https://owgp.org.uk/wp-content/uploads/2020/11/SiG-Offshore-Wind-Programme-Flyer-Nov-2020.pdf>
- *Application Form:* <https://owgp.org.uk/about/business-transformation-programmes/>

## \*\*Wind Expert Support Toolkit – Opening in May 2021\*\*

- The next phase of WEST will be launching in May and accepting applications on a rolling basis. This is suitable for companies already active in offshore wind or potential new entrants.

## \*\*Development Grants – Opening in May 2021\*\*

- The next OWGP grant funding competition will be launching in May which will be offering grants of £100K to £1M for transformative supply chain projects.
- Projects must enable a step-change in company growth and maximize export opportunities.



### Sharing in Growth Offshore Wind

Offshore Wind capacity in the UK will grow from 10GW in 2020 to over 40GW by 2030 and will result in over £40bn of supply chain contracts. OWGP has a budget of £100m to support supply chain growth through:

- Grant awards
- Business transformation support

Within Business Transformation OWGP will provide **insight** into growth opportunities through the Wind Expert Support Toolkit (WEST) and **onsite** intervention from Sharing in Growth (SiG) to help companies to win contracts in the UK and increase exports.

**Apply Today!**

### Who is Sharing in Growth?

Established in 2012, Sharing in Growth is an award winning organisation that has secured over £5bn of contracts to companies in Aerospace, Civil Nuclear and associated sectors, accelerating the companies' growth beyond their peers.

The approach is to work closely with the leadership team, combining Sharing in Growth's benchmark analysis with the companies' strategy to define key business challenges. This results in a wholly bespoke set of intervention 'blocks' with their specific targets.

### Typical areas of focus

- 1 Accelerating profitable growth by focussing on customer need, commercial and sales
- 2 Galvanising a leadership team, clear deployment of goals, with the management and culture to deliver a strategic aim
- 3 Reducing the cost of a key product or service
- 4 Reducing cost of procurement
- 5 Optimising operations to release working capital
- 6 Operationalising a new product or service

"The degree of change we have undergone in four years with Sharing in Growth is unprecedented in our 125-year history and has played a big part in transforming our company into a globally competitive organisation securing work for 200 employees."

Steve Kirk  
Managing Director, CW Fletcher

SHARING IN GROWTH

Offshore  
Wind  
Growth  
Partnership

Find out more...



Ravneet Kaur

INNOVATION MANAGER



01670 357 699

ravneet.kaur@ore.catapult.org.uk



Andrew Stormonth-Darling

PROGRAMME MANAGER

07741 165 050

andrew.stormonth-darling@ore.catapult.org.uk



Claire Canning

PROGRAMME MANAGER



+44 (0)141 559 7050

claire.canning@ore.catapult.org.uk



## Contact us

---


Email us: [info@ore.catapult.org.uk](mailto:info@ore.catapult.org.uk)

Visit us: [ore.catapult.org.uk](http://ore.catapult.org.uk)

Engage with us:



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



**Sam Mayall**  
Director  
Offshore Survival Systems



## Offshore Survival Systems





Origins







What we've achieved





OneWeb



VATTENFALL 

**CATAPULT**  
Offshore Renewable Energy

  
OCEAN INFINITY®




  
Orsted

Innovate UK

**ASV** unmanned  
marine systems

  
SAVIOUR  
medical

  
SCOTTISHPOWER  
RENEWABLES

  
Maritime and  
Coastguard Agency

  
CHARTWELL  
MARINE



 Quaybridge

  
Offshore  
Wind  
Growth  
Partnership

ATKINS

indigo  ventures

**SDIC**   
Red Rock Power Limited

  
CARBON  
TRUST



# Offshore Survival Systems

Thank you



[www.offshoresurvivalsystems.com](http://www.offshoresurvivalsystems.com)  
[sam.mayall@offshoresurvivalsystems.com](mailto:sam.mayall@offshoresurvivalsystems.com)





**John Giles**  
Technical Director  
W3G Marine



W3GM FST ROBOT WELDING  
FEASIBILITY STUDY  
OWGP STRAND B

17/04/2021



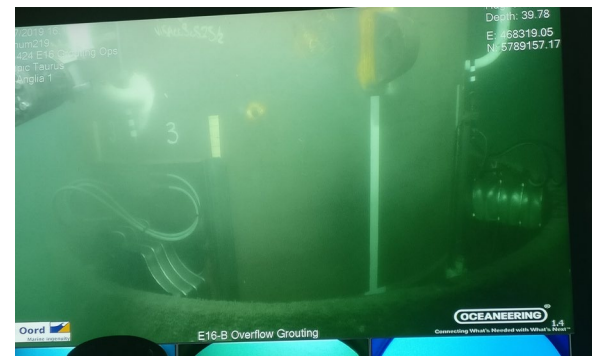


# Offshore trial on EA1 2019

W3G carried out a trial in 2019 on one of the EA1 jacket legs. It proved very useful in working through the procedure required to set a leg gripper

The procedure required an engineer to board the jacket and operate the inflation lines

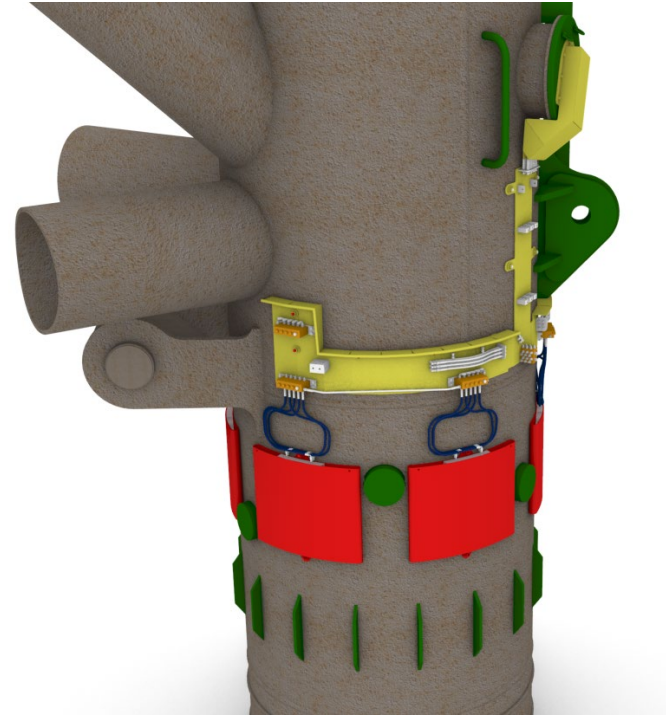
As can be seen by the ROV views on the right, the packers were set and subsequently grouted in





# Achieved ICAS qualification

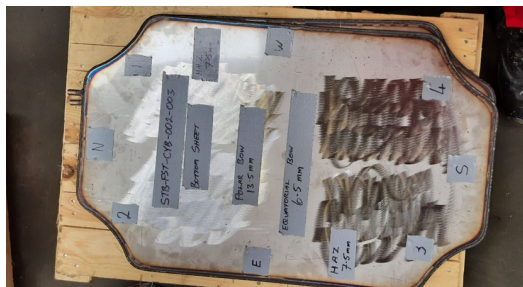
- W3G have won a contract to install the gripper system on St Brieuc wind farm, for a proportion of the turbines.
- The system has undergone rigorous testing and achieved third party certification
- Typical working loads are 230t radial and 50t uplift per gripper, giving us a resistance of more than 200t uplift per leg.
- The gripper system takes a depth of 1m from the top of the pile/ bottom of the stopper, and requires a set of hoses down each leg.



# SEVERAL WELDS OF PACKERS BY ROBOT



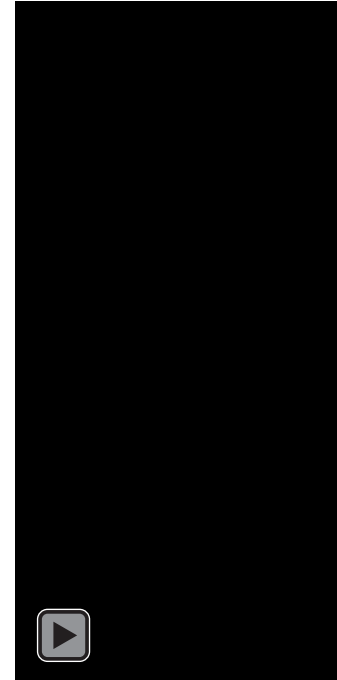
- The robots have been used with both TIG and MAG welding
- Jigs have been made to hold the packer in the orbital work holder
- Several configurations of weld design have been worked up.
- Because of the thin plates, and heavy weld required, the development has been to minimise the burn through of the sides of the weld



# CONCLUSION OF ROBOT WELDS

---

- Welding trials have produced packers with consistent weld quality
- The robot weld cycle time is a quarter of the manual weld time.
- The robots require less physical space, and have the capability of 24 hours a day and 7 days a week production.
- W3G are looking to invest in a robotic production cell, which will enable the packer design to be used in much bigger projects.
- W3G Marine have had some enquiries for the packer system on other wind farms, in Europe and Asia.
- The robot production cell will enable these projects to be developed further.





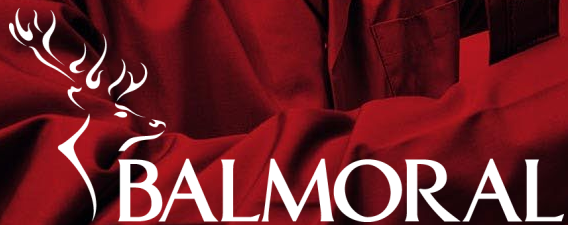
**Ian Milne**  
Sales Manager – Renewables  
Balmoral



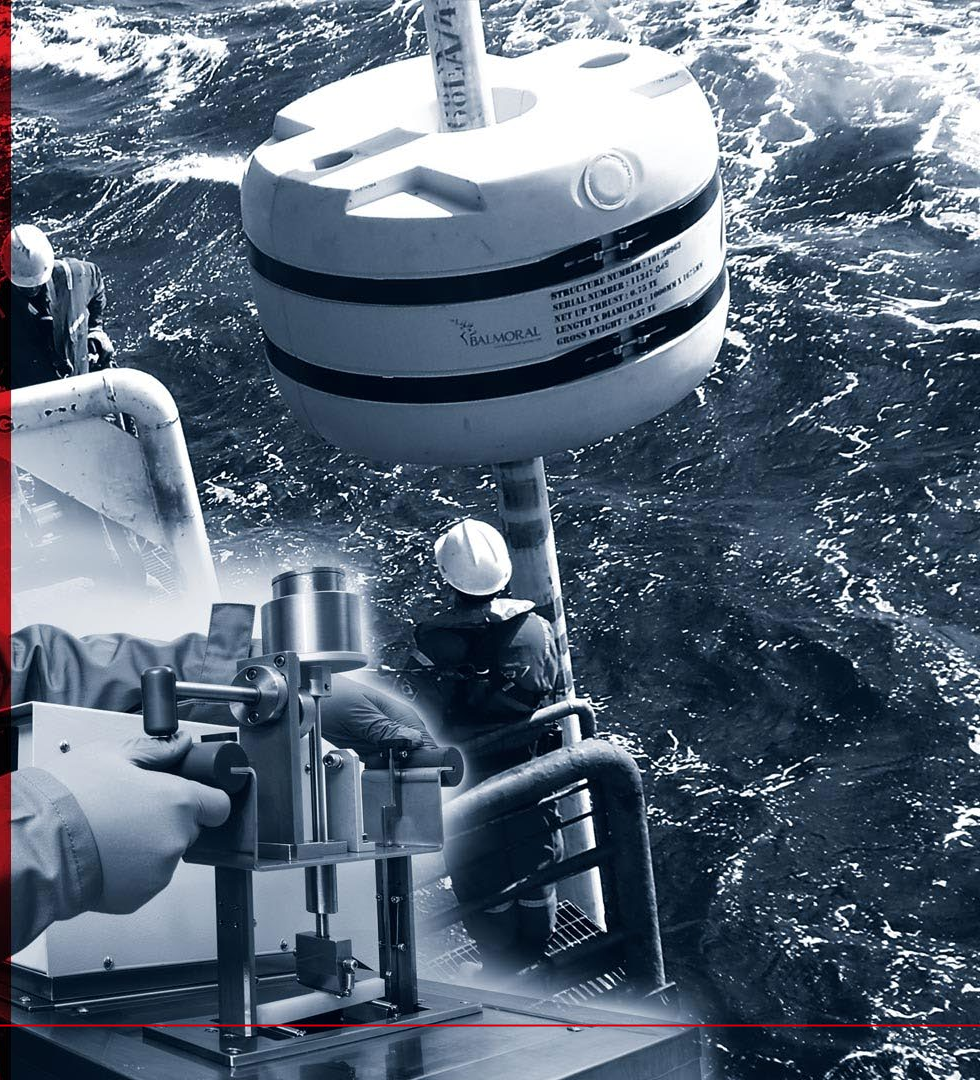
# BALMORAL Innovation keeps us afloat

Scottish Renewables – Offshore  
Wind Conference

Ian Milne, Sales Manager –  
Renewables



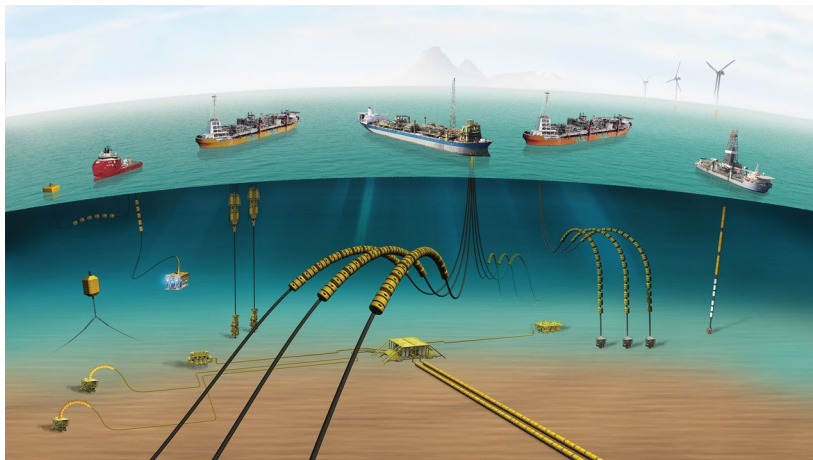
**BALMORAL**



# Our company



- Privately owned company
- Headquarters in Aberdeen with a global supply
- Sales Office in Houston & Newcastle
- Manufacturing facilities in Aberdeen & Newcastle
- App. 300 plus employees in Aberdeen
- Agents positioned in the key market areas globally
- Europe's largest privately owned subsea test center



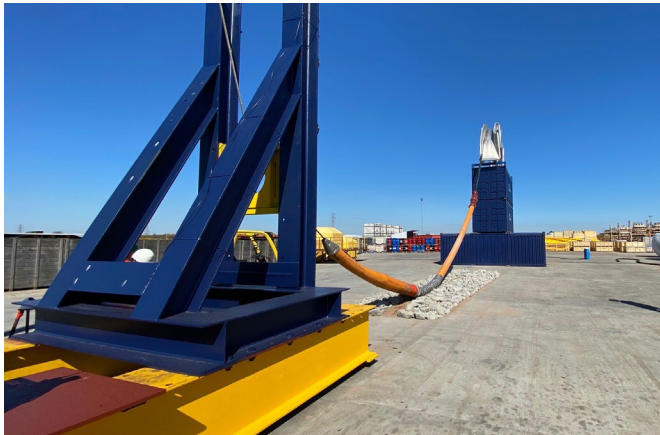
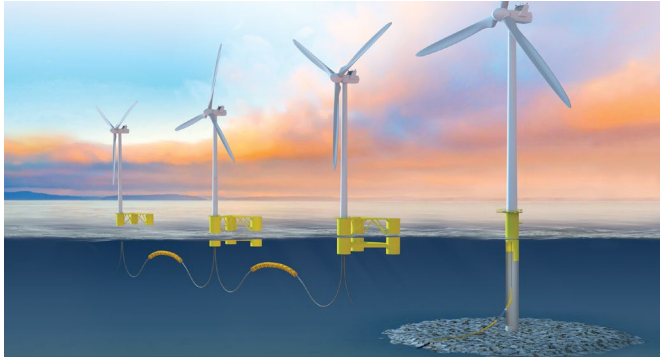
Traditionally known for serving the exploration, installation and production phases of O&G markets

- Distributed Buoyancy
- Marine / Anchor Mooring Buoys
- Drill Riser Buoyancy
- Bend stiffeners
- Bend Restrictors
- Subsea Cable & Flowline Protection (CPS)

F4OR are helping Balmoral transition our offering to the renewable market for fixed and floating wind.



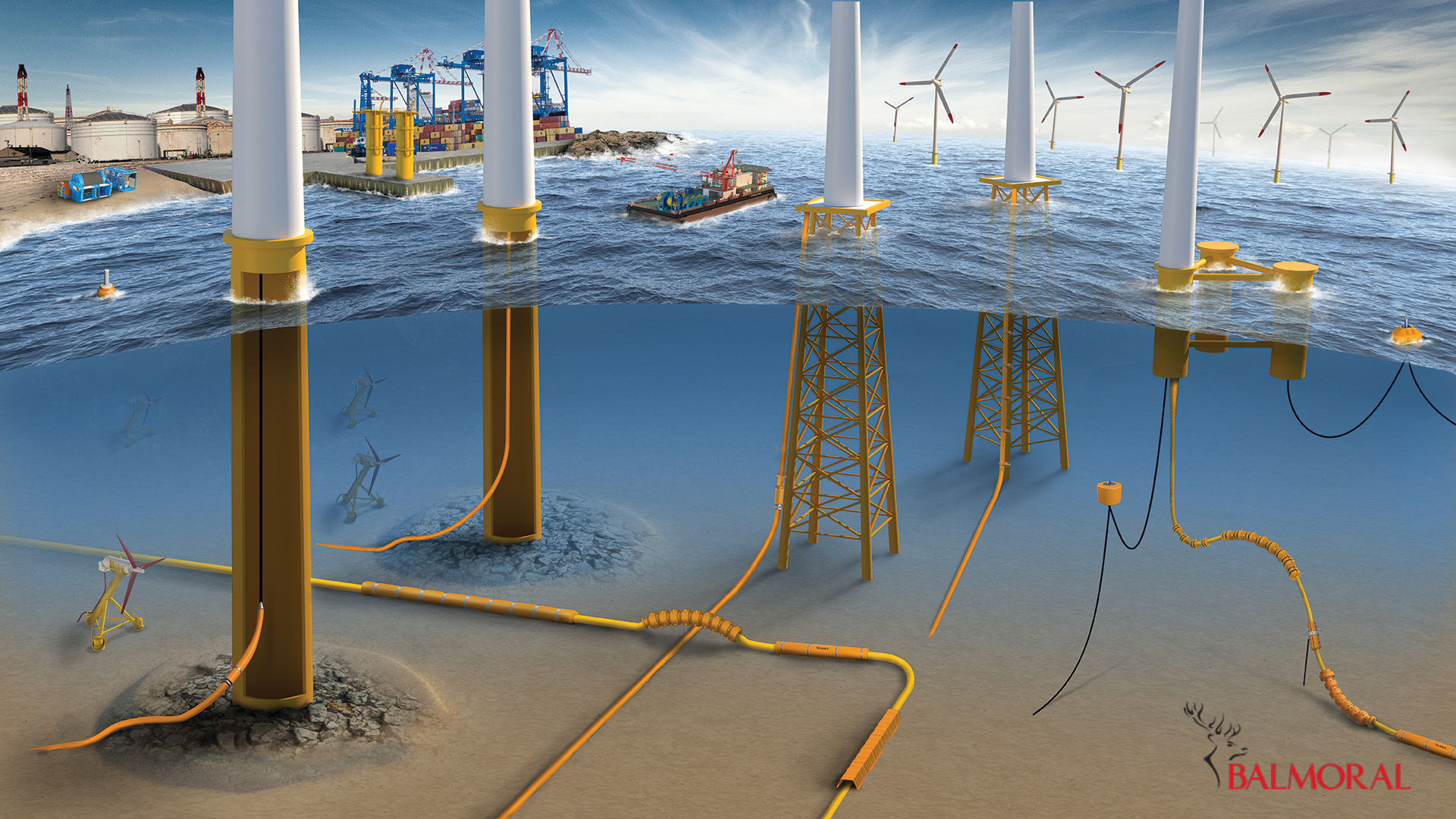
# Our F4OR Journey



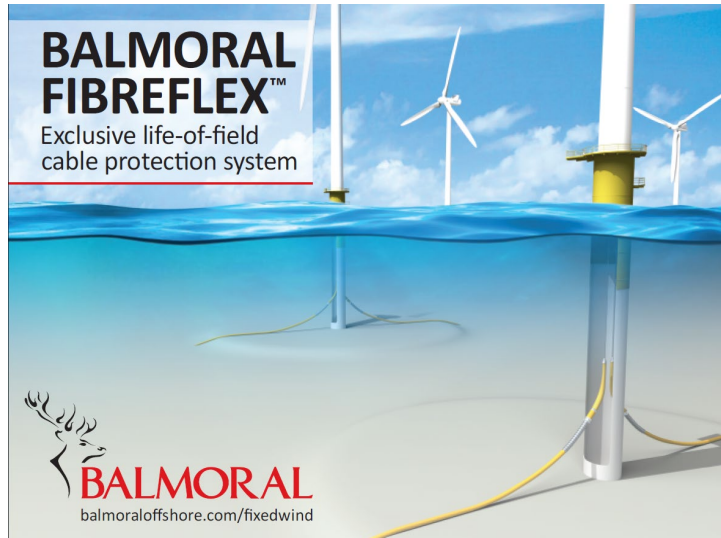
- Exposure to UK developers
- Understanding of the market expectations
- Embracing continuous improvement
- Energy transition from Oil & Gas to Renewables
- Enhances your brand through a recognised body
- Ensures our processes & procedures are to the correct level by benchmarking the “industry norm”
- Drives communication and information throughout all levels of the organisation
- Strategy and risk exposure a key element
- Assist you with recognising the need for cost efficiencies and innovation
  
- Labour intensive programme lasting ~ 12 months which required Senior Management buy in
- Audit format, led by our HSEQ Manager
- Some improvement suggestions did not meet with our business model
- Initial lack of understanding of our existing market and appreciation of existing processes / standards







**THANK YOU** for your attention



Ian Milne

Sales Manager – Renewables

[ian.milne@balmoral.co.uk](mailto:ian.milne@balmoral.co.uk)

+44 (0) 7525 837732





# Q & A



ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



This session  
begins at  
1300

ORGANISED BY



IN ASSOCIATION WITH



# Ministerial Address

## The Rt Hon Kwasi Kwarteng MP Secretary of State for Business, Energy and Industrial Strategy



ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER





This session  
begins at  
1415



# Delivering all of our ambitions: accelerating the pace for economic and climate recovery

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER





**Adam Morrison**  
Project Director – Moray West  
Offshore Wind Farm  
Ocean Winds



# **Danielle Lane**

**Co-Chair of the Offshore Wind Industry  
Council & UK Country Director  
Vattenfall**



**Richard Britton**

**Global Offshore Development Director  
ScottishPower**



April 2021

---

***Drawing on Iberdrola's  
experience in other markets,  
what more can the  
UK/Scotland do to speed up  
offshore deployment***



## Iberdrola – an introduction

Iberdrola's building blocks: **social market economy**  
and a proactive contribution to **UN Sustainable Development Agenda**...



### A **Global leader** in the utilities sector:

**UK** – 100% **renewables** production; Transmission & Distribution networks

**Europe (exc UK)** – **Leading energy company** in Spain and a large, growing presence across the continent

**USA** – Energy distribution in North-East and the country's 3<sup>rd</sup> highest wind producer

**Mexico** – Leading electricity producer

**Brazil** – Energy leader

**APAC** – Targeting new opportunities

... fully integrated in the **company's strategy** and corporate governance system



# Iberdrola Offshore - Global Pipeline



# Iberdrola's Offshore credentials

## Iberdrola's experience across global markets and sharing best practise is critical to its success:



**Consenting** – Ideally a **single consent** in a **defined period**. Certainty of process is essential in a none competitive environment.



**Cumulative Impact** – Ensuring **lessons learned globally** are appropriately integrated into national policy



**Seabed Rights** – **Early exclusivity and certainty** ensures significant and accelerated investment from developers



**Community Benefit** – Substantial and positive contribution to **local economies, causes** and the creation of **additional jobs**



**Wind Turbines** – **Cutting edge technology**. Enforced early limits lead to challenges on financial models and inevitable amendments



**Transmission Assets** – **Clear certainty on regulatory regime** allows both a defined consenting process and construction planning



**Site Characteristics** – **Flexibility in layout** facilitates optimised consenting, construction & operational strategies



**Land Rights** – **Justified compulsory acquisition rights** keep project costs down and remove ransom strips

---

**Defined, time bound and non-competitive  
consenting process**

**Clear grid strategy that meets project life cycle**

**Regular price auction**



**Zoe Barnes**  
Strategy Manager  
Quaybridge



# Quaybridge

**Next Generation Offshore**

**Wind: Socio-economic  
development in Scotland**

Zoe Barnes

April 2021

# Vision – Mission – Values



## VISION

Offshore wind as a driver of positive change in the energy system and wider economy.

## MISSION

A fresh approach and new investment to develop and deliver next generation offshore wind projects.

## VALUES

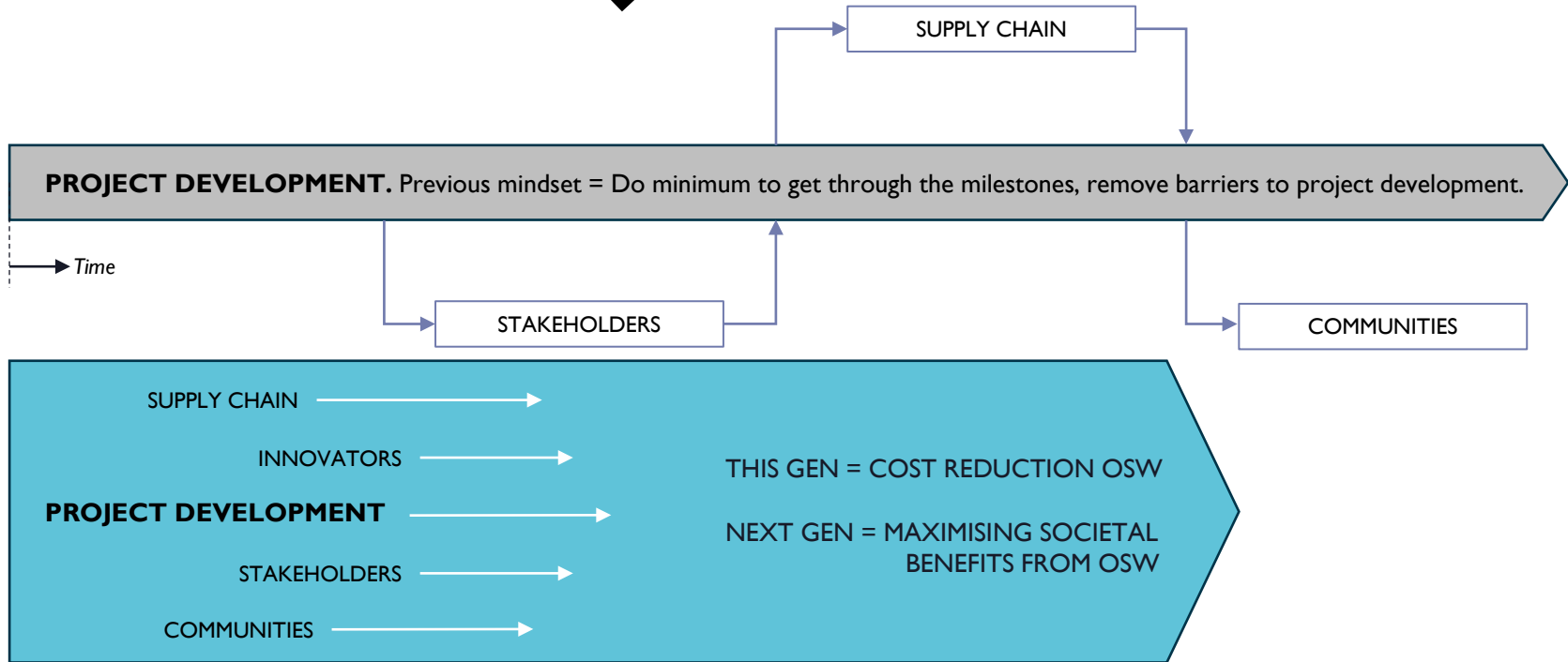
- Entrepreneurial energy
- Technical quality
- Commercial maturity
- Learning from the past
- Ready for the future

**WE DEVELOP NEXT GENERATION OFFSHORE WIND PROJECTS**

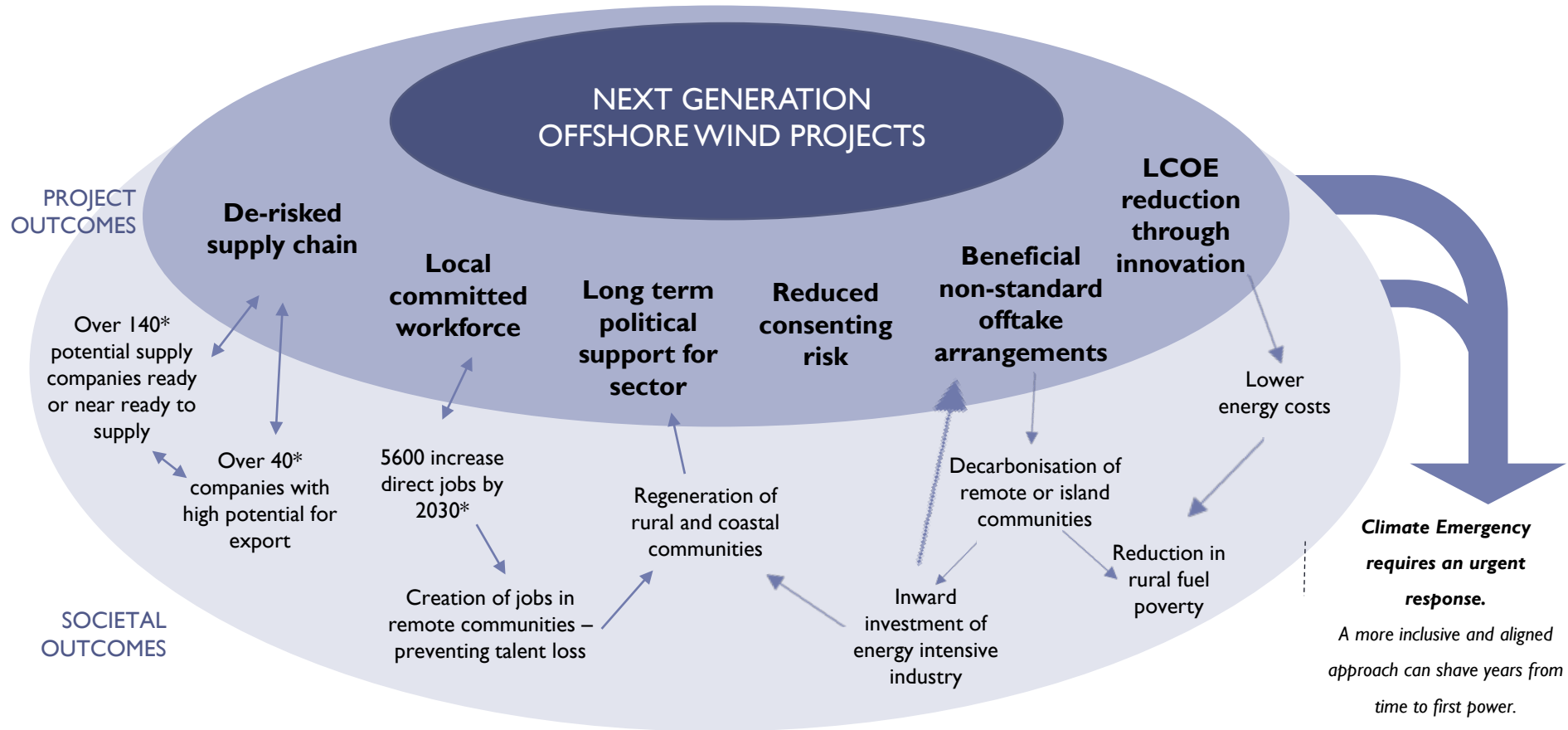


# Time to do things differently

OSW SECTOR DEAL ✓



# The prize— if we get this right



\* Quaybridge Analysis

# Our strategy: Next Generation Offshore Wind

TO DELIVER OUR VISION...



**VISION**

Offshore wind as a driver of positive change in the energy system and wider economy.

...WE FOCUS ON FOUR KEY AREAS...



**SUPPLY CHAIN DEVELOPMENT**



**INNOVATION**



**SKILLS DEVELOPMENT**



**COMMUNITY INITIATIVES**

...DELIVERED VIA A SERIES OF INITIATIVES

Supply chain intervention

Export initiatives

Alternative offtake initiatives

Floating wind cost reduction

Innovation and new tech support

Skills transition initiatives

Early years STEM support

Enabling diversity in the workforce

Community funding programmes

Local community initiatives



LEADS TO STRONG AND EFFECTIVE STAKEHOLDER RELATIONSHIPS



ENABLES EXPLOITATION OF LATEST TECHNOLOGY



A BROADER DEFINITION OF ECONOMIC DEVELOPMENT

# Example 1: Global supplier showcasing



## SUPPLY CHAIN DEVELOPMENT

Thinking beyond specific project requirements – creating sustainable supply chains



## CASE STUDY

Export success is key to long-term supply chain sustainability

- Getting promising Scottish companies in front of our international partners to create export opportunities.
- Under pilot scheme 13 Scottish companies were invited to showcase with 8 securing a place on global supplier databases, providing direct access to new clients and overseas markets.
- Additional 40 Scottish companies identified as ready for showcasing
- Building supply chain experience in overseas markets – de-risks Scotwind projects.



# Example 2: Offshore Survival Systems



## INNOVATION SUPPORT

Economic development and cost reductions through pro-active, early-stage innovation support



## CASE STUDY

- OSS joined pilot Quaybridge mentoring programme in 2019 at concept stage, with one employee, Sam.
- Developing an autonomous search and rescue vessel and service offering.
- Worked closely with OSS to identify barriers to success.
- Supported them to overcome these (technical, market, commercial support and personal development). In 2020 made an equity investment through our parent company.

### *Result*

- Multi-million pound company working with a range of large developers and partners.
- Due to launch first commercial product this summer



# Example 3: STEM Careers Support



## SKILLS DEVELOPMENT

Looking at the challenges to delivering project and maximising socio-economic development, from day 1.



## CASE STUDY

- Skills = Potential barrier to maximising socio-economic impact of ScotWind
- Developed three QB workstream programmes:
  - 1. **Inspiring** the next generation
  - 2. **Supporting transition**
  - 3. **Training** the next generation

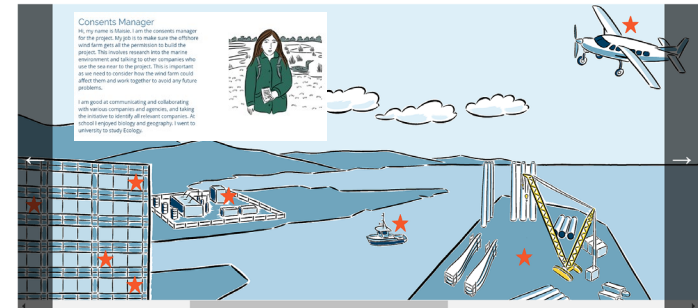
### 'Inspiring'

- Ongoing collaboration with Education Scotland – *maximising impact*
- Identified gap in resources – breadth of careers in OSW
- Developed online open-source resource in collaboration with Education Scotland. Available to all schools in Scotland

Started workstream 2 – Skills transition in collaboration with ESP

## Secondary School Guide

Welcome to this interactive guide for jobs in the offshore wind industry. Click on the stars to learn about the wide variety of opportunities across the life-cycle of an offshore wind farm, from engineers to marine mammal observers and everything in-between.





# Conclusions



Climate emergency demands an urgent response. Time to do offshore wind development differently.

Economic development is not just about the supply chain. The impact created through skills, innovation and communities can be as significant regionally.



Engage deep and early with stakeholders, supply chain and communities to really understand needs.

Co-create opportunities locally to achieve alignment right from the start.



Contribute to wider national policy objectives – it's time offshore wind steps up to play a full role in society.



Thank you for your time  
Contact:  
[zoe.barnes@quaybridge.com](mailto:zoe.barnes@quaybridge.com)



**Chris Willow**

Head of Floating Wind Development  
RWE Renewables



# Taking concrete steps into floating wind

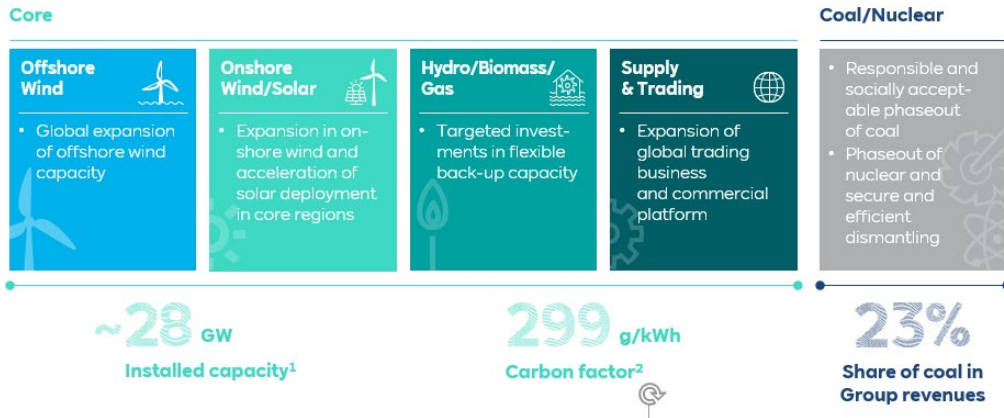
Thursday 22 April

Chris Willow – Head of Floating Wind Development

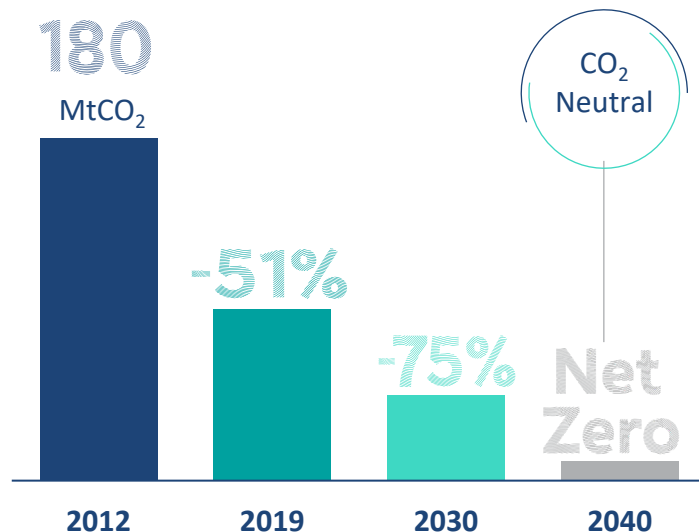
# Following the integration of innogy Renewables and E.ON Climate & Renewables, RWE now stands as one of the largest renewable players in the world

20,000 employees, active in 20 countries

A clear focus on growth and a driving force behind the energy transition..



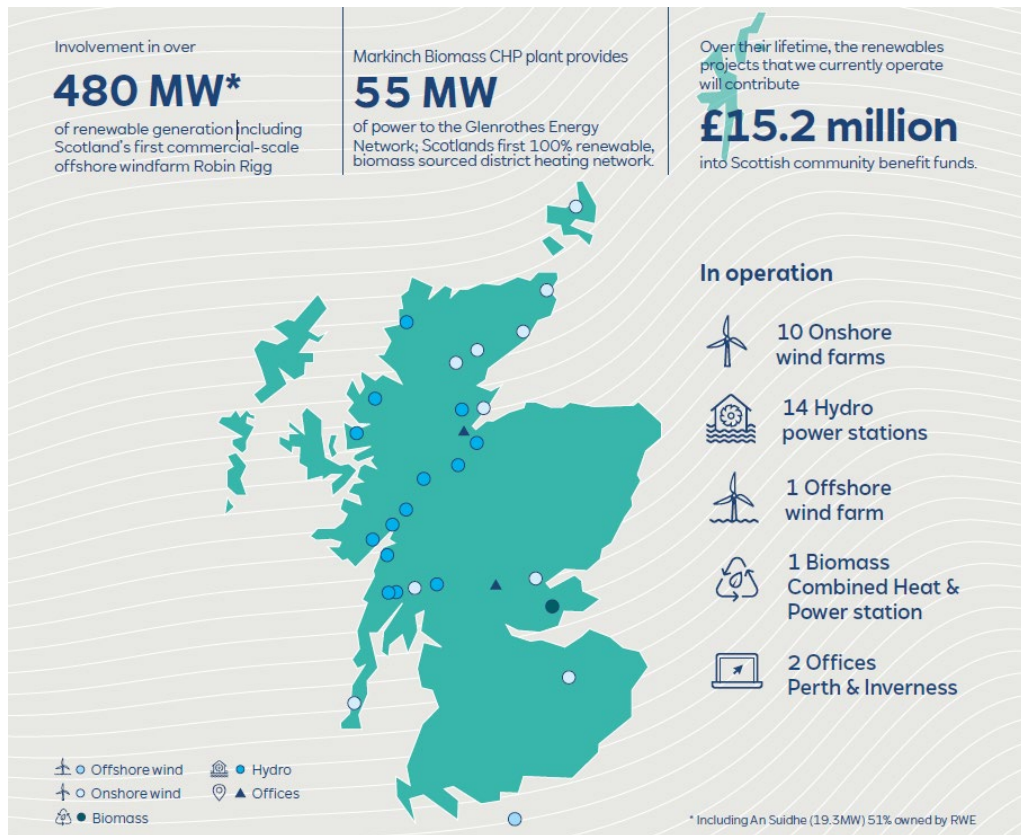
A clear goal to be CO2 neutral by 2040



RWE engaged in leading sustainability initiatives:



# RWE in Scotland



In Scotland, we are involved in **480 MW of installed renewable capacity across 27 sites<sup>1</sup>**, with offices in **Perth and Inverness**.

Includes Scotland's first commercial-scale offshore wind farm, Robin Rigg in the Solway Firth (174 MW)<sup>2</sup> and 55 MW biomass combined heat and power (CHP) plant at Markinch, home to the Glenrothes district heating network.

**Scotland is a key market for RWE.**

We are developing a number of onshore wind projects.

Via ScotWind, we aim to capitalise on our vast experience in fixed offshore and involvement in a number of floating wind demonstration projects around the world.

# Concrete foundations as a opportunity for the Scottish supply chain





# Concrete foundations as a opportunity for the Scottish supply chain

## Benefits

- No existing supply chain elsewhere
- Suitable infrastructure
- labour intensive
- Exportable know-how

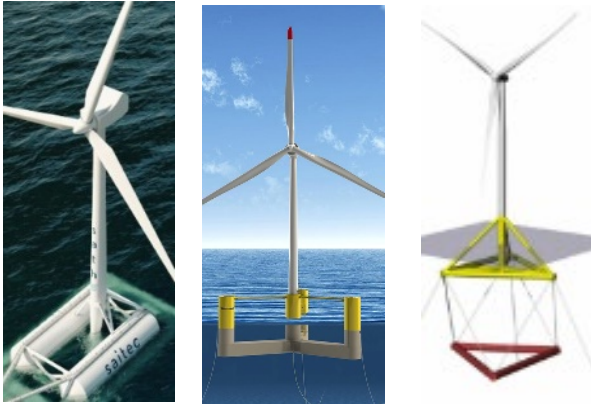
## Uncertainties

- Potential for competitiveness?
- Important knowledge gaps?
- Scottish supply chain capability?

# Concrete foundations as a opportunity for the Scottish supply chain



## Demo portfolio



## Scope

- Review of the designs, techniques and materials
- Analysis Scottish supply chain
- Recommendations for next steps

# RWE

**Thank you for your attention**

A decorative graphic in the bottom right corner consisting of numerous thin, white, curved lines that form a grid-like pattern, curving towards the right and bottom edges of the slide.



**Sarah Pirie**  
Head of Commercial  
Red Rock Power Limited



**Red Rock Power Limited**

**Supporting offshore  
deployment in Scotland:  
future regulatory changes**

22 April 2021



# 730

MWs have been successfully deployed in Scotland since the 2009 out of c.5GW of consented capacity.

# 10.5

GWs of offshore wind have been deployed in the UK by 2020. Expected to increase to 27.5 GW by 2026.

Approximately 2.5 GW will come from Scottish projects all currently in construction.

# 9.2

GWs offshore wind have been allocated CfDs in the UK compared to c2.4 GW in Scotland.



*“It has never been hard to tell the difference between a Scotsman with a grievance and a ray of sunshine.”*

PG Wodehouse





# Future offshore wind deployment in Scotland





# Current Projects

*Fools look to tomorrow, wise men use tonight*

Current construction activities on Scottish sites expected to be completed in 2023.

Up to four Scottish projects expected to be eligible for AR4 based on current timescales.

The TNUOS charging system penalises the competitiveness of Scottish projects competing for CfDs. In the short term this can be addressed through having sufficiently high cap for the auction and adopting a soft cap approach.



# ScotWind Projects

*Failing means yer playing...*

Delays to ScotWind compared to Round 4 projects potentially place new Scottish projects at a disadvantage in terms of delivery timescales combined with higher risks.

How do we ensure Scottish projects can successfully compete?

- Consenting processes, resources and planning
- Reinforce the needs case for offshore wind
- Long-term TNUOS reform





# Beyond ScotWind...

*What's fur ye will no go by ye*

Setting out the long-term ambition for offshore wind in Scotland

- Future seabed releases
  - Scottish Marine Plan
  - Crown Estate Scotland processes
- Grid planning and constraints
- Building a globally competitive supply chain



# Focus for success

Lang may your lum reek...

- Create an ongoing and long-term route map for offshore deployment in Scotland starting with AR4 to secure long-term investment and supply chain
- Enable long-term grid planning to remove barriers to deployment
- Use the advantages of devolved matters to accelerate deployment and reduce risk e.g. planning policy, consenting control, Crown Estate Scotland
- Concerted action on grid charging to ensure a level playing field for offshore projects with geographic diversification of supply and improved competition for consumers





# Q & A



# WITH THANKS TO OUR SPONSORS & SUPPORTERS

IN ASSOCIATION WITH



EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER



EVENT SUPPORTER





# EVENTS CALENDAR 2021

## OFFSHORE WIND CONFERENCE

21 & 22 APRIL  
ONLINE

## YOUNG PROFESSIONALS GREEN ENERGY AWARDS

27 MAY  
ONLINE

## ONSHORE WIND CONFERENCE

1 JUNE  
ONLINE

## BEYOND FEASIBILITY: CAPTURING THE ENERGY TRANSITION'S HYDROGEN OPPORTUNITY

17 JUNE  
ONLINE

## MARINE CONFERENCE

23 JUNE  
ONLINE

## HYDRO CONFERENCE

26 AUGUST  
ONLINE

## FLOATING OFFSHORE WIND CONFERENCE

15 & 16 SEPTEMBER  
ABERDEEN

## LOW-CARBON HEAT CONFERENCE

23 SEPTEMBER  
ONLINE

## THE SCOTTISH GREEN ENERGY AWARDS

2 DECEMBER  
EDINBURGH

**BOOK NOW**

[scottishrenewables.com/events](https://scottishrenewables.com/events)

  @ScotRenew

ORGANISED BY



IN ASSOCIATION WITH



# OFFSHORE WIND CONFERENCE

EXHIBITION SPONSOR



PROGRAMME SPONSOR



SIDE EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



EVENT SPONSOR



OFFICIAL MEDIA PARTNER

