

Cornwall
FLOW
Accelerator

Floating Offshore Wind Materials & Manufacturability
Webinar
Monday 28th March 2022
Session 1

Facilitator: Simon Cheeseman, ORE Catapult



Cornwall FLOW Accelerator

Housekeeping

Welcome

Sessions will be recorded.

Slides will be made available after the event.

There will be a short Q&A session (time allowing) after each update, otherwise there is a longer Q&A session at the end of each session.

We will use the Zoom polling feature to ask survey questions.

Vicki Sharpe will be working behind the scenes managing Zoom.

Julie Taylor will be keeping an eye on delegate questions raised in the Chat.



CELTICSEAPOWER



Cornwall **FLOW** Accelerator



CELTIC SEA
CLUSTER



HM Government



European Union
European Regional
Development Fund



UNIVERSITY OF
PLYMOUTH



Cornwall FLOW Accelerator

A game of two halves

Format:

Session 1: Blades & Towers (10:00 to 12:00)

Session 2: Foundations and Anchoring & Mooring (14:00 to 16:00)

This webinar is the first of a series of industry engagement events, designed to:

- Highlight the size and scope of Floating Offshore Wind in the Celtic Sea area
- Use a 'blades to anchors' approach to consider innovation challenges
- Bring industry up to a shared level of understanding regarding current state of the art in design and manufacturing of offshore wind turbines
- Understand the opportunities for decarbonisation in Floating Offshore Wind
- Inspire the supply chain to become involved in Floating Offshore Wind
- Identify areas for deeper dive workshops (in person/virtual)



Cornwall **FLOW** Accelerator



CELTIC SEA
CLUSTER



HM Government



European Union
European Regional
Development Fund



UNIVERSITY OF
PLYMOUTH



UNIVERSITY OF
EXETER



CATAPULT
Offshore Renewable Energy



European Union
Cronfa Datblygu
Rhanbarthol Ewrop
European Regional
Development Fund

Cornwall FLOW Accelerator

Cornwall FLOW Accelerator explained

CFA project: £6,49m part ERDF funded project, Jan 2021 to Jun 2023

Purpose: Accelerate deployment of FLOW in Celtic Sea, by undertaking the groundwork to develop the project pipeline and help prepare the supply chain

Led by Celtic Sea Power (formally Wave Hub Development Services) and supported by University of Exeter, University of Plymouth, and the Offshore Renewable Energy Catapult. In collaboration they will:

- Deploy a floating LIDAR to collect wind resource data at predetermined areas in the Celtic Sea;
- Design, develop and build a numerical simulator model linked to University motor vessel simulators to study the logistics of offshore operations and impact on Levelised Cost of Energy;
- Provide research led expertise to develop low carbon manufacture of floating offshore wind technology; and
- Undertake business engagement, to stimulate supply chain interest and innovation, provide dissemination to regional stakeholders and build sustainable partnerships



CFA – Where does it fit in



Cornwall
FLOW
Accelerator

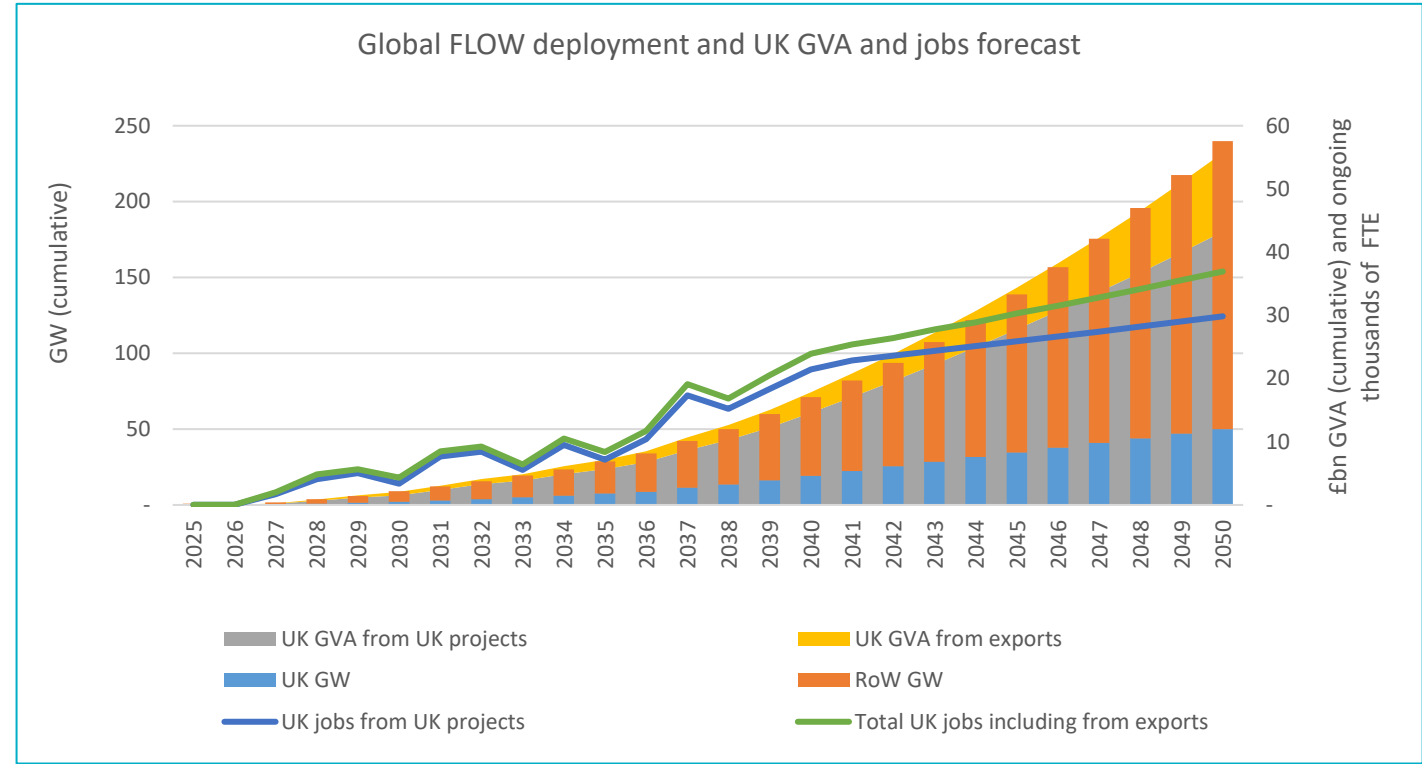
The Celtic Sea Cluster will bring leadership and coordination to the key issues facing the development of floating wind in the Celtic sea. Within the Cluster CFA is providing the engine room to help:

- Establish the market;
- Accelerate the supply chain; and
- Create sustainable jobs.



Cornwall FLOW Accelerator

FLOW Context



	2030	2040	2050
UK GW	2 GW	19 GW	50 GW
Global GW	9 GW	71 GW	240 GW
UK cumulative GVA (domestic)	£1.5 bn	£14.5 bn	£43.2 bn
UK cumulative GVA (exports)	£0.5 bn	£3.3 bn	£12.5 bn
UK jobs (domestic)	3,400	21,400	29,900
UK jobs (exports)	1,000	2,500	7,100

Cornwall FLOW Accelerator

Survey question

Q1. Were you aware of the Cornwall FLOW Accelerator project before this webinar?

1. Yes
2. No



Cornwall **FLOW** Accelerator



HM Government



European Union

European Regional
Development Fund



Morning Agenda

Cornwall FLOW Accelerator

Simon Cheeseman (ORE Catapult – Southwest Regional Manager)	Outline of days proceedings Size & scope of FLOW in Celtic Sea Benefits of CFA & Celtic Sea Cluster	10:00 to 10:20 20 mins
Mark Forrest (ORE Catapult – Blades Research Leader)	Blades – state of the art & the art of the possible Key audience questions – SC	10:20 to 10:45 25 mins
Dylan Duncan (ORE Catapult – Mechanical Research Engineer)	Towers – state of the art & what could change Key audience questions - SC	10:45 to 11:10 25 mins
Industry speaker – Guy Raymond (RWE - Floating Wind Knowledge Manager)	What does 1 GW look like, RWE supply chain approach, port development, supply chain issues Key audience questions - SC	11:10 to 11:35 25 mins
All Speakers	Q&A Panel facilitated by SC	11:35 to 12:00 25 mins

Cornwall FLOW Accelerator

Afternoon Agenda

Simon Cheeseman (ORE Catapult – Southwest Regional Manager)	Recap of objectives of the day, size of market. Summary of the morning session as it plays into afternoon	14:00 to 14:20 20 mins
Dylan Duncan (ORE Catapult – Mechanical Research Engineer)	Foundations. Current development. Key issues & future materials. Material choices pros and cons. Key audience questions - SC	14:20 to 14:45 25 mins
Ellen Jump (ORE Catapult – Project Engineer)	Anchoring & Mooring. Size and scope. Where to from here? Key audience questions - SC	14:45 to 15:10 25 mins
Industry speaker – Ole Stobbe (BW Ideol – Business Development Manager Northern Europe)	Local Employment & Content in Floating Wind with Serialised Concrete Hull Fabrication Key audience questions - SC	15:10 to 15:35 25 mins
All Speakers	Q&A Panel facilitated by SC	15:35 to 16:00 25 mins

Blades

Mark Forrest

(ORE Catapult – Blades Research Leader)



Cornwall FLOW Accelerator

Survey question

Blades

Q2. Are you interested in a collaborative R&D project on:

1. blade segmentation?
2. additively manufactured cores?
3. thermoplastic?
4. alternative renewable materials?



Cornwall **FLOW** Accelerator



HM Government



European Union
European Regional
Development Fund



Towers

Dylan Duncan

(ORE Catapult – Mechanical Research Engineer)



Survey question

Towers

Q2. Are you interested in a collaborative R&D project on solutions other than for a typical steel conical tower?

1. Yes
2. No

Industry Speaker

Guy Raymond

(RWE - Floating Wind Knowledge Manager)



Questions and Answers

Any questions related to Session 1



HM Government



European Union
European Regional
Development Fund



What's Next – Follow on events

Cornwall FLOW Accelerator

Title	Details	Covering
Data for FLOW	Date: April 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for data in Celtic Sea FLOW 3. Explore potential supply of data to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand
Concrete for FLOW	Date: May 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for concrete in Celtic Sea FLOW 3. Explore potential supply of concrete to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand
Composites for FLOW	Date: June 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for composites in Celtic Sea FLOW 3. Explore potential supply of composites to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand
PRIMARE: Industry Day	Date: 8 th July 2022 Venue: Penryn Campus, Uni of Exeter Format: Showcase. In person only, exhibition Organiser: CFA/UoEx	1. Presentations of FLOW industry needs and innovation 2. identify gaps in regional FLOW capability and explore areas for research/industry collaboration
Anchoring and Mooring for FLOW	Date: Sept 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for anchoring and mooring in Celtic Sea FLOW 3. Explore potential supply of anchoring and mooring to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand

Cornwall FLOW Accelerator

Special thanks to all our morning speakers

Thanks to those who helped make it happen:

Julie Taylor – Event manager

Vicki Sharpe – Zoom manager

Phil Johnston – Organiser

Neil Farrington - Organiser



HM Government



European Union
European Regional
Development Fund



Cornwall FLOW Accelerator

Thank you for participating in Session 1

Session 2 will commence at 14:00
You can use the same Zoom link



HM Government



European Union
European Regional
Development Fund



Lunch – please be back here at 14:00



Cornwall
FLOW
Accelerator

Floating Offshore Wind Materials & Manufacturability
Webinar
Monday 28th March 2022
Session 2

Facilitator: Simon Cheeseman, ORE Catapult



Housekeeping

Welcome

Sessions will be recorded.

Slides will be made available after the event.

There will be a short Q&A session (time allowing) after each update, otherwise there is a longer Q&A session at the end of each session.

We will use the Zoom polling feature to ask survey questions.

Vicki Sharpe will be working behind the scenes managing Zoom.

Julie Taylor will be keeping an eye on delegate questions raised in the Chat.

Cornwall
FLOW
Accelerator



CELTICSEAPOWER



Cornwall **FLOW** Accelerator



CELTIC SEA
CLUSTER



HM Government



European Union
European Regional
Development Fund



UNIVERSITY OF
PLYMOUTH



A game of two halves

Format:

~~Session 1: Blades & Towers (10:00 to 12:00)~~ ✓



Session 2: Foundations and Anchoring & Mooring (14:00 to 16:00)

This webinar is the first of a series of industry engagement events, designed to:

- Highlight the size and scope of Floating Offshore Wind in the Celtic Sea area
- Use a 'blades to anchors' approach to consider innovation challenges
- Bring industry up to a shared level of understanding regarding current state of the art in design and manufacturing of offshore wind turbines
- Understand the opportunities for decarbonisation in Floating Offshore Wind
- Inspire the supply chain to become involved in Floating Offshore Wind
- Identify areas for deeper dive workshops (in person/virtual)



CELTICSEAPOWER



Cornwall FLOW Accelerator



HM Government



European Union
European Regional
Development Fund



Cornwall FLOW Accelerator

Cornwall FLOW Accelerator explained

CFA project: £6,49m part ERDF funded project, Jan 2021 to Jun 2023

Purpose: Accelerate deployment of FLOW in Celtic Sea, by undertaking the groundwork to develop the project pipeline and help prepare the supply chain

Led by Celtic Sea Power (formally Wave Hub Development Services) and supported by University of Exeter, University of Plymouth, and the Offshore Renewable Energy Catapult. In collaboration they will:

- Deploy a floating LIDAR to collect wind resource data at predetermined areas in the Celtic Sea;
- Design, develop and build a numerical simulator model linked to University motor vessel simulators to study the logistics of offshore operations and impact on Levelised Cost of Energy;
- Provide research led expertise to develop low carbon manufacture of floating offshore wind technology; and
- Undertake business engagement, to stimulate supply chain interest and innovation, provide dissemination to regional stakeholders and build sustainable partnerships



CFA – Where does it fit in



Cornwall
FLOW
Accelerator

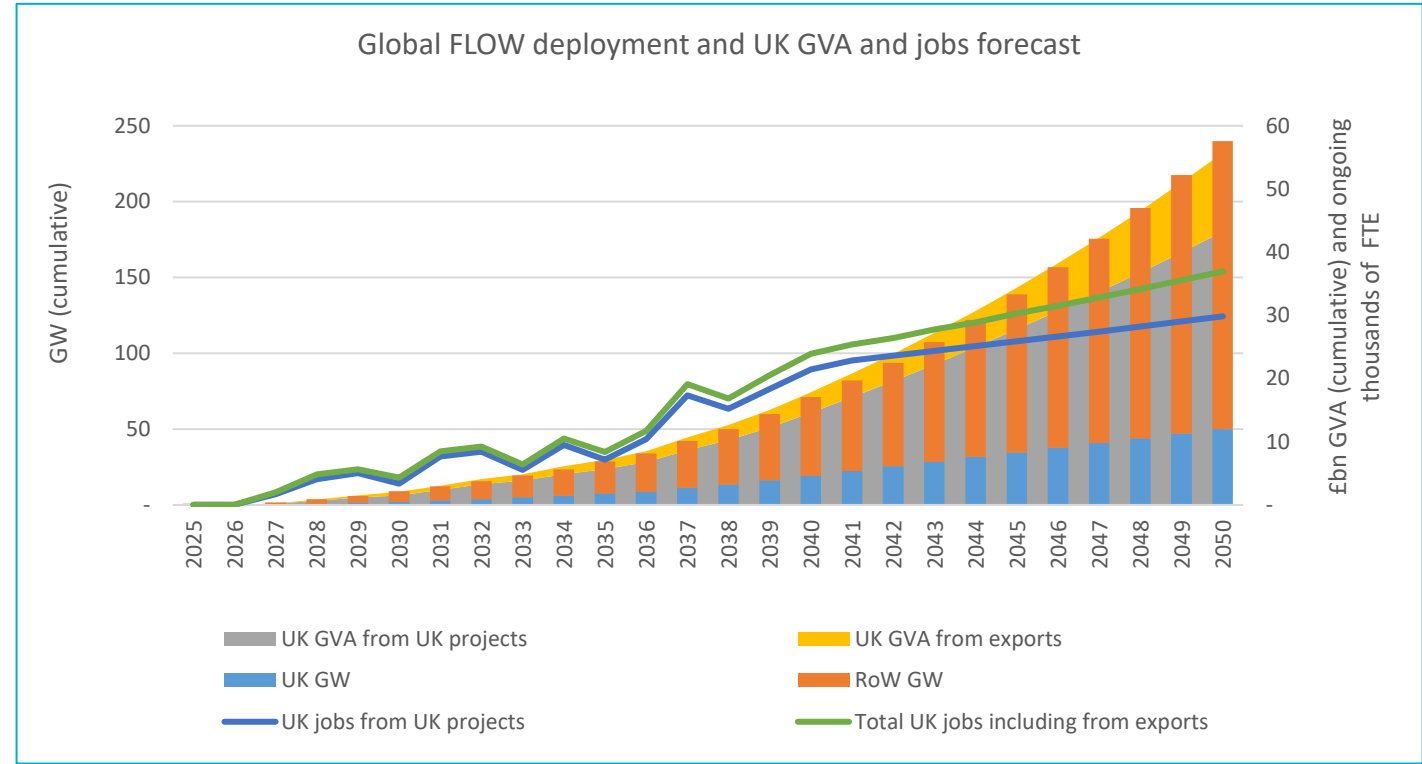
The Celtic Sea Cluster will bring leadership and coordination to the key issues facing the development of floating wind in the Celtic sea. Within the Cluster CFA is providing the engine room to help:

- Establish the market;
- Accelerate the supply chain; and
- Create sustainable jobs.



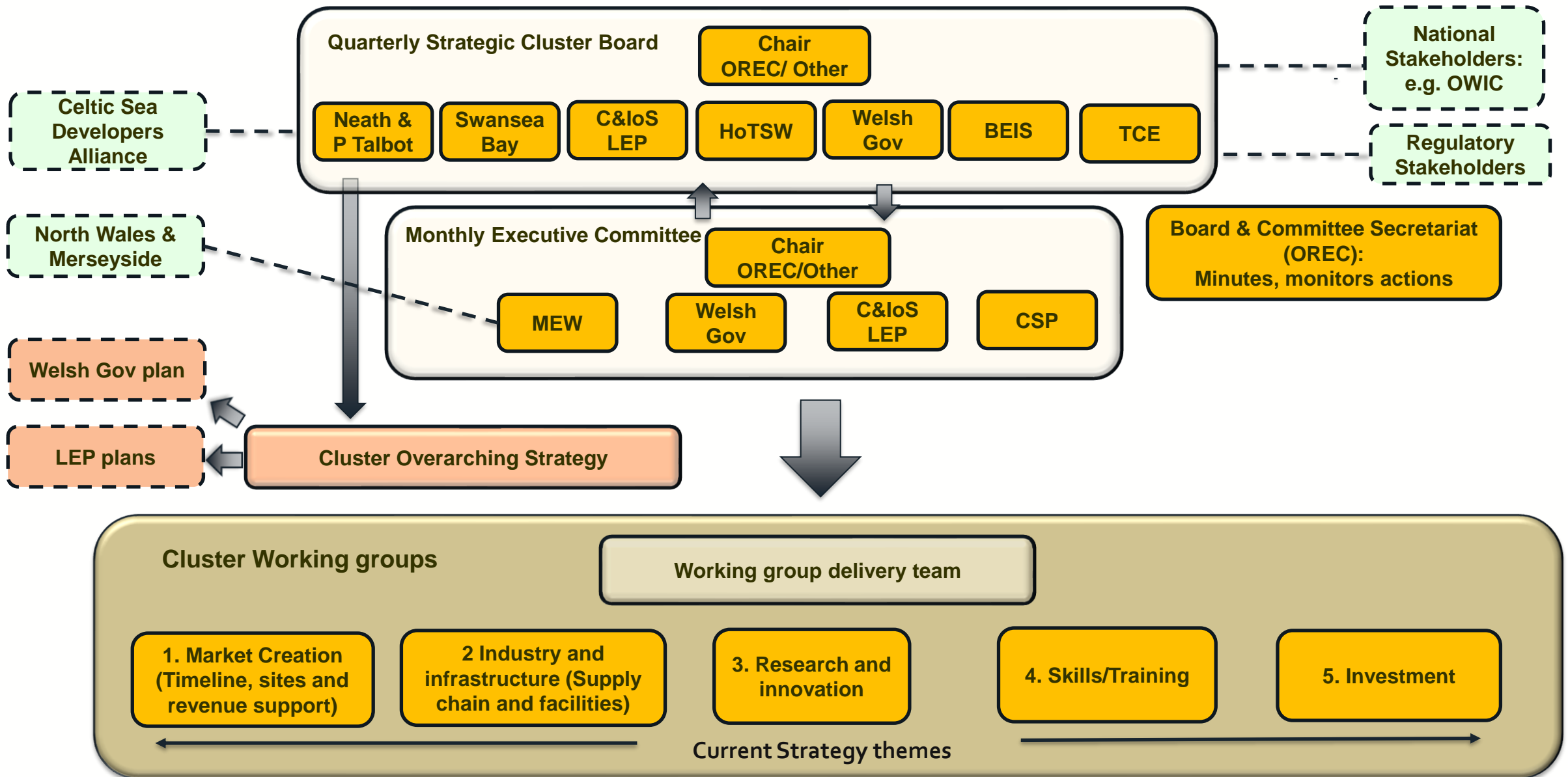
Cornwall FLOW Accelerator

FLOW Context

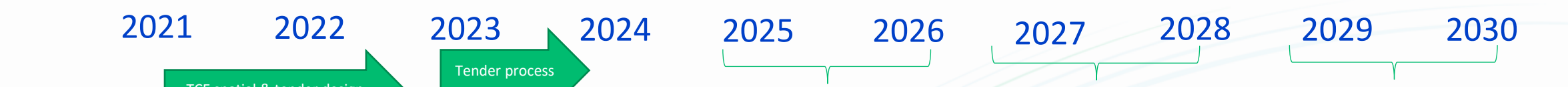
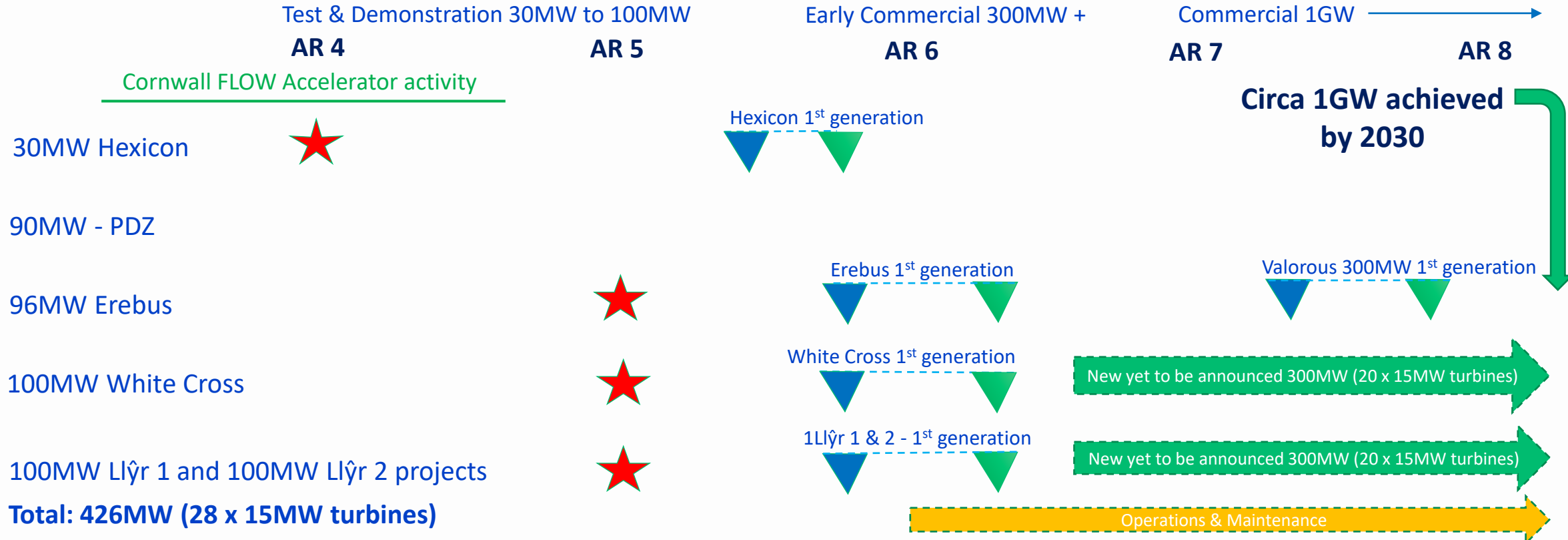


	2030	2040	2050
UK GW	2 GW	19 GW	50 GW
Global GW	9 GW	71 GW	240 GW
UK cumulative GVA (domestic)	£1.5 bn	£14.5 bn	£43.2 bn
UK cumulative GVA (exports)	£0.5 bn	£3.3 bn	£12.5 bn
UK jobs (domestic)	3,400	21,400	29,900
UK jobs (exports)	1,000	2,500	7,100

Celtic Cluster Governance Model v2



Celtic Sea Timeline to 2030

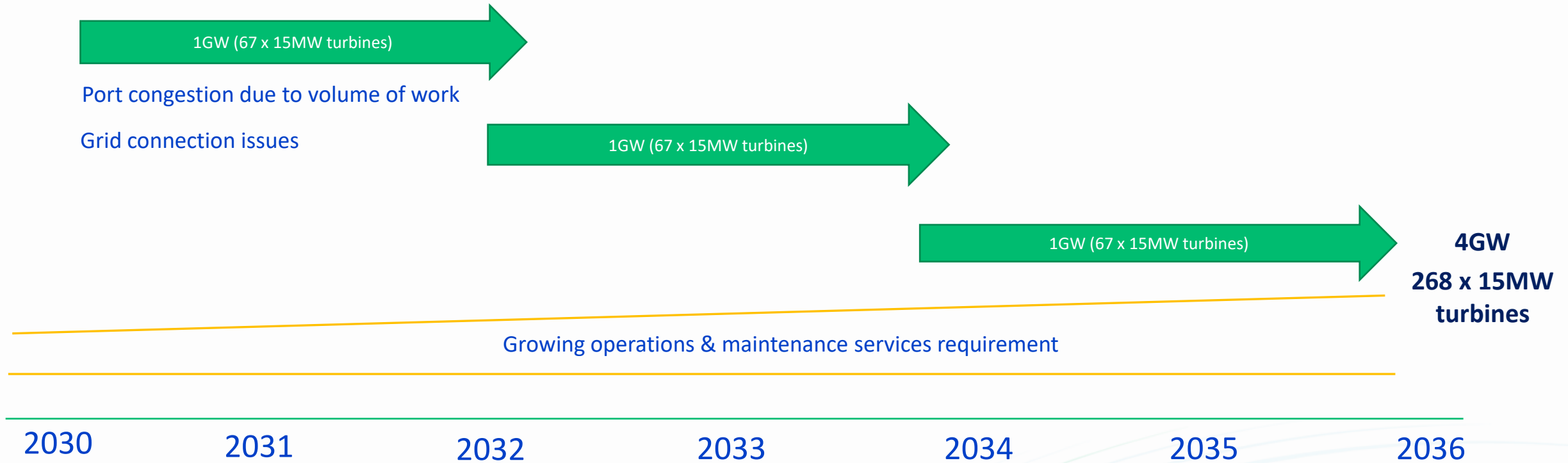


- Notes:**
- ★ AR bid
 - ▼ Site development BAU
 - ▼ CSC accelerated deployment

BEIS Celtic Sea directed supply chain funding


Celtic Sea Timeline to 2030 to 2036

1GW achieved by 2030. Beyond 2030 roll out of Commercial arrays

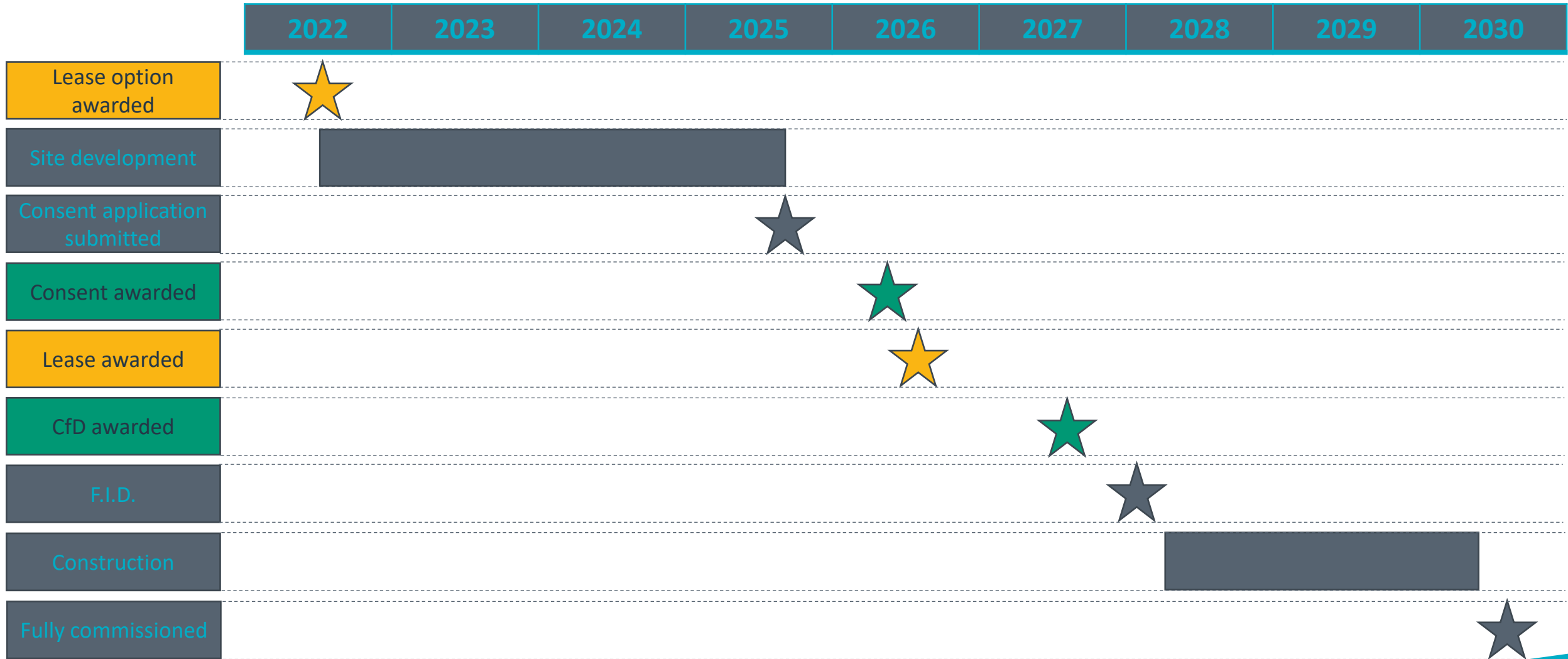


Notes:

 Capacity deployment

 Approaching end of 10 year warranty period for early turbines installed from 2026

ScotWind from lease option award to commissioning – earliest projects illustrative timeline



Key	Crown Estate Scotland
	Project Developer
	Government

Cornwall FLOW Accelerator

Afternoon Agenda

Simon Cheeseman (ORE Catapult – Southwest Regional Manager)	Recap of objectives of the day, size of market. Summary of the morning session as it plays into afternoon	14:00 to 14:20 20 mins
Dylan Duncan (ORE Catapult – Mechanical Research Engineer)	Foundations. Current development. Key issues & future materials. Material choices pros and cons. Key audience questions - SC	14:20 to 14:45 25 mins
Ellen Jump (ORE Catapult – Project Engineer)	Anchoring & Mooring. Size and scope. Where to from here? Key audience questions - SC	14:45 to 15:10 25 mins
Industry speaker – Ole Stobbe (BW Ideol – Business Development Manager Northern Europe)	Local Employment & Content in Floating Wind with Serialised Concrete Hull Fabrication Key audience questions - SC	15:10 to 15:35 25 mins
All Speakers	Q&A Panel facilitated by SC	15:35 to 16:00 25 mins

Foundations

Dylan Duncan

(ORE Catapult – Mechanical Research Engineer)



Survey question

Foundations

Q3. Are you interested in a collaborative R&D project on more experimental solutions for foundations other than steel or concrete, such as composites?

1. Yes

2. No

Anchoring & Mooring

Ellen Jump

(ORE Catapult – Project Engineer)



Survey question

Mooring & Anchoring

Q4. If you are or will be manufacturing components for anchoring and mooring are you working on reducing the carbon intensity of your components?

1. yes, understand current impact, working on reducing
2. Yes, understand current impact, now need to identify ways to reduce
3. Yes, trying to quantify current impact
4. No, but considering
5. No, haven't considered

Cornwall FLOW Accelerator

Survey question

Mooring & Anchoring

Q5. Do you have technology or process solutions you feel could make an impact in this area (mooring/anchoring carbon intensity) which you would like to discuss in more detail?

1. Yes
2. No



Cornwall **FLOW** Accelerator



HM Government



European Union
European Regional
Development Fund



Local Employment & Content in Floating Wind with Serialised Concrete Hull Fabrication

Ole Stobbe

(BW Ideol – Business Development Manager Northern Europe)



Questions and Answers

Any questions related to Session 2



HM Government



European Union
European Regional
Development Fund



Cornwall FLOW Accelerator

What's Next

Title	Details	Covering
Data for FLOW	Date: April 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for data in Celtic Sea FLOW 3. Explore potential supply of data to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand
Concrete for FLOW	Date: May 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for concrete in Celtic Sea FLOW 3. Explore potential supply of concrete to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand
Composites for FLOW	Date: June 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for composites in Celtic Sea FLOW 3. Explore potential supply of composites to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand
PRIMARE: Industry Day	Date: 8 th July 2022 Venue: Penryn Campus, Uni of Exeter Format: Showcase. In person only, exhibition Organiser: CFA/UoEx	1. Presentations of FLOW industry needs and innovation 2. identify gaps in regional FLOW capability and explore areas for research/industry collaboration
Anchoring and Mooring for FLOW	Date: Sept 2022 TBC Venue: Cornwall / Virtual Format: Workshop. In person, invited speakers online. Organiser: CFA	1. Celtic Sea FLOW: Opportunities and Challenges 2. Set out likely demand for anchoring and mooring in Celtic Sea FLOW 3. Explore potential supply of anchoring and mooring to Celtic Sea FLOW from industry. 4. Case studies 5. Open forum on: How to enhance / scale up regional capabilities to meet Celtic Sea FLOW demand



Cornwall FLOW Accelerator

Special thanks to all our speakers

Thanks to those who helped make it happen:

Julie Taylor – Event manager

Vicki Sharpe – Zoom manager

Phil Johnston – Organiser

Neil Farrington - Organiser



HM Government



European Union
European Regional
Development Fund



Thank you for participating in Session 2

**Cornwall
FLOW
Accelerator**

**You will receive a short feedback
questionnaire**





CELTIC SEA CLUSTER

Establish the floating wind market ● Accelerate supply chain ● Create sustainable jobs



HM Government



European Union
European Regional
Development Fund