ALL-ENERGY EXHIBITION AND CONFERENCE 2023

Decarbonise EXHIBITION AND CONFERENCE 2023

Built by RX In the business of building businesses

Marine and Floating Offshore Wind consenting

"Streamlining the process without shortcutting necessary environmental considerations?"

Session 2 - Boisdale room
14:00-15:30

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Part 1 – Hard and soft constraint mapping for Marine Energy & Floating Wind
Part 2 – Environmental impacts and evidence gaps for Floating Offshore Wind
Part 3 – Understanding and minimising environmental impact

Chair:

- **Neil Farrington**, Strategic Offshore Development Manager, Celtic Sea Power.

Panellists:

- **Sion Roberts**, Marine Consents Manager, The Crown Estate
- **Marc Murray**, FLOW Development Director, Cierco Energy
- **Ben Huskinson,** Director Development Services, Simply Blue Group
- **Chris McConville**, Head of Commercial, Floating Power Plant
- **Professor Beth Scott**, University of Aberdeen, Co-Director of Supergen ORE

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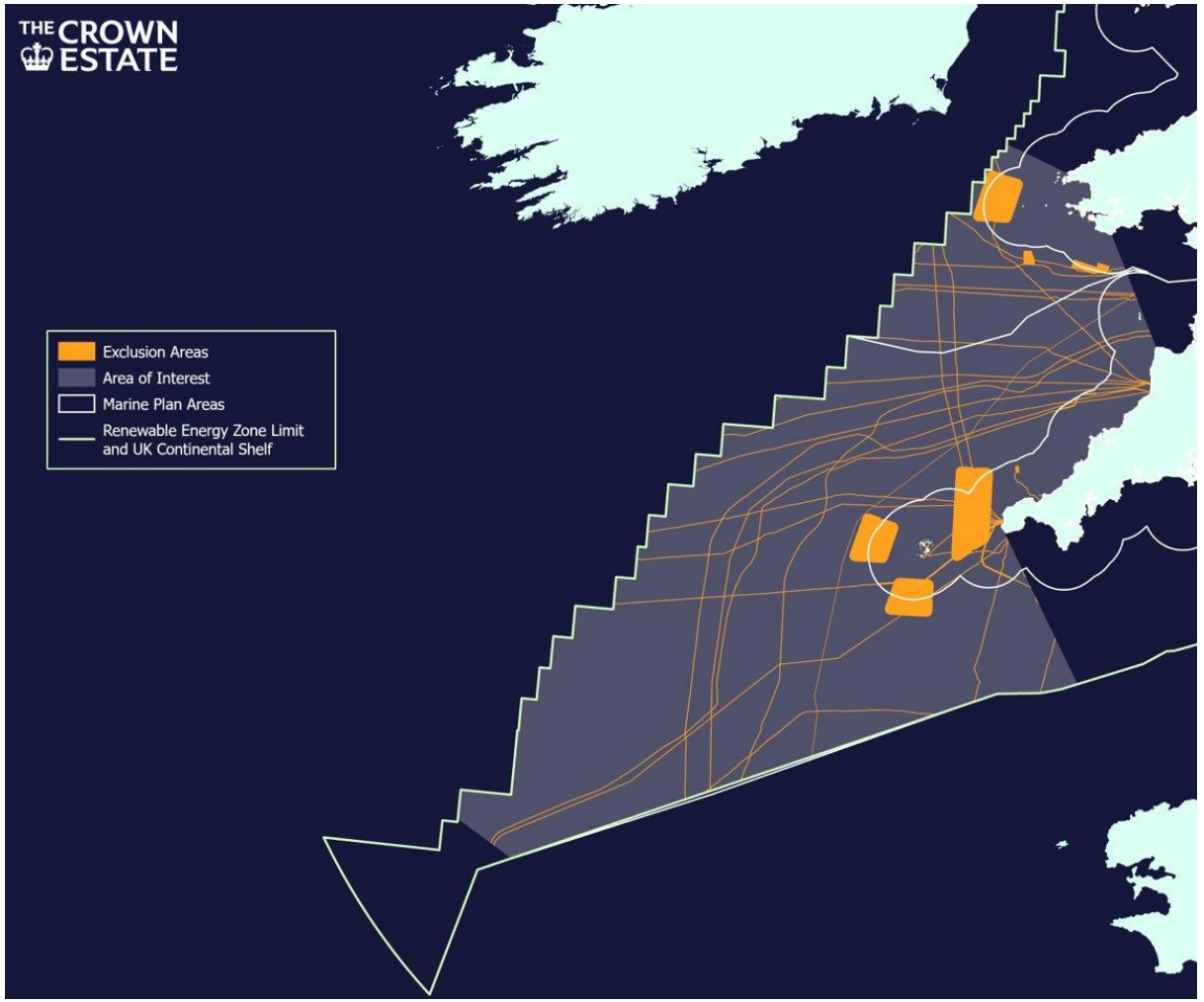
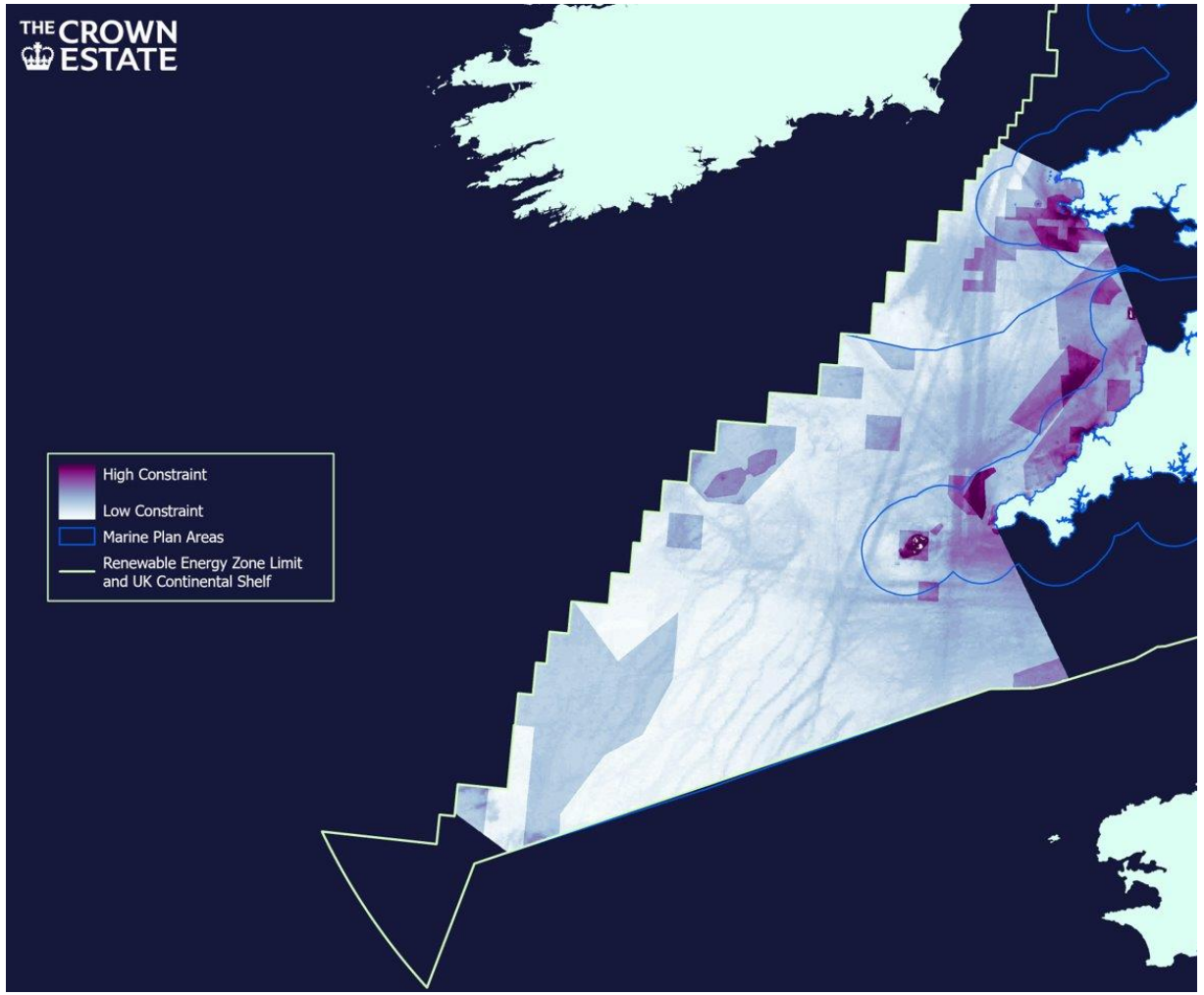
Sion Roberts

The Crown Estate

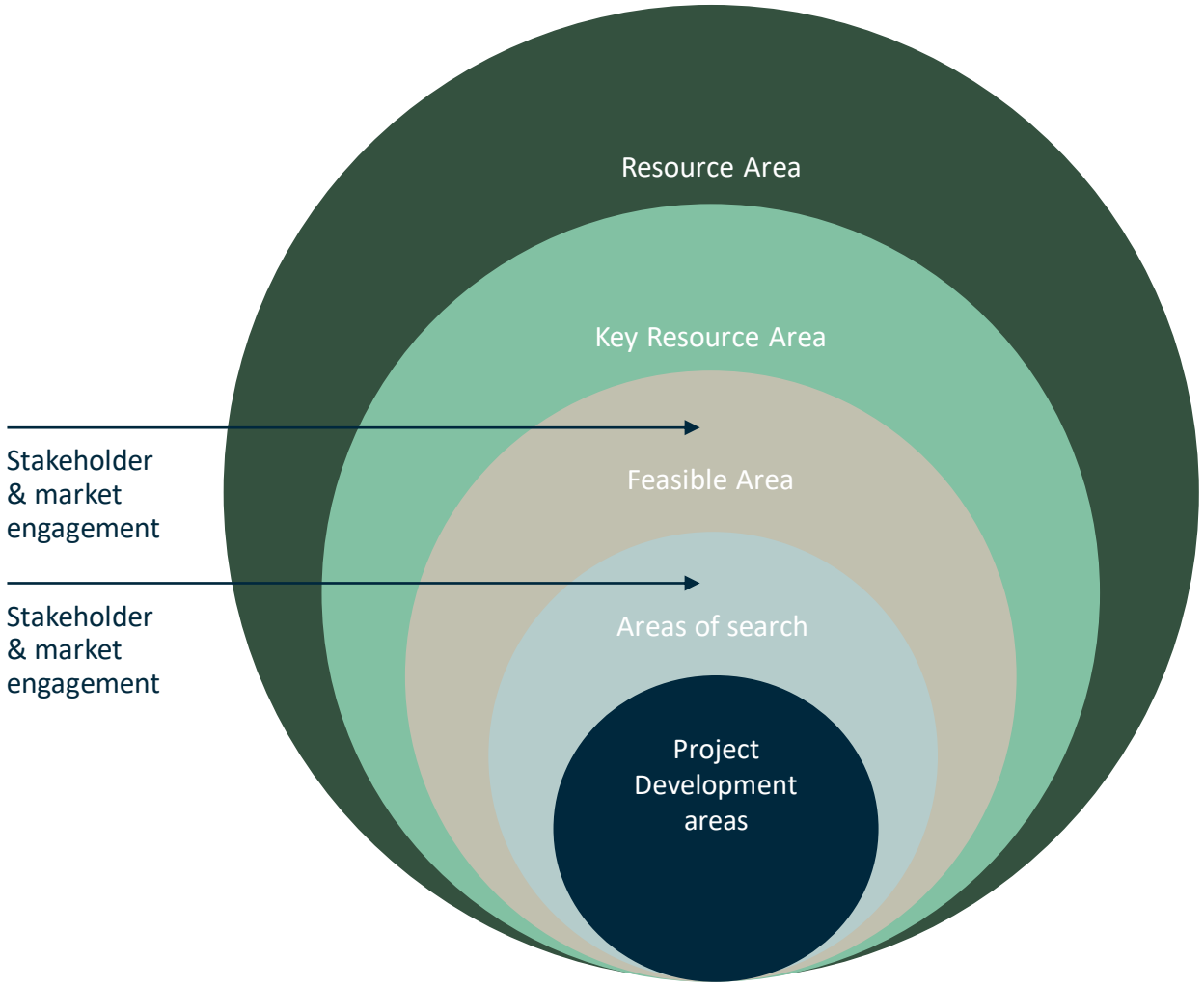
04/05/2023

Floating wind





Spatial opportunity



Availability of Interest

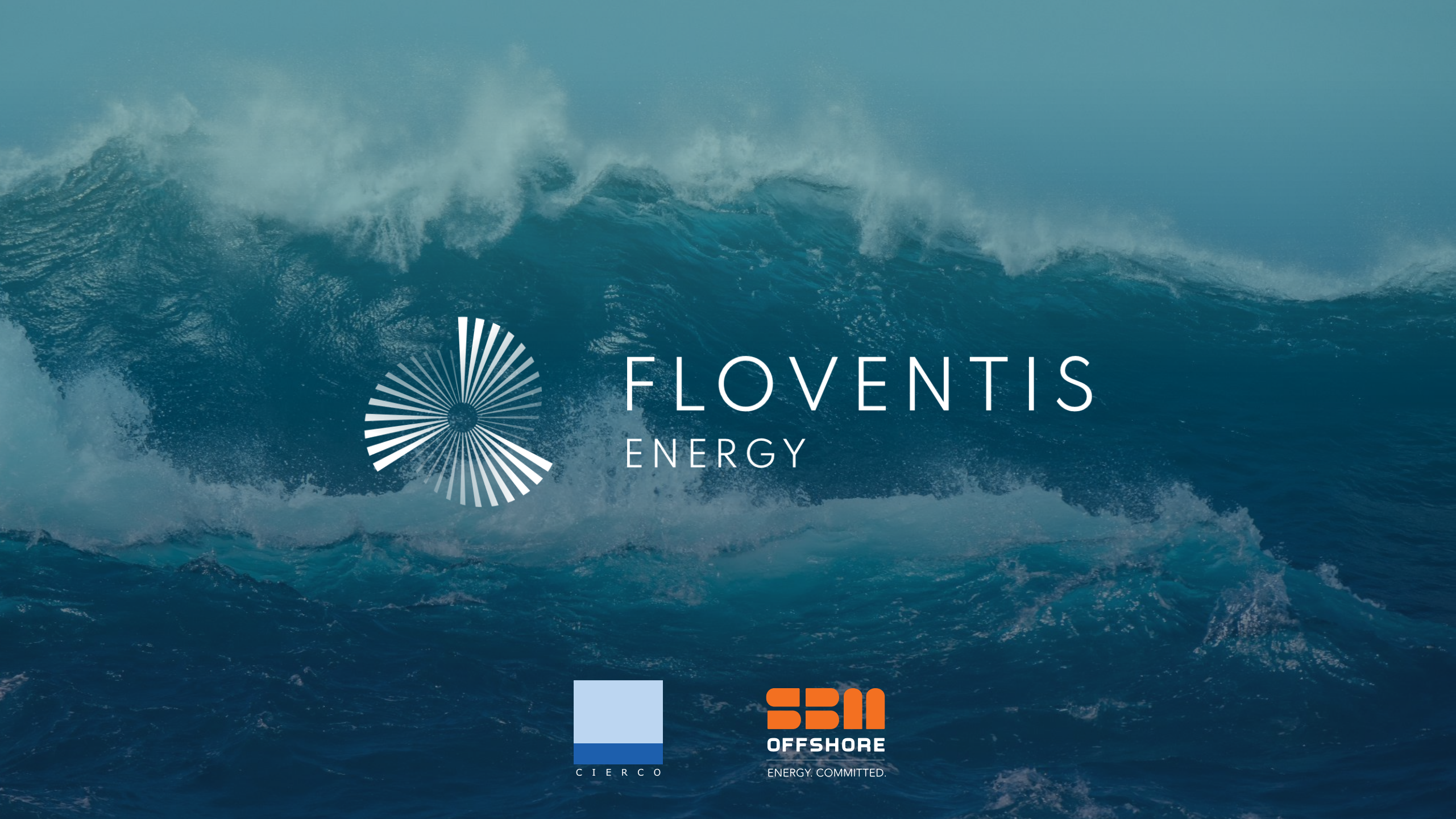
Consideration of the quality of resource and other cost drivers

Removal of development exclusions (e.g. existing infrastructure)

Weighted analysis of related risks to development (e.g. other marine users, interests and environmental sensitivities)

Single issue refinement

Refinement as a result of the HRA, if required


FLOVENTIS
ENERGY
CIERCO
SBM
OFFSHORE
ENERGY. COMMITTED.

Harnessing Power from Floating Offshore Wind Llŷr 1 & 2

31km offshore

Clean, green power
For **200,000** homes*

2 x 100 MW arrays**

25 year
Operating life

60-70 metre
Water depth

*Based on R-UK statistics using BEIS data. **Agreement for lease by The Crown Estate is subject to a Habitats Regulation Assessment.

Mapping of constraints and consenting challenges

- Fundamentally the environmental considerations are broadly the same as fixed.
- Need to review project consent entry requirements:
  - >2 decades of data gathered on ecological interactions in key areas.
  - More strategic investment (and credit) given to regional characterisation.
  - Emphasis should be on post installation monitoring.
  - Approach needs to be proportional and sensible – particularly for T&D projects.
- In new areas, education and presentation of evidence is key – Industry is familiar but it will be new to stakeholders and there is a natural resistance and suspicion.

Simply Blue Group

Ben Huskinson

Director, Development Services

- Chartered Environmental Scientist with 15+ years experience of consenting & environmental assessment of large scale infrastructural projects.

2011
Year founded

>€400m
Euros raised

> 10GW
early stage floating wind projects under development

Team of 100+ people
with experience in floating wind
Rapid expansion

Strategic Partnerships with
O&G & National Utilities

Global supply chain
relationships

Projects in more than
11 countries

Simply Blue Group

SBG Activity – Ireland & British Isles

In Partnership with:

TotalEnergies subsea 7 Ørsted

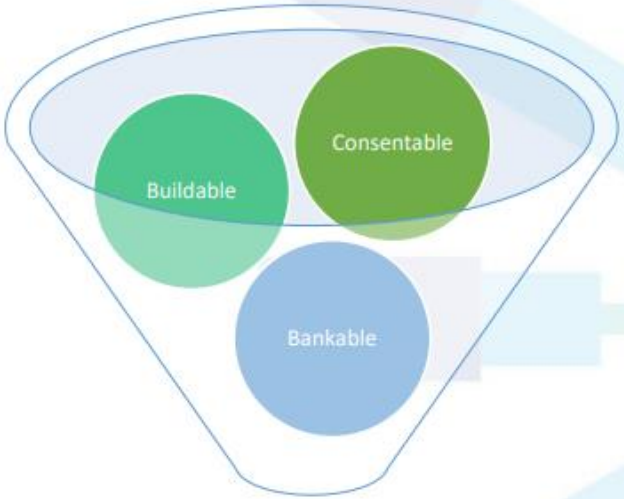
Legend:

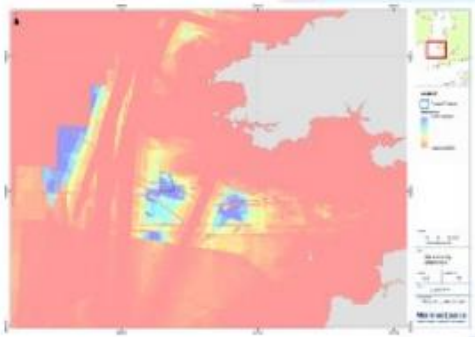
- Floating Wind
- Wave Energy
- Low Impact Aquaculture

Strategic Resource Areas: Hard and soft constraint mapping

- **Strategic Approach to Site Selection** in Celtic Sea
  - Adopt a **plan led approach** and complete a **consenting strategy** prior to constraint mapping;
  - Acquire regional / local datasets where available;
  - **Local stakeholder consultation & engagement key** to categorising and refining assumptions (both onshore and offshore);

  - 30+ technical and environmental inputs modelled:
    - **Hard Constraints** – Exclusion zones, Engineering and Environmental No-Go Areas / Buffers
    - **Soft Constraints** – Weighted average, using a range of methodologies (AHP, pairwise comparison, weighted average, stress testing). Outputs as a heat map.
    - Consultation with Statutory Authorities / NGO's / local community groups etc. prior to finalisation.





Professor Beth Scott

Marine Ecologist

1495 UNIVERSITY OF ABERDEEN

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MARINE ALLIANCE FOR SCIENCE AND TECHNOLOGY FOR SCOTLAND

ECOWind

PELAgIO

Physics-to-Ecosystem Level Assessment of Impacts of Offshore Wind Farms

https://ecowind.uk/projects/pelagio/

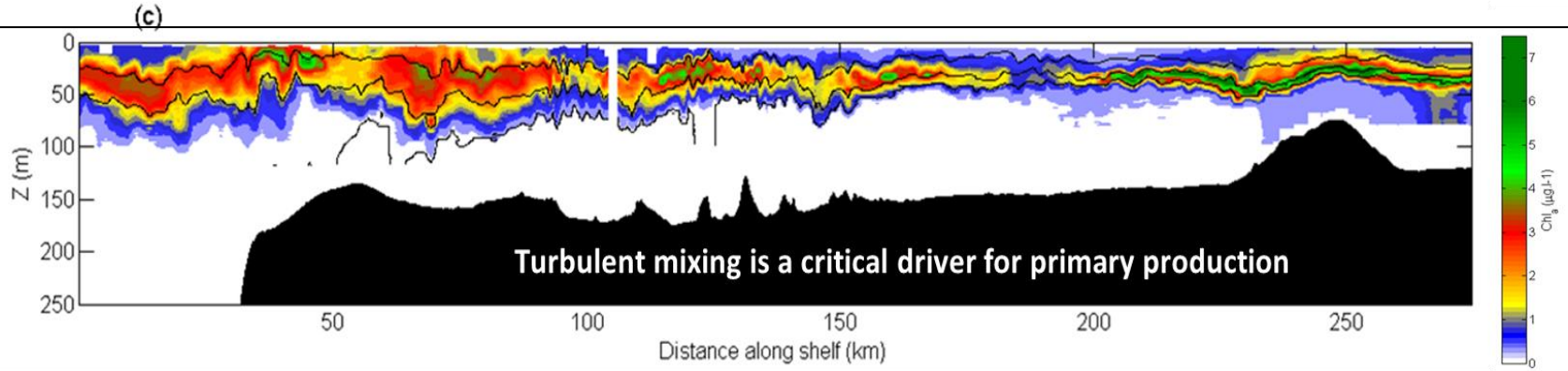
Supergen Offshore Renewable Energy

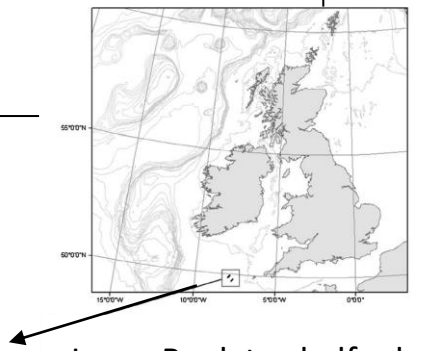
https://supergen-ore.net/

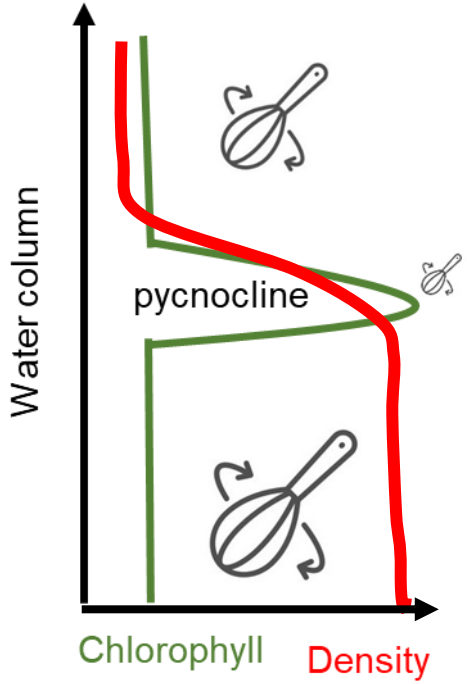
https://www.abdn.ac.uk/sbs/research/predict-938.php

https://ukerc.ac.uk/project/the-marine-energy-biodiversity-and-food-nexus-econex/

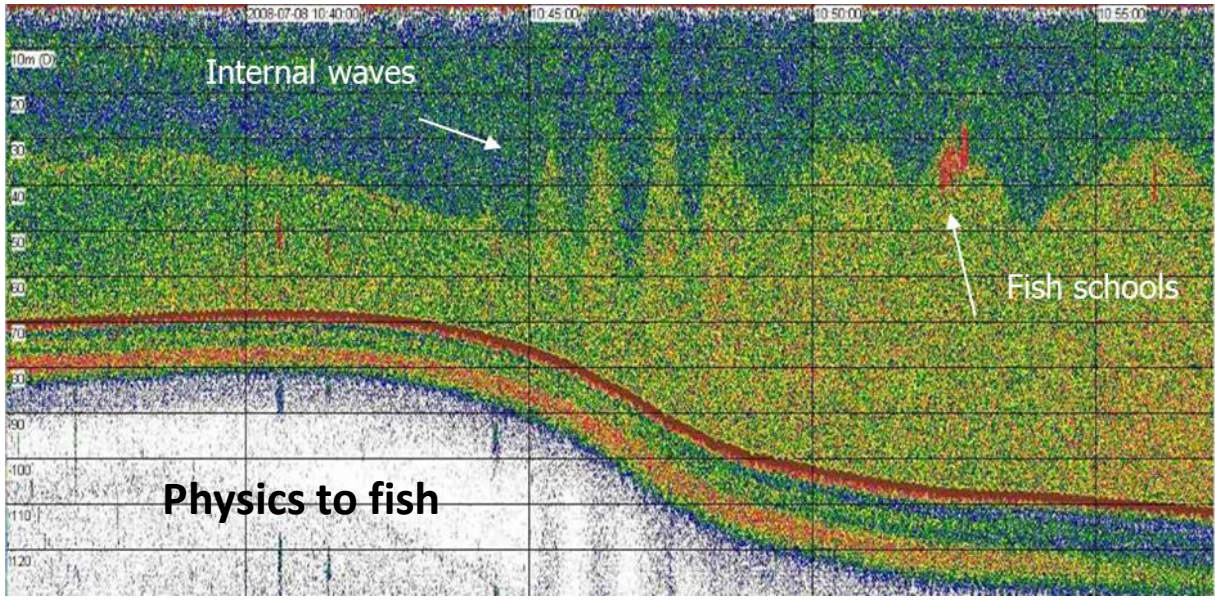
Activity in: Hard and soft constraint mapping for the strategic resource area mapping in the Celtic Sea







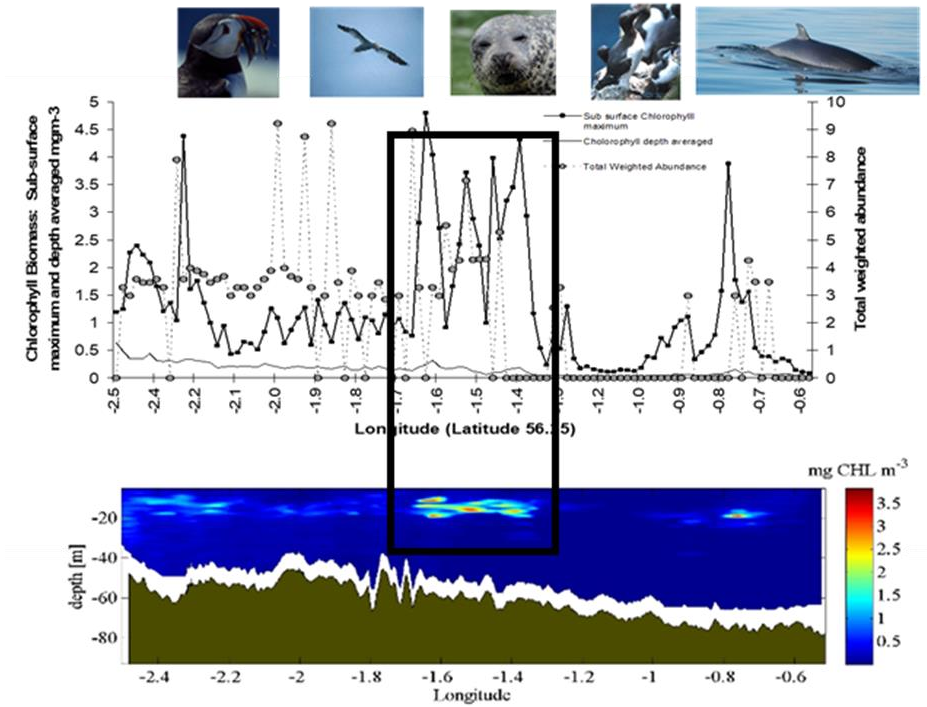
Identify the locations of NEW primary production:
Small changes in mixing - large change in amount of plankton



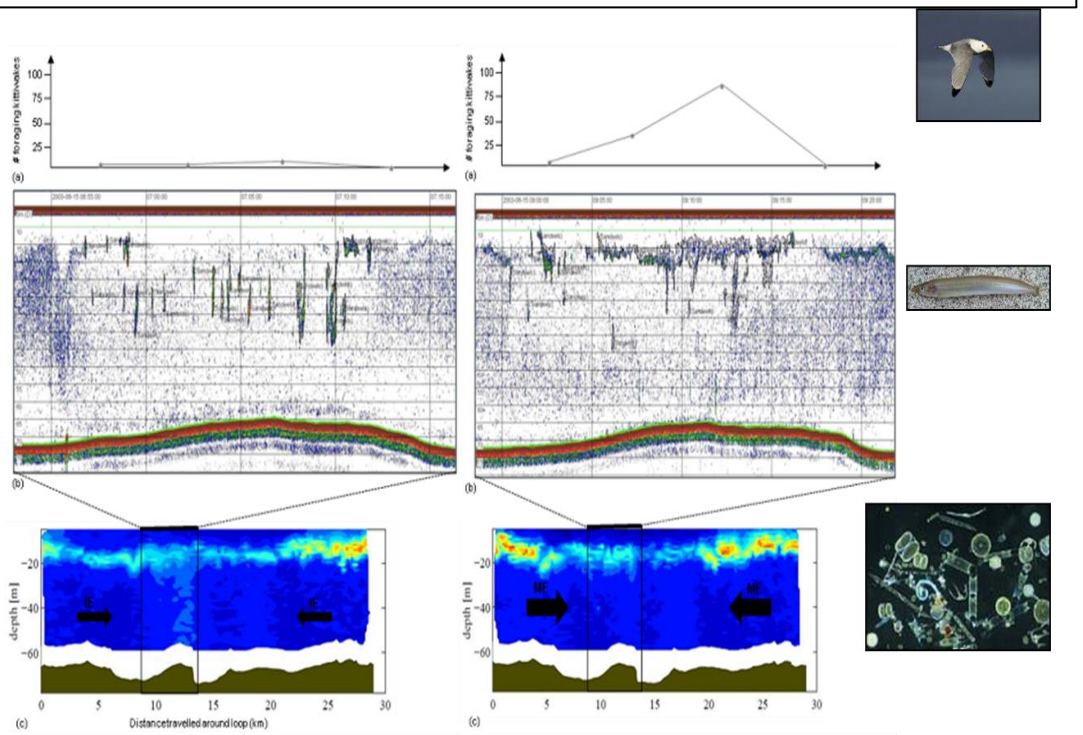
How: Reducing consenting process with ecological considerations

Don't interfere with **areas of new primary production** in marine systems as that is the **limited 5%** of the area where mobile predators catch their prey.

All foraging animals grouped as one predator



Know **WHY (and WHEN)** seabirds and marine mammals choose to forage in a location – this will massively **reduce uncertainty** in collision risk and displacement models



Embling et al (2012) JAE, Embling et al (2013) Prog Ocean), Scott et al (2013) Prog Ocean

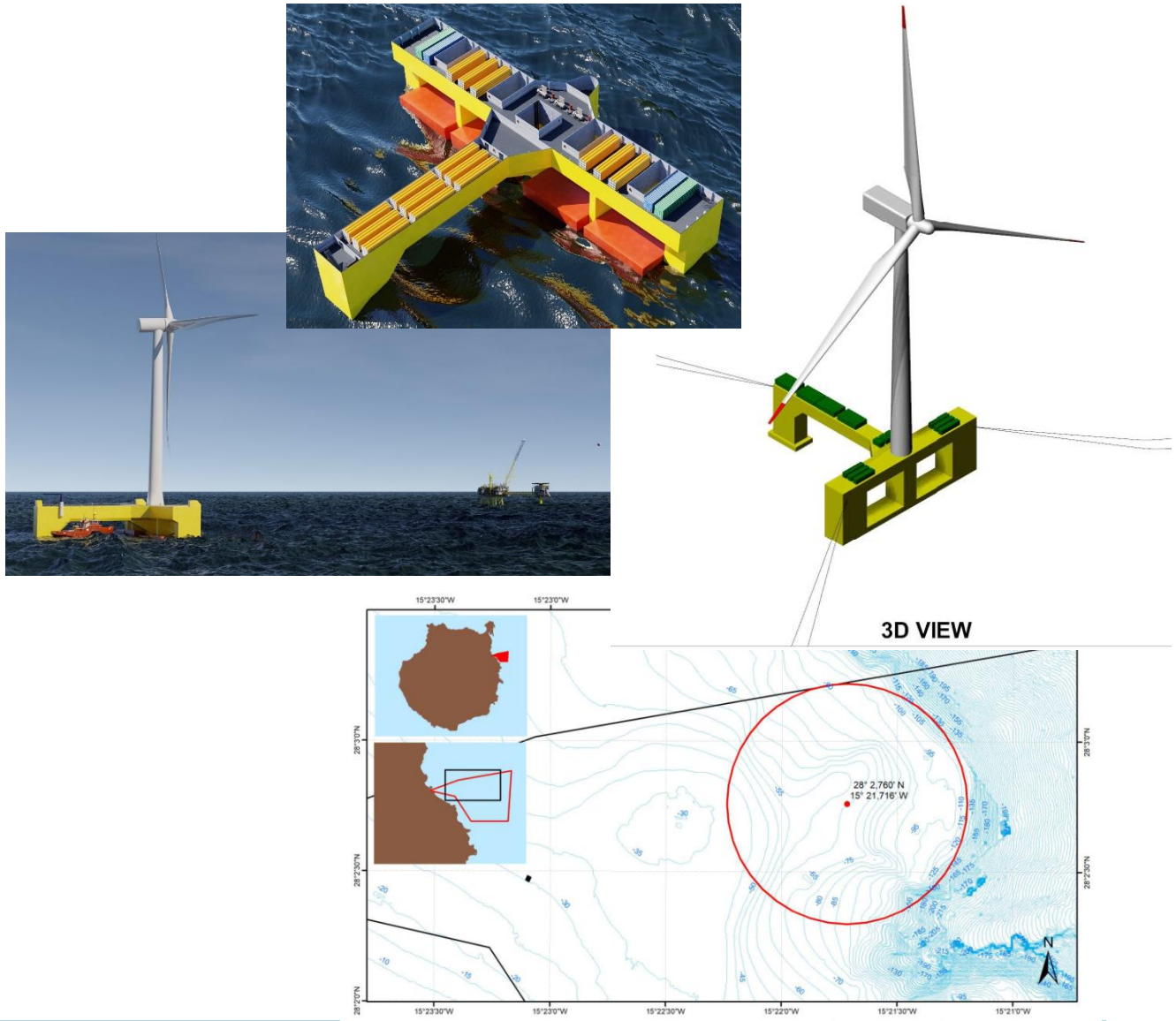
FLOATING POWER PLANT

CHRIS MCCONVILLE, HEAD OF COMMERCIAL,
FLOATING POWER PLANT

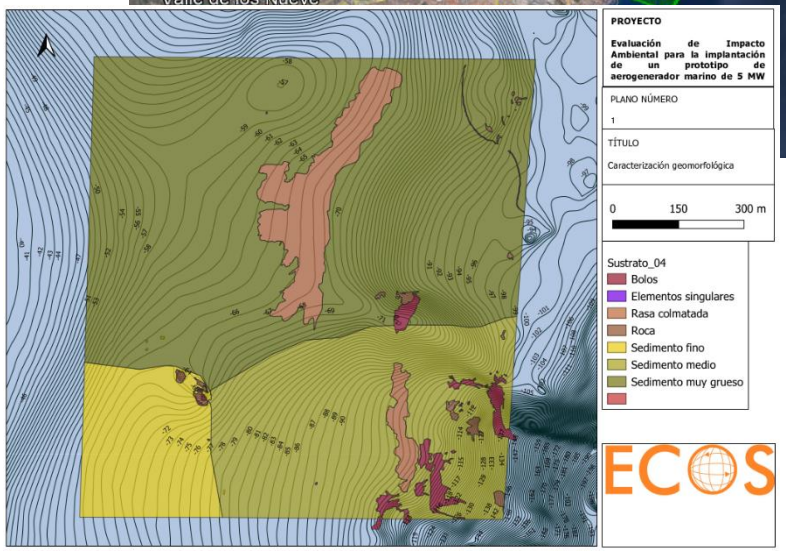
CMC@FLOATINGPOWERPLANT.COM

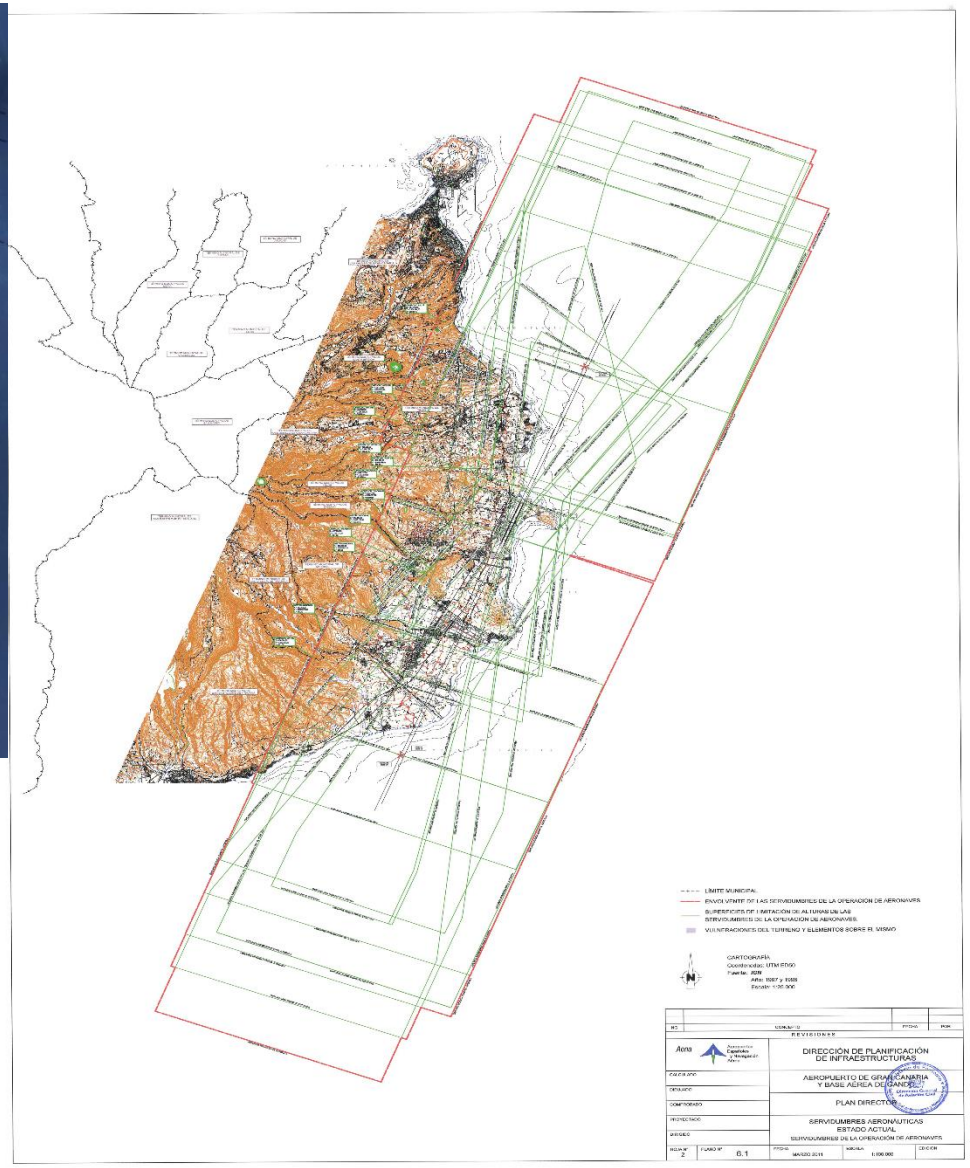
FPP INTRO

- **Technology Developer**
  - Floating Wind Turbine
  - Optional H2 Systems
  - Optional WEC
- **Company**
  - HQ in Denmark
  - UK Office
  - Spanish Office
- **Projects**
  - Previous pilot project in Denmark
  - Currently developing demo project in Spain
  - Targeting niche markets initially



CONSTRAINTS INFORMING TECHNOLOGY SELECTION AND DESIGN





Discussion

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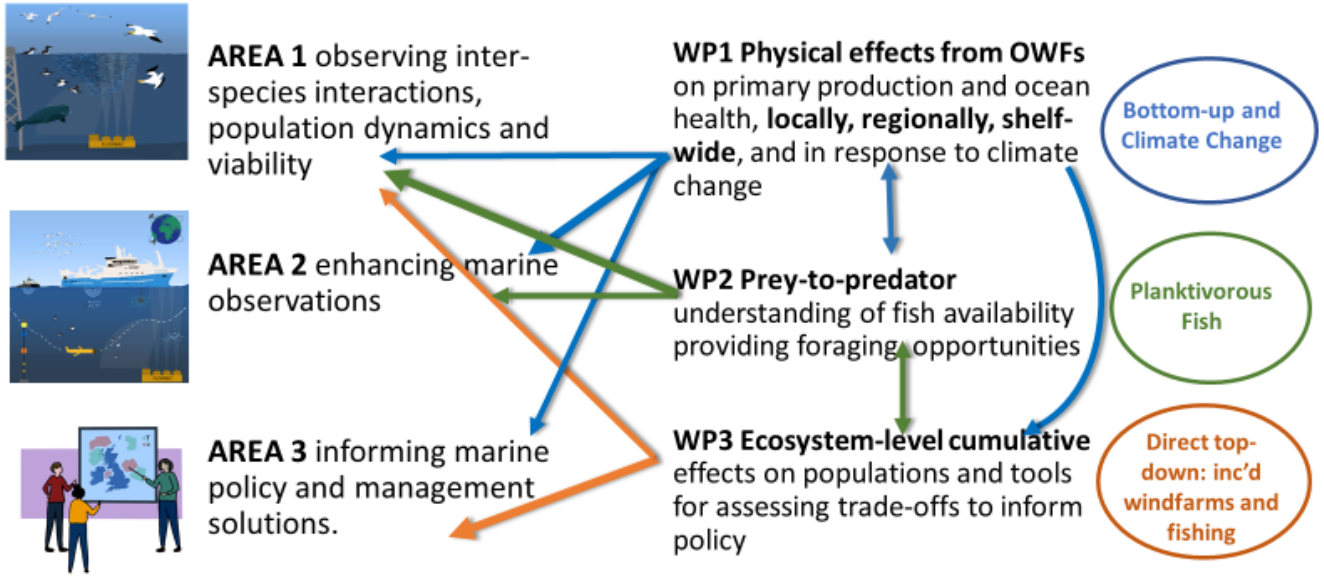
Part 2 – Environmental impacts and evidence gaps for Floating Offshore Wind

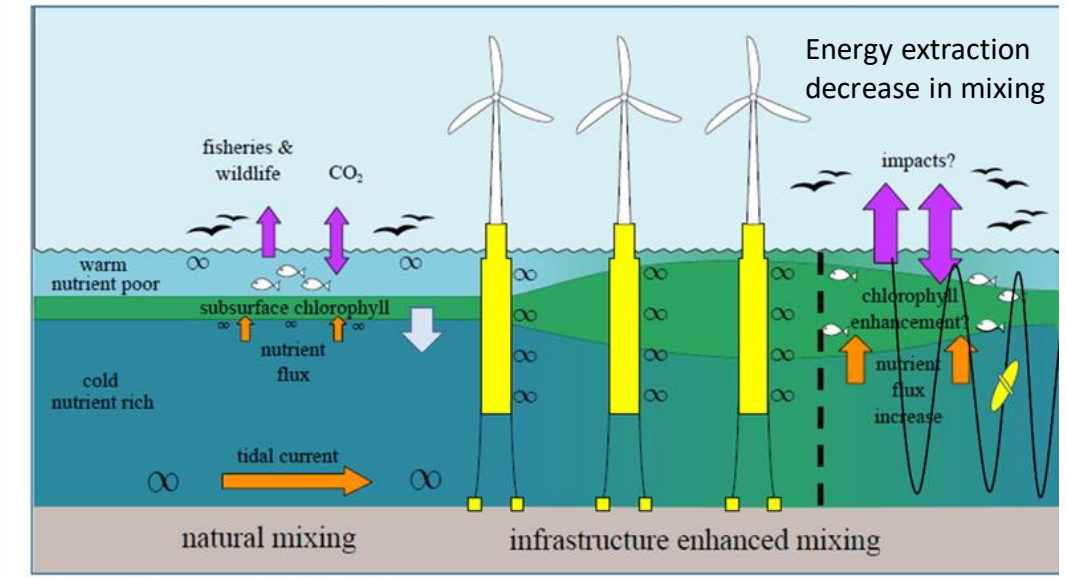
Activity in: Environmental impacts and evidence gaps in Floating offshore wind

ECOWind

ECOWind PELAgIO

Ecosystem approaches = accurate cumulative effects including factoring in positive aspects of climate change reduction





Modified from Dorrell et al, 2022

How: Reducing consenting process with ecological considerations

ECOWind

Integrate environmental monitoring into offshore wind infrastructure.

Use of continuous and concurrent data across trophic levels and scales (**Low Carbon**)

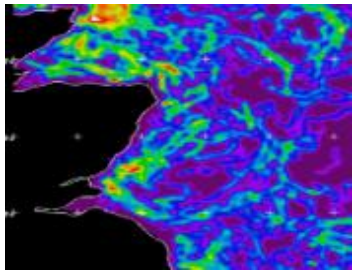
- Autonomous upward facing platforms
- Gliders (AUV)
- Satellite data
- Tagged birds/mammals
- Seasonal (migration) fish distributions from fisheries data

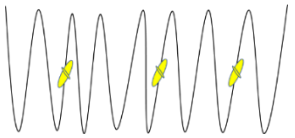
Local

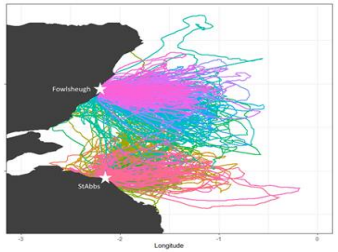
(FLOWBEC, AUV, Moorings)
(10 m-1 km)

Regional

(AUV, NEODAAS/tag data)
(1-100 km)

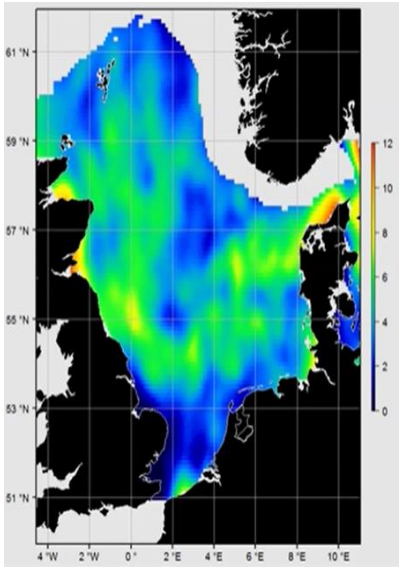






Shelf Wide

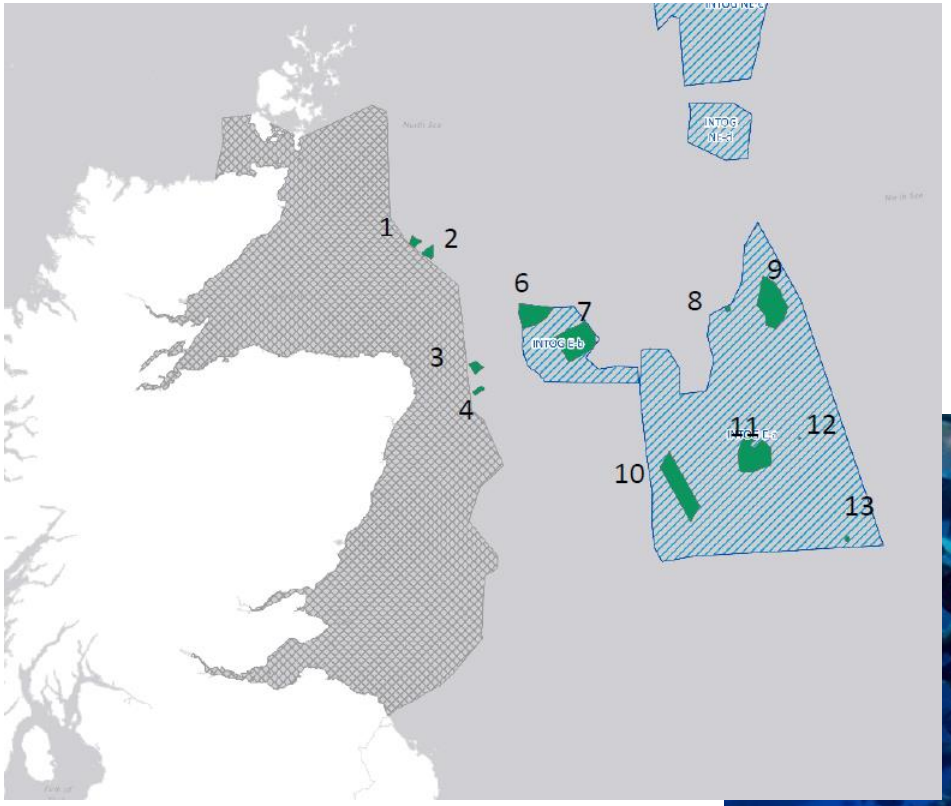
(ICES/HERAS/PREDICT)
(>1000 km)

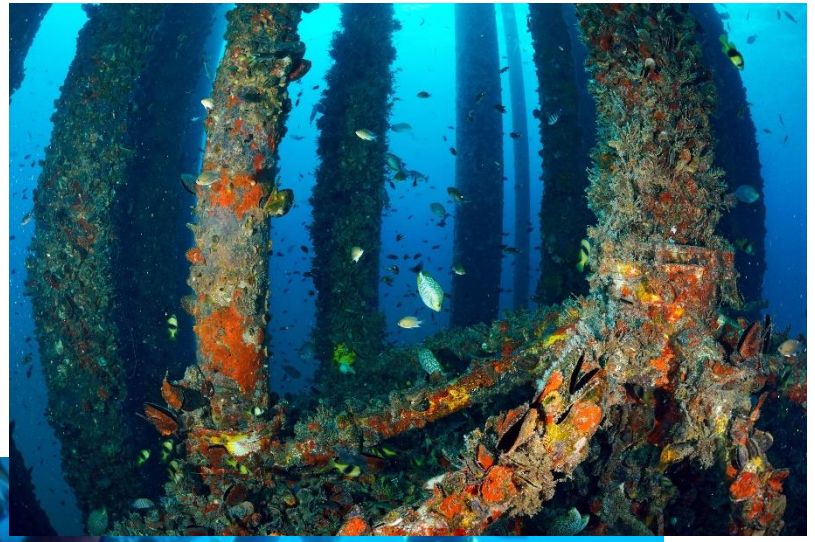


PREDICT

EVIDENCE – GAPS OR RELEVANCE?

- Long Term Impacts
- Cumulative Impacts
- Decommissioning





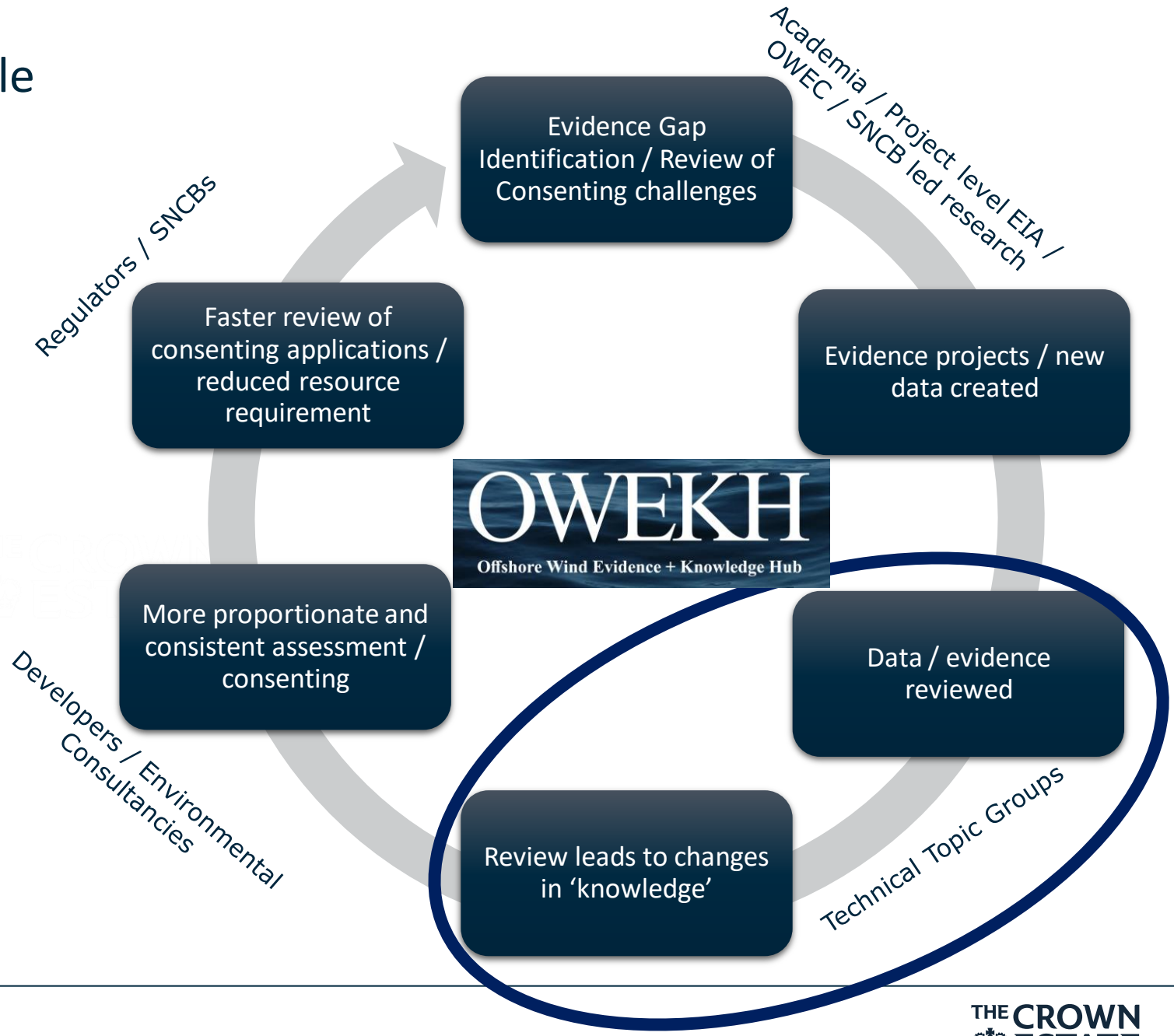
Defining and Addressing Evidence Gaps

What makes a good research programme?

- Collaborative
- Informed
- Directed
- Focused

But… how do we initiate change?

The Evidence and Knowledge Cycle



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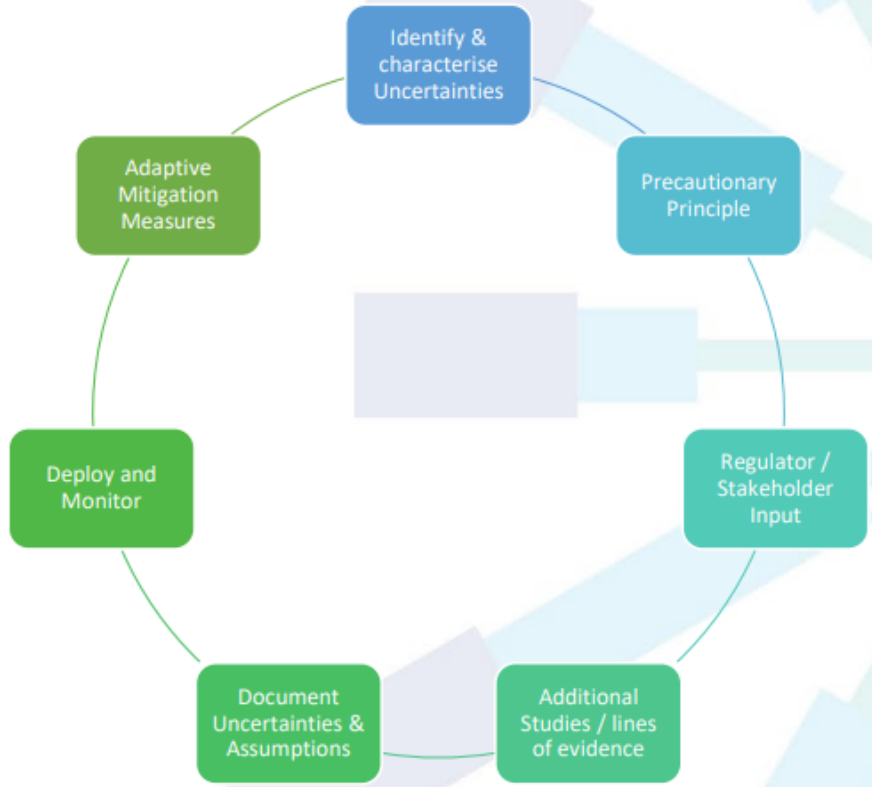
Addressing Environmental impacts and evidence gaps

- Potential **lack of existing or baseline data,** particularly in new areas that have been unlocked for FOW development.

- **Impacts that may be particular to FOW**, for example:
  - FOW Underwater Noise Monitoring and Mitigation
  - Potential effects of dynamic cable EMF on marine ecology.
  - Monitoring Framework for Fish Aggregation Effects
  - Entanglement
  - Potential cumulative and in-combination impacts of FOW farms



Above topics actively being addressed by sector (e.g. TCE, Catapult FOW CoE) in conjunction with eNGO's and other relevant stakeholders.

Environmental evidence Gaps

- The Llŷr projects amongst first tranche of new floating wind projects in the UK.
- CADEMO will be the first offshore wind project on the US West Coast.
- Some new areas posed by floating - key aspects:
  - Secondary entanglement with marine megafauna.
  - Anthropogenic mixing on seasonally stratified seas.
  - Fishing vessel interactions.
  - Ecological enhancement through nature inclusive design.

Environmental evidence Gaps – How to address?

- Use T&D projects as pathfinders
  - fund post consent/installation monitoring – design monitoring programmes with a view to enabling future commercial (incl. replicability and application).
  - Encourage integration of new monitoring technology as industry enabling actions.
- Acknowledge there will be interactions – avoidance at all cost misses the opportunity to examine issues at an appropriate scale without major impact.
- Strategic overview – look towards coordination of monitoring requirements regionally

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Discussion

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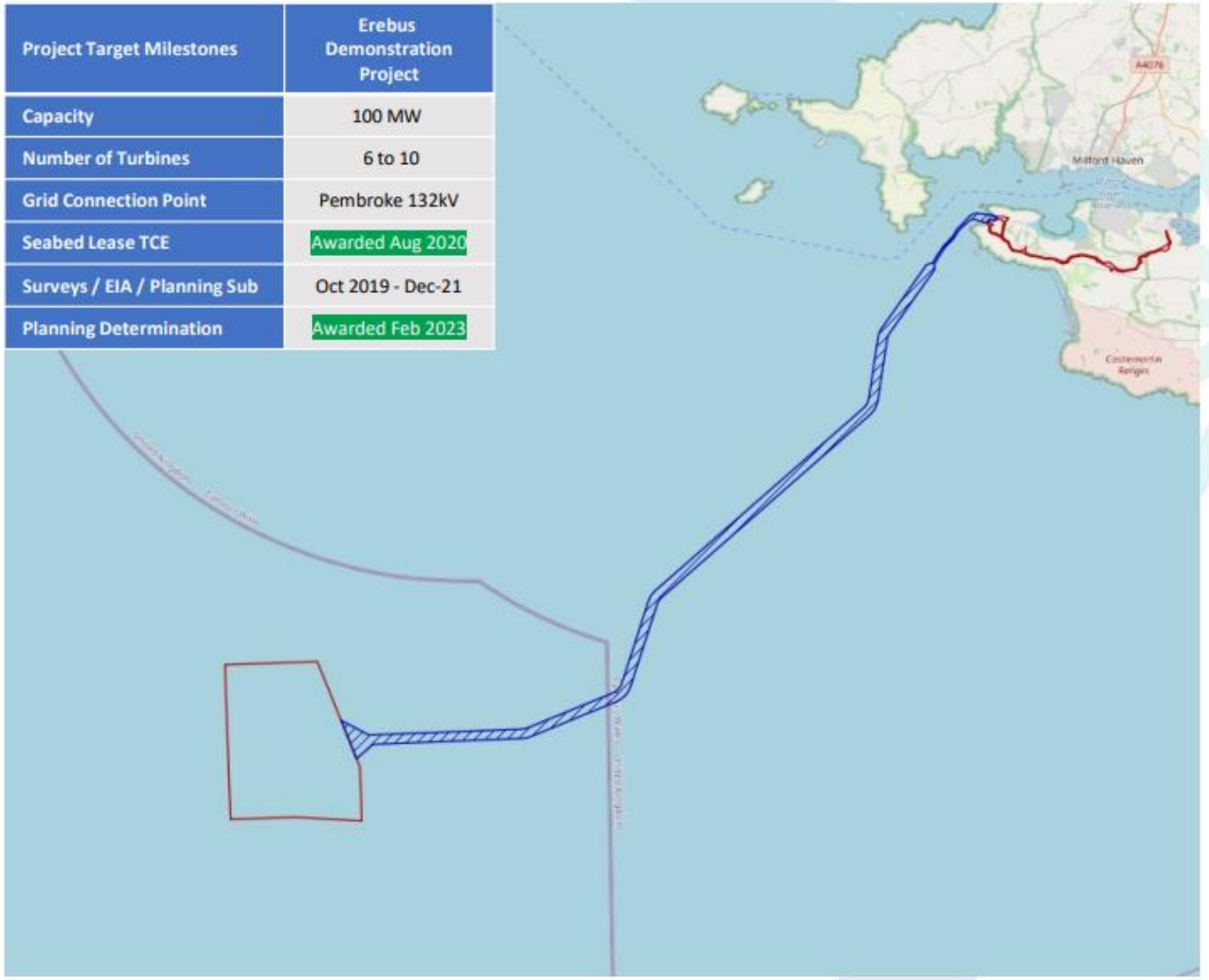
Part 3 – Understanding and minimising environmental impact

SBG – Activity in Celtic Sea

- **Pioneering FOW Developer in the Celtic Sea**
  - Adopted a stepping-stone approach
  - Constraint Mapping and Site Selection completed in 2019

- **Blue Gem Wind - Project Erebus:**
  - JV Partnership between SBG and TotalEnergies
  - 100MW project, located 35 km off Pembrokeshire Coast.
  - Full lease awarded in 2020
  - **First FOW project to secure consent through S.36 / ML in the region**

Project Target Milestones	Erebus Demonstration Project
Capacity	100 MW
Number of Turbines	6 to 10
Grid Connection Point	Pembroke 132kV
Seabed Lease TCE	Awarded Aug 2020
Surveys / EIA / Planning Sub	Oct 2019 - Dec-21
Planning Determination	Awarded Feb 2023

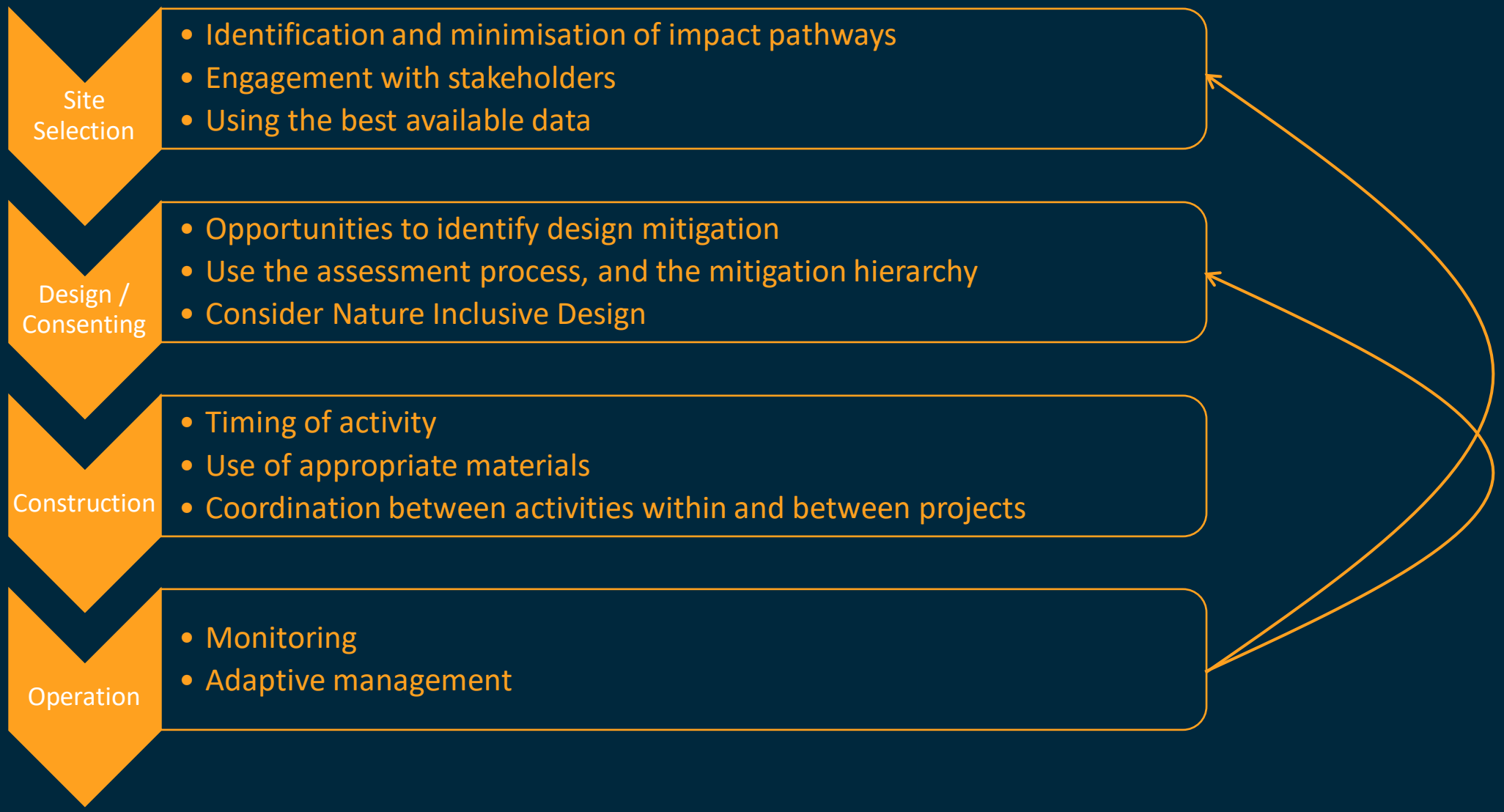


Understanding & minimising environmental impact

Being the first project of its type in the region presented challenges in the determination process and a subsequent risk to timelines, which were addressed as follows:

- **Reached a point of certainty with the Regulator to the consent and determination process:**
  - Detailed Consenting Strategy agreed with Regulator at project inception.
  - Compliance with relevant policies / spatial planning objectives
  - Pre-agreed EIA / HRA methodology, terminology and format
- **Early and proactive stakeholder engagement throughout EIA & HRA process**
  - Thorough EIA Scoping and EIA process.
  - Early engagement with MoD/DiO, MCA, TWT, RSPB, public consultation etc. &
  - Early identification and engagement of potential issues, impact uncertainties etc., commissioning of additional studies / datasets where required.
- **Advanced engineering design maturity to inform EIA**
  - Refinement of PDE (e.g. turbine dimensions, cable route protection, landfall, etc.,) for interaction with sensitive habitats / species.
  - Detailed construction and operational environmental management plans with additional monitoring proposed (deploy and monitor) for residual impacts / areas of uncertainty.

Opportunities to minimise impacts



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MINIMISING IMPACTS

- Managing, not eliminating risk
- Operational Management

Understanding and minimizing impact

- Floventis view the Llŷr T&D projects and CADEMO projects as pathfinders
- Currently working with industry groups and academic centres in the UK and US to explore opportunities to provide a platform to investigate environmental interactions at an appropriate scale

Understanding and minimizing impact – how to address?

- Start applying practical solutions based on evidence. Focus should be on those areas least understood:
  - Acknowledge that some areas no longer need precautionary approach (impacts and interactions are known).
  - Less focus on modelling worst case scenarios where there is evidence.
  - It will be counterproductive to keep “adding” issues without lessening focus on other areas – need to place focus on key issues.
  - When examining new areas, there is a need to seek long term solutions rather than just data gathering – what is required to understand and address the issue.
- Seize the opportunity of ecological enhancement (incl. nature inclusive design) as mitigation.

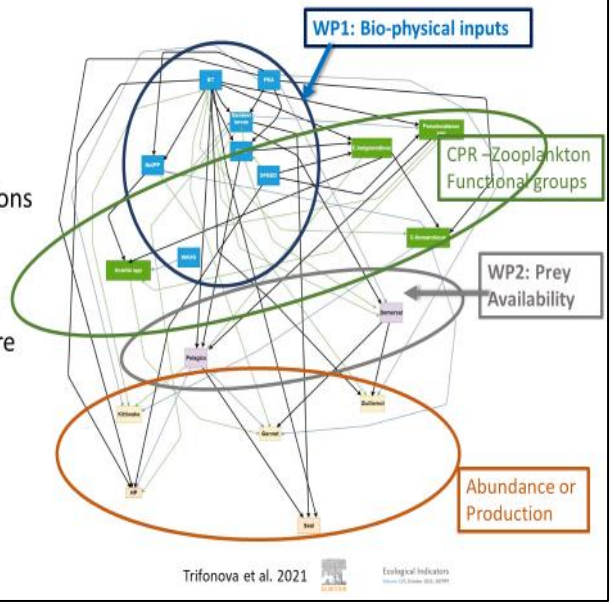
Activity in: Understanding and minimising environmental impact

Use simple ecosystem models to predict population trends (Machine learning)

WHY: Dynamic Bayesian network ecosystem modelling approach?

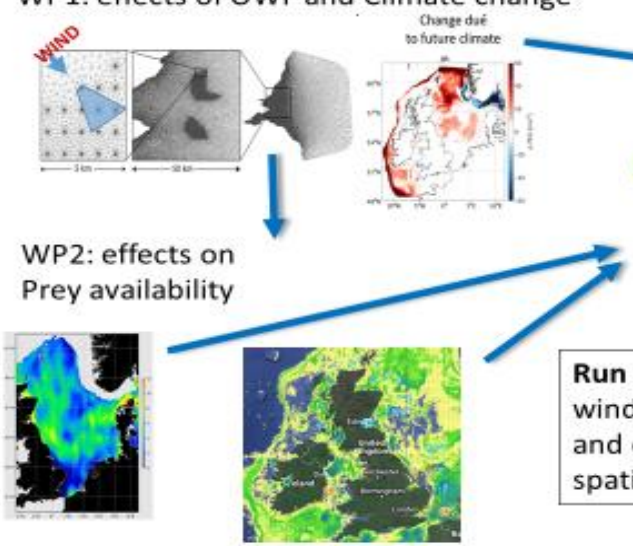
- Short cut through mechanism
- Pragmatic way of finding associations via pattern between variables

i.e. If when A goes up B always goes down – high confidence that A & B are strongly connected – one is a good indicator of the other



Trifonova et al. 2021

Rapidly test effects of Physical drivers: energy extraction, climate and fish distributions



Run Scenarios – with/without windfarms, fishing displacement and climate change at different spatial scales

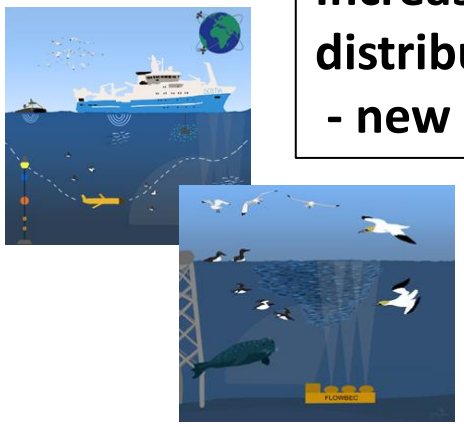
Assess MSP trade-offs

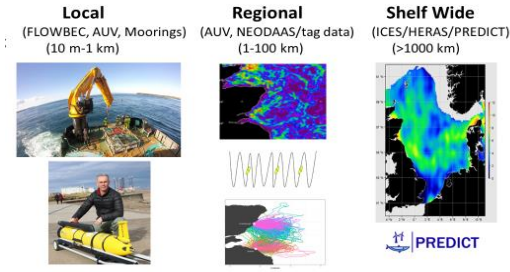
How: Reducing consenting process with ecological considerations

3 D's of Environmental Impacts

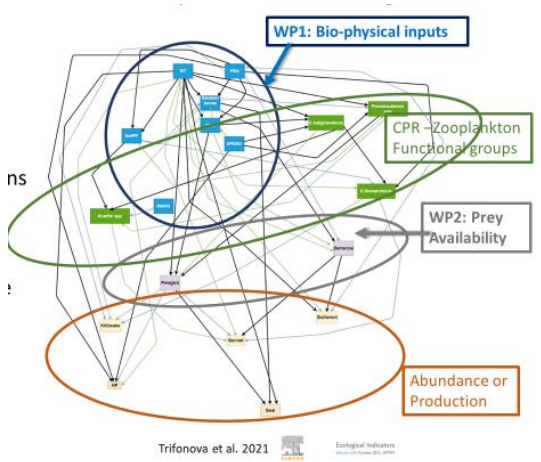
Disturbance | Displacement | Death

Increased understanding in drivers of prey distributions – rapidly lowers uncertainty
- new low carbon monitoring pre and post





NEW 3 C's – Evidence for:
Cumulative Effects
Compensation
Climate Change



Final Discussion

"Why does it take so long to develop marine and floating wind systems? What must we challenge to speed up deployment without shortcutting necessary environmental considerations?"

- **Thank you!**

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