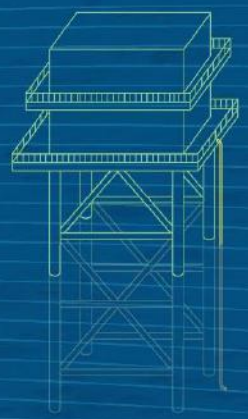
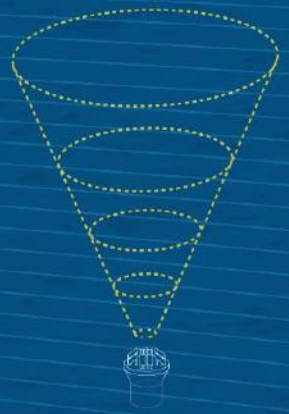
Offshore Renewables Joint Industry Programme
ORJIP Offshore Wind

21st January 2015,

Emilie Reeve,
ORJIP Offshore Wind
Programme Manger





Consenting risk is a major issue for offshore wind

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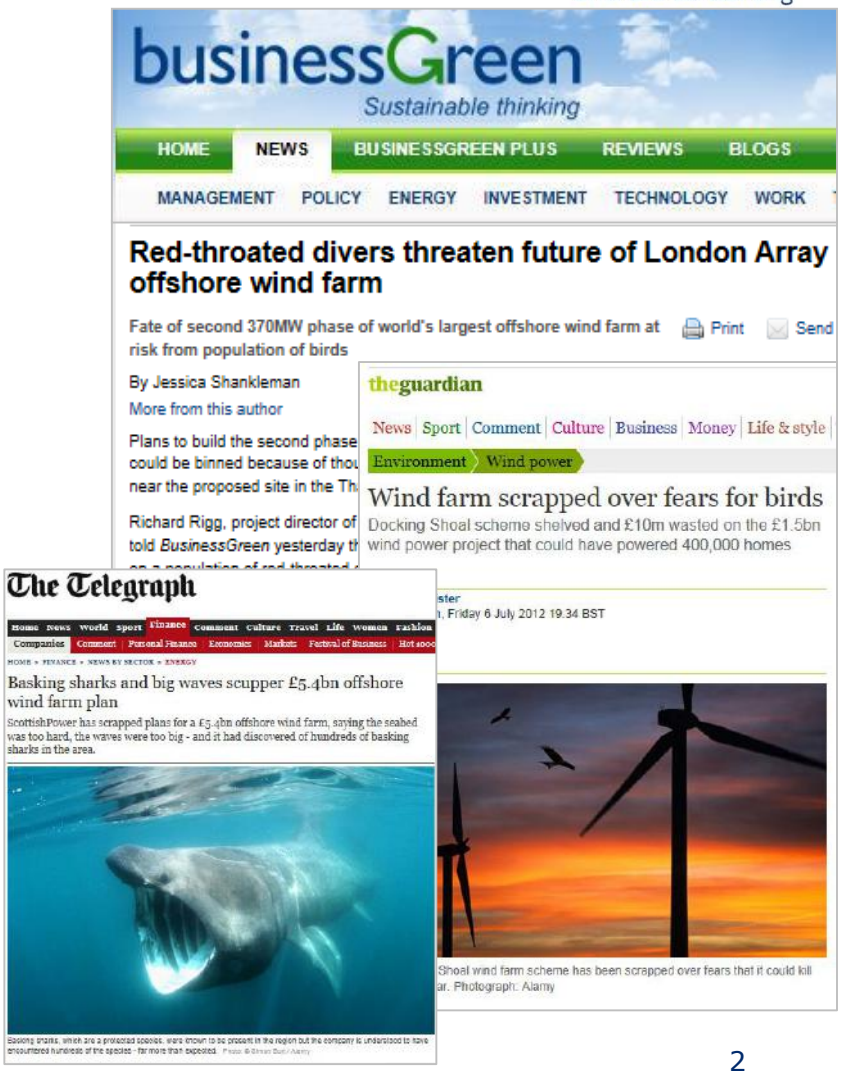
The challenge

- Before a wind farm can be built, developers must be awarded consent but…
- consenting decisions depend on the risk of environmental impact
- Developers to prove that the risk is minimal
- Two most notable environmental impacts
  - **Birds** – fatalities due to collision, and population displacement
  - **Marine Mammals** –injury from high levels of underwater noise due to construction, and population displacement
- Due to a lack of empirical scientific data, consenting authorities are very cautious when making their decision



Offshore Renewable Joint Industry Programme (ORJIP)

Reducing the Risk of Consent

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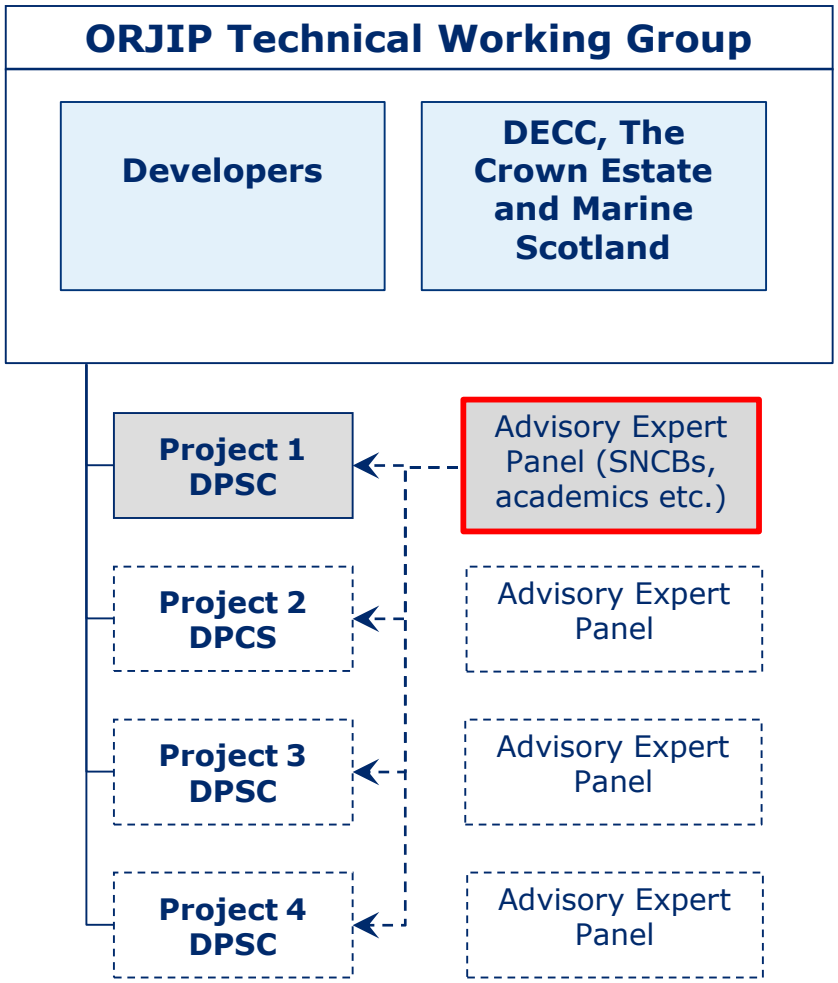
The Solution

- ORJIP set up in 2012 by DECC, The Crown Estate, Marine Scotland and 16 offshore wind developers
- **Objective:** to reduce consenting risk for offshore wind farms through:
  - funding research projects to better inform consenting authorities on the true environmental risk of offshore wind
- Based on the good reputation of OWA, in 2013 Carbon Trust was contracted to manage the ORJIP programme
- Four initial key research projects to reducing the risk of consenting to offshore wind
- A programme open to all countries

Essential to have expert advice

Involvement of SNCBs and experts



Develop project ideas (All developers plus public funders)

Decide whether to participate in projects

DPSC manages delivery and direction of project (Developers funding the project + public funders)

Experts advise on the findings and direction of the project to gain industry acceptance.

ORJIP Research projects

Research priorities identified in 2012

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1. Bird Collision Avoidance

Objective: To improve the evidence base informing bird collision avoidance rates to improve consenting decisions

2. Population consequences of acoustic disturbances

Objective: Identify consequences of acoustic disturbances on marine mammals

3. Underwater noise mitigation

Objective: Test efficacy of noise mitigation systems on piling foundations

4. Acoustic deterrent devices

Objective: Review and test efficacy of acoustic deterrent devices

As the industry has moved forward and adapted since 2012, so have the consenting priorities for developers. A review of the priority research areas will be undertaken in early 2015 to ensure priorities are aligned with current consenting.

Bird collision avoidance study

Objective: To improve the evidence base informing bird collision avoidance rates to inform consenting decisions

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15 Participants: DONG Energy, EDF, Eneco, Fluor, Mainstream Renewable Power, RWE, Scottish Power Renewables, Siemens, SSE, Statoil, Statkraft, Vattenfall, DECC, The Crown Estate and Marine Scotland

Approach: Niras and DHI have installed state of the art monitoring equipment at Thanet Offshore Wind farm to monitor micro, meso and macro bird avoidance behaviours.

Duration: 2.5years, starting March 2014

Benefits:

- Start using the outcomes of this study from February 2015
- Bi-annual interim reports to be published
- Study outcomes accepted by SNCBs
- Empirical evidence to improve collision risk models
- Greater certainty on the true risk of bird collisions

Population consequences of acoustic disturbances

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VATTENFALL

Vattenfall are leading DEPONS project *(Disturbance Effects on the Harbour Porpoise Population in the North Sea)*

- **Coordination with ORJIP:** Regular progress updates delivered to ORJIP working group. DEPONS research to feed into future ORJIP projects.
- **Objective:** Identify the consequences of acoustic disturbances on Harbour porpoise populations
- **Approach:** Conduct evidence based modelling of population level consequences of underwater noise disturbance to North Sea harbour porpoise.
- **Participants:** Vattenfall, Forewind, SMartwind, East Anglia Offshore Wind, Clusius (Eneco)

ORJIP is anticipating the findings from DEPONS and is considering whether to conduct an expansion on the DEPONS work.

DEPONS

AARHUS UNIVERSITY
DCE - DANISH CENTRE FOR ENVIRONMENT AND ENERGY

Underwater noise mitigation technology

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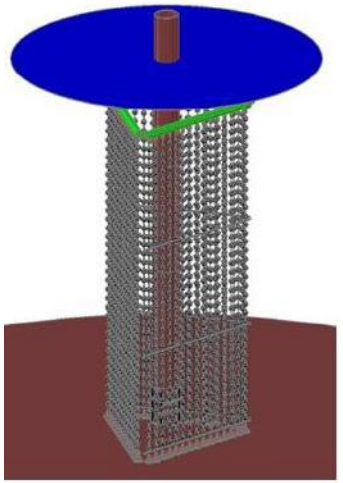
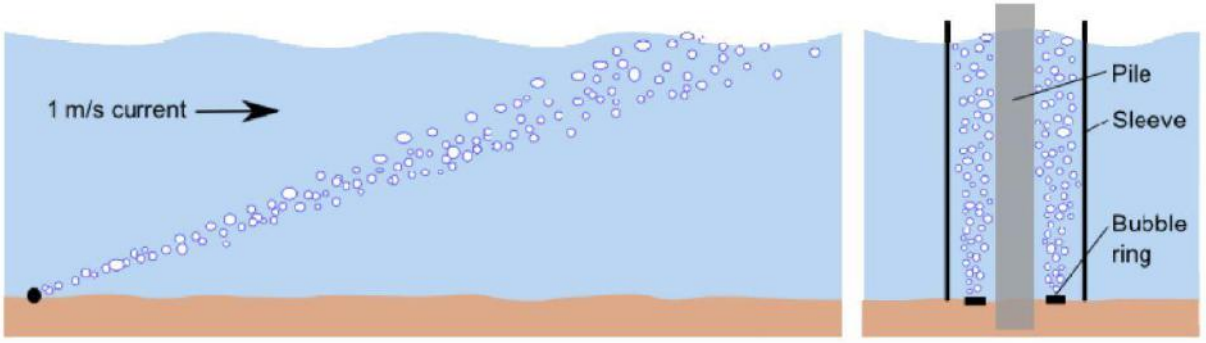
Objective: Test efficacy of noise mitigation systems on piling foundations



Is this still a priority for offshore wind consenting in UK?

It is critical to mitigate against marine mammal injury from underwater noise. But at present little is known about the true efficacy of noise mitigation technologies and the impact of using them e.g. increased boat activity, prolonged installation etc.

If Acoustic Deterrent Devices are shown to be efficacious do we need noise mitigation technology in UK?



Acoustic Deterrent Devices study

Objective: Review and test efficacy of acoustic deterrent devices

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Phase 1 – completed early 2014

- 34 ADD devices were reviewed from 22 manufacturers
- 4 were currently in use/marketed for use
- 2 being developed

- To date there is a basic level of understanding on efficacy of deterrent devices for the five proxy species but little evidence or no understanding of:
  - Deterrence in offshore environments
  - Long term responses to deterrence
  - Flexibility of effective range

	Harbour porpoise	*Grey seal*	*Harbour seal*	*Bottlenose dolphin*	*Minke whale*
Q1 Basic deterrence	✓	✓	✓	x	x
Q2 Deterrence in 'Offshore' environment	✓	x	x	x	x
Q3 Long term responses	x	x	x	x	x
Q4 Flexibility of effective range	x	x	x	x	x

Previous research on the response of deterrence devices on the five priority species

Acoustic Deterrent Devices study

Objective: Review and test efficacy of acoustic deterrent devices

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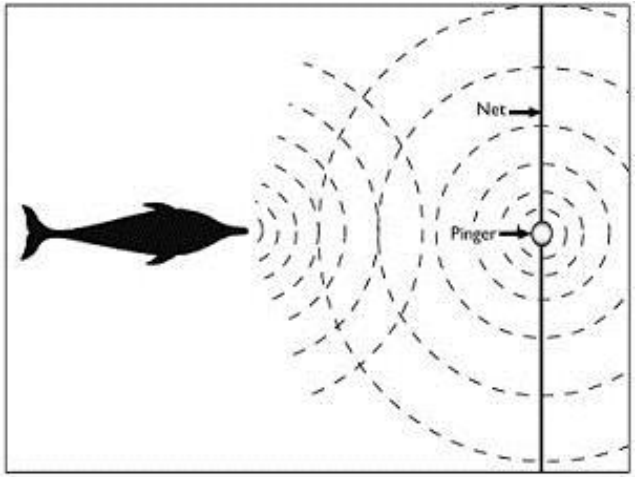
Phase 2 – ADD testing in an offshore environment

- Aim to test efficacy of ADD systems in an offshore environment

Recommendations from Phase 1:

Benefits:

- More control over mammal mitigation and less uncertainty
- Moving from a passive to active approach
- ADDs more practical, cheaper and reduce H&S risk
- Could lead to consenting reduction risk



Risks:

- Current research indicates limited effectiveness
- Complexity of testing in real world environment
- Results may not be acceptable to SNCBs

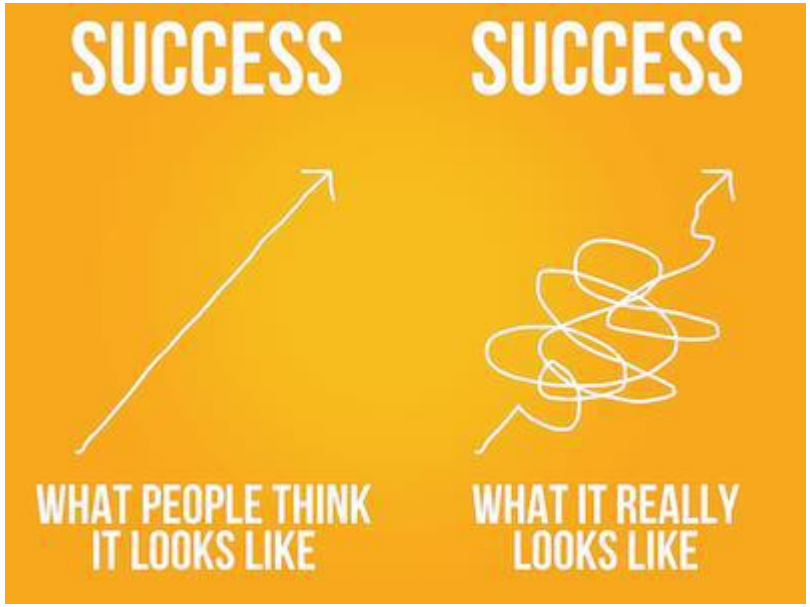
Next steps:

- ORJIP developers are meeting with SNCBs to develop an accepted scope of work.

ORJIP Offshore Wind is a Success

ORJIP has taken some time to develop, but is now starting to deliver the necessary research to better inform consenting decisions.

Without the benefit of joint industry collaboration it is unlikely these key consenting challenges would be addressed.



The move away from fossil fuel dependence is critical for the future of the marine environment.

Through collaborative research ORJIP is working to accelerate offshore consenting and progress the move to renewable energy.

Thank You

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Department of Energy & Climate Change

The Scottish Government

DONG energy

e·on

MAINSTREAM RENEWABLE POWER

RWE

SCOTTISHPOWER RENEWABLES

SSE Renewables

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