

UK Assessment of Environmental Impacts of Offshore Wind

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Offshore Wind in the UK

Regulators:

BEIS

- Responsible for issuing consent for offshore wind farms >100MW via a Development Consent Order (DCO)
- Sets strategic plan/programme for offshore energy development in UK waters
- Approves decommissioning plans for offshore renewable energy developments



Regulators:

Marine Management Organisation

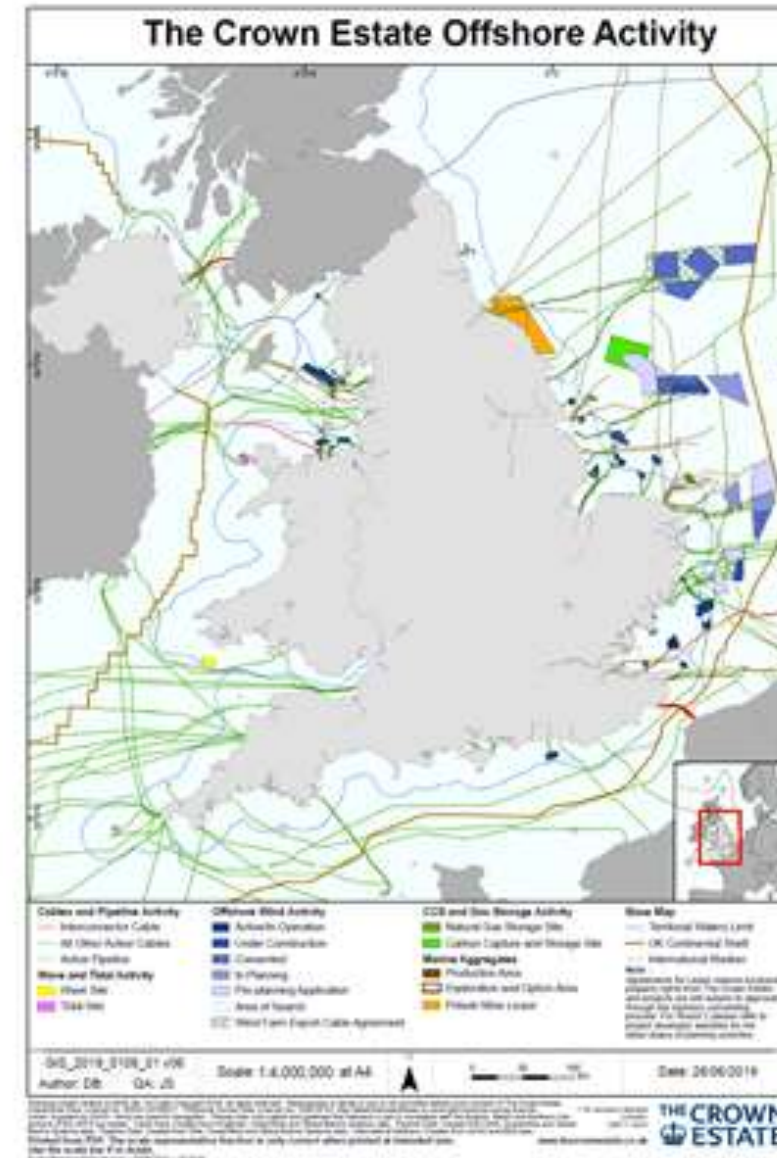
- Regulator for developments <100MW
- Issues Marine Licences and Marine Wildlife Licences for developments



Offshore Wind in the UK

The Crown Estate

- Seabed owner and manager; responsible for leasing areas of seabed for a range of activities
- Works within overarching government policy and plans when releasing areas of seabed and awarding rights



Offshore Wind in the UK

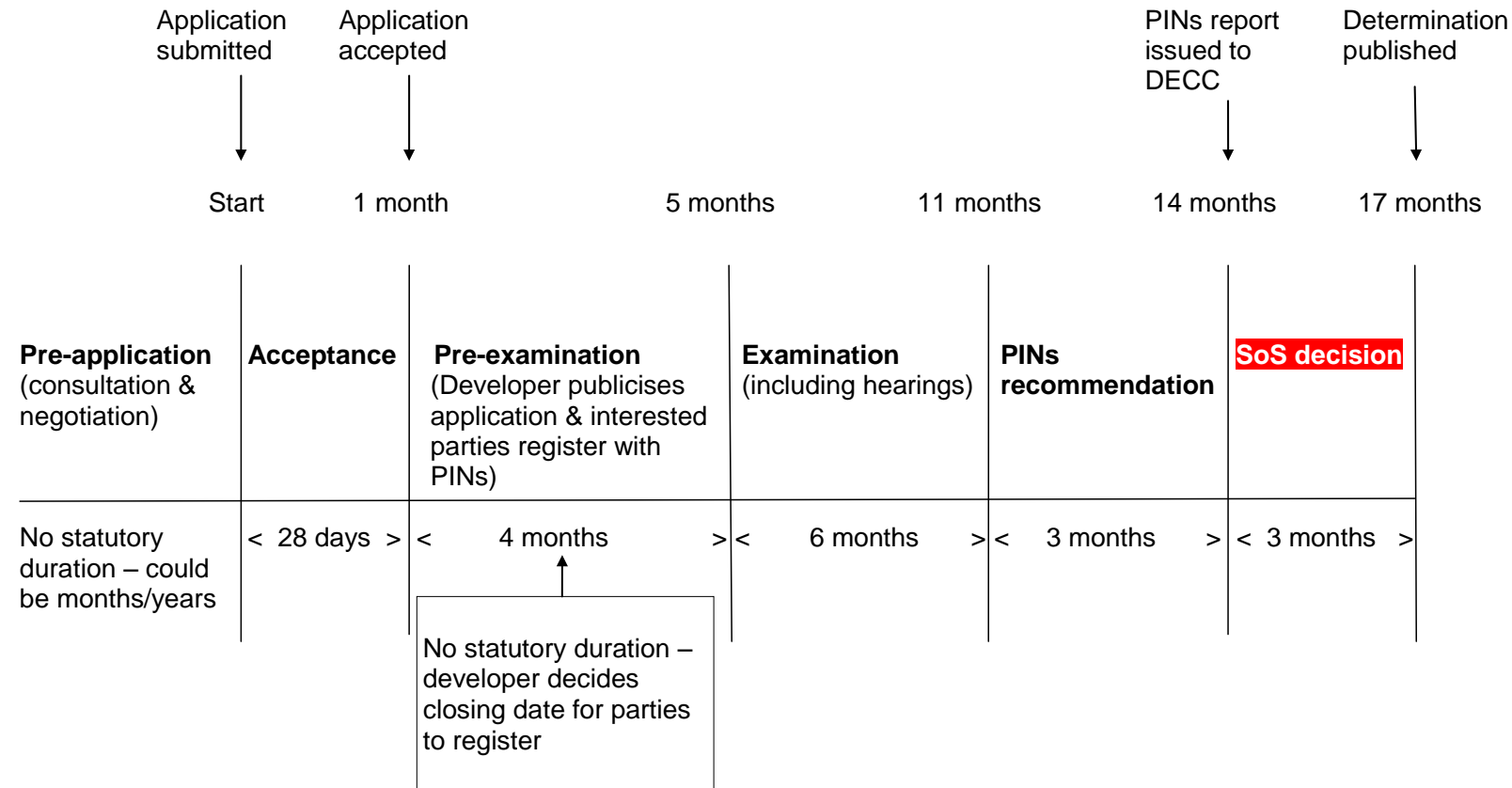
Offshore wind in the UK

- Three offshore leasing rounds to date: 2001, 2002 and 2010
- Currently an 'extension round' to existing wind farms
- Round Four leasing expected 2019
- End of May 2019 - 8.5GW installed capacity
- Sector Deal aiming for 30GW by 2030
- Net Zero by 2050 75GW??



Nationally Significant Infrastructure Projects

Planning Act (2008)





To construct an offshore windfarm developers must obtain:

- Seabed lease
- Development Consent Order
- Marine Licences (with conditions which must be discharged pre and post construction)

Project Envelopes and Changes to Projects

- Developer's application for consent and supporting EIA usually based on a project design envelope; need to maintain flexibility until Financial Investment Decision made
- EIA assesses worst case scenarios for various impacts and receptors. The 'Rochdale envelope'
- Consent issued specifies design parameter limits (based on EIA and WCS), e.g.:
 - Maximum capacity, max no. turbines/rating
 - Minimum hub height (for OWF); minimum water clearance depth (for tidal stream)
 - Permitted foundation types
 - Inter-array cabling and export cables
- Regulatory regime allows changes to be made to planned projects post-consent, through application to the regulator

European Environmental Protection

International:

- Aarhus Convention
- Espoo Convention

European:

- Habitats Directive 92/43/EEC

- Birds Directive 2009/147/EC

- Competent authority cannot authorise plan or project if it cannot rule out an adverse impact on the integrity of a European site (alone or in combination)

- Protection of European Protected Species

Strategic Environmental Assessment (SEA) Directive 2001/42/EC – plans and programmes

Environmental Impact Assessment (EIA) Directive 2011/92/EU - projects

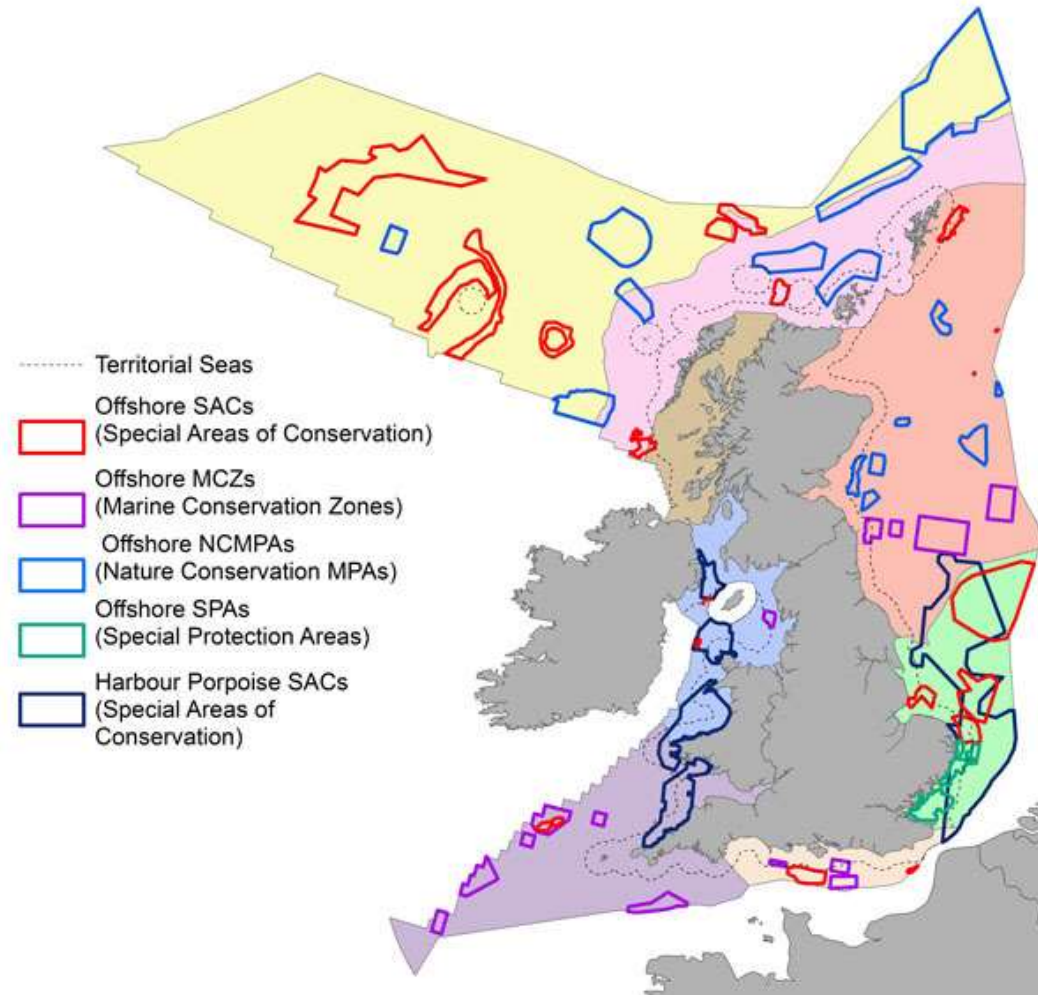
Habitats Regulations

- The **Conservation of Habitats and Species Regulations 2017** transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales.
- Natura 2000 is a network of nature protection areas in the territory of the European Union. It is made up of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated respectively under the Habitats Directive and Birds Directive.
- In accordance with the Habitats Regulations, all competent authorities, (Secretary of State for Energy Nationally Significant Infrastructure Projects – NSIPs), must undertake a formal assessment of the implications of any new plans or projects that may be capable of affecting the designated interest features of European Sites before deciding whether to undertake, permit or authorise such a plan or project. A **Habitats Regulation Assessment (HRA)**.

Protected Sites

- Special Areas of Conservation (**SACs**) and Special Protection Areas (**SPAs**) are collectively termed European sites and form part of a network of protected sites across Europe. This network is called Natura 2000.
- The Convention on Wetlands of International Importance 1972 (“the Ramsar Convention”) provides for the listing of wetlands of international importance. These sites are called Ramsar sites.
- Marine Conservation Zones (**MCZs**) domestic legislation – largely inshore waters, protect named habitat or flora.
- UK Government policy is to afford MCZs and Ramsar sites in the United Kingdom the same protection as European sites.

Protected Sites



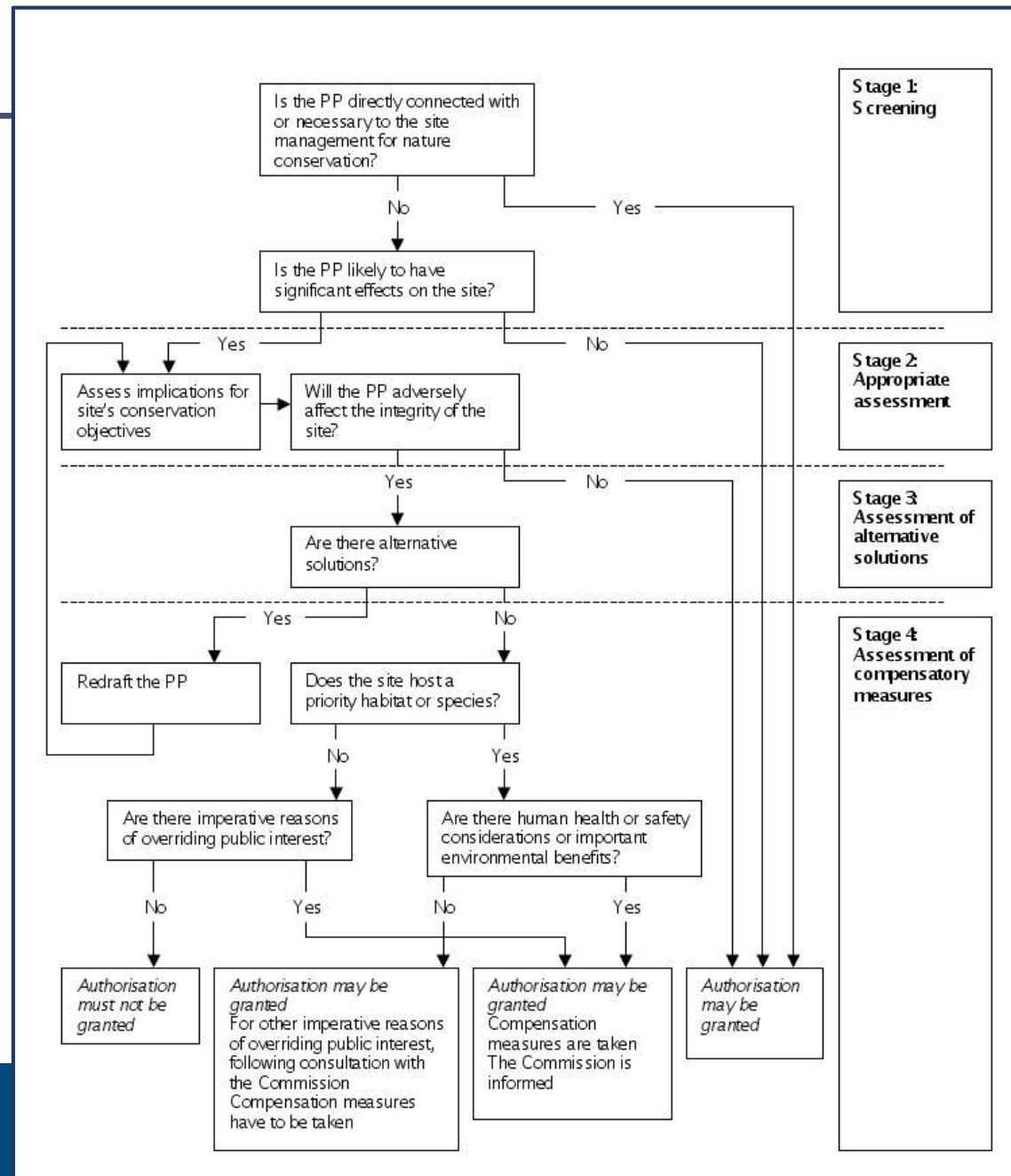
Levels of Environmental Assessment

- Strategic Environmental Assessment
 - Ongoing, funded by Government
 - Addresses gaps in environmental knowledge
- Plan level HRA
 - Undertaken when new tranche of seabed is released for lease
- Project Level HRA
 - Undertaken when issuing a Development Consent Order.



Habitats Regulation Assessment

- Assesses all of the information from Examination
- Weigh up the arguments
- Reach a view on Likely Significant Effect and Adverse Effect on Integrity
- Draft an HRA, evidence of the SoS consideration of the issues



Offshore Windfarm Environmental Assessment Process

- Development Consent Order application process is run by the Planning Inspectorate which appoints Examining Authority (~three Examiners)
- Developer must submit an Environmental Statement (includes 'shadow' HRA and EIA)
- Typical Environmental Statement can comprise over 100 separate documents
- With over 20 separate potential environmental impacts
- Anyone can make a representation at the Examination:
 - Developer
 - Statutory Nature Conservation Advisors
 - Environmental non-government organisations
 - Public
- At end of examination the Examining Authority submits report to the Secretary of State

Environmental Assessment

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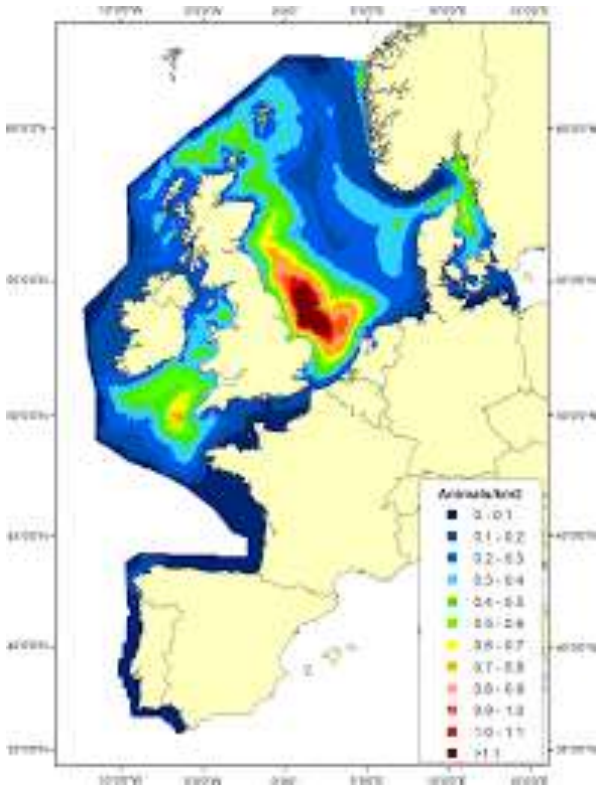
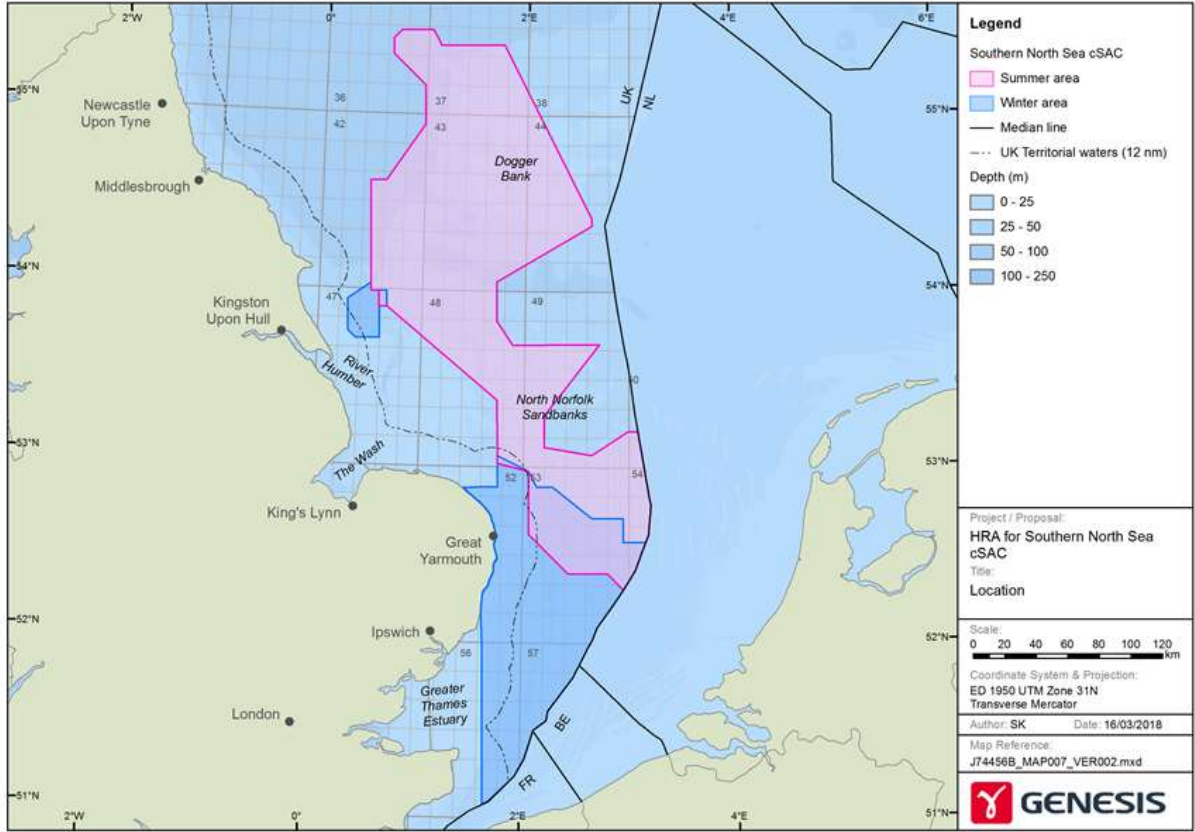
- Write a Habitats Regulation Assessment to inform the Secretary of State's decision on whether to grant a Development Consent Order.
- Consider any 'unresolved' environmental issues from the examination.
- For Offshore Windfarms in the Southern North Sea there are many issues which SNCBs, NGOs or local opposition groups could submit a representation, these are:
 - Fish and shellfish
 - **Marine mammals**
 - **Ornithology**
 - Commercial fisheries
 - Aviation, military and communications
 - Seascape*
 - Terrestrial ecology

Underwater Noise

- Particular issue in protected sites for Marine Mammals (harbour porpoise)
- Large harbour porpoise SAC in the Southern North Sea

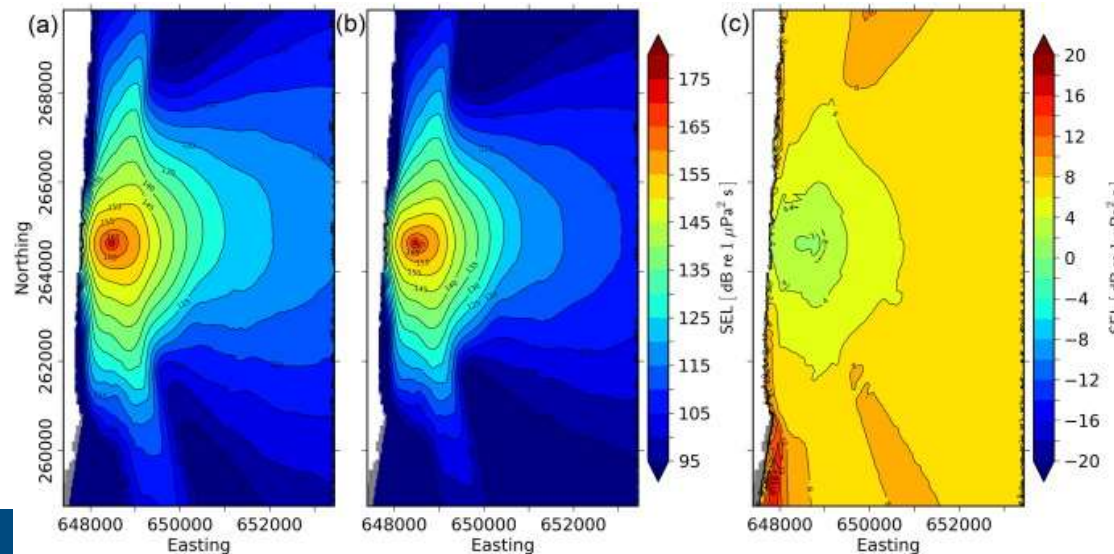


Underwater Noise



Underwater Noise

- Most wind turbines are monopiles which are installed using hydraulic 'hammer'
- Generate high levels of underwater noise
- Assessments will often include underwater noise modelling



Underwater Noise

- Piling must be considered in-combination with other offshore industries producing impulsive underwater noise:
 - Oil and Gas exploration – geophysical surveys
 - Military Sonar
 - Unexploded Ordinance Clearance
- Regulators of different industries working together



Injury Mitigation

- Marine Mammal Mitigation Plans
- Marine Mammal Observers
- Passive acoustic monitoring
- Soft Start
- Acoustic Deterrent Devices

Disturbance Mitigation - Threshold Approach

- Spatial-temporal approach within the SAC

1. Noise disturbance within a cSAC from a plan/project individually or in combination will not exclude harbour porpoises from a maximum of 20% of the relevant area³ of the cSAC for a period of 1 day⁴, and,
2. Over a season⁵, the noise disturbance within a cSAC from a plan/project individually or in combination per day will not exclude harbour porpoises from an average of 10% of the relevant area of the cSAC.

- Lead to competition from different industries

Mitigation

- Timing of construction (out of season)
- Different construction methods
- Physical mitigation



Ornithology

- Impact on birds from Special Protection Areas
- Birds which forage offshore, i.e. kittiwake, gannet
- Birds which avoid windfarms
- Impacts throughout operation



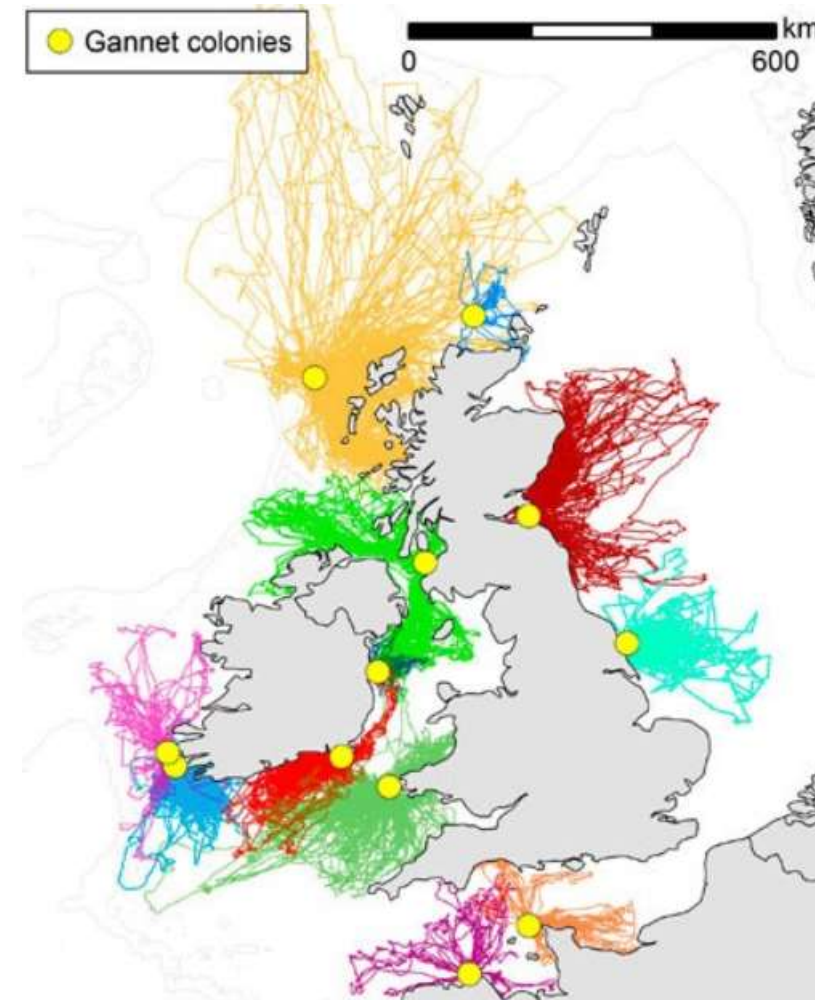
Ornithology

- Assessment reliant on modelling:
 - Collision risk
 - Avoidance
- Band Model (reliant on good empirical data)

Method		Number of collision victims per year							
		Lesser Black-backed Gull		Black-headed Gull		Brent Goose		Sandwich Tern	
SOSS Band model	(95% avoidance)		74		12		1		3
	(98% avoidance)		30		5		0		1
	(99% avoidance)		15		2		0		1
	(99.5% avoidance)		7		1		0		0
Flux Collision Model		p = 0.0073 ^b	14	p = 0.0021 ^b	2	p = 0.0008 ^a	0	p = 0.005 ^d	3
		p = 0.0108 ^b	19	p = 0.019 ^c	6			p = 0.006 ^d	2
		Average	17	p = 0.019 ^c	8			Average	2
				Average	5				

Ornithology

- More data needed for bird strike rates (difficult at sea)
- Tagging to determine habituation and avoidance
- Likely to be the cause of Adverse Effect on a protected site
- Compensation to be considered



Discharging Consent Conditions

- Narrowing 'Rochdale Envelope' before construction begins
- Surveys before and after construction and during operation:
 - Digital Aerial Surveys for birds and marine mammals
 - Seismic seabed mapping
- In-principle plans finalised, i.e.:
 - Marine Mammal Mitigation Protocols
 - Vessel movement plan
 - Site Integrity Plan
 - Decommissioning Plans

Current Challenges

- Coordinating electrical connections
- Limited space in North Sea – marine spatial planning to reduce environmental Impacts
- Working closely with Environmental NGOs to reduce risk of legal challenge
- Encourage use of new wind turbine technologies (i.e. floating turbines)





Obrigado

Qualquer questões?

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