

# Annex IV Adaptive Management Webinar

## The Survey, Deploy & Monitor (SDM) policy: an example of Adaptive Management?



Finlay Bennet,  
Marine Scotland Science

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# Overview of SDM policy & Adaptive Management



- Why was the SDM policy developed?
- What is the SDM policy (including examples)?
- How might this type of policy develop
- Where does the SDM policy sit in the context of Adaptive Management?



# Why SDM (1) - general issues



- **Political backing to achieve goal of Scotland supplying 100% of electricity demand from renewable energy sources by 2020**
- **The marine environment: high wave, wind & tidal resource potential**
- **New technologies to be deployed at relatively small scales**
- **Uncertainty regarding the impacts (acknowledgement that mechanisms for potential effects had an extremely limited empirical basis - collision risk, displacement & barrier effects)**



# Why SDM (2) – specific EIA issues



- High cost of default standard multi-year baseline surveys
- How best to survey mobile species (those species with higher levels of natural spatio-temporal variation in abundance & distribution)
- Purpose of pre-determination surveys:
  - Primarily site characterisation site for determination of proposals
  - May inform post-consent monitoring (but questions are likely to differ)
- Draft guidance on survey/monitoring marine renewables commissioned by SNH



Scottish Natural Heritage  
Dualchas Nàdair na h-Alba

All of nature for all of Scotland  
Nàdar air fad airson Alba air fad

# Why SDM (3) policy debate



Two ends of the spectrum on deciding how much baseline survey is required for project determination:

1. Increase effort over greater number of years and at larger spatial scale to fully describe natural variation (the DRIPy approach)
2. Improve confidence by focusing on measuring the mechanisms of effect post-deployment (the Deploy & Monitor approach)

Consensus that standardised 2 year baseline surveys was not proportionate in all circumstances



# What is SDM (1) – A survey policy for novel technologies



- 1 year pre-determination site characterisation survey can be proportionate & risk-based approach
- Suitable for lower risk situations:
  - Environmental sensitivity
  - Device/technology risk
  - Project scale
- Retain value of expert opinion in decision making



# What is SDM (3) – Environmental sensitivity mapping & scoring



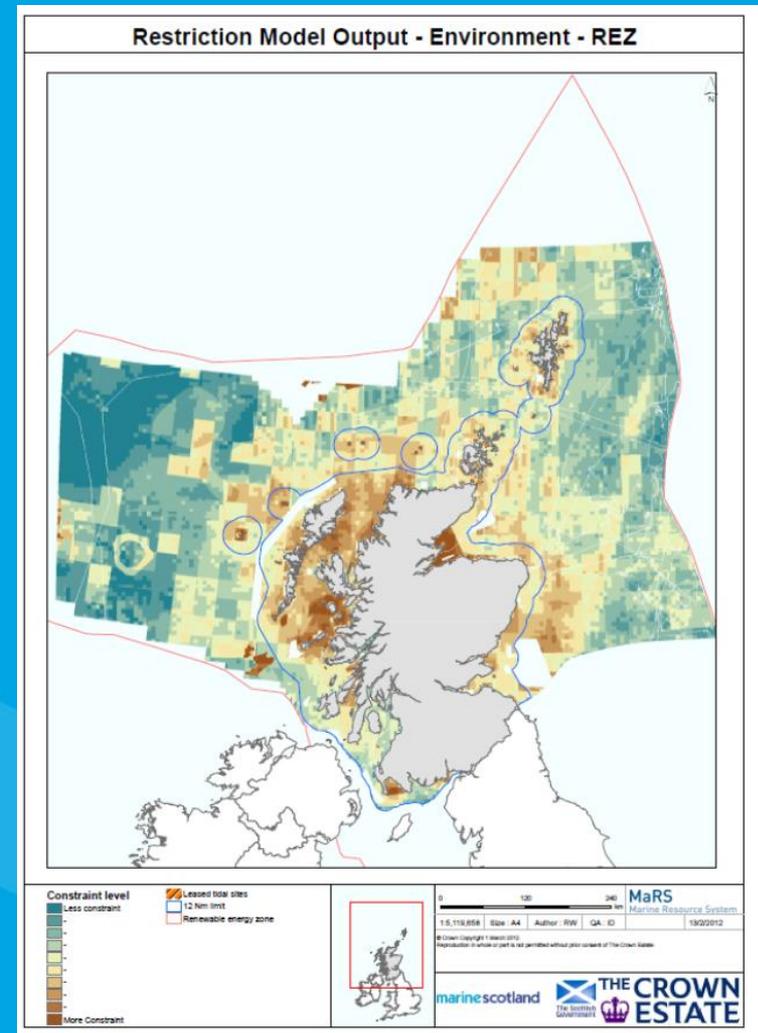
Similar to Strategic Environmental Assessment in approach and undertaken over relatively large spatial scale.

Darker brown = higher sensitivity

Map combination of 19 different sensitivity layers, each of which were weighted.

Included:

- Seabird distributions
- Marine protected areas
- Marine mammal distributions
- Fish spawning grounds



# What is SDM (4) – Device/technology risk analysis & scoring



Technology category	Technology type
Tidal	Tidal impoundment
	Tidal stream - Horizontal axis turbine
	Tidal stream - Enclosed Tips (Venturi)
Wave	Attenuator
	Point Absorber
	Oscillating Wave Surge Converter
	Oscillating Water Column
Floating Wind	Spar-horizontal axis WT
	Semi-submersible platform - Horizontal axis WT
	Semi-submersible platform - Vertical axis WT
	Tension leg - submerged platform



Technology types. Adapted from Mascarenhas et al. (2015).

# What (5) – project size



	Criteria	Assessment
Small scale	<10 MW	Low
Medium scale	10-50 MW	Medium
Large Scale	>50 MW	High



# What (6) –tidal array examples



**Nautricity 0.5 MW contra-rotating tidal turbine consented in 2014. Example where 1 year site survey informed consent decision.**

**Meygen 86 MW project proposal. High risk under the SDM policy. Phase 1 is 4 turbines. Intensive monitoring of harbour seal collision risk will inform future phases.**

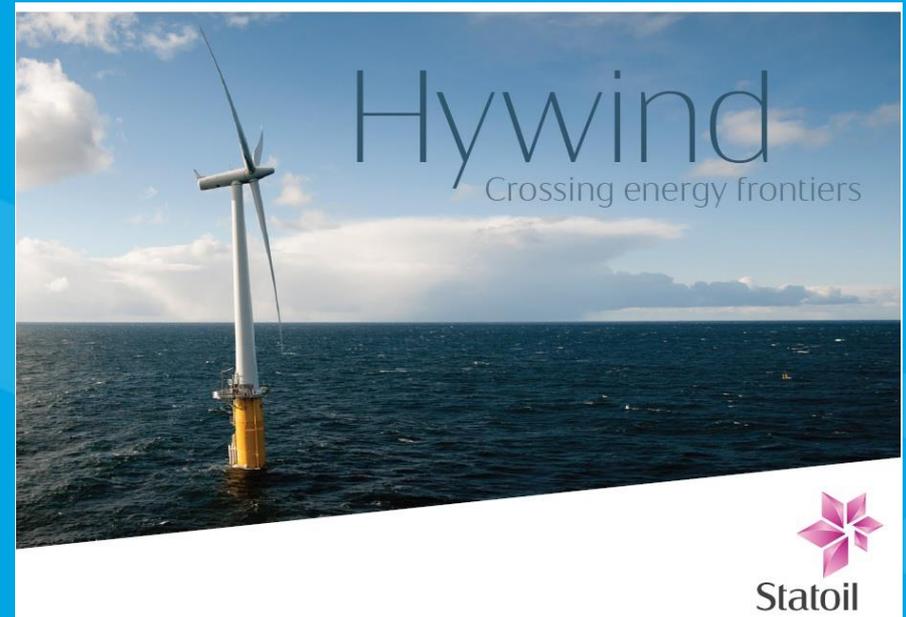


# What (7) – Floating wind example



## Hywind

- 5 devices each 6 MW
- Medium risk
- 1 year site survey found spike in auk numbers during post-breeding period
- Agreement to undertake second year of survey during this sensitive period



# Policy development (1) – NRW



The Scottish  
Government

Guidance to inform marine mammal site characterisation requirements at wave and tidal stream energy sites in Wales (Sparling *et al.* 2015)

- a more flexible approach  
(e.g. if very low likelihood that effects will exceed acceptable thresholds there is no utility in undertaking additional survey)



**Cyfoeth  
Naturiol  
Cymru**  
**Natural  
Resources  
Wales**

# Policy development (2) – RiCORE



**Aim is establishing a risk-based approach to consenting marine renewables**

- **Level of survey requirement is based on environmental sensitivity, technology risk profile and project scale**
- **Partners are from Ireland, Portugal, Spain, France and Scotland**
- **Series of workshops & reports**
- **Final conference – June 2016 in Brussels**

<http://ricore-project.eu/>



# Policy development (3) – RiCORE cont.

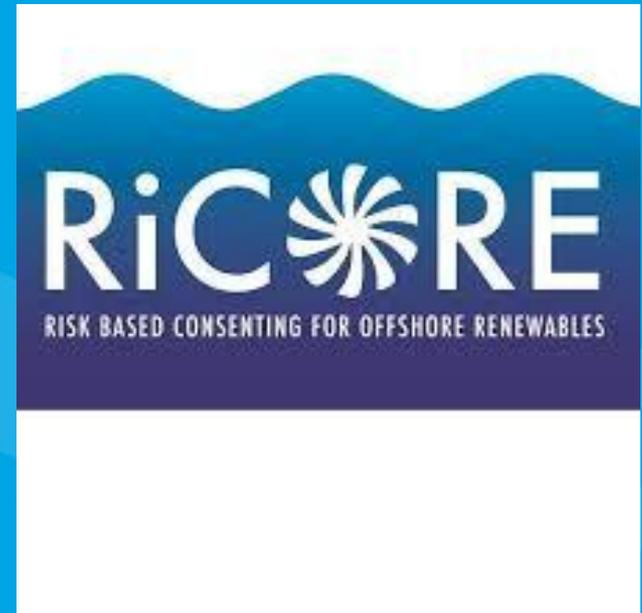


key challenges & recommendations to focus on:

Mapping sensitivity (limited data)

Assessing technology/device risk & project scale

Integrating post-consent monitoring into the process



# Policy development (4) – updating the draft SDM policy

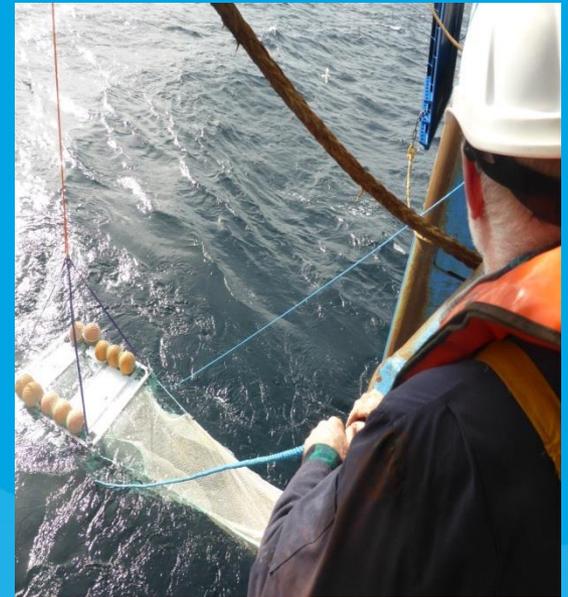


Considering developments in good practice e.g.  
RiCORE & NRW recommendations

A policy to inform post-consent monitoring

Value of demonstration projects as a means of  
reducing a scientific uncertainties

- Pooled resources enables sufficient effort
- Sufficient effort essential for robust conclusions
- Focus on key uncertainties that may affect development



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# Policy development (4) – Turning off the DRIP



Marine renewable energy suffers from the common phenomenon of being **Data Rich** but **Information Poor** (**DRIPy** data)

- MMO report on offshore windfarm monitoring 2014

Challenges associated with monitoring to reduce uncertainty:

- Spatio-temporal scales
- Tolerance thresholds of change
- Levels of necessary confidence (P values)

Rationalising the purpose of monitoring, and integrating the consequences of reducing uncertainty (e.g. mitigation, or more realistic advice combined with ceasing monitoring?).

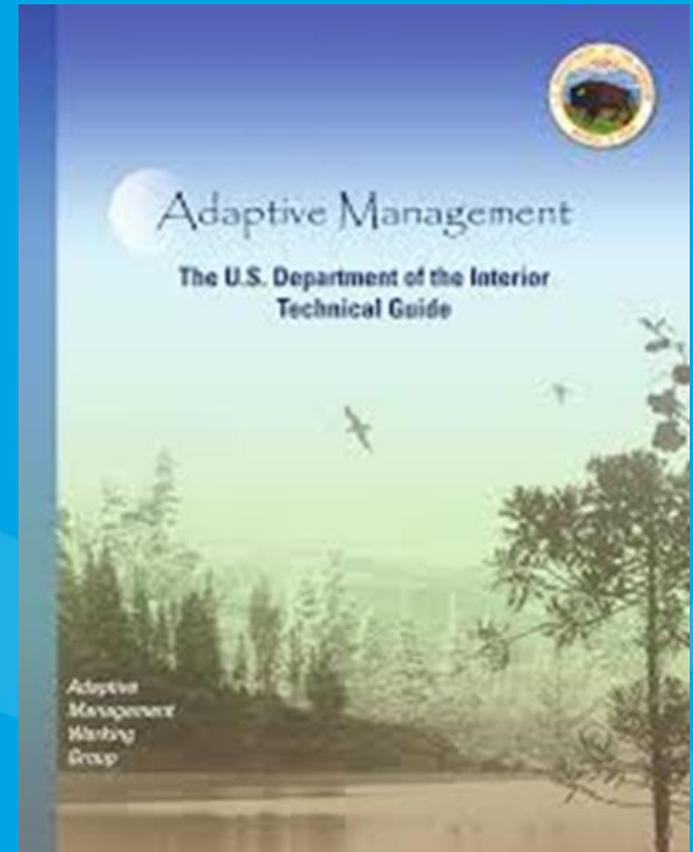


# Adaptive Management (1) – definition



Adaptive management plan  $\neq$  mitigation plan  
(reduces scientific uncertainty) (reduces impact)

Need to prioritise & balance the desire to reduce scientific uncertainty against impacts of actions



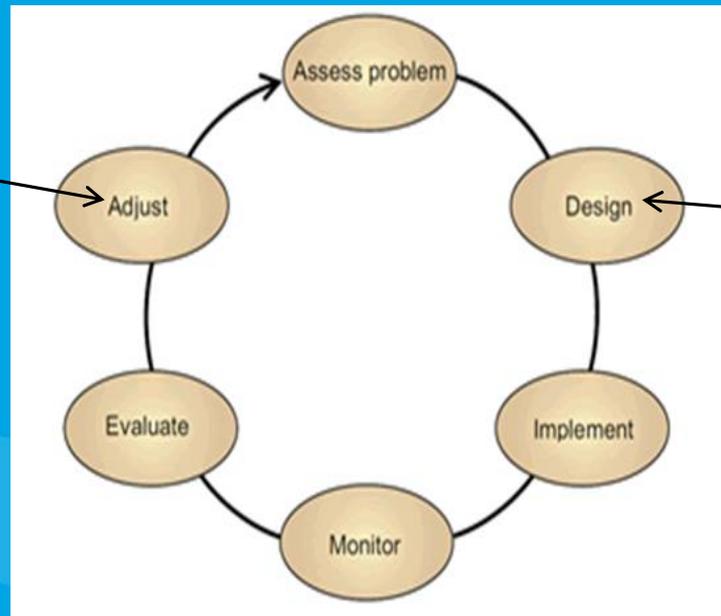
# Adaptive Management (2) – problem scoping key & SDM



1. Is some kind of management decision to be made?
2. Can stakeholders be engaged?
3. Can management objective(s) be stated explicitly?
4. Is decision making confounded by uncertainty about potential management impacts?
5. Can resource relationships and management impacts be represented in models?
6. Can monitoring be designed to inform decision making? \* 
7. Can progress be measured in achieving management objectives?
8. Can management actions be adjusted in response to what has been learned?
9. Does the whole process fit within the appropriate legal framework?

\* distinction between pre-consent monitoring and post-consent monitoring is important  
SDM informs pre-consent monitoring

# Adaptive Management (3) – feedback loop of learning



Mitigation plan to  
reduce the impact  
of the activity / or  
allow more activity

SDM policy  
provides a  
proportionate  
approach to  
mitigate at the  
Design phase

# Some conclusions



1. **SDM enables a strategic adaptive management approach through demonstration that decision making regarding pre-consent survey effort/design is risk-based & proportionate (not DRIPy).**
2. **A draft policy that could be further refined based on current/emerging best practice**
3. **It has enabled decision making over reduced time-scales**
4. **It has allowed the focus of attention to progress to question of how to reduce the scientific uncertainty and what post-consent monitoring is needed**
5. **Remaining barriers with respect to potential impacts and concern about scientific uncertainty best addressed through collaborative post-consent demonstration projects**

# References & links



The Scottish  
Government

1. U.S. Department of Interior - Adaptive Management Technical Guidance (2009)  
<https://www.usgs.gov/sdc/doc/DOI-%20Adaptive%20ManagementTechGuide.pdf>
2. SNH's draft guidance on site characterisation surveys (2011)  
<http://www.snh.gov.uk/docs/B925810.pdf>
3. Scottish Government's draft Survey, Deploy & Monitor policy (2011)  
<http://www.gov.scot/Topics/marine/Licensing/marine/Applications/SDM>
4. Scottish Government's Regional Locational Guidance (2012)  
<http://www.gov.scot/Topics/marine/marineenergy/Planning>
5. Project Novel Technology Selection RiCORE Deliverable 3.2 (Mascarenhas et al 2015)
6. Guidance to inform marine mammal site characterisation requirements at wave and tidal stream energy sites in Wales (Sparling et al 2015)  
<http://www.naturalresources.wales/our-evidence-and-reports/guidance-to-inform-marine-mammal-site-characterisation-requirements-at-wave-and-tidal-stream-energy-sites-in-wales/?lang=en>
7. MMO (2014). Review of post-consent offshore wind farm monitoring data associated with licence conditions.  
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**Thank you**

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