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**Offshore Wind
Industry Council
Pathways to Growth
Strategic Monitoring
Workshop report
and next steps**



Offshore Wind Industry Council Pathways to Growth Strategic Monitoring Workshop

Workshop report and next steps

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Annex 3 Pre-workshop Brief: Review of current UK and international approaches to strategic/regional monitoring

Author	Version	Date
K Collins	1	13 June 2023

1 Executive Summary

The Offshore Wind Industry Council (OWIC) commissioned Howell Marine Consulting (HMC) to design and deliver a collaborative workshop, bringing together stakeholders across industry and Government, to discuss strategic monitoring for offshore wind and explore options for future delivery. The workshop was held on 4 May 2023.

This report provides a summary of the outputs of the workshop, along with an overview of the pre-workshop engagement undertaken which included a review of existing strategic monitoring approaches to identify best practice and lessons learned.

A working definition of strategic monitoring for offshore wind was proposed within the pre-workshop engagement and used within the workshop:

“a multi-project approach to monitoring the impacts of offshore wind development”.

1.1 Pre-workshop Engagement

Four examples of strategic monitoring approaches were reviewed within the pre-workshop brief and circulated to participants for comment. These were:

- Regional Advisory Group(s) (RAG) for offshore wind, Scotland.
- British Marine Aggregates Regional Environmental Assessment (MAREA), England and Wales.
- Wozep offshore wind ecological research programme, Netherlands.
- Oil Sands Monitoring (OSM), Alberta, Canada.

Respondents to pre-workshop engagement generally supported the development of a strategic monitoring approach to offshore wind based on the RAG or MAREA examples. The two international examples gained less support, however their approaches towards early stakeholder engagement were seen as good practice. All approaches would need to be adapted to be relevant and useable in the context of offshore wind in England and Wales.

Respondents were also asked to rank a series of statements related to developing a successful strategic monitoring programme. This feedback was combined with survey responses during the workshop where participants were asked to rank the most important barriers to success. Taken together, the response shows a strong desire for clear leadership with policy direction, and the need for continued collaboration within a defined governance structure. Further details on the pre-workshop engagement are presented in Section 4.

1.2 Workshop Outputs

The workshop outputs, discussed in Section 5, were developed through three breakout group sessions which explored the following:

1. The agreed aims of strategic monitoring and areas of disagreement/lack of current consensus.
2. Challenges regarding the adoption of a strategic monitoring approach.

3. Steps needed to overcome the barriers and achieve the agreed aims of strategic monitoring.

1.2.1 Areas of agreement related to the principles of strategic monitoring

The first breakout group discussions resulted in the following list of principles or areas of agreement regarding what strategic monitoring for offshore wind should address::

- Increased understanding of impact at a greater level than through project level monitoring.
- Improved evidence to assess impact and design compensation and mitigation measures.
- Data standardisation and sharing
- Reduced consenting uncertainty through validation of pre-consent modelling and providing opportunities to identify development sites at both a plan and a project level.
- Consistency for developers across UK regulatory regimes and across SNCB advice for considering projects in a given area.
- Resource alignment to minimise duplication and provide cost, time and resource benefits.
- Increased opportunities to work with other sectors or academia.

1.2.2 Areas where there is currently no consensus on what strategic monitoring would look like

Additional consideration will be needed for the following points; however it was evident that there is willingness and general support for the development of strategic monitoring for offshore wind:

- The exact definition and level of ambition of “strategic monitoring” with consideration of how to group projects geographically.
- How to align competing priorities faced by developers, both within individual companies and as an industry.
- The need for strong and clear leadership. It was generally agreed that a single leadership authority was needed to define scope, level of ambition and to provide the imperative for strategic monitoring to become a key industry priority.
- Understanding whether strategic monitoring should be secured through the consenting process, or through a voluntary approach.
- Understanding how projects with different timelines could enter into a strategic monitoring programme, and how this would allow for coordination with future projects.
- How to fund and resource strategic monitoring.

1.2.3 Barriers to success and actions to overcome barriers

In the remaining two breakout sessions the areas where consensus is required in order to progress a strategic monitoring approach were used to identify priority barriers to success. These barriers related to multiple challenges. Actions were then identified for both industry and government/regulators which would help to overcome these barriers. The outcomes from these breakout sessions are presented in Table 1 below. The proposed actions need to be considered and owners identified. It is suggested that a smaller stakeholder group be formed to develop an action plan to agree deliverables.

Table 1 Actions required for strategic monitoring and associated barriers

Barrier	Remaining Challenges	Key Industry Actions	Key Government/Regulator Actions
Lack of clear, single point, of leadership	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Leadership arrangements • Procedural and legal frameworks 	<ul style="list-style-type: none"> • None identified in workshop 	<ul style="list-style-type: none"> • Define needs case and propose strategic monitoring approach to industry for discussion. • Define the decision maker / accountable body. • Consider how marine plans could be used to support the policy justification for strategic monitoring.
Commitment not secured or maintained	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Industry priorities • Urgency/timelines • Resourcing 	<ul style="list-style-type: none"> • Commit to developing strategic monitoring. • Provide statement of support and commitment that includes <ul style="list-style-type: none"> ○ Commitment to continuous engagement with government/regulators 	<ul style="list-style-type: none"> • Commit to developing strategic monitoring. • Provide statement of support and commitment.
The needs case for strategic monitoring not being defined	<ul style="list-style-type: none"> • Scope and definitions • Urgency/timelines 	<ul style="list-style-type: none"> • Revisit existing RenewableUK work of proposed strategic monitoring and update as needed. 	<ul style="list-style-type: none"> • Provide policy-backed reasons for adopting strategic monitoring. • Set out a proposed approach based on desired level of ambition. • Consider alignment with existing monitoring programmes (both synergies and differences). • Communicate sense of urgency, along with opportunities. • Consider pilot study to test proposed approach.
Resource not secured	<ul style="list-style-type: none"> • Leadership arrangements • Urgency/timelines • Resourcing 	<ul style="list-style-type: none"> • Identify key staff within companies to act as strategic monitoring leads within future discussions. 	<ul style="list-style-type: none"> • Identify key staff to engage on strategic monitoring development. • Propose funding strategy for discussion.

Barrier	Remaining Challenges	Key Industry Actions	Key Government/Regulator Actions
Approach to dealing with complexity not agreed	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Industry priorities • Procedural and legal frameworks 	<ul style="list-style-type: none"> • None identified in workshop 	<ul style="list-style-type: none"> • Propose scope and framework which integrates considerations of complexity and balances project and strategic need.
Industry competition concerns	<ul style="list-style-type: none"> • Industry priorities • Procedural and legal frameworks • Urgency/timelines 	<ul style="list-style-type: none"> • Explore potential frameworks and commercial agreements through internal company discussions with legal teams. 	<ul style="list-style-type: none"> • None identified in workshop
Data sharing and standardisation arrangements required	<ul style="list-style-type: none"> • Industry priorities • Procedural and legal frameworks 	<ul style="list-style-type: none"> • Develop voluntary approach to data sharing. 	<ul style="list-style-type: none"> • Identify best practice from other monitoring programmes and propose standardisation approaches.
Linking strategic to project level monitoring	<ul style="list-style-type: none"> • Scope and definition • Level of ambition • Industry priorities • Procedural and legal frameworks • Urgency/timelines 	<ul style="list-style-type: none"> • Identify industry barriers and opportunities (risks and benefits) to participating in strategic monitoring. • Focusing on evidence needs which are linked to priority consenting challenges 	<ul style="list-style-type: none"> • Provide clarity on regulatory barriers (what happens if one project in a cluster fails to secure consent/CfD etc)
Precedence of current approach	<ul style="list-style-type: none"> • Level of ambition • Procedural and legal frameworks 	<ul style="list-style-type: none"> • Commit to exploring new ways of working. • Commit to engagement. • Explore the transition between pre-consent/construction monitoring to post-construction monitoring to provide additional value, lessons learnt and consistency. • Consider dividing monitoring into workstreams to minimise delays in consenting and monitoring sign-off. 	<ul style="list-style-type: none"> • Work with regulators to agree ways of working and approaches towards impact assessment and monitoring conditions.
Securing strategic monitoring within consenting	<ul style="list-style-type: none"> • Procedural and legal frameworks • Urgency/timelines 	<ul style="list-style-type: none"> • Consider developing proposed voluntary approaches to deliver project monitoring through strategic approaches. 	<ul style="list-style-type: none"> • Work with regulators to agree standard conditions (where possible).

2 Introduction

The Offshore Wind Industry Council (OWIC) established the Pathways to Growth (P2G) workstream as part of the Offshore Wind Sector Deal, aiming to identify and overcome strategic deployment barriers in relation to consents and cumulative environmental impacts for offshore wind development in the UK.

P2G is supported by the P2G Coordination Group – a group comprising representatives from government, Statutory Nature Conservation Bodies (SNCBs), regulatory bodies, offshore wind trade organisations and developer representatives. This group identified 10 ‘barriers’ that they believe will have the greatest negative impact on the future deployment of offshore wind if they are not resolved. These “Barriers to Growth” are outlined at [OWIC | Pathways to Growth](#).

Barrier 9 (strategic data) is defined as “the different approaches to collecting monitoring data at project sites across the UK is preventing the development of a coordinated, robust evidence base to support the understanding and potential resolution of uncertainty regarding impacts from offshore wind developments”. A key ambition within the strategic data barrier is to use lessons learned from other countries and sectors to help develop strategic monitoring across the UK. It was agreed with the P2G Coordination Group that a workshop to explore some of these lessons should be held to drive forward discussions about taking a more strategic approach to offshore wind post consent monitoring. eddebated in the workshop were the following:

- What lessons can we learn from strategic monitoring in other countries / sectors?
- What do we want strategic monitoring to look like?
- How do we move forward to adopt this approach?

Howell Marine Consulting (HMC) was commissioned by P2G to design and deliver a collaborative workshop, bringing together stakeholders across industry, and Government, to discuss strategic monitoring and work towards an agreed approach for its development.

The workshop, held on 4 May 2023, provided an opportunity to create an initial shared vision for what could (and could not) be supported in terms of strategic monitoring. Participants were invited to actively engage in working towards an action plan for adopting a strategic monitoring approach for offshore wind and the workshop focussed on the following areas of discussion:

- Potential solution for strategic monitoring (exploring whether there was a shared vision)
- Challenges to achieving potential solution (priority barriers to success)
- Steps that need to be taken to overcome barriers

This report provides a description of the workshop along with pre-workshop engagement which included case studies of existing strategic monitoring approaches used both within the UK and internationally.

The report is structured as follows:

- **Section 3** outlines the workshop approach.
- **Section 4** provides details of the pre-workshop engagement undertaken by HMC and the feedback received from participants which helped to frame workshop discussions.

- **Section 5** details the workshop outputs, including areas of consensus or agreement and areas of disagreement related to strategic monitoring vision and barriers. This section also details the agreed actions to be taken forward for a strategic monitoring approach to be implemented.
- **Section 6** recommends next steps which should be taken to develop a strategic monitoring approach, based on workshop outputs.

3 Workshop approach

The workshop was designed to allow participants to actively participate in building a shared vision for strategic monitoring, identify barriers from their perspectives and to work towards an action plan for implementing a strategic approach to monitoring for offshore wind. The workshop was held online over a full day and comprised a series of “knowledge sharing” sessions and breakout group activities. The workshop agenda is provided in Annex 1 along with the list of organisations and companies represented by attendees.

3.1 Knowledge sharing sessions

Short presentations were given by the following speakers to help frame discussions:

- **Defra: Offshore Wind Strategic Monitoring.** Lisa Irwin, Head of Offshore Wind Environmental Standards and Monitoring, Marine and Fisheries Directorate.
- **Defra: Marine Natural Capital Ecosystem Assessment (mNCEA) and Strategic Monitoring.** Rohan Allen, Head of Data and Analysis, Strategic Data and Evidence team, Marine and Fisheries Directorate.
- **Marine Scotland: Regional Advisory Groups in Scotland** Gayle Holland, Head of Offshore Renewable Energy Consenting.
- **NnG Offshore Wind/EDF: RAG approach – a developer’s perspective.** Polly Tarrant, Environment Manager.
- **Mineral Products Association/BMAPA: Regional approach to delivery – A marine aggregates industry perspective.** Mark Russell, Executive Director.

In addition to these presentations, speakers took part in Q&A sessions and contributed their knowledge to the breakout sessions described below. Presentations were also given by the P2G Coordination Group Manager, Rachael Mills, and HMC Principal Consultant, Kathryn Collins, on the pre-engagement feedback. Presentation slides are included in Annex 2.

3.2 Breakout groups

Active participation was encouraged during the workshop through the use of breakout rooms which split participants into three groups containing a mix of industry, government/regulator and NGO stakeholders. Discussion within the groups was facilitated by members of the HMC team, and comments were collected using the online whiteboard tool Miro.

Session 1 asked participants to discuss potential solutions for strategic monitoring, or what strategic monitoring should aim to address. Areas of agreement and disagreement were recorded and discussed within a full group feedback session.

Session 2 asked participants to identify the challenges they perceive regarding the adoption of a strategic monitoring approach. This session provided a list of priority barriers as well as comments on these barriers.

Session 3 asked participants to identify the steps needed to overcome the barriers and achieve the aims discussed in earlier session. The output of session 3 was a list of potential actions which participants felt were needed from both an industry and a government perspective.

4 Pre-workshop engagement

4.1 Pre-workshop report

In preparation for the workshop, and to provide workshop participants with background information on strategic monitoring, HMC produced a paper and summary report reviewing current UK and international approaches to strategic (or regional) monitoring. Feedback was sought on the summary report, discussed in Section 4.2, which helped to shape the workshop agenda and start to identify key themes of agreement and disagreement.

The report defined strategic monitoring, for the purposes of discussion in the OWIC workshop, as “a multi-project approach to monitoring the impacts of offshore wind development”.

Four strategic monitoring approaches were detailed within the pre-workshop reporting. These are outlined below along with the benefit of these as case studies for exploring strategic monitoring for offshore wind. The pre-workshop brief provided analysis of the benefits, challenges and applicability of each approach and these details are included in Annex 3.

4.1.1 Regional Advisory Group(s) (RAG) for offshore wind, Scotland.

This approach is currently used in the Forth & Tay and Moray Firth areas in Scotland and has been set up as a partnership established by Scottish Government. The RAG aims to ensure that appropriate and effective monitoring of the impacts of the developments are undertaken to satisfy the requirements of the Section 36 consent and marine licence conditions of offshore wind farms within their geographic areas. This case study is highly relevant to current strategic monitoring discussions for the rest of the UK as it is an established approach, albeit within a different consenting regime.

4.1.2 British Marine Aggregates Regional Environmental Assessment (MAREA), England and Wales.

This approach was developed to address wider scale cumulative effects for the marine aggregates industry and to overcome a specific need related to securing marine licences for aggregates extraction following the establishment of the marine licensing system under the Marine and Coastal Access Act. This industry led, voluntary approach was endorsed by British Marine Aggregates Producers Association (BMAPA), The Crown Estate and the Marine Management Organisation (MMO) and is now used for post-consent monitoring. The case study was included to illustrate how consenting challenges can be overcome to successfully implement strategic monitoring, and to explore the barriers faced in agreeing such an approach.

4.1.3 Wozep offshore wind ecological research programme, Netherlands.

This approach is run by the Dutch government and was formed to advance understanding of how offshore wind farms impact protected species and to provide the best possible estimate of ecological impact when developing roads maps for proposed offshore wind developments. Whilst this approach encompasses a wider remit than is currently possible within the England and Wales context, in that it was designed to identify offshore wind sites at a strategic plan level, it has been included as a case study due to its approach to early engagement with

stakeholders and success in integrating an adaptive approach to offshore wind impact assessment.

4.1.4 Oil Sands Monitoring (OSM), Alberta, Canada.

This approach brings together existing monitoring programmes to understand cumulative impacts associated with the Oil Sands Industry. It is a voluntary approach where participating stakeholders, including developers, can choose their level of engagement and therefore the opportunities they have to benefit from shared data and collective approaches. Whilst this approach, like Wozep, is wider than sectoral consent-related monitoring best practice can be drawn from it in relation to how the programme operates a nested model in which different impacts can be explored by different stakeholder groupings as needed or desired.

4.2 Pre-workshop engagement feedback

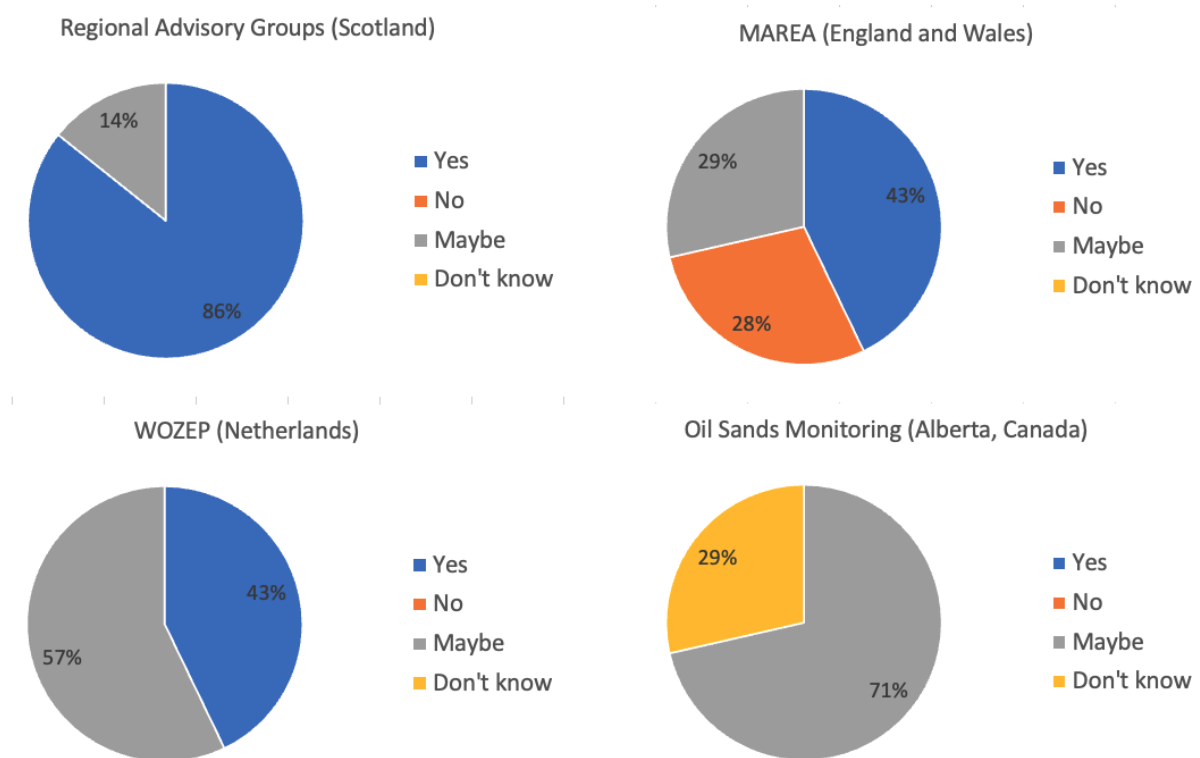
The pre-workshop brief was accompanied by a survey to gather initial thoughts on the strategic monitoring examples and the suggested key elements of a successful strategic monitoring approach for offshore wind provided by the P2G Coordination Group Manager. The survey was completed by seven respondents and whilst this response rate is low, it does provide valuable data relating to workshop participants views on strategic monitoring approaches. The feedback received was used to help to frame the workshop, based on the comments received. This feedback is outlined below, and was presented during the workshop (see Section 3.1, and Annex 2) focusing on the key insights and messages from respondents.

4.2.1 Support for a strategic monitoring approach based on the case examples provided.

Respondents were asked to state whether or not they would support the implementation of a strategic monitoring approach for offshore wind based on wider use of the RAG approach (i.e. applying a similar approach in England and Wales), a MAREA-style approach, a Wozep-style approach and an OSM-style approach.

Figure 1, below, shows the responses for the question “would you support use of the example approaches for implementing strategic monitoring for offshore wind in the UK? Generally, respondents were very supportive of the RAG approach and mostly supportive of a MAREA-style approach with some amendments. A Wozep-style approach was also generally supported, noting that the full approach would not currently fit with the UK regulatory or policy landscape, no respondents stating that they would not support it. Respondents were unsure on what level of support they would give to an OSM-style approach, with all either stating “Maybe” or “Don’t know”.

Figure 1. Pre-workshop Engagement Feedback: “Would you support the use of the example approaches for implementing strategic monitoring for offshore wind in the UK?”



4.2.2 Adaptations needed and challenges identified within the case examples

For each strategic monitoring example respondents were asked for their thoughts on any elements of the approach that would need to change to make it applicable for offshore wind strategic monitoring in the UK, and for any barriers or challenges that might make a similar approach unfeasible. Key statements received from respondents are provided below.

Regional Advisory Groups (RAGs)

Expanding the use of a RAG approach to England and Wales would need consideration of geographic scale and number of participants. Changes needed to adapt the approach as currently implemented in Scotland may include the need for a central coordinator rather than developers sharing secretariat responsibility. In addition, geographic alignment could be considered based on the Marine Plan Areas to define a regional approach.

Currently the RAG only considers post-consent monitoring requirements and this could be expanded if applied to England to include pre-consent monitoring. Regulatory complexity in England and Wales, with reference to the Development Consent Order (DCO) process was stated as a challenge to be overcome. Other regulatory challenges were noted by respondents including disparity between The Crown Estate leasing process and development consenting, and the Holistic Network Design process.

Marine Aggregates Regional Environmental Assessment (MAREA)

Respondents stated that whilst a regional approach could work for offshore wind monitoring, the MAREA approach would need to be amended so that each set of regional projects was managed by an independent organisation, rather than the wind farm developers themselves. The difference in scale between the aggregates and the offshore wind industries would also need to be considered and it was felt by respondents that a voluntary, industry-led, approach would not currently be suitable for offshore wind strategic monitoring as the terms of the approach are not universally agreed.

Challenges raised related to a MAREA-style approach included concerns over funding uncertainty, and how commitments and participation could be secured within a voluntary approach.

WOZEP

Respondents felt that whilst the comprehensive nature of WOZEP was attractive, it is difficult to see how such an all-encompassing approach could be applied to the mature offshore wind sector in the UK. Governance support from a range of stakeholders, from both industry and government would be required and more regional approaches would still be required to sit within a wider programme. The use of adaptive management, seen in WOZEP as well as other strategic monitoring approaches, would also need to be defined and agreed for such an approach to be implemented.

Funding and government coordination were seen by respondents as key barriers to implementation of a Wozep-style approach. In addition, it was felt that, with the maturing of offshore wind in the UK, the plan-check-do approach used within Wozep would require a radical reform of current leasing, planning and consenting practices.

Oil Sands Monitoring (OSM)

Within OSM, stakeholders can choose their level of participation into specific monitoring projects within the overarching programme. It was felt by respondents that this voluntary approach would need to be changed for a similar monitoring programme to be implemented for offshore wind in the UK.. The reasoning behind these statements from respondents required additional investigation and the use of voluntary approaches was a theme considered in the workshop. Like other case example approaches, it was felt that an independent organisation would be needed to coordinate and run a similar programme for offshore wind.

4.2.3 Key elements of a successful strategic monitoring programme

Respondents were asked to rank statements suggested by the P2G Coordination Group Manager related to developing a successful strategic monitoring programme in order of importance for delivering a successful strategic monitoring programme. The statements were ordered by respondents as follows:

1. Clear leadership with policy direction provided by government.
2. A governance structure to oversee the outputs.
3. Engagement with industry and at an early enough stage to ensure objectives are deliverable.
4. Requirements driven programme design.
5. Data sharing agreements and agreed parameters around when and how data can be made publicly available.
6. Mandatory data standards to ensure the data can be analysed collectively.

7. Agreement across government, regulators and SNCBs on the scale monitoring to ensure the data provides meaningful evidence.
8. Ongoing collaboration across government, regulatory and advisory bodies, academia and eNGOs.
9. An associated knowledge transfer programme that actively data outputs into practical findings.

This ordering shows a clear need, according to respondents, for government to provide leadership and policy direction related to strategic monitoring. A clear governance structure and continued engagement with industry during the design of any strategic monitoring programme also ranked highly.

5 Workshop outputs

This section summarises the discussions held within the three breakout sessions:

1. The agreed aims of strategic monitoring and areas of disagreement/lack of current consensus.
2. Challenges regarding the adoption of a strategic monitoring approach.
3. Steps needed to overcome the barriers and achieve the agreed aims of strategic monitoring.

The information from each breakout session, collected on the Miro boards, has been combined and analysed to allow common themes to be identified and for the feedback and discussion to be presented accordingly.

Crucially for the purposes of working towards an agreed strategic monitoring approach these outputs include both areas of consensus and areas of disagreement. All comments made during the workshop have been anonymised. It should be noted that whilst the workshop was attended by a good mix of stakeholders (regulator, industry, consultant, SNCB), the outputs below represent the views of those who attended the workshop and should not be considered as definitive views of industry, government or other organisations.

5.1 Building a shared vision for strategic monitoring

The first breakout discussions focussed on what strategic monitoring for offshore wind could look like and sought to identify areas of consensus on a shared vision. Comments collected during this session have been grouped into themes covering areas of general agreements between participants, and areas where more consideration is needed prior to forming an agreement. The outputs of these discussions are detailed below.

5.1.1 Main points of agreement or consensus

The areas presented below were broadly agreed during the workshop. It should be noted that while consensus was identified relating to these areas as high-level points of agreement, the detail of what each area includes would need further definition. For example, point one “increasing understanding” states that increasing understanding of offshore wind impacts through strategic monitoring would be beneficial and is an agreed aim in developing such a programme. However, the details of the content of that understanding are complex and will need additional scoping before agreement can be reached. As such, these areas of agreement should be viewed as a set of principles which a strategic monitoring approach should work to. The points of agreement and details from the first breakout group discussion are presented in Table 2.

Table 2 Points of agreement regarding the aims of strategic monitoring

Point of agreement / Principle for strategic monitoring	Statements drawn from breakout group discussions
Increasing understanding	<ul style="list-style-type: none"> • A strategic monitoring programme for offshore wind should be designed so that it increases understanding of the environmental impact of development. • Successful strategic monitoring needs to deliver a greater level of understanding than is currently possible through individual project level monitoring. • Strategic monitoring should go beyond data collection and to use multi-project data to fill evidence gaps related to cumulative effect and receptor population level monitoring at appropriate temporal and spatial scales • Allow consideration of ways to address key issues which are too great to be considered at a project level.
Building the Evidence Base and Validating Predictions	<ul style="list-style-type: none"> • Improving the evidence base used to assess impact and design compensation and mitigation measures. • A stronger evidence based would help to validate predictions from Environmental Impact Assessment and allow for transparent reporting and analysis.
Data Standardisation and Sharing	<ul style="list-style-type: none"> • The evidence base needed to support a strategic approach to monitoring needs to be populated with comparable data • Agreeing to standard approaches to data collection are necessary. • Increased data standardisation requires guidelines regarding the methods of presenting results, and this could utilise the Marine Data Exchange. • Collected data needs to be shared with relevant stakeholders.
Refining Mitigation (PCM, pre/post, lessons learnt, closing feedback loop)	<ul style="list-style-type: none"> • A strategic approach should aim to refine the mitigation measures needed for development projects. • There is an opportunity for strategic monitoring to focus on more than post-consent monitoring, and in so doing compliance monitoring outputs could help to close the feedback loop related to how lessons are learnt from consented and constructed projects for those still in the pipeline. • Could create opportunities to use existing monitoring to design less impactful projects and identify appropriate mitigation.
Reducing Uncertainty	<ul style="list-style-type: none"> • A successful strategic monitoring approach needs to reduce consenting uncertainty. • Wider than pre-consenting monitoring requirements although a strategic approach would aid the validation of these. • Opportunities to use a strategic approach to identify development sites at both a plan and a project level.

Point of agreement / Principle for strategic monitoring	Statements drawn from breakout group discussions
	<ul style="list-style-type: none"> • Standardisation of data collection and analysis should help to agree impacts and approaches to mitigation with regulators and statutory nature conservation bodies (SNCBs), whilst still allowing for site-specific considerations. • A successful strategic monitoring approach would increase confidence in predicted effects which inform planning and consenting.
Consistency of approach	<ul style="list-style-type: none"> • A strategic monitoring approach should provide consistency for developers across UK regulatory regimes and across the advice provided by SNCBs when considering projects in a given area. • Consistency of reporting was also seen as an important aspect of using strategic monitoring to increase understanding and reduce consenting risk.
Aligning Resource	<ul style="list-style-type: none"> • Resource alignment is needed to minimise duplication of effort and bring about cost, time and resource benefits. • Aligning resource would allow for both the consideration of synergistic monitoring for pre- and post-consent project monitoring, and to provide more holistic responses to research needs related to cumulative or ecosystem level assessment.
Supporting other initiatives	<ul style="list-style-type: none"> • A strategic monitoring approach should address key questions rather than limiting ambition to speeding up project consenting and limiting risk. • Could increase opportunities for industry to work with other sectors or academia through sharing data and resources. • Clear desire from industry representatives for the outputs of strategic monitoring to be a valuable asset as part of wider contribution to combatting climate change and support strategic compensation.

5.1.2 Main points to consider before agreement can be reached

General agreement towards the development of strategic monitoring approach for offshore wind is clear from the themes discussed above. Whilst this agreement is useful for building a needs case to adopt a strategic approach, the details require further consideration before agreement can be reached. Key points from workshop discussions are outlined below in Table 3.

Table 3 Areas where consensus hasn't yet been reached regarding strategic monitoring

Areas yet to be agreed	Details from breakout group discussions
Scope and definitions	<ul style="list-style-type: none"> • There is currently no consensus on exactly what we mean by “strategic monitoring” • TheThe working definition used in the workshop was that strategic monitoring referred to a multi-project approach to monitoring the impacts of offshore wind development, however thisthis definition is not universally agreed. • The scope of a strategic monitoring / multi-project approach needs to be decided • Consideration is also needed about how to group projects which span UK national borders and therefore consenting regimes.
Level of ambition	<ul style="list-style-type: none"> • Ambition could be limited to post-consent monitoring for small clusters of offshore wind developments or could be as wide as a fully integrated national-level strategic monitoring approach to marine management, cross sector and with additional research components. • Any strategic monitoring proposals should not be burdensome or duplicate the resource needs of project-level monitoring • The overall aim of strategic monitoring has not been agreed between all stakeholder groups.
Industry Priorities	<ul style="list-style-type: none"> • Different developers maintain different financial appetites towards contributing to a strategic approach, and the competitive nature of the industry along with commercial sensitivities can result in a reluctance to invest time and resource in voluntary schemes where the benefit is not clear.
Leadership arrangements	<ul style="list-style-type: none"> • Strong and clear leadership is needed to build momentum for strategic monitoring. • A single leadership authority may be needed to define scope, level of ambition and to provide the imperative for strategic monitoring to become a key industry priority but there is currently no agreement on who should lead. • Suggestions include Defra, regulators (such as the MMO), a developer-led task force, or an independent coordinating body from either industry or regulator side.
Procedural and legal frameworks	<ul style="list-style-type: none"> • There remains disagreement between stakeholders regarding whether strategic monitoring should be secured through the consenting process, or through a voluntary approach. • If developers can be assured that strategic monitoring decreases consenting risk then it is likely that a voluntary approach could be secured, however given the current lack of agreement on scope and ambition it is likely that a more formal approach would be needed.

Areas yet to be agreed	Details from breakout group discussions
	<ul style="list-style-type: none"> • Questions remain on how strategic monitoring could be secured through the consenting process.
Urgency/timelines	<ul style="list-style-type: none"> • Aligning developer timelines is a challenge that requires additional consideration before implementing a strategic monitoring approach. • There remains little consensus on the urgency of developing a strategic monitoring approach.
Resourcing	<ul style="list-style-type: none"> • How strategic monitoring would be funded, and who would need to feed into its development, is still to be agreed. • Dedicating staff and finance to strategic monitoring programmes competes with other industry priorities, and without a strong needs case it is challenging to justify the resource.

5.1.3 Working towards consensus

From the discussions held in the first workshop breakout sessions it is clear that there is a willingness from developers to explore a strategic monitoring approach. The areas where agreement on a vision for strategic monitoring require additional consideration fundamentally relate to the need to agree the questions that strategic monitoring wants to answer. The key areas of ambition, scope and leadership arrangements require agreement, or proposed definitions, before a strategic monitoring approach could be adopted. The other areas of disagreement relate to the lack of clear need, or urgency, to prioritise resource towards developing a strategic monitoring approach.

5.2 Priority barriers to success

Building on the strategic monitoring vision discussions and with focus on areas which require additional consideration prior to agreement, the second breakout group sessions focussed on the barriers which need to be overcome for a successful strategic monitoring approach. Many of these barriers directly relate to at least one of the areas requiring agreement outlined above, and this is illustrated in the table below.

Table 4 outlines the priority barriers for success identified by workshop participants and provide additional details under each of their headings. The actions needed to overcome the identified barriers are discussed in Section 5.3.

Table 4. Priority barriers to success

Barrier	Related area(s) of disagreement	Details
Lack of clear, single point, of leadership	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Leadership arrangements • Procedural and legal frameworks 	Without a focal point and authority for driving forward strategic monitoring, setting level of ambition and scope, it is unlikely that the positive discussions on the potential of strategic monitoring will develop into actions.
Commitment not secured or maintained	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Industry priorities • Urgency/timelines • Resourcing 	Without commitment from both government and industry, strategic monitoring cannot be developed. Previous proposals for strategic monitoring approaches have failed to gain the momentum needed to be implemented and without there is reluctance to commit time and resource to engagement without a clear direction being set out.
The needs case for strategic monitoring not being defined	<ul style="list-style-type: none"> • Scope and definitions • Urgency/timelines 	Whilst it is generally considered that strategic monitoring would be beneficial for both industry and regulators, a barrier still exists in defining exactly why the approach is needed. Without clear objectives, purpose and a defined shared vision it is challenging to provide a statement of need to implement a change of approach.
Resource not secured	<ul style="list-style-type: none"> • Leadership arrangements • Urgency/timelines • Resourcing 	Currently there is no incentive to fund or provide resource to developing strategic monitoring approaches. Without a clear need to do so, it is challenging to dedicate time or financial support to developing an approach.
Approach to dealing with complexity not agreed	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Industry priorities • Procedural and legal frameworks 	There is no doubt that both offshore wind development and their environmental impacts are complex. Different projects face different challenges, issues and uncertainties. With a large number of variables to consider, large geographic scale and the potential for projects to require multiple consents across different regulator regimes, complexity remains a key barrier to agreeing the scope and ambition of strategic monitoring.
Industry competition concerns	<ul style="list-style-type: none"> • Industry priorities • Procedural and legal frameworks 	Developers may express a desire to work together, as evidenced in Section 5.1, however financial competition between developers, and commercial sensitivities around consenting and CfD (contracts for difference) are a challenge, particularly related to data sharing.

	<ul style="list-style-type: none"> • Urgency/timelines 	
Data sharing and standardisation arrangements required	<ul style="list-style-type: none"> • Industry priorities • Procedural and legal frameworks 	<p>Balancing data sharing (both between developers and with other stakeholders) and maintaining levels of confidentiality is a specific challenge related to the commercial side of offshore wind development.</p> <p>Likewise, there is currently no requirement to standardise data collection or analysis and without this it is challenging to use existing data to inform strategic monitoring.</p>
Linking strategic to project level monitoring	<ul style="list-style-type: none"> • Scope and definition • Level of ambition • Industry priorities • Procedural and legal frameworks • Urgency/timelines 	<p>Connected to the need for a defined reason to adopt strategic monitoring, agreement is needed on how strategic monitoring programmes would interact with individual projects. A concern exists that failure of strategic monitoring programmes could jeopardise projects and without assurance against this, the competitive nature of offshore wind development is likely to remain a barrier to strategic monitoring.</p>
Precedence of current approach	<ul style="list-style-type: none"> • Level of ambition • Procedural and legal frameworks 	<p>Related to the statement of need for strategic monitoring, there is current precedence for not adopting such an approach. Precedence of the current approach to consenting and monitoring can be considered as a barrier to innovation. Likewise, there is a challenge faced in retrofitting a new strategic approach to an existing system.</p>
Securing strategic monitoring within consenting	<ul style="list-style-type: none"> • Procedural and legal frameworks • Urgency/timelines 	<p>Regulatory barriers exist related to how monitoring is secured within development consent orders (DCOs) and related offshore wind consents and leases. How multi-project monitoring programmes are secured within individual project consents requires additional consideration and coordination with regulators, industry and advisors.</p>

5.3 Actions needed to overcome identified barriers

Following the identification of key barriers to adopting a strategic monitoring approach, a final breakout group session explored and proposed actions needed to overcome the identified barriers.

These proposed actions relate to both industry and government/regulators and are discussed below, and summarised in Table 5.

5.3.1 Industry key actions

Industry actions needed for the development of strategic monitoring relate mostly to committing to continued engagement with government and a willingness to explore possibilities related to adopting a strategic approach.

Previous strategic monitoring plans and proposals written by RenewableUK in 2015 and 2017 were mentioned by some workshop participants. There is an opportunity to revisit these and update them as necessary to inform an industry proposal to what strategic monitoring should look like.

More specifically related to overcoming risk and commercial challenges, actions are proposed to explore what is possible with commercial agreements and data standardisation related to sharing data and methodologies.

On the consenting side, industry action is required to commit to exploring how current precedence may be holding back innovation. Current comments related to consenting requirements should be explored to ensure that ways of working are not being discounted due to existing industry culture and norms.

Industry action is required to develop a proposed voluntary approach to strategic monitoring which would then allow government and regulators to understand what is currently seen as possible from an industry perspective. This does not preclude the actions outlined for government/regulators included in Table 5 and discussed below.

5.3.2 Government/Regulator key actions

The need for leadership was the top action articulated by workshop participants. Given the challenges of overcoming current industry commercial challenges and the perceived risks associated with adopting a voluntary approach, the strong message was that government should take the lead on developing strategic monitoring. Many of the identified barriers would become surmountable if there was a strong need defined for participating in a strategic monitoring approach as this would provide justification for cultural change and resourcing commitment.

There are several ways in which government leadership could be secured and this would need to be explored by relevant parties. Regardless of the department or organisation tasked with leading the development of strategic monitoring, they would need the authority to make decisions and provide accountability.

Leadership also requires setting out the ambition and scope of strategic monitoring. The will for industry to participate in exploring its development was clear from the workshop. Until

government ambition is defined it is unlikely that industry will be able to commit further to developing a strategic monitoring approach. This can be informed by industry, as proposed above, but the final vision on ambition needs policy backing.

A key action for government/regulators is to explore and agree how strategic monitoring could be secured through consenting mechanisms. This requires innovation and a move away from current precedent.

Table 5. Actions needed to overcome identified barriers

Barrier	Remaining Challenges	Key Industry Actions	Key Government/Regulator Actions
Lack of clear, single point, of leadership	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Leadership arrangements • Procedural and legal frameworks 	<ul style="list-style-type: none"> • None identified in workshop 	<ul style="list-style-type: none"> • Define needs case and propose strategic monitoring approach to industry for discussion. • Define the decision maker / accountable body. • Consider how marine plans could be used to support the policy justification for strategic monitoring.
Commitment not secured or maintained	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Industry priorities • Urgency/timelines • Resourcing 	<ul style="list-style-type: none"> • Commit to developing strategic monitoring. • Provide statement of support and commitment that includes <ul style="list-style-type: none"> ○ Commitment to continuous engagement with government/regulators 	<ul style="list-style-type: none"> • Commit to developing strategic monitoring. • Provide statement of support and commitment.
The needs case for strategic monitoring not being defined	<ul style="list-style-type: none"> • Scope and definitions • Urgency/timelines 	<ul style="list-style-type: none"> • Revisit existing RenewableUK work of proposed strategic monitoring and update as needed. 	<ul style="list-style-type: none"> • Provide policy-backed reasons for adopting strategic monitoring. • Set out a proposed approach based on desired level of ambition. • Consider alignment with existing monitoring programmes (both synergies and differences). • Communicate sense of urgency, along with opportunities. • Consider pilot study to test proposed approach.
Resource not secured	<ul style="list-style-type: none"> • Leadership arrangements • Urgency/timelines • Resourcing 	<ul style="list-style-type: none"> • Identify key staff within companies to act as strategic monitoring leads within future discussions. 	<ul style="list-style-type: none"> • Identify key staff to engage on strategic monitoring development. • Propose funding strategy for discussion.

Barrier	Remaining Challenges	Key Industry Actions	Key Government/Regulator Actions
Approach to dealing with complexity not agreed	<ul style="list-style-type: none"> • Scope and definitions • Level of ambition • Industry priorities • Procedural and legal frameworks 	<ul style="list-style-type: none"> • None identified in workshop 	<ul style="list-style-type: none"> • Propose scope and framework which integrates considerations of complexity and balances project and strategic need.
Industry competition concerns	<ul style="list-style-type: none"> • Industry priorities • Procedural and legal frameworks • Urgency/timelines 	<ul style="list-style-type: none"> • Explore potential frameworks and commercial agreements through internal company discussions with legal teams. 	<ul style="list-style-type: none"> • None identified in workshop
Data sharing and standardisation arrangements required	<ul style="list-style-type: none"> • Industry priorities • Procedural and legal frameworks 	<ul style="list-style-type: none"> • Develop voluntary approach to data sharing. 	<ul style="list-style-type: none"> • Identify best practice from other monitoring programmes and propose standardisation approaches.
Linking strategic to project level monitoring	<ul style="list-style-type: none"> • Scope and definition • Level of ambition • Industry priorities • Procedural and legal frameworks • Urgency/timelines 	<ul style="list-style-type: none"> • Identify industry barriers and opportunities (risks and benefits) to participating in strategic monitoring. • Focusing on evidence needs which are linked to priority consenting challenges 	<ul style="list-style-type: none"> • Provide clarity on regulatory barriers (what happens if one project in a cluster fails to secure consent/CfD etc)
Precedence of current approach	<ul style="list-style-type: none"> • Level of ambition • Procedural and legal frameworks 	<ul style="list-style-type: none"> • Commit to exploring new ways of working. • Commit to engagement. • Explore the transition between pre-consent/construction monitoring to post-construction monitoring to provide additional value, lessons learnt and consistency. • Consider dividing monitoring into workstreams to minimise delays in consenting and monitoring sign-off. 	<ul style="list-style-type: none"> • Work with regulators to agree ways of working and approaches towards impact assessment and monitoring conditions.
Securing strategic monitoring within consenting	<ul style="list-style-type: none"> • Procedural and legal frameworks • Urgency/timelines 	<ul style="list-style-type: none"> • Consider developing proposed voluntary approaches to deliver project monitoring through strategic approaches. 	<ul style="list-style-type: none"> • Work with regulators to agree standard conditions (where possible).

These poll responses illustrate that the workshop raised awareness of the importance of collaboration between all stakeholders and that the regulatory and process challenges fall within wider communication and collaborative working approaches. These barriers, considered alongside the key elements needed for successful strategic monitoring show that leadership and communication are key requirements to future discussions.

6.2 Next Steps

Next steps following the workshop are for key industry representatives and government to identify owners for the actions outlined in Section 5. Continued dialogue between industry and government is also needed and it is suggested that this is undertaken within a smaller group of key stakeholders who are empowered to speak on behalf of their sectors.

There are many paths to securing a successful strategic monitoring framework for offshore wind, but the fundamental challenge is to define its purpose, scope and ambition. Once a definition is proposed, it can be explored and amended to allow for agreement. The case examples discussed in Section 3 provide evidence that the success of a strategic monitoring programme revolves on leadership and clarity.

Annex 1 Workshop agenda and list of attendees

Pathways to Growth (P2G) Strategic Monitoring Collaborative Workshop Agenda: 4 May 2023

9:30 – 9:45 Settling in

9:45 – 10:45 Overview of previous/current strategic monitoring thinking and feedback deep dive

1. HMC will give a summary of the approaches, challenges, benefits and applicability to offshore wind.
2. Rachael Mills to give 15 min talk on her comments on the strategic monitoring approaches
3. Defra (offshore wind) will deliver a 15 overview of current strategic monitoring thinking focussing on the outputs from Cefas within OWEAP

10:45 – 11:00 Comfort Break

11:00 – 11:30 Knowledge sharing session 1

- Gayle Holland - Marine Scotland
- Polly Tarrant EDF

11:30 – 12:10 Breakout session 1: Potential solutions for strategic monitoring (shared vision, based on knowledge sharing sessions in the morning)

- OUTPUT: areas of agreement and disagreement on a shared vision for strategic monitoring (“what do we think strategic monitoring should aim to address?”)

12:10 – 12:30 Summary session (full group) on strategic monitoring shared visions

12:30 – 13:15 Lunch

13:15 – 13:45 Knowledge sharing session 2

- Mark Russell- Marine Aggregates/BMAPA
- Rohan Allen - Defra (MNCEA)

13:45 – 14:25 Breakout session 2: Challenges to achieving potential solution (priority barriers to success)

OUTPUT: list of barriers and “red-lines” either collectively or from individuals (“what couldn’t we currently support?”)

14:25 – 14:45 Summary session (full group) on challenges and barriers

14:45 – 15:00 Comfort break

15:00 – 15:40 Breakout session 3: Steps that need to happen to overcome barriers

OUTPUT: Action plan for exploring and overcoming barriers (“who needs to do what in order to progress towards resolving barriers?”)

15:40 – 16:10 Summary session (full group): What do we do next, who, when and how?

16:10 – 16:30 Summary, thanks & close

Includes summary of next steps and contacts for any further questions or comments.

List of Organisations Represented at Workshop

APEM ltd	BEIS
Cefas	Defra
energy-uk	Hartley Anderson Ltd
Howell Marine Consulting [facilitators]	JNCC
Mainstream Renewable Power	Marine Conservation Society
Marine Scotland	Mineral Products Association Ltd
MMO	Natural England
Natural Resources Wales	NatureScot
Ørsted	OWIC
Planning Inspectorate	Renewable UK
RPS	RWE
Scottish Power	Scottish Renewables
SMRU Consulting	SSE Renewables
Wildlife trusts	

Annex 2 Workshop “knowledge sharing” presentations

**HMC: Workshop agenda and pre-engagement feedback. Kathryn Collins,
Principal Consiltant**



**Pathways to Growth
(P2G) Strategic
Monitoring Collaborative
workshop – 4th May 2023**



Workshop agenda

- 9:30 – 10:45: Introductions/ Overview
- 11:00 – 12:30: Session 1: Potential solutions
 - Knowledge sharing session
 - Breakout session 1
 - Summary
- *12:30 – 13:15 Lunch*
- 13:15 – 14:45 Session 2: Challenges
 - Knowledge sharing session
 - Breakout session 2
 - Summary
- 15:00 – 16:10: Session 3: Steps to overcome barriers
- 16:10 – 16:30: Summary session: Next steps

Welcome and Context

Workshop Objectives

- Working towards a strategic monitoring approach for offshore wind
- Creating a shared vision
- Working towards an action plan for what the adoption of a strategic monitoring approach



Welcome and Context

Introduction to hosts and speakers

- HMC facilitation team
- Rachael Mills - OWIC
- Speakers:
 - Lisa Irwin, Head of Offshore Wind Environmental Standards and Monitoring, Marine and Fisheries Directorate - Defra
 - Rohan Allen, Head of Data and Analysis, Strategic Data and Evidence team, Marine and Fisheries Directorate - Defra (will join later)
 - Gayle Holland, - Head of Offshore Renewable Energy Consenting - Marine Scotland
 - Polly Tarrant, Environment Manager - EDF
 - Mark Russell, Executive Director - BMAPA (will join later)



Welcome and Context

How the day will run and ground rules

- Today is about collaboration and discussion
- Miro used to collect your comments/thoughts/suggestions
- Summary sessions will be recorded for note-taking only
- Ground Rules:
 - Please avoid discussing specific live consent applications directly
 - Discussion of any alternative approaches does not prejudice current projects



Overview of current strategic monitoring thinking

- Recap of pre-workshop brief and feedback received

Strategic Monitoring Examples

What do we mean by “strategic monitoring”

- Multi-project approach to monitoring impact (pre, during, post-construction)
- Regional... sectoral... national?
- Solution to:
 - Co-ordinate monitoring efforts
 - Assess the cumulative impacts
- Project level versus “strategic” level – programmes need to address both
- Four examples provided in the pre-workshop brief...



Scotland's Regional Advisory Groups (RAG) for Offshore Wind

Background

- Regional – Forth and Tay & Moray Firth
- Multi-sector partnership
- S.36 consent, marine licence conditions
- Monitoring framework:
 - Facilitates collaboration
 - Data-driven approach
 - Data coordination & prioritisation
 - Comprehensive view for key areas



RAG

Benefits	Challenges
Collaboration between developers	Limited lessons learned due to age of RAGs
Coordination of data - comprehensive view - wider than project level	Developers liable for costs - hosting meetings/ secretariat support
Lowers monitoring costs	Data standards to align monitoring data
Opportunities for additional monitoring/ research	Time and resource cost of agreeing monitoring approach
Aligns monitoring with industry objectives, Scottish government targets, and academic research	Commercial agreements



RAG

Applicability to offshore wind in England/Wales

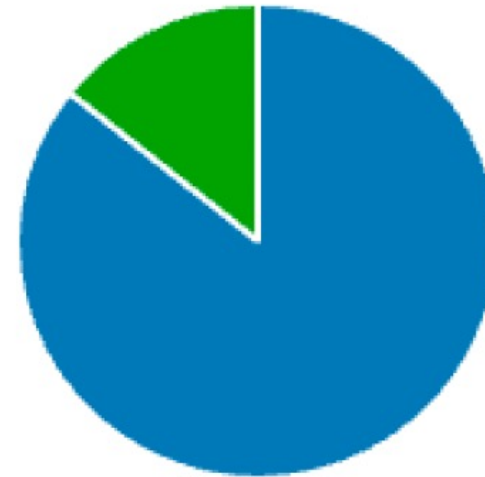
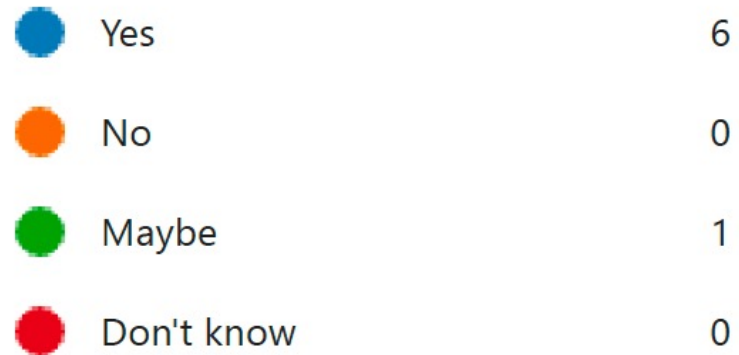
- Connected to S.36 consent
 - more challenging to agree through DCO
 - standard deemed marine licence conditions
- Voluntary, industry led approach
- Aligned without statutory authority if DCO conditions met?
- Policy direction to regulatory bodies
 - clear direction
 - prove importance of a strategic approach



Pre-workshop Feedback - RAG

RAG Approach for strategic monitoring

Would you support wider use of the RAG approach for Offshore Wind in the UK?



Pre-workshop Feedback - RAG

RAG Approach for strategic monitoring

Aspects of the RAG examples that might need to be modified:

- Post consent & early phase development
- Marine Plan Areas - cross region
- NGO lead convenor
- RAG core efficient group
- ToR focus on research & monitoring without licence related decisions



Pre-workshop Feedback - RAG

RAG Approach for strategic monitoring

Challenges that might make a RAG approach unfeasible:

- DCO process - mandate participation & monitoring conditions
- Possible changes to consenting regime, HND process
- Disparity between TCE leasing process and regions
- Offshore Wind Environmental Improvement Package



British Marine Aggregates Regional Environmental Assessment (MAREA)

Background

- Regional approach - Marine aggregate industry
- Voluntary initiative - wider scale cumulative effects
- Aims:
 - Baseline environmental conditions
 - Cumulative and in-combination effects
- MAREA Method:
 - Scoping phase - existing regional data and identify gaps
 - Regional-scale mapping of sensitive receptors
 - Assessment
- Post-consent monitoring



MAREA

Benefits	Challenges
Lessened regulatory burden	Willingness to work together & with regulators to define the approach
Designed with working practices in mind	Commercial agreements - sensitive information
Shared resources - minimised survey costs	Time and resource
Integrated knowledge	Site specific monitoring still required for some receptors
OneBenthic tool <ul style="list-style-type: none">- collation of aggregates data- facilitate impact evaluation- inform management decisions	



MAREA

Applicability to offshore wind in England/Wales

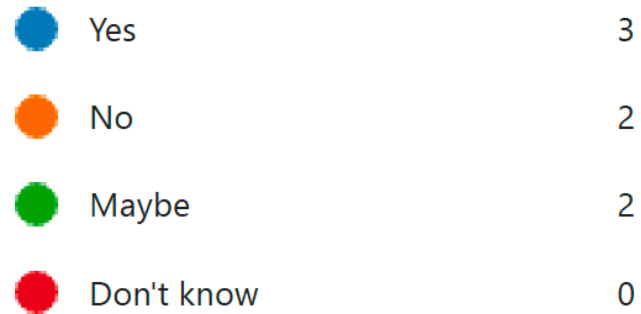
- Solution to a specific problem
- Key lesson - importance of having a clear problem-solution case set out
- Voluntary approach – adopted/refined with engagement from regulators



Pre-workshop Feedback - MAREA

MAREA Approach for strategic monitoring

Would you support wider use of the MAREA approach for UK OW?



Pre-workshop Feedback - MAREA

MAREA Approach for strategic monitoring

Aspects of the MAREA examples that might need to be modified?

- Centrally managed - Regulators - supported by SNCB/industry
- Resource issues
- Government oversight/collaboration
- Participation needs to be a condition in the DCO - standardised monitoring methodologies - large scale data sets.



Pre-workshop Feedback - MAREA

MAREA Approach for strategic monitoring

Challenges that might make a MAREA approach unfeasible:

- Clear process for funding
- Voluntary engagement - challenges commitments/ participation
- Not likely to work if this is in addition to project specific monitoring consent conditions
- Scale of OWF comparatively
- Challenges to secure full endorsement on being representative for the wider industry
- Ensuring costs of any monitoring equalised/ proportionate



Wozep Offshore Wind Ecological Research Programme, Netherlands

Background

- Formed to advance understanding of:
 - Impacts to protected species
 - Best possible estimates - Road maps
- Reduce scientific uncertainties - assumptions from EIA, AA
- Long-term impacts and upscaling of OWFs
- Assessing necessity/efficiency of mitigation measures



Wozep

Benefits	Challenges
Plan-Do-Check-Act approach to integrated planning	High costs for all parties involved
Wider than project level consenting - future planning	Research questions need to be clarified
Adaptive approach - ongoing improvements, priorities	<ul style="list-style-type: none">- applicable to industry needs- challenging when balancing academic & industry needs



Wozep

Applicability to offshore wind in England/Wales

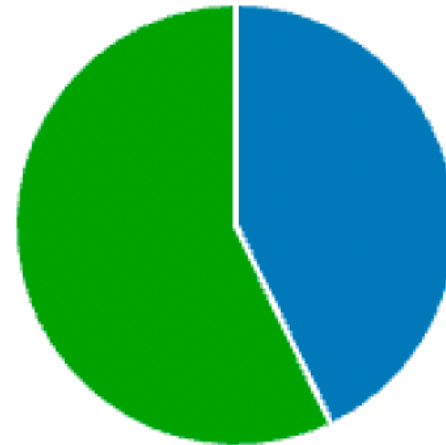
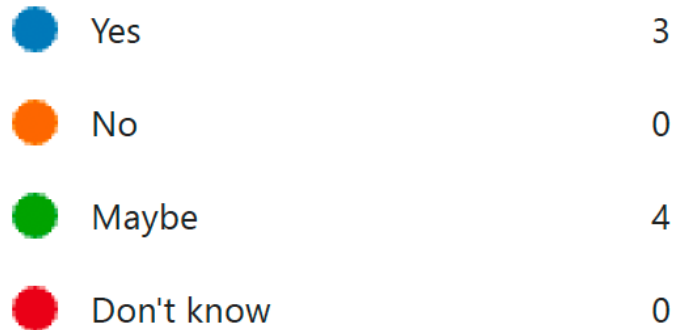
- Wider than what is possible through UK consenting frameworks
 - plan level research programme
 - incorporates monitoring needs for offshore wind consents
- Best practice - early engagement with stakeholders to design programmes



Pre-workshop Feedback - WOZEP

Wozep Approach for strategic monitoring

Would you support wider use of the Wozep approach for UK OW?



Pre-workshop Feedback - WOZEP

Wozep Approach for strategic monitoring

Elements of WOZEP that might need to change to make sure this approach would be deliverable for UK OW:

- Consent conditions to pay into programme - proportional to the scale of the project
- RAGs could sit within a 'WOZEP' type structure to link all other R&D activities together
- Run by SNCB with governance support
- Short-term & long-term objectives
- Needs to feedback to consenting processes
- Clear framework for the adaptive process, keeping flexibility as knowledge improves



Pre-workshop Feedback - WOZEP

Wozep Approach for strategic monitoring

Challenges that might make a Wozep approach unfeasible:

- Cost and government resource
- If to be funded via consent conditions, how to determine who pays what?
- Informed assessment on additional cost
- Radical reform of approaches - legislative changes
- Condensed timelines to meet targets



Oil Sands Monitoring (OSM), Alberta, Canada

Background

- Oil Sand industry - monitoring programmes - cumulative impacts
- Voluntary \$50 million industry levy per annum
 - holistic assessment of impacts
 - various levels of integrated monitoring data
- Divides programmes into targeted studies that include:
 - Research
 - Development of methodologies
 - Core monitoring
 - Long-term routine programmes
- Community-based monitoring



OSM

Benefits	Challenges
Existing regional projects - wider issues	Clearly define the scope and content early - avoiding duplication - avoid additional costs to rerun surveys
Utilised what was already in place	Integrated design requires administrative burden to manage
Easier data sharing for multiple uses - combined into one data store	High effort/ costs - front loaded
Adaptable - Level of participation & financial commitment	



OSM

Applicability to offshore wind in England/Wales

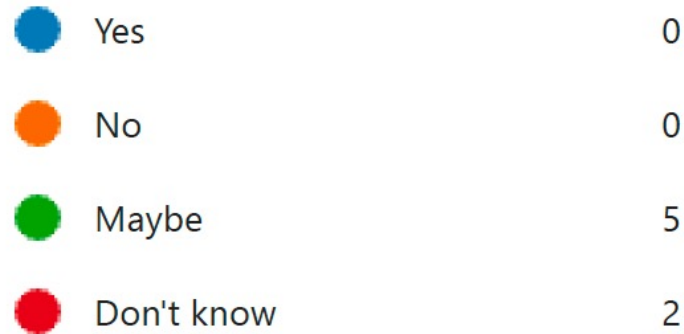
- Wider than monitoring for consenting purposes
 - research programme within which consenting sits
- Best practice - need to take the time to design monitoring programmes prior to implementation
- Administration burdens



Pre-workshop Feedback - OSM

OSM Approach for strategic monitoring

Would you support wider use of the OSM approach for UK OW?



Pre-workshop Feedback - WOZEP

OSM Approach for strategic monitoring

Elements that might need to change to make sure this approach would be deliverable for UK OW:

- Level of participation - Need clearer joint/central/cross stakeholders requirement needs.
- Central regulatory body - efficiently manage the process & ensure work is meaningful and impactful for the sector
- Difficult to see how the community aspect will be applicable for offshore developments, but may be appropriate for intertidal/onshore



Pre-workshop Feedback - WOZEP

OSM Approach for strategic monitoring

Challenges that might make a OSM approach unfeasible:

- Level of participation – fragmented commitment – reduce the value of the programme.
- Community based monitoring initiatives challenging to implement in the offshore environment.
- Regulatory bodies resourcing
- Need to align English and Welsh regulators

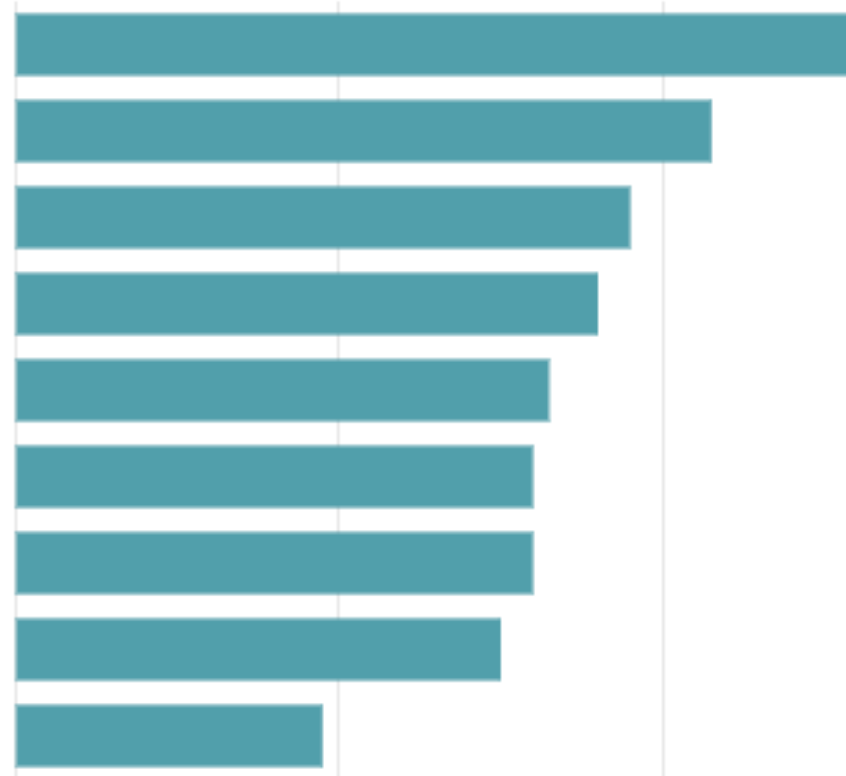


General Feedback

Overall

Order of importance for developing a successful strategic monitoring programme:

1. Clear leadership with policy direction provided by government
2. Engagement with industry and at an early enough stage to ensure objectives are deliverable
3. Ongoing collaboration across government, regulatory and advisory bodies, academia and eNGOs
4. Data sharing agreements and agreed parameters around when and how data can be made publicly available.
5. Mandatory data standards to ensure the data can be analysed collectively.
6. Agreement across government, regulators and SNCBs on the scale monitoring to ensure the data provides meaningful evidence
7. Requirements driven programme design
8. An associated knowledge transfer programme that actively data outputs into practical findings
9. A governance structure to oversee the outputs



General Feedback

Overall

Thinking about the statements above, which do you think present the biggest challenges and how could these be overcome?

- Ongoing collaboration - timely/ regular assessments of outputs - updating advice
- Unified approach across UK - commitments
- Fragmented regulatory regimes - universal framework with consistent standards
- Push for engagement/ data sharing/ mandatory standards
- How to increase standardisation without stifling innovation in monitoring techniques?
- How will data be fed back into decision making in a timely manner, closing the feedback loop?



General Feedback

Overall

Is there anything else that you think is needed for a successful monitoring programme?

- MSD/ MPA monitoring - maximise value of efforts
- Clear roadmap - stakeholder/SNCB guidance
- More focus - future pipeline aims
- Well funded and resourced programme to ensure success
- Transparent reporting and frequent analysis
- Feedback loop to incorporate data in plan and project level decisions



**P2G: Comments on pre-engagement feedback. Rachael Mills, P2G
Coordination Group Manager**

What is Pathways to Growth (P2G)?

- Offshore Wind Sector Deal delivery workstream focused on resolving key consenting and environmental issues.
- Supported by a multi-stakeholder collaborative group – the Pathways to Growth Coordination Group.
- Monitor activities to resolve a top 10 list of issues by:
 - **Maintaining an overview** of all the work in consents, licencing and the environment.
 - **Providing Feedback** on what is already being done or is needed to provide resolution to the identified issues.
 - Ensuring **actions complement and enhance** the work of existing work programmes and strategic groups.
 - Initiating **new work through existing groups and bodies** where gaps emerge (or supporting the P2G Team to deliver work to resolve gaps).

P2G Co-ordination Group

Chaired by Brian McFarlane (OWIC)

Coordinated by and supported by the P2G Team (OWIC)



Plus offshore wind developer representatives

Why suggest key elements?



HMC request to maintain independence



A genuine wish to drive forward a solution or solutions



A starter for 10 to be challenged

- Are these the right elements?
- Are they easy/difficult to implement?
- If you agree with any of these elements how are challenges to implement them overcome?



Not to criticise current practice

The key elements and why

Clear leadership with policy direction provided by government to enable regulatory bodies to drive the approach through consent conditions consistently.



An approach that is licensable and enforceable

Engagement with industry and at an early enough stage to ensure that monitoring programme objectives are deliverable i.e. to enable commercial issues to be resolved before data collection needs to start.



Delivery challenges are exposed early and can be solved in time

Ongoing collaboration across government, regulatory and advisory bodies, academia and eNGOs to understand monitoring programme outputs and to act quickly to adapt approaches where necessary.



Monitoring remains targeted at delivering evidence to meet the objectives

Data sharing agreements and agreed parameters around when and how data can be made publicly available.



Data used as early as possible to inform consenting decisions

Mandatory data standards to ensure the data can be analysed collectively.



Collective analysis and valid across a wider area

The key elements and why

Agreement across government, regulators and SNCBs on the scale at which monitoring programmes should be defined to ensure the data provides meaningful evidence specific to the receptors it is targeted at.



Data that can be used more widely to support decision making.

Requirements driven programme design – ensuring that monitoring is designed to deliver answers to consenting questions and not purely for research purposes.



Issue driven to ensure the monitoring remains relevant to resolving the issue.

An associated knowledge transfer programme (or similar) that actively takes the monitoring data outputs to assimilate them into practical findings about understanding or shapes further monitoring to ensure gaps in understanding are resolved as rapidly as possible.



Regular checks to ensure data feeds into decision making
An opportunity to use the OWEC Offshore Wind Evidence and Knowledge Hub?

A governance structure to oversee the outputs of the monitoring programme(s) that can identify necessary adaptations to monitoring objectives or scope to ensure it continues to deliver meaningful outputs.



Clear decision making so changes can be made rapidly

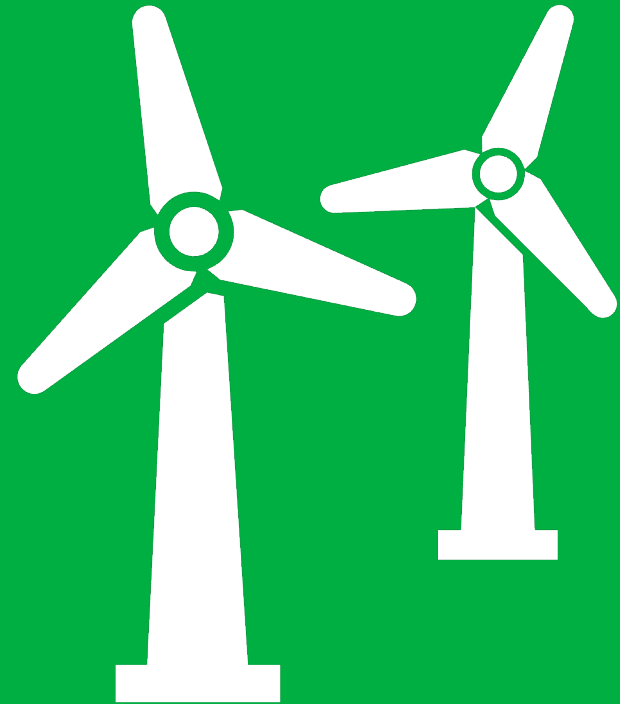
Defra: Offshore Wind Strategic Monitoring. Lisa Irwin, Head of Offshore Wind Environmental Standards and Monitoring, Marine and Fisheries Directorate.



Department
for Environment
Food & Rural Affairs

Offshore Wind Strategic Monitoring

May 2023

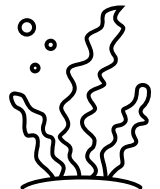
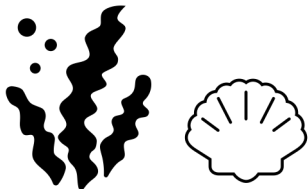


British Energy Security Strategy, April 2022

The British Energy Security Strategy saw the Government commit to implementing a new Offshore Wind Environmental Improvement Package which included five policy measures:

- Reforms to the Habitats Regulation Assessment
- Strategic Compensation
- Establishing a Marine Recovery Fund
- **Strategic approach to monitoring**
- Offshore Wind Environmental Standards (OWES)

All of these measures aim to accelerate deployment of offshore wind whilst enhancing the marine environment.



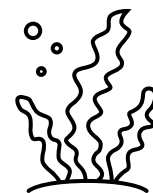
Offshore Wind Strategic Monitoring



Deliver a strategic approach to environmental monitoring

- To identify opportunities to make better use of monitoring data collected at offshore wind farms
- To facilitate improvements to monitoring practices that can help address shared evidence gaps and areas of uncertainty

Defra, Natural England and the Marine Management Organisation (MMO) have been working closely together to explore what a strategic monitoring programme for offshore wind could look like. Understanding the views and feedback from industry and other interested parties is a key part of this work.



What is Strategic Monitoring?

Monitoring:

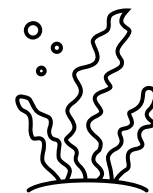
Post-consent marine data collection, designed to inform the assessment of impacts to the marine environment as a result of offshore wind development, and the subsequent recovery of receptors.

Strategic Monitoring:

A coordinated and joined-up approach in order to deliver complementary and targeted monitoring programmes through the pooling of time, money and/or resources, in order to achieve shared monitoring goals.

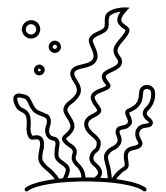
Why do we need Strategic Monitoring?

- Understanding marine impacts of offshore wind development is challenging and many **evidence gaps** and **areas of uncertainty** remain
- Strategic monitoring could help target monitoring plans to address objectives and fill evidence gaps by coordinating efforts and facilitating collaboration
- Reducing uncertainty regarding impacts and recovery will help regulators to assess the impact of projects with greater certainty
- Cross-sectoral agreement of the need for strategic monitoring



What could Strategic Monitoring provide?

- **Coordinated & joined-up** post-consent monitoring programmes
- **Facilitated collaboration** between developers, Gov and other stakeholders
- Monitoring of a greater spatio-temporal **scale and scope**
- Greater sample sizes and robust statistical analyses
- **Avoiding duplication** of objectives/receptors between projects
- Focussed efforts to **address evidence gaps** regarding impacts / recovery
- **Reduced uncertainty over impacts** – smoother and faster consenting



Defra: Marine Natural Capital Ecosystem Assessment (mNCEA) and Strategic Monitoring. Rohan Allen, Head of Data and Analysis, Strategic Data and Evidence team, Marine and Fisheries Directorate.

(To be added)

**Marine Scotland: Regional Advisory Groups in Scotland Gayle Holland, Head of
Offshore Renewable Energy Consenting.**

Strategic Monitoring Workshop –
Regional Advisory Groups in
Scotland



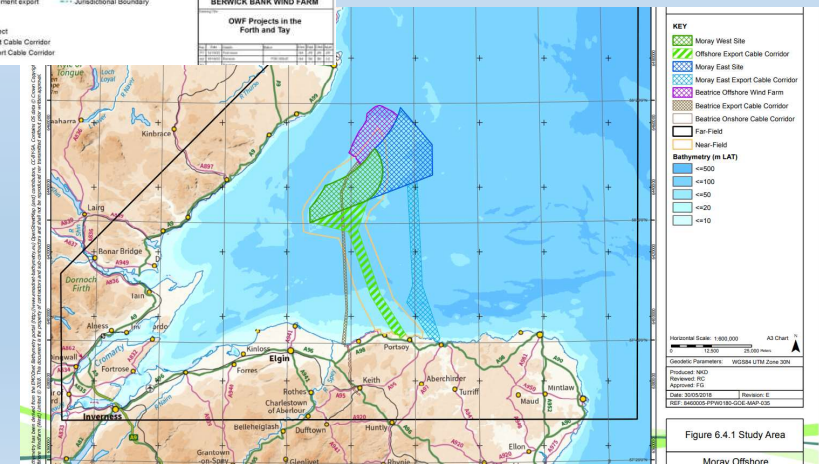
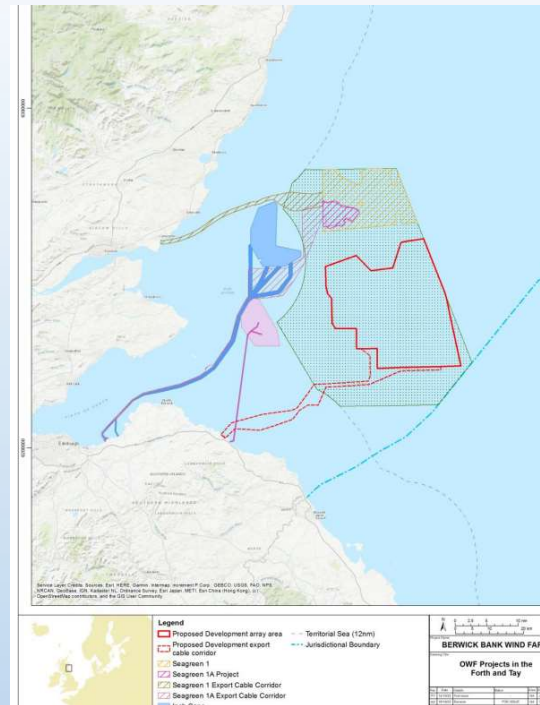
Scottish Government
Riaghaltas na h-Alba
gov.scot

Gayle Holland
Head of Offshore Renewables Consenting

marinescotland

History

- FTOWDG and MFOWDG set up in 2011
- F&T – Neart na Gaoithe, Inch Cape and Seagreen
- MF – Beatrice, Moray East and Moray West
 - Encourage collaboration in pre-application surveys
 - Discussion forum for survey methodologies
 - Consideration of cumulative impact assessment



Licence Conditions

- The Project Environmental Monitoring Programme (PEMP) is a live document, consultation with the RAG must be undertaken before approval by Scottish Ministers
- The Company must participate in the RAG to inform monitoring and mitigation programmes

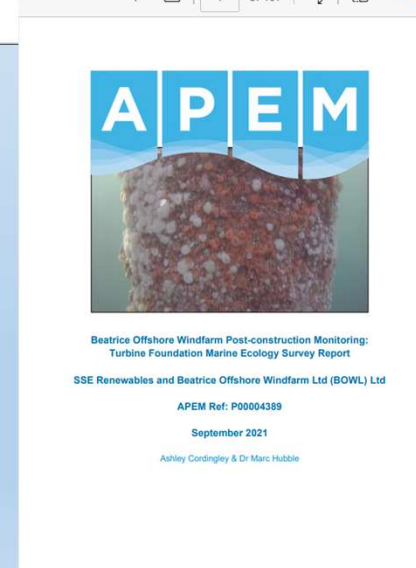
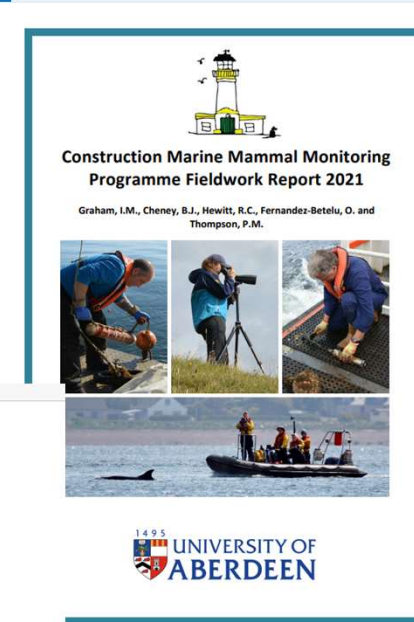
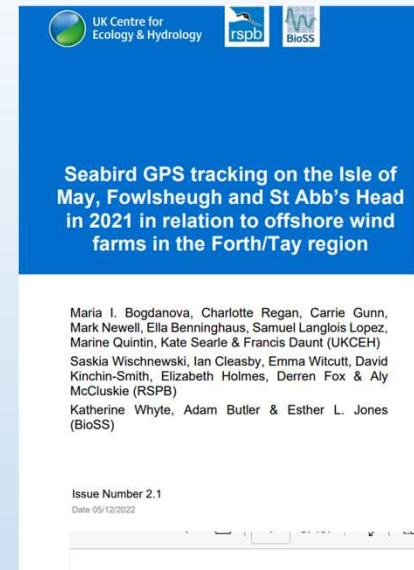
FTRAG and MFRAG structure

- Main Group
 - Benthic ecology
 - Marine fish
 - Diadromous fish
- Subgroups
 - Marine mammals
 - Ornithology
- Each groups meets approx. twice a year
- Each group has ToRs and agreed membership



Aim of the RAGS

- Ensure effective monitoring is undertaken
- Allow for collaboration to provide more strategic outputs and potential cost savings
- Discuss relevant strategic opportunities identified through ScotMER
- Identify lessons learned and good practice – feedback into guidance/ casework



Benefits and Challenges

- Benefits

- More effective monitoring
- Avoid duplication of effort
- Able to answer bigger questions
- Sharing lessons learned and the ability to adapt monitoring
- Forum for comparing monitoring results to inform future advice
- Adaptive management
- Overlap with ScotMER
- Cost savings
- Data integration

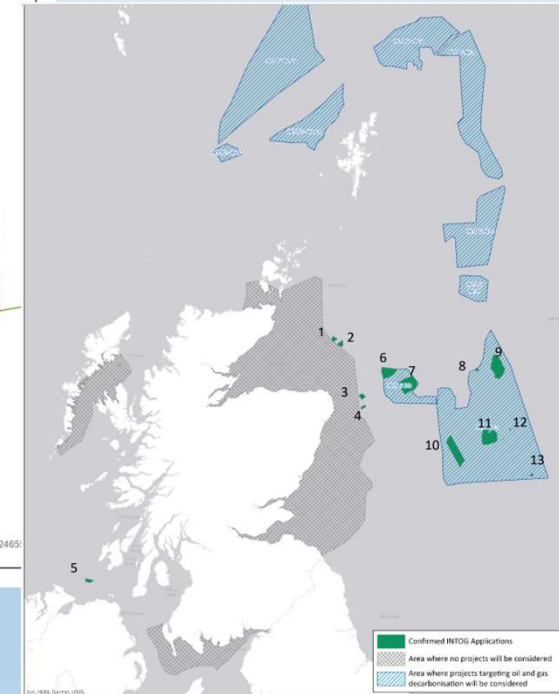
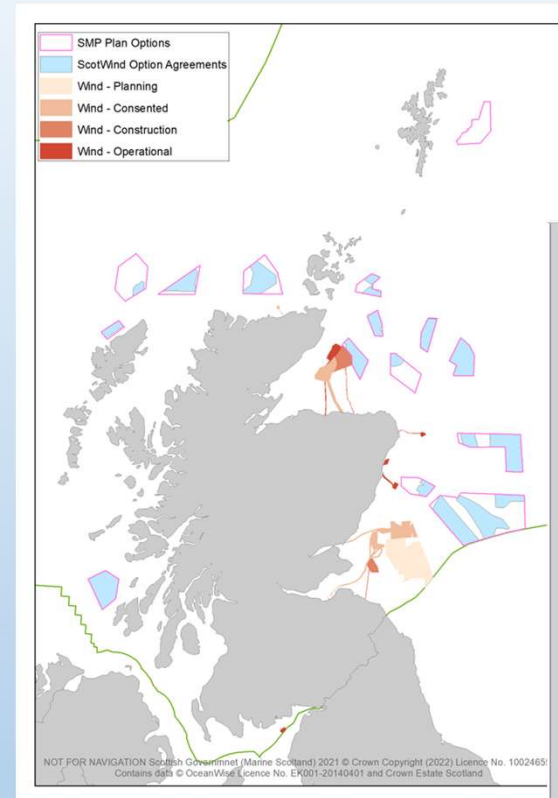
- Challenges

- Resource for meeting attendance
- Contractual agreements between developers – may slow processes
- Different projects at different stages may have different priorities

Overall - for current scale and setup pros outweigh cons

Forward Look

- Reviewing licence conditions as part of streamlining work
- Reviewing options for RAGs – through the manual consultation
 - FTRAG and MFRAG likely to continue
 - Could expand the membership of these existing groups
 - Could set up new regional groups
 - Could set up larger Scottish Group
 - Could introduce a different model
 - Developers working together out with licence conditions
 - Strategic monitoring of compensation measures likely to be important.



Thankyou

FTRAG

<https://marine.gov.scot/ml/forth-tay-regional-advisory-group-ftrag>

MFRAG

<https://marine.gov.scot/ml/moray-firth-regional-advisory-group-mfrag>

**NnG Offshore Wind/EDF: RAG approach – a developer’s perspective. Polly
Tarrant, Environment Manager.**



OWIC P2G Strategic Monitoring Workshop

RAG approach: a developers perspective

04/05/2023

Polly Tarrant

Environment Manager

Polly.Tarrant@nngoffshorewind.com



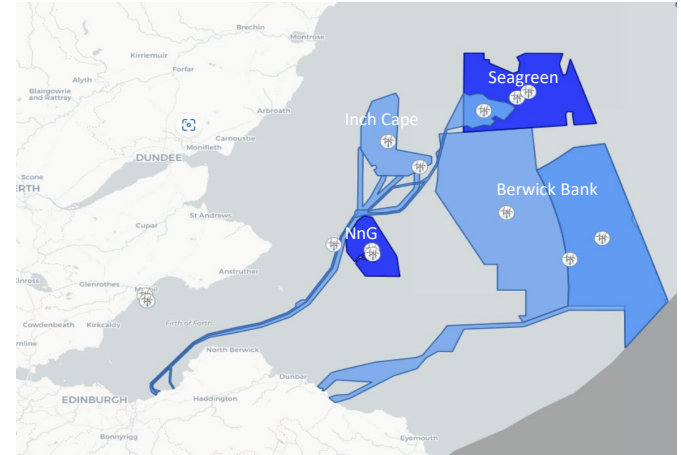
1. Background to the Forth and Tay Regional Advisory Group (FTRAG)

Developments involved:

- Neart na Gaoithe (NnG)
- Seagreen
- Inch Cape
- [Berwick Bank]

All 3 consented Project have different construction timelines, which have changed since gaining consent(s)

Each consented Project must have a Project Environmental Monitoring Programme (PEMP) approved by Scottish Ministers prior to construction



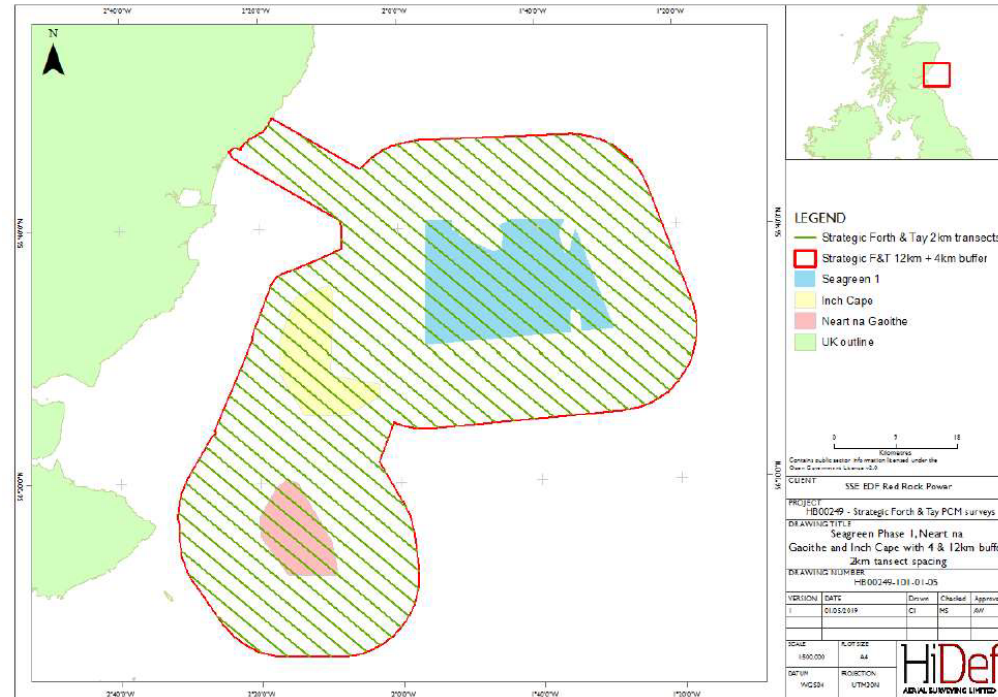
2. Positive experiences



- FTRAG facilitates and encourages collaboration
- Monitoring ends up being of larger scale and strategic nature, with agreed objectives/ research questions
- “Money well spent” – costs shared across developers focusing on priority species and areas
- Lessens chances of silo working, between developers but also pieces of research within a region
- Experience sharing, between developers and in the FTRAG
- Ensures linkages to existing programmes, e.g. ScotMER

3. Forth and Tay Digital Aerial Survey Programme - example

- Collaborative pre-construction surveys cover pretty much the whole of the Forth and Tay region
- All 3 of the wind farm sites (plus buffers) were surveyed as one survey each month,
 - The data creates a regional data set as well as project specific data
 - Cost sharing/saving



3. Some of the challenges

- Commercial agreements to share data and costs can be difficult to put in place
 - Led purely by the developers with individual developers taking on the financial risk of contracting and managing the research
- Delivery of the monitoring (and organising, and recently chairing meetings) is lead by developers. Therefore, agreeing monitoring approaches and working with multiple parties can be:
 - Very time consuming – often with one developer having to take the lead
 - Requires a large degree of transparency and cooperation
 - Vary depending on spend appetites and project portfolios

4. What can strategic monitoring help address

Industry relevant questions in relation to the impacts of offshore wind which have the potential to contribute to the evidence base and reduce consenting risk for offshore wind

- Ensure that time and money is best spent when the outputs are most valuable and relevant.
- Reduce likelihood of silo working and/or duplication.

NnG OFFSHORE
WIND



Mineral Products Association/BMAPA: Regional approach to delivery – A marine aggregates industry perspective. Mark Russell, Executive Director.

Regional approach to delivery

A marine aggregate industry perspective

OWIC P2G Strategic Monitoring Workshop, 4th May 2023

Mark Russell

Executive Director - Planning, Mineral Resources & BMAPA

Mineral Products Association

Mark.Russell@mineralproducts.org

When you know there is a wave coming...



**You can position yourselves to take
advantage...**



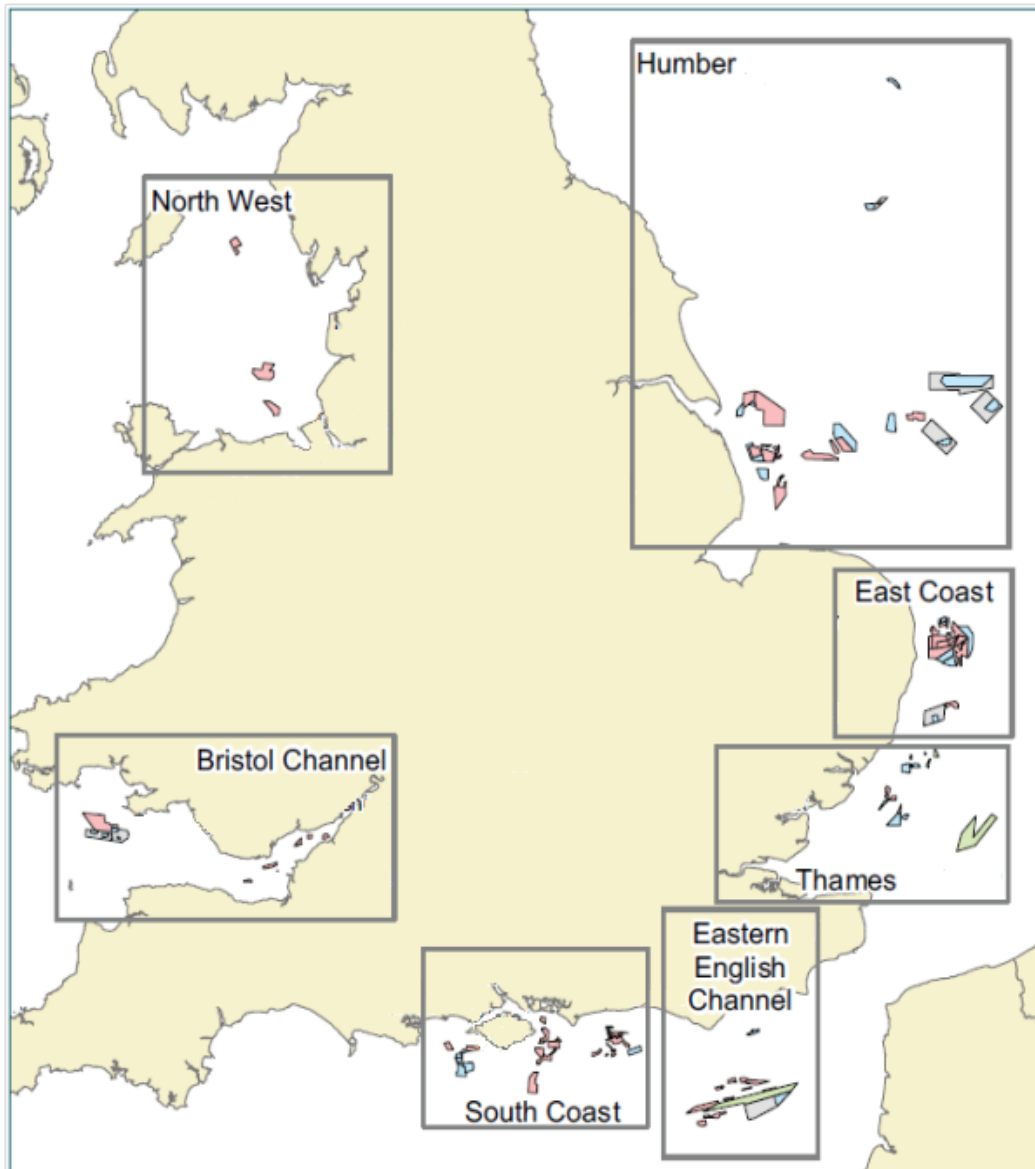
Or not...!



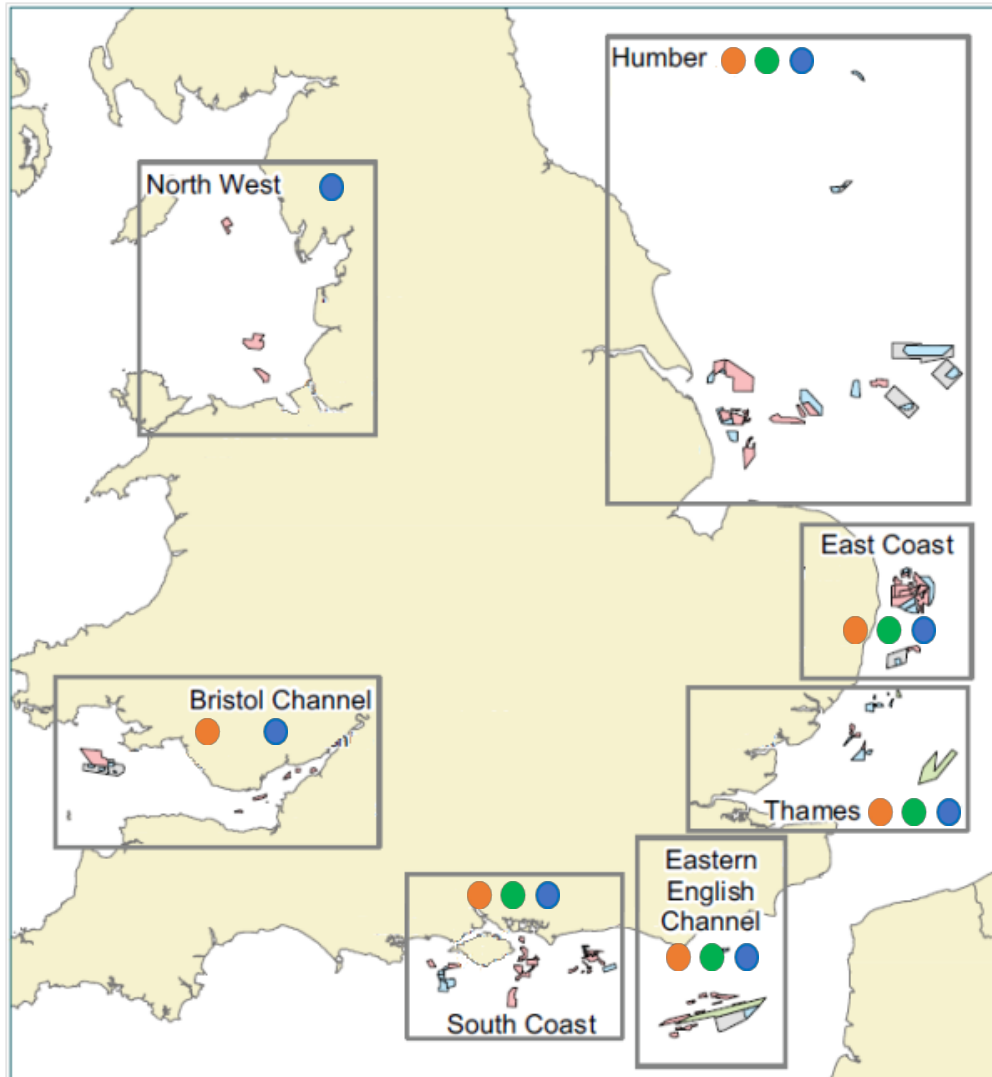
Why adopt a regional approach?

- No statutory basis initially: voluntary industry initiative
- Common drivers - three consenting phases for existing activities since 2008 - business continuity exposed
- Distribution of industry interests meant common EIA issues to address - cumulative effects & Habs/Birds req
- Common benefits to operators
 - saves time & effort/reduces duplication
 - saves cost
 - delivers a consistent outcome
- Similar benefits to regulators & advisors - best use of resources - answer the common exam questions once!

By the end of 2014, this approach supported delivery of >100 consents - now underpins licence compliance - will support future re-licensing



Regional cooperation & delivery - three distinct components



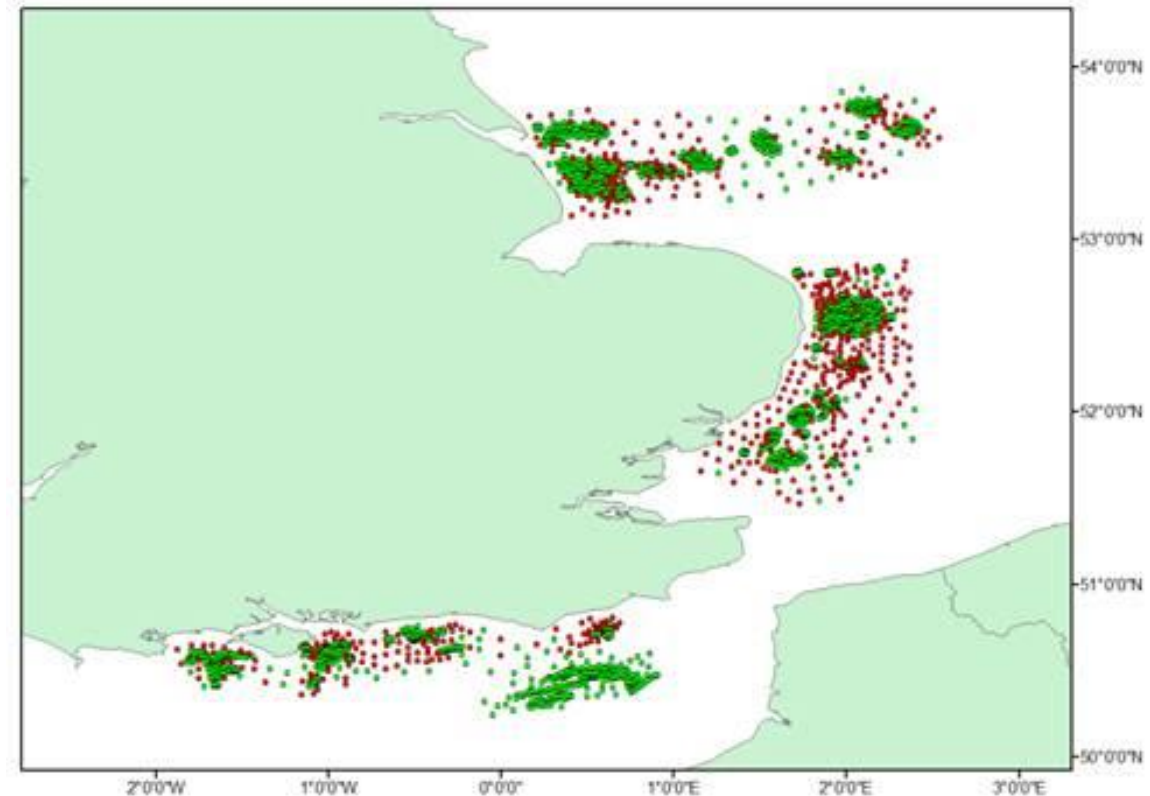
- **REGIONAL ENVIRONMENTAL CHARACTERISATION (REC)**
Provides regional context for sectors activities
Aggregates Levy funded 2003-2011
Multi-disciplinary - geology, habitats, resources, heritage
Broadscale surveys & desk based data analysis
- **REGIONAL ENVIRONMENTAL ASSESSMENT (REA)**
Delivers cumulative/in-combination assessment
Voluntary industry approach - 2000-2014
Baseline regional surveys add detail to REC understanding
Consistent cumulative/in-combination outputs feed into site specific EIA
- **REGIONAL MGMT & MONITORING PROGRAMME (RMMP)**
Delivers licence compliance requirements
Standard conditions/monitoring requirements - 2013>
Includes new seabed monitoring method using “big data”
Coordinated through regional industry associations
Delivered through regional surveys & reporting

Context to regional management & monitoring development

- Moving from a position where most historic licences didn't have monitoring requirements to a position where every licence had a minimum requirement from 2013 onwards;
- Cost implications - increased cost per tonne dredged (commodity price doesn't change, monitoring simply adds to the cost base);
- Time/effort implications - to deliver the requirements in the right way and at the right time;
- Capacity implications - across operators, regulators, advisors and survey contractors;
- Opportunity to develop standard mitigation/management requirements coupled with standard survey/ compliance reporting obligations (seabed sampling, multibeam & sidescan) throughout 15-year licence term and beyond to be delivered through regional programmes;
- Standard requirements conditioned to the marine licences issued by MMO.

Regional delivery

- Five regional monitoring programmes in place - coordinated via five industry-led regional management associations;
- These deliver regional sediment/benthic and multibeam/sidescan data for over 60 licence areas;
- Regional delivery underpinned by standard compliance conditions in all marine licences;
- Timing of individual licence requirements now aligned at a regional scale. Regional timings are then staggered to spread survey/reporting workload;
- Local sensitivities are still addressed through site specific licence conditions.



Key benefits for developers & regulators/advisors

The regional approach enabled:

- Common view of information requirements, delivery pinch points & risks - reduces the number of surprises...
- Shared understanding of needs/requirements/limitations - both across developers & also regulator/advisors (RAG group established - more consistent advice)
- More cost effective/innovative solutions to address key evidence gaps
- Better use of environmental data, whether existing or newly acquired
- Common approach to reduce time & effort across the development cycle (15 years+)
- Better relationships between developers & regulators/advisors

Outcome = More consistent/robust processes & evidence for timely decision-making

Key challenges for delivery

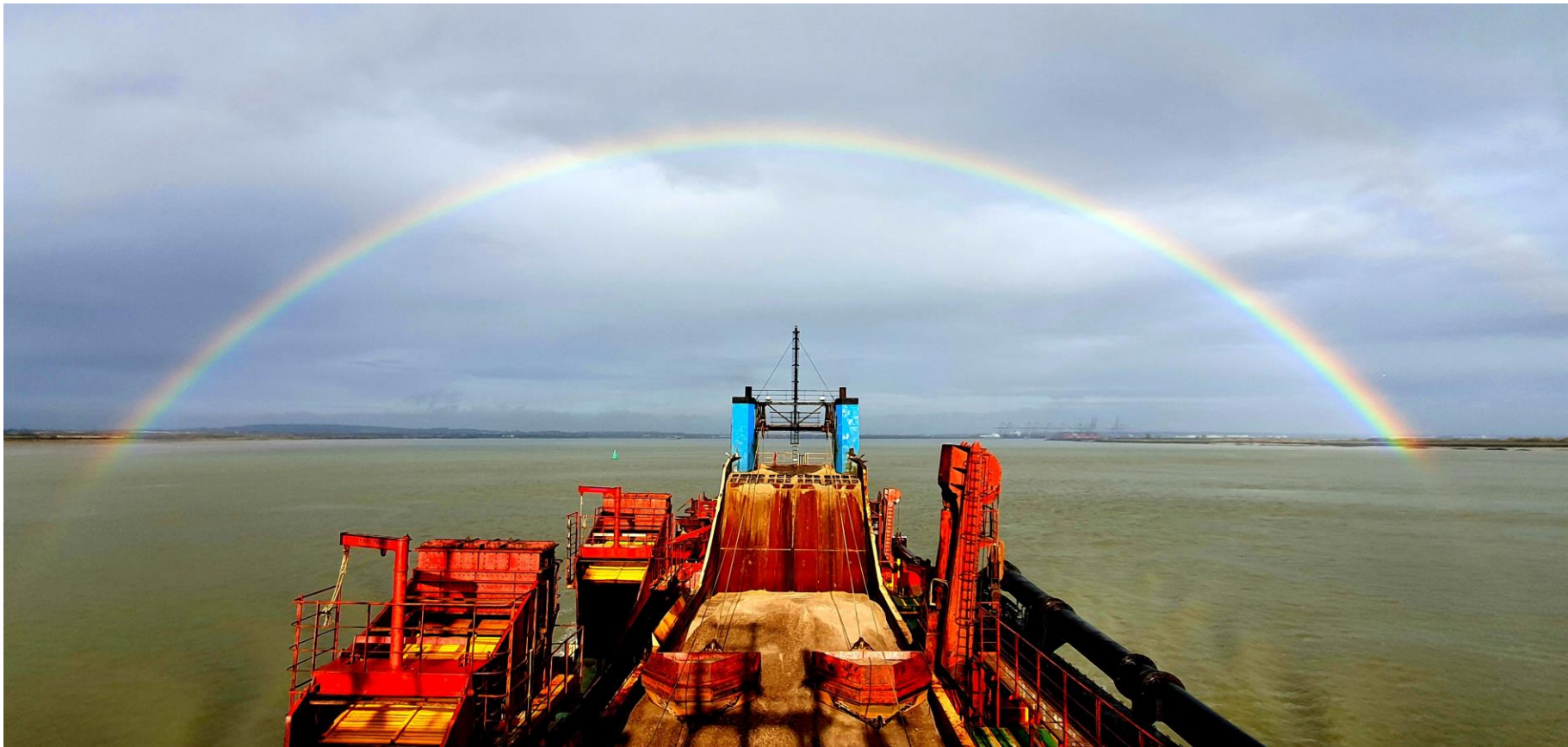
The regional approach took time to develop & evolve:

- Leadership is needed across all parties - plus need someone to coordinate & drive
- Requires a culture shift - everyone has to be prepared to do things differently
- Shared vision, understanding & ambition a/c all parties - benefits & risks plus a willingness to compromise
- Trust is key & building relationships takes time - not just developer/regulator/advisor but also developer/developer
- Who pays...? Pump-prime investment can help build confidence and share risk - plus how to share costs fairly and equitably between developers
- Corporate memory fades over time = ongoing challenge

But the prize is significant for everyone: genuine win/win opportunities

Reduces risk - Increases confidence - Reduces time/effort/costs - Increases certainty

www.bmapa.org



Annex 3 Pre-workshop Brief: Review of current UK and international approaches to strategic/regional monitoring

Offshore Wind Industry Council Pathways to Growth Strategic Monitoring Workshop

Pre-workshop brief

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Author	Version	Date
K Collins, K Lloyd	0.3	5 April 2023

Introduction

This summary report provides an overview of the benefits and challenges of implementing a strategic monitoring programme, in preparation for the OWIC Strategic Monitoring workshop on 4th May 2023. Information on existing strategic monitoring approaches has been drawn from UK and international examples which are covered in more detail in Annex 1.

Feedback received from participants on the approaches in this document will be used to frame the conversations during the workshop and focus attention on areas of discussion needed to develop a strategic approach to monitoring offshore wind developments.

What do we mean by Strategic Monitoring?

For the purpose of the workshop, strategic monitoring is taken to mean a multi-project approach to monitoring the impacts of offshore wind development. This could be regional, sectoral, or national. For industry-led approaches this is likely to be regional, with several developments operating a co-ordinated monitoring programme.

Strategic monitoring can be seen as a solution to the need to co-ordinate monitoring efforts and assess the cumulative impacts of multiple projects located within an area, whilst maintaining relevance at an individual project scale. This could equally be called a “regional approach” or a “co-ordinated multi-project approach”.

The workshop on 4th May is designed to develop an agreed approach to strategic monitoring which could be supported by industry, as well as government and other stakeholders. Collaborative working between all stakeholders is crucial and this pre-engagement work is designed to complement other strategic monitoring work being undertaken by Defra and others.

Existing strategic monitoring approaches: benefits, challenges and applicability

Four existing strategic monitoring approaches have been reviewed, and are outlined below, along with their benefits, challenges and applicability to offshore wind in England and Wales.

1.1 Scotland’s Regional Advisory Groups (RAG) for Offshore Wind

This approach has been implemented for two marine areas in Scotland: Forth and Tay, and Moray Firth. For each area, a Regional Advisory Group (RAG) has been set up as a partnership established by Scottish government which includes local authorities, government agencies, industries and other stakeholders. The RAG aims to ensure that appropriate and effective monitoring of the impacts of the developments are undertaken to satisfy the requirements of the Section 36 consent and marine licence conditions of offshore wind farms within their geographic areas.

Benefits:	Challenges:	Applicability:
<ul style="list-style-type: none"> • Facilitates collaboration between developers. • Focuses on coordination of data collection to form a comprehensive view of key receptors which is wider than project level. • Coordination of data collection lowers monitoring costs • Identifies opportunities for additional monitoring or research beyond individual projects. • Aligns monitoring with industry objectives, Scottish government targets, and academic research. 	<ul style="list-style-type: none"> • Limited lessons learned to data due to age of RAGs (established in 2020). • Developers liable for costs include hosting meetings and secretariat support. • Need to agree data standards to align monitoring data. • Time and resource cost of agreeing monitoring approach. • Commercial agreements needed to allow for sharing data. 	<ul style="list-style-type: none"> • RAG has been established in Scotland in connection to Section 36 consent. • More challenging to agree through DCO due to examination process, but not impossible. Standard deemed marine licence conditions could be proposed with agreement from relevant bodies. • Could be proposed as a voluntary, industry led, approach, monitoring could be aligned without statutory authority as long as DCO/licence conditions are met. • Would benefit from UK Gov promotion to provide clear direction, through policy direction to regulatory bodies. Not impossible without, but policy direction would allow for all parties to understand the importance of a strategic approach.

1.2 British Marine Aggregates Regional Environmental Assessment (MAREA)

The marine aggregate industry has used a regional approach to address wider scale cumulative effects by developing a Marine Aggregate Regional Environmental Assessment (MAREA) voluntary initiative, endorsed by the British Marine Aggregates Producers Association (BMAPA), The Crown Estate and the Marine Management Organisation. The primary aims of a MAREA are to identify the baseline environmental conditions in a region with several marine aggregate applications and to assess the potential cumulative and in-combination effects of all the existing and future dredging operations. The approach is now also used for post-consent monitoring for aggregates marine licences.

Benefits:	Challenges:	Applicability:
<ul style="list-style-type: none"> • Lessened regulatory burden for additional site-specific EIA and project level monitoring. • Led by industry so designed with working practices in mind. • Shared resources minimised survey costs • Allowed operators to integrate their knowledge into the approach. • The related OneBenthic tool used for the collation of aggregates data can facilitate impact evaluation and inform management decisions. 	<ul style="list-style-type: none"> • Required a willingness to work together, with regulators to define the approach. • Commercial agreements required to deal with sensitive information. • Time and resource needed to agree approach to consenting and conditioning of marine licences. • Site specific monitoring still required for some receptors so not all costs are minimised 	<ul style="list-style-type: none"> • The MAREA approach was identified as solution to a specific problem: understanding the regional effects of multiple projects for consenting purposes. • Key lesson is the importance of having a clear problem-solution case set out. • This was a voluntary approach to working together which could be adopted and refined with engagement from regulators.

1.3 Wozep Offshore Wind Ecological Research Programme, Netherlands

Wozep is an offshore wind ecological research programme run by the Dutch government. It was formed to advance understanding of how offshore wind farms impact protected species and provide the best possible estimate of the ecological impact when developing road maps for proposed offshore wind developments. The long-term research programme aims to reduce scientific uncertainties regarding knowledge gaps and assumptions from Environmental Impact Assessment (EIA), Appropriate Assessment (AA), and other project level assessments, as well as understanding long-term impacts and upscaling of OWFs and assessing the necessity and efficiency of mitigation measures.

<p>Benefits:</p> <ul style="list-style-type: none"> • Used to inform the Dutch government’s Plan-Do-Check-Act approach to integrated planning for offshore wind. • Wider than project level consenting; informs planning for future offshore wind development. • Adaptive approach allows for ongoing improvements to the programme, so topics can be prioritised as needed. 	<p>Challenges:</p> <ul style="list-style-type: none"> • High costs for all parties involved in setting up and running the programme. • Research questions still need to be clarified so they are applicable to industry needs which can be challenging when balancing academic and industry needs 	<p>Applicability:</p> <ul style="list-style-type: none"> • Wider than what is possible through UK consenting frameworks as this includes research programmes too – this is a plan level research programme that incorporates the monitoring needs for offshore wind consents. • Best practice can be taken regarding early engagement with stakeholders to design programmes.
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1.4 Oil Sands Monitoring (OSM), Alberta, Canada

Alberts Oil Sand Monitoring (OSM) programme brings together existing monitoring programmes to understand cumulative impacts associated with the Oil Sand industry. The programme is supported by a voluntary \$50 million industry levy per annum which allows for a more holistic assessment of impacts and provides opportunities for developers to use various levels of integrated monitoring data for their own needs.

<p>Benefits:</p> <ul style="list-style-type: none"> • Took existing regional projects and combined them to look at wider issues. Worked with what was already in place rather than starting something fresh • Allows for easier data sharing for multiple uses as everything from previous projects is combined into one data store. • Provides the opportunity for participants to choose their level of participation (and financial commitment). The greater the participation, the greater the access to benefits 	<p>Challenges:</p> <ul style="list-style-type: none"> • The need to clearly define the scope and content of monitoring programmes early is important for avoiding duplication of monitoring effort later. • Where monitoring has not been planned properly, additional costs have been incurred to rerun surveys. • Integrated design requires administrative burden to manage. • Time and costs can be high when designing integrated programmes; these are often front-loaded. 	<p>Applicability:</p> <ul style="list-style-type: none"> • Like Wozep, this approach is wider than monitoring for consenting purposes – it is a research programme within which consenting sits. • Best practice can be drawn from the need to take the time to design monitoring programmes prior to implementation • Administration of programmes needs to sit with an “owner”, and this can be burdensome.
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P2G Coordination Group Manager suggested key elements of a successful strategic monitoring programme

The strategic monitoring approaches outlined above provide examples of best practice which should be considered in developing a strategic approach to monitoring multiple offshore wind developments in England and Wales.

The P2G Coordination Group Manager has reviewed these examples and has suggested the following as key elements of a successful strategic monitoring programme:

- Clear leadership with policy direction provided by government to enable regulatory bodies to drive the approach through consent conditions consistently.
- Engagement with industry and at an early enough stage to ensure that monitoring programme objectives are deliverable i.e. to enable commercial issues to be resolved before data collection needs to start.
- Ongoing collaboration across government, regulatory and advisory bodies, academia and eNGOs to understand monitoring programme outputs and to act quickly to adapt approaches where necessary.
- Data sharing agreements and agreed parameters around when and how data can be made publicly available.
- Mandatory data standards to ensure the data can be analysed collectively.
- Agreement across government, regulators and SNCBs on the scale at which monitoring programmes should be defined to ensure the data provides meaningful evidence specific to the receptors it is targeted at.
- Requirements driven programme design – ensuring that monitoring is designed to deliver answers to consenting questions and not purely for research purposes.
- An associated knowledge transfer programme (or similar) that actively takes the monitoring data outputs to assimilate them into practical findings about understanding or shapes further monitoring to ensure gaps in understanding are resolved as rapidly as possible.
- A governance structure to oversee the outputs of the monitoring programme(s) that can identify necessary adaptations to monitoring objectives or scope to ensure it continues to deliver meaningful outputs.

Annex 1. Review of current UK and international approaches to strategic/regional monitoring

1 Introduction

Howell Marine Consulting (HMC) has been commissioned by the Offshore Wind Industry Council (OWIC) to facilitate a workshop for the Pathways to Growth (P2G) workstream to discuss the development of a strategic approach for offshore wind monitoring in England and Wales.

This paper provides examples of strategic approaches to environmental monitoring which have been adopted both in the UK and internationally, both for offshore wind and for other industries. These approaches generally involve collaboration between individual developers within an industry to deliver monitoring at a multi-project or regional level.

It is acknowledged there is currently considerable interest and development in thinking about strategic monitoring within offshore wind consenting and monitoring. Current Defra, Natural England and other developing positions are not included in this paper, which instead focuses on approaches which have already been established and from which lessons can be learnt to help develop these emerging positions.

The examples in this paper are used to explore the benefits and challenges of adopting strategic approaches to monitoring and for each example, the applicability to the English and Welsh offshore wind regulatory and policy framework is discussed. The report summary sets out key lessons which can be taken from these examples which should be considered during the development of strategic monitoring approaches.

For the purpose of this paper, strategic monitoring is taken to mean a multi-project approach to monitoring the impacts of offshore wind development. This could be regional, sectoral, or national. For industry-led approaches this is likely to be regional, with several developments operating a co-ordinated monitoring programme.

Strategic monitoring can be seen as a solution to the need to co-ordinate monitoring efforts and assess the cumulative impacts of multiple projects located within an area, whilst maintaining relevance at an individual project scale. This could equally be called a “regional approach” or a “co-ordinated multi-project approach”.

UK Examples of Strategic/Regional Monitoring

1.5 Strategic monitoring in the UK

There is increasing interest in the UK towards the adoption of strategic, regional or multi-project monitoring programmes to address consent requirements related to environmental impact. Two examples are explored in this section, namely the establishment of regional advisory groups (RAG) in Scotland to deliver strategic monitoring for offshore wind farms in geographic regions, and the use of Regional Environmental Assessment, and associated strategic benthic monitoring data collection, within the marine aggregates industry.

These two key examples show that it is possible for multiple offshore development projects to align their monitoring programmes for the benefit of multiple parties and that the needs case for both provided the motivation and justification to develop such approaches.

1.6 Regional Advisory Groups for Offshore Wind in Scotland

Currently two Regional Advisory Groups exist in Scotland related to offshore wind. These are the Forth and Tay RAG (FTRAG) and Moray Firth RAG (MFRAG).

1.6.1 Overview of Approach

The Forth and Tay Regional Advisory Group (FTRAG) was set up in 2020 and is a partnership established by Scottish government which includes local authorities, government agencies, industries, and other stakeholders. The FTRAG employs a collaborative approach to deliver the strategic monitoring of offshore wind projects in the Forth and Tay regions of Scotland. It aims to ensure that appropriate and effective monitoring of the impacts of the developments are undertaken to satisfy the requirements of the Section 36 consent and marine licence conditions of offshore wind farms including Neart na Gaoithe Offshore Wind Limited (NnGOWL), Inch Cape Offshore Limited (ICOL) and Seagreen Wind Energy Limited (Seagreen)¹. The details of discussions held within the FTRAG and how the group is coordinated are currently unavailable. The Terms of Reference for the group state that these details will become available as the group develops.

Similarly, the Moray Firth Regional Advisory Group (MFRAG) has been set up to ensure that appropriate and effective monitoring of the impacts of offshore wind developments are undertaken to satisfy the requirements of the section 36 (s.36) consent and marine licence conditions of Beatrice Offshore Wind Farm Limited (BOWL), Moray Offshore Windfarm (East) Limited (Moray East) and Moray Offshore Windfarm (West) Limited (Moray West).²

1.6.2 Benefits of the RAG Approach

The FTRAG has set up a monitoring framework that facilitates collaboration between developers and their monitoring programmes to provide more strategic outputs and potential cost savings³. This uses a data-driven approach, in which the coordination of data is prioritised to create a comprehensive view for key areas of offshore wind monitoring such as benthic ecology, marine mammals, ornithology, fish biology and other environmental work streams as required.

An analysis of environmental data related to post-consent monitoring of licence requirements for offshore wind farms revealed that regional or strategic level data collection can be more efficient for monitoring since it lowers costs for developers, accelerates data acquisition, and minimises disruption to other users⁴. Data-driven collaborative monitoring approaches for offshore wind energy projects is an example of how a coordinated effort among operators, regulators and interested parties can provide significant benefits in terms of the performance

¹ <https://marine.gov.scot/ml/forth-tay-regional-advisory-group-ftrag>

² <https://marine.gov.scot/ml/moray-firth-regional-advisory-group-mfrac>

³ https://marine.gov.scot/sites/default/files/ftrag_-_terms_of_ref_ftrag_draft_march_2020_clean.pdf

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/317787/1031.pdf

of monitoring and strategic management. It identifies strategic opportunities and proposals for additional monitoring or research beyond the requirements of the individual development Environmental Monitoring Plans (EMPs).

The advantage of this regional strategy is that it facilitates proportionate, focused, and risk-based monitoring, which aims to produce complementary results at a larger scale and result in cost savings. Additionally, collaborative monitoring can assist in identifying and managing current and future environmental impacts, permitting stakeholders to take corrective actions when necessary. This strategy will align monitoring efforts with industry objectives, Scottish Government targets, and the most recent academic research in marine renewables and other relevant areas by incorporating expertise from various sector areas⁵.

1.6.3 Challenges and Lessons Learned

FTRAG's terms of references state that lessons learned and best practises will be shared as these come to light during discussions⁶. There is currently no information available about the collaborative data-driven approach's effectiveness. The developers are liable for paying all reasonable FTRAG costs, such as those associated with hosting meetings and providing secretariat support.⁷

Furthermore, it is probable that offshore wind developers would apply various data systems and technologies, making it challenging to compile the data in a complementary and strategic form in the absence of any clear frameworks.

1.6.4 Applicability to offshore wind in England and Wales

The RAG approach is still in its infancy but its establishment in Scotland shows that such approaches can be adopted if there is willingness to work together to agree a coordinated programme of monitoring data collection.

Securing the RAG approach through conditions attached to marine licences and Section 36 consents in Scotland is a simpler process than it would be through the Development Consent Order (DCO) required for offshore wind developments in England and Wales. Marine Scotland are the consenting authority for offshore wind farms in Scotland, whereas the DCO process is managed by The Planning Inspectorate with the final decision being made by the relevant Secretary of State. As the DCO incorporates both marine and terrestrial consent decisions, and the MMO are one of a number of statutory advisors within the process rather than consenting authority, the regulatory framework is more complex in relation to agreeing monitoring across projects. It is also worth noting that each DCO becomes a separate piece of secondary legislation, thus adding precedence to case law which impacts both marine and terrestrial decision-making. While there are legal and development risk obstacles to consider these could be addressed through policy direction. This is the key lesson to be taken from the RAG approach: it has been promoted by Scottish Government, who also, through Marine

⁵ https://marine.gov.scot/sites/default/files/ftrag_-_terms_of_ref_ftrag_draft_march_2020_clean.pdf

⁶ https://marine.gov.scot/sites/default/files/ftrag_-_terms_of_ref_ftrag_draft_march_2020_clean.pdf

⁷ https://marine.gov.scot/sites/default/files/ftrag_-_terms_of_ref_ftrag_draft_march_2020_clean.pdf

Scotland, manage the offshore wind consenting process. This has allowed for a clear direction to be set for the establishment of a regional approach.

1.7 Marine Aggregate Regional Environmental Assessment

The marine aggregate industry has used a regional approach to address wider scale cumulative effects by developing a Marine Aggregate Regional Environmental Assessment (MAREA) voluntary initiative, endorsed by the British Marine Aggregates Producers Association (BMAPA), The Crown Estate and the Marine Management Organisation⁸. The approach was developed soon after the publication of the Marine and Coastal Access Act 2010 to address the needs of the aggregate industry in relation to converting existing consents into marine licences. The primary aims of a MAREA are to identify the baseline environmental conditions in a region with several marine aggregate applications and to assess the potential cumulative and in-combination effects of all the existing and future dredging operations⁹.

Although the UK aggregate sector undertook the MAREAs as a voluntary initiative, the evaluation methodology was not created by the industry alone but rather was the result of a collaborative process between the industry and a Regulatory Advisory Group (RAG), members of which include the MMO, English Heritage, Natural England, the Joint Nature Conservation Committee (JNCC) and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). To guarantee that the regulator and the industry receive consistent advice, the RAG offers a platform for advisers to discuss cross-cutting issues. By sharing resources, skills, and capacities across advisers, this more coordinated approach also promotes the development of practical and pragmatic solutions to address environmental protection issues¹⁰.

In order to lessen the regulatory burden for the additional site-specific EIA, the RAG advised that impacts on the physical, biological, and human environments were evaluated inside the MAREA. Thus, the RAG proposed a fundamental question to focus the ‘effects led’ MAREA process, including “Should existing dredging continue and new areas be dredged within the MAREA regions? (i.e. are the current levels of dredging activity environmentally acceptable and if so, can they be increased without causing significant environmental impact?)”¹¹.

The initial step of the MAREA was a scoping phase which located existing regional data and identified data gaps for additional baseline surveys and desk-based studies. For each MAREA region, a thorough numerical modelling exercise was conducted applying regional-scale hydrodynamic and sediment transport models linked to regional-scale mapping of sensitive receptors in order to estimate the overall effects of the dredging activities¹². The impact assessment then incorporates a receptor (habitat or species) value and sensitivity assessment (based on the receptor's tolerance, adaptability, and recoverability to a particular effect) with

⁸ <http://marine-aggregate-rea.info/about-marea>

⁹ <http://marine-aggregate-rea.info/about-marea>

¹⁰ https://bmapa.org/documents/BMAPA_TCE_Good_Practice_Guidance_04.2017.pdf

¹¹ <http://marine-aggregate-rea.info/sites/www.marine-aggregate-rea.info/files/private/aoda-vol2-final.pdf>

¹² https://www.researchgate.net/publication/300017785_Regional_Environmental_Assessment_of_Marine_Aggregate_Dredging_Effects_The_UK_Approach

a prediction of effect magnitude (based on extent, duration, frequency, and elevation above baseline) to evaluate the impact significance¹³ Impacts are monitored over a standardised timeframe to confirm whether the models were correct and identify any unexpected impacts.

1.7.1 The benefits and challenges of the MAREA approach

The MAREA approach offers developers the chance to integrate their knowledge and adopt a more consistent approach to evaluating potential regional scale effects, with one main advantage being it enables a comprehensive view of the environmental impacts of marine aggregate extraction across a larger geographic area, as data was collected over a wider area than the proposed dredge sites¹⁴. Additionally, it enables the identification of data needs at a scale that considers both site-specific interests and the demand for a regional view. This could aid in prioritising conservation efforts and identifying locations with increased environmental sensitivity¹⁵. By minimising duplication of effort and ensuring that all data outputs are consistent with one another, this in turn improves survey efficiency¹⁶.

The MAREA approach also benefits the regulators, by streamlining the regulatory process and enhancing consistency in decision making by providing a more robust regional overview¹⁷. A review of four MAREAs demonstrated the MAREAs may be used as a quality control mechanism, benchmarking EIA scoping activities, and supporting streamlined statutory advice in practice¹⁸.

The approach is now being held up as a model of best practice for the wider UK marine development sector and these principles are being applied to the way the sector will carry out the monitoring and compliance duties associated with the new regulatory consents over the next 15 years and beyond, having successfully demonstrated the practical benefits of collaborative working and a more coordinated approach to management¹⁹.

The MAREA approach has been successful in streamlining aggregates extraction consents and standardising monitoring reporting. The requirement to move towards a regional approach, in part, originated in the need to bring marine aggregates into the new marine licensing regime under the Marine and Coastal Access Act 2009 (MCAA) as existing consents came to the end of their life and new 15-year marine licences were required. This was a burdensome task for both industry and regulators and required extensive collaborative working to agree licence conditions which met the needs of both sides.

1.7.2 OneBenthic and the Regional Seabed Monitoring Programme

The OneBenthic dataset has provided a baseline evaluation of the UK seabed macrofauna, and a brand-new strategy for assessing the effects of activities on seabed sediments. The OneBenthic data system pools together data and allows for open interrogation and serves as

¹³https://www.researchgate.net/publication/300017785_Regional_Environmental_Assessment_of_Marine_Aggregate_Dredging_Effects_The_UK_Approach

¹⁴ https://bmapa.org/regulation_and_management/regional_assessment.php

¹⁵ https://bmapa.org/regulation_and_management/regional_assessment.php

¹⁶ https://bmapa.org/regulation_and_management/regional_assessment.php

¹⁷ https://bmapa.org/regulation_and_management/regional_assessment.php

¹⁸ https://ueaeprints.uea.ac.uk/id/eprint/48093/1/PhD_THESIS_KEITH_COOPER.pdf

¹⁹ <https://www.agg-net.com/resources/articles/marine-aggregates/the-continuing-recovery-in-the-uk-marine-aggregates-sector>

the foundation for the marine aggregate industry's Regional Seabed Monitoring Programme (RSMP) which provides the data used within the MAREA. It has improved the sustainability of dredging by ensuring that the conditions of the seabed remain favourable for recolonisation and cut compliance monitoring costs by 50% (BMAPA, 2015)²⁰.

The use of the OneBenthic tool has proven to be highly beneficial for the strategic monitoring for marine benthic environments. Useful data contained in the OneBenthic database, which feeds into the tool, were generated from the Cooper and Barry 2017²¹ study in which data was contributed? by Welsh Government, Defra, MMO, the Crown Estate, and the British Marine Aggregate Manufacturers Association²². Large amounts of benthic data (macrofauna and sediment particle size) are contained in the OneBenthic database, which brings these datasets together in one location in the public domain where they can be analysed in an online tool that supports research and facilitates data reuse²³. The resulting high-quality, standardised dataset is used in scientific research and promotes innovative and collaborative ways of working²⁴. Large datasets, such as that aggregated under OneBenthic, are key for answering critical concerns including biodiversity, marine spatial planning, conservation, climate change and cumulative effects²⁵. Shared databases also reduce the costs of environmental assessment for seabed users and developers²⁶.

The information gathered by the benthic tool can be used to evaluate the possible effects of aggregate extraction, identify areas that are particularly sensitive and thus inform management decisions and adjust operations accordingly. The dataset addresses the long-standing problem of developer-led sampling initiatives focusing on only licenced areas and thus helps form a wider picture of environmental conditions²⁷. As a result, the industry demonstrates its commitment to the UK's environmental objectives and provides evidence to regulators to encourage strategic and proactive measures for marine planning. The collaborative dataset strategy exemplifies the advantages of improved integration between industry and government, as well as the potential of reliable and large-scale data to address environmental challenges.

The limitations of the approach, however, include that a lot of assumptions are made when clustering data from a sizable number of sample points over a sizable period of time, in this case, 48 years and it is difficult to appropriately integrate data from many sources and programmes. Although the data has undergone extensive standardisation and error checking, it is still possible that some data may be inconsistent or that certain species may not have been correctly identified.

²⁰ <https://www.cefas.co.uk/impact/case-studies/big-data-an-opportunity-to-do-things-differently/>

²¹ <https://www.nature.com/articles/s41598-017-11377-9>

²² https://openscience.cefas.co.uk/ob_obdetgc/

²³ https://openscience.cefas.co.uk/ob_obdetgc/

²⁴ https://rconnect.cefas.co.uk/onebenthic_portal/

²⁵ https://openscience.cefas.co.uk/ob_obdetgc/

²⁶ https://openscience.cefas.co.uk/ob_obdetgc/

²⁷ <https://www.sciencedirect.com/science/article/pii/S0964569120302696#sec4>

1.1.1 Learning lessons from marine aggregates

Unlike the Scottish offshore wind RAG approach, the use of a regional approach to monitoring and data collection used within the marine aggregates sector was industry-led, albeit supported and encouraged by the MMO. The regional approach was identified as the solution to the problem of understanding regional effects of multiple projects within a period in which multiple consents needed to be secured to allow the industry to continue operating as before.

The marine aggregates industry is much smaller than offshore wind, with fewer individual companies operating in the sector. Companies also have a long history of co-location of operations. The existing relationships and operating practices between companies made this approach easier to adopt. BMAPA has been instrumental in navigating the negotiations between individual operators.

International Examples of Strategic/Regional Monitoring

1.8 International examples of strategic monitoring

The UK based regional monitoring programme examples in section 2 demonstrate that strategic approaches can be adopted for offshore development sectors. Adopting similar approaches for offshore wind in England and Wales would require some, but not insurmountable, adaptation for the specific regulatory context.

The examples in this section are of programmes which have been set up outside of the UK. As such, their direct applicability to offshore wind in England and Wales is limited, however lessons can be learnt from their experience and examples of best practice can be gained. These examples also offer the opportunity to consider whether a more ambitious approach to strategic monitoring could be adopted, either now or as a future aspiration.

1.9 Wozep – Netherlands

1.9.1 Overview

Wozep is an offshore wind ecological research programme run by the Dutch government. It was formed to advance understanding of how offshore wind farms impact protected species and provide the best possible estimate of the ecological impact when developing road maps for proposed offshore wind developments²⁸. The long-term research programme aims to reduce scientific uncertainties regarding knowledge gaps and assumptions from Environmental Impact Assessment (EIA), Appropriate Assessment (AA), and other project level assessments, as well as understanding long-term impacts and upscaling of OWFs and assessing the necessity and efficiency of mitigation measures²⁹. The Wozep programme uses adaptive management within the legislative process for offshore wind to promote a better understanding of the target ecological system, more effective mitigation measures and

²⁸ <https://www.noordzeeloket.nl/en/functions-and-use/offshore-wind-energy/ecology/offshore-wind-ecological-programme-wozep/>

²⁹ https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

improved management decisions and refined regulations. The strategy focuses on several key elements of strategic management, including planning, policy, stakeholder engagement, monitoring and evaluation³⁰. This is a wider management approach that encompasses more than just monitoring.

The programme was developed through a collaborative and a transparent process to identify cooperative goals and information gaps. Workshops were held for government, stakeholders and Dutch knowledge institutes and research bureaus to work towards agreeing objectives and desired outputs³¹.

The cause-effect relationships of the priority species and pressures (marine mammals, underwater noise, bird collision and displacement, bats migration, benthos, long term development of soft and hard substrate) are the focus of Wozep monitoring³². The Wozep team presented the findings to the Wozep preparation and consulting group for comments and feedback. This group includes representatives from several departments of the Dutch government, wind industry and NGOs. The engagement of government and stakeholders in the design phase of the programme is beneficial as it builds trust across the different sectors. Additionally, the Wozep team will better understand concerns, requirements, and priorities from various viewpoints, which will help to ensure that the research targets key aspects and provides helpful insights and recommendations.

1.9.2 Using Wozep as the basis for offshore wind planning decisions

The method used for integrated planning included a Plan-Do-Check-Act (PDCA) iterative planning cycle, illustrated in Figure 1. Under "Planning," EIA, AAs, and the KEC are created to determine whether and under what circumstances wind farm site decisions could be issued for the chosen wind farm sites³³. The research programme's function is within the "Doing" phase, to reduce the scientific uncertainty around the presumptions established in planning³⁴. Results from Wozep will be checked against the planning assumptions in the "Checking" phase to determine their validity. As a result, this informs the need for modifications in policies for the next planning phase³⁵. Additionally, it may directly influence the priorities and research ideas within the Wozep monitoring and research programme³⁶.

³⁰https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

³¹https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

³² https://offshorewind.rvo.nl/file/download/4ac84388-a643-4782-ab2b-95544190ba39/152386312120180412_workshop_offshore%20wind%20ecological%20programmeme%20wozep_i.%20van%20Osplunder-f.pdf

³³https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

³⁴https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

³⁵https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

³⁶https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

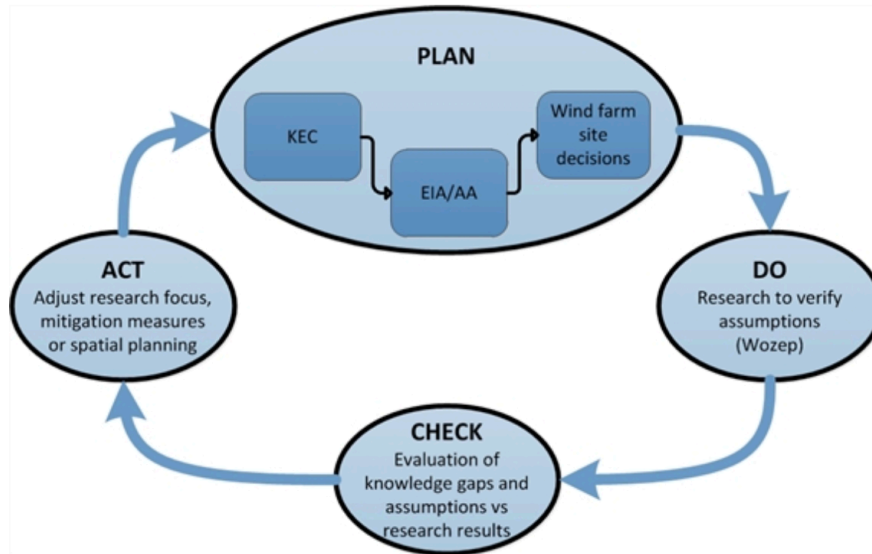


Figure 1: The pro-active relationship of Wozep research in the PDCA cycle taken from https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programme_wozep_-_monitoring_and_research_programme_2017-2021_5284.pdf

1.9.3 The importance of collecting appropriate data

One of the most crucial components of the wider Wozep research programme was to make it feasible for robust analyses to be undertaken and to obtain trustworthy and reproducible conclusions. To do this, the programme made data and information management a priority. The requirements and guiding principles for clear data and information management for Wozep are more specifically as follows:

- a joint approach including third parties;
- a single location for data storage;
- traceability, quality, and transparency of the data are key;
- national and international standards are implemented;
- joint data analyses must be possible for and by the various Wozep partners;
- use and reuse of data and information is encouraged³⁷.

Many steps have been implemented towards data management in the 2016 and 2017-2021 programmes including creation of a data lab, workshops to inform how to use the data lab, standardising data delivery and improving quality.

International cooperation is highly valued by the Wozep monitoring and research programme. The Wozep data lab, makes globally accessible data is made available, organises and participates in international joint research projects, and hosts international workshops. Wozep is built on the belief that a successful strategic programme requires significant international

³⁷https://www.noordzeeloket.nl/publish/pages/122275/offshore_wind_ecological_programmeme_wozep_-_monitoring_and_research_programmeme_2017-2021_5284.pdf

collaboration and connections when the topic is as globally interconnected as the ecological impact of OWFs.

Evaluation is essential for guaranteeing the strategic research programme's success. Wozep regularly conducts extensive midterm evaluations and updates the steering group on the status of the research projects, modifications to the programme and planning, including their justifications, as well as anticipated future plans and adjustments³⁸.

1.9.4 Benefits of Wozep's plan-do-check-act cycle

The benefit of the continuous PDCA cycle is that it enables ongoing improvements to the Wozep research programme and the tools that make use of the information. The cycle includes information from several national and international research programmes in addition to Wozep's results in order to more accurately determine the priority topics. Research indicates that the PDCA cycle is fundamental to continuous improvement, provides a simple but effective approach for problem solving and ensures that ideas are thoroughly tested before committing to full implementation³⁹.

During the evaluation process, it proved to be very useful for all members involved in policy development, research, management and execution, to analyse and structure the position and evolution of Wozep, and the progress in the OWF policies and plans⁴⁰. Interviews were held with members of the Wozep team, as well as with other experts. The majority of those respondents reported that Wozep is a good monitoring programme that will provide insightful data on offshore wind generation⁴¹. The results from research within Wozep are highly valued and utilised by policy makers, permitting agencies, the offshore wind industry, and other stakeholders⁴².

1.9.5 Challenges

A main challenge of a strategic research programme is the high research costs that are involved. One of the primary takeaways from the programme thus far is that the research questions still need to be clarified, the objectives need to be more defined, and it has been advised to further discuss and determine how the study into mitigation strategies may be better included into Wozep⁴³.

Many stakeholders and experts recommend collaborating further with research programmes in other North Sea countries to find synergies, reduce research costs, validate and strengthen results and improve potential mitigation measures⁴⁴. The evaluation team advised using the working groups and intergovernmental networks already in place to investigate options for one

³⁸ <https://www.noordzeeloket.nl/en/functions-and-use/offshore-wind-energy/ecology/offshore-wind-ecological-programmeme-wozep/wozep-research-programmeme/general-reports/@203440/midterm-evaluation/>

³⁹ https://www.researchgate.net/profile/Vivek-Deshpande/publication/318743952_Application_Of_Plan-Do-Check-Act_Cycle_For_Quality_And_Productivity_Improvement-A_Review/links/597ae3b00f7e9b0469e78636/Application-Of-Plan-Do-Check-Act-Cycle-For-Quality-And-Productivity-Improvement-A-Review.pdf

⁴⁰ <https://www.noordzeeloket.nl/publish/pages/197398/wozep-midterm-evaluation-2021.pdf>

⁴¹ https://www.noordzeeloket.nl/publish/pages/155005/midterm_evaluation_wozep_2018_rhdhv.pdf

⁴² <https://www.noordzeeloket.nl/publish/pages/197398/wozep-midterm-evaluation-2021.pdf>

⁴³ <https://www.noordzeeloket.nl/publish/pages/197398/wozep-midterm-evaluation-2021.pdf>

⁴⁴ <https://www.noordzeeloket.nl/publish/pages/197398/wozep-midterm-evaluation-2021.pdf>

or two research priorities⁴⁵. Additionally, it is advised that academics be encouraged and driven to cooperate more and to create coordinated research proposals for submission to national governments and research programmes, to strengthen the opportunity for strategic research in protecting species and ecosystems⁴⁶. This is similar to the objectives of the ECOWind programme⁴⁷.

1.9.6 Applicability to offshore wind in England and Wales

On initial review the Wozep approach to strategic monitoring appears to have little applicability to the UK offshore wind consenting context as it is a government-led approach to wider marine planning for the offshore wind sector. Wozep applies to more than just consent and operational monitoring. It is used to predict and understand offshore wind impacts at a national sectoral level. Individual projects still have monitoring requirements, but these form part of the overarching data-collection and analysis programme. In many ways, the objectives of Wozep align more with the current NERC/Crown Estate ECOWind programme ⁴⁸ than the then regional approaches discussed in section 2.

That said, lessons can be taken from Wozep related to the value of open data sharing, data standardisation and finding synergies in monitoring programmes which can reduce costs from multiple organisations.

The Wozep programme asks for more monitoring data than can be secured through project-relevant consent conditions. Such data could still be voluntarily collected by industry, but this would remain outside of the development consent requirements.

1.10 Oil Sands Monitoring (OSM) – Alberta, Canada

1.10.1 Overview

The province of Alberta in Western Canada has a long history of regional cooperative projects, such as the cooperative regional aquatic monitoring programmes, the cooperative research programme for the oil sands industry, and the regional cumulative impacts management assessment association. Reviews of these existing programmes revealed the need for a more fully integrated monitoring system; however, the attempts at integrated interpretation and analysis made before 2012 were hampered by problems such as inconsistent indicators, shortened sampling schedules, incompatible analytical methods, and fragmented data sets (Gosselin et al., 2010)⁴⁹.

Currently, the governments of Alberta (state) and Canada (federal) work together to administer Oil Sands Monitoring (OSM), which is supported by a voluntary \$50 million industry levy per year. It analyses numerous indicators across various media and divides programmes into targeted studies that are diversified and comprise research and the development of

⁴⁵ <https://www.noordzeeloket.nl/publish/pages/197398/wozep-midterm-evaluation-2021.pdf>

⁴⁶ <https://www.noordzeeloket.nl/publish/pages/197398/wozep-midterm-evaluation-2021.pdf>

⁴⁷ <https://ecowind.uk>

⁴⁸ <https://ecowind.uk/>

⁴⁹ <https://www.frontiersin.org/articles/10.3389/fenvs.2021.666698/full>

methodologies as well as core monitoring, which includes long-term routine programmes⁵⁰. OSM's current focus also includes enhancing the function of community-based monitoring. OSM operates on a semi-distributed model, with geographically dispersed groups of individuals from the Provincial and Federal governments, local community members and representatives, private contractors, and non-governmental organisations participating.

The OSM uses an ecosystem-based approach that incorporates multiple essential components of the system such as hydrology, surface and groundwater quality and quantity, climatology, sediment dynamics and quality, local and regional air quality and atmospheric deposition, aquatic and terrestrial biological indicators and endpoints, as well as the relationships among the components⁵¹.

1.10.2 Four models of integrated monitoring

There are four models that have been used to integrate monitoring including, integrated interpretation, integrated analysis, and partially and completely integrated designs. Using this paradigm, monitoring studies can be classified according to the time (when in the study cycle) and strategy (what to integrate: data, results, or designs).

Integrated interpretation includes the combination of information simultaneously considering conclusions from several independent, but related studies, each of which may have addressed a particular hypothesis or set of queries. Integrated interpretation typically takes place during the discussion of findings in scientific papers.

Integrated analysis allows for the combining of data from many projects to address novel hypotheses or reduce the level of uncertainty surrounding a predetermined topic. The ability to infer relationships at many spatial and temporal scales is one advantage of integrated analysis. If material is readily available, easily accessible, and pertinent to the study questions of the investigator, integrated analysis can be carried out retrospectively with simplicity and can additionally be facilitated by publicly available data. Integrated analyses are made easier inside OSM through direct researcher collaboration as well as by making data available on publicly accessible databases.

Partially integrated design and data collection investigates a subset of the main set of questions, indicators, or environments, such as the collection of data from biological indicators as well as information on some environmental contaminants. OSM's Terrestrial Biological Monitoring programme combines interpretation and analysis with the Before-After-Dose-Response (BADR) design. These efforts were facilitated by the formation of technical advisory committees tasked with standardising data collection methodologies at the regional level. These committees supplemented early commitments for integrated monitoring of related studies in the programme's initial design and helped to optimise sampling designs for water quality and air monitoring.

A fully integrated design is defined as the complete overlap of all study components to address a single scientific goal. This is accomplished not only by coordinating experimental designs

⁵⁰ <https://www.frontiersin.org/articles/10.3389/fenvs.2021.666698/full>

⁵¹ https://publications.gc.ca/collections/collection_2011/ec/En14-47-2011-eng.pdf

and/or analytical units but also by inquiring more complex questions that span multiple disciplines. Integrated designs encourage more efficient use of funds and can strengthen credibility, providing data for high-impact work. For example, the OSM includes the benthic macroinvertebrate programme and the Enhanced Monitoring Programme, which are designed to inform mine water return and the Representative Sub-basins Study (REPS), which are used to conduct necessary focused integrated monitoring, process studies, and modelling to assess and predict casual linkages of oil sands operations to observed effects.

1.10.3 Lessons learnt from OSM

Attempts at fully integrated monitoring through the wider OSM programme have resulted in large initial and ongoing time investments by scientists and managers, emphasising the potentially high (and often front-loaded) resource investments required to reap the benefits of integrated design as a programme matures.

The weakness of less fully integrated models includes the inability to communicate a clear direction on what constitutes integrated monitoring and how it can be achieved, unclear responsibilities, or a lack of familiarity among participants on how to effectively operate within an integrated programme, a lack of investment, travel restrictions, or all of the above can all have an impact on the development of an integrated programme. There is a risk that models which operate across multiple monitoring partners or subcontractors may also fail to address any potential competing financial self-interests for limited funding effectively.

Failure to plan properly prior to the start of monitoring may result in increased management and operational costs, as well as a loss of institutional or sectoral support (Reynolds et al., 2011). Administrative difficulties increase at large spatial scales and iterative planning cycles are likely to be required to build towards a rigorous integrated design.

When integration occurs during design, the flexibility of studies may be reduced but the strength of inference is reinforced and expanded for known questions. Thus, a broad design is likely to result in a loss of specificity but an increase in generality. Furthermore, if integration isn't fully developed into joint understanding between parties, there is a risk that the data collected won't meet the desired objectives.

1.10.4 Applicability to offshore wind in England and Wales

Like Wozep, it is unlikely that an approach similar to the OSM programme would be directly applicable for offshore wind in England and Wales. The objectives of the programme are wider than those required within the regulatory framework for offshore development as they bring in increasing levels of scientific research and monitoring integration.

The key message to take from OSM is the importance for strategic monitoring programmes to be clearly set up in terms of their objectives and proposed outputs. If programme design is not clearly defined and fit-for-purpose, it is likely that additional cost will be required later to address shortcomings.