



SHEPHERD+ WEDDERBURN

POST HEARING SUBMISSION ON BEHALF OF

(1) BARROW OFFSHORE WIND LIMITED (REF: 20049974) (2) BURBO EXTENSION LTD (REF: 20049975) (3) WALNEY EXTENSION LIMITED (REF: 20049977) (4) MORECAMBE WIND LIMITED (REF: 20049973) (5) WALNEY (UK) OFFSHORE WINDFARMS LIMITED (REF: 20049978) (6) ØRSTED BURBO (UK) LIMITED (REF: 20049976) (THE "ØRSTED IPs")

IN CONNECTION WITH THE Application by Morecambe Offshore Wind Limited for an Order Granting Development Consent for the Morecambe Offshore Wind Farm

1. Introduction

- 1.1 This post hearing submission is provided in accordance with Deadline 4 of the examination timetable for the application by Morecambe Offshore Windfarm Limited (the “**Applicant**”) for an Order under the Planning Act 2008 (the “**Act**”) granting Development Consent for the Morecambe Offshore Windfarm Generation Assets (the “**Project**”).
- 1.2 We represent six owners of operational offshore windfarms in the East Irish Sea (as set out relevant representations RR-008, RR-014, RR-056, RR-088, RR-089, RR-093), who we refer to together as the “**Ørsted IPs**” for the purposes of this submission.
- 1.3 The Ørsted IPs attended issue specific hearing 3 (“**ISH3**”) for the Project on 5 February 2025. This document summarises the submissions made by the Ørsted IPs during ISH3 and responds briefly to the Applicant’s oral submissions. This submission is provided alongside:
- 1.3.1 a response to deadline 3 submissions; and
 - 1.3.2 a response to action point 23 arising from ISH3 [EV7-006].

2. Submissions made at ISH3

- 2.1 At ISH3, the Ørsted IPs addressed agenda item 6 (Other Offshore Infrastructure and marine operations), in respect of wake loss effects.
- 2.2 In summary, in response to questions raised by the examining authority, the Ørsted IPs made submissions regarding the Applicant’s approach to its assessment of net GHG effects of the Project, which it has undertaken to complete.
- 2.3 The Ørsted IPs outlined that the Applicant’s assessment should take into account long term impacts on energy generation at the Ørsted IPs assets – i.e. that life extensions of the assets are not pursued beyond the ‘earliest expected decommissioning dates’ (provided in response to ExQ1 [REP3-109]), as a result of the wake loss of the Project. This matter is addressed in detail in the Ørsted IPs’ response to action point 23.
- 2.4 The Ørsted IPs also responded to questions from the examining authority regarding the approach taken to the wake loss assessment undertaken by Wood Thilsted. In particular, the Ørsted IPs outlined that Wood Thilsted’s approach was to model two realistic scenarios based on information in the application for the Project, and knowledge regarding the turbine technology likely to be available at the time of construction. It was acknowledged that the Applicant is best placed to predict the layout of the Project, but that Wood Thilsted’s assessment was based on realistic and reasonable parameters and did not seek to maximise impact. It is noted that the Applicant agreed that the parameters utilised in the assessment were reasonable.
- 2.5 The Ørsted IPs also confirmed their position is that the key requirement for wake effects to be assessed and addressed is within the NPS-EN3 as an impact on an ‘other sea user’. This regime does not require an impact to be “significant” in an EIA sense. Rather, the Ørsted IPs’ view that the predicted wake effects are “material” is a commercial consideration, having particular regard to future viability under paragraph 2.8.347 and decisions regarding lifetime extension. Wake loss is relevant to the EIA assessment in terms of climate change and the Applicant’s GHG assessment.

3. Response to point made by the Applicant at ISH3

- 3.1 At ISH3, the Applicant outlined that its position in respect of the wake loss issue is that:
- 3.1.1 practically speaking, it is not possible to mitigate for the effects of wake loss of the Project, without significantly reducing the boundary of the site; and
 - 3.1.2 there is no policy drive in the NPS-EN3 for compensation for wake effects.

Mitigation

- 3.2 The Ørsted IPs do not agree with the Applicant that the only possible mitigation for the wake effects of the Project is through increasing the distance between the Project and the Ørsted IPs assets.
- 3.3 A number of other mitigation measures exist, including:
- 3.3.1 design changes such as installing a smaller number of larger turbines and reducing density at the site;
 - 3.3.2 reducing temporal overlap between projects; and
 - 3.3.3 operational measures including wind sector management and wake steering.
- 3.4 Alternative mitigation measures have recently been implemented in the German North Sea, as a result of submissions made in the 2024 consultation process on an Offshore Development Plan, which related to proposed lease areas. During that process, BP p.l.c (“BP”) made submissions in respect of proposed new lease sites nearby their own existing sites (granted in a previous process), raising concerns regarding wake loss. BP recommended that “*When determining areas, greater consideration should be given to the efficiency of electricity generation, so that higher electricity yields can be generated on the areas through less wake effect.*” BP opposed the adjacent sites being selected for further development and, in the case those sites were selected, sought to mitigate the wake effects arising from the proposed new windfarms at their own sites.
- 3.5 BP argued that if the new sites were retained, mitigation measures were required to “*reduce the yield losses to the areas already allocated*”. BP’s proposed mitigation measures included delaying tendering for the sites (to reduce temporal overlap with BP’s developments) and a reduction to the power density of the sites. As a result of these submissions, the capacity of the proposed sites was reduced by 50% (from 2GW to 1GW). This approach was welcomed by EnBW. A certified translated version of BP’s submission is provided at **Appendix 1** and an article reporting on the decision is provided at **Appendix 2**.
- 3.6 The Applicant’s position that the effects of the Project cannot be mitigated is pure assertion. The Applicant has not provided any evidence demonstrating that it has explored possible mitigation measures and has not engaged with the Ørsted IPs in this respect. As outlined in the Ørsted IPs’ deadline 1 submission [REP1-103], the NPS-EN3 requires the Applicant to assess wake effects, engage with the Ørsted IPs in respect of those effects and take steps to mitigate the effects. It is not appropriate to simply assert that mitigation is not possible.
- 3.7 It is noted that cumulative effects of developments on wind resource at a number of the Ørsted IPs’ assets were highlighted in the Crown Estate’s Round 4 bidding process documentation as a constraint requiring “*significant mitigation*”. Therefore, the Applicant has been on notice since the time of bidding, that this is an issue which would require mitigation. A copy of the Irish Sea Characterisation Report from the Round 4 bidding process is attached as **Appendix 3**.

Compensation

- 3.8 As outlined in detail in the Ørsted IPs’ deadline 1 submission [REP1-103], the policy drive of the relevant sections of NPS-EN3 is for new offshore wind development to engage with existing sea users to ensure effects of new development are appropriately mitigated, such that co-existence is possible. In summary, where a proposal may impact existing assets:
- 3.8.1 The Applicant should “*work with the impacted sector to minimise negative impacts*” and the Secretary of State should be satisfied that site selection/design has “*been made with a view to avoiding or minimising disruption or economic loss*”.
 - 3.8.2 The Secretary of State may consider using arbitration to resolve how adverse effects on commercial activities may be addressed.
 - 3.8.3 In respect of decision-making, provided schemes have been carefully designed and early consultation has taken place “*mitigation measures may be possible to negate or reduce effects on other offshore infrastructure or operations to a level sufficient to enable the Secretary of State to grant consent*”. Where future viability of the asset is likely to be affected, the Secretary of State should give “*substantial weight*” to the adverse effect.

- 3.9 While compensation is not specifically mentioned, the expectation of the NPS-EN3 is clearly that applicants for new development will implement best efforts to engage with existing sea users on adverse effects and identify solutions. This is how fisheries coexistence has been managed. The Ørsted IPs consider the expectation is that applicants take a broad approach to addressing adverse effects, which could include compensation. If the Secretary of State is not satisfied with the approach taken it may refer the parties to arbitration which could deal with adverse economic effects.
- 3.10 It is noted that it is routine in consenting processes for parties to discuss and resolve issues regarding a proposed development privately (the UK Government notes in the Clean Power 2030 Action Plan that issues with wake have historically been dealt with outside of the planning process). If a party's concern is resolved through private discussions, it is standard to update decision makers in that respect. Decision makers will take account of and may rely on such agreement in reaching a determination. While the SoS cannot force a compensation payment to be made, it can refer an issue to a third party to resolve if it is unhappy with the level of effect/residual effect.
- 3.11 If no effort is made to minimise the wake effects of the Project on the Ørsted IPs' developments, then the Applicant will have failed to comply with important policies of the NPS-EN3 (as well as North West Marine Plan, as outlined in responses to ExQ1 [REP3-109]). The full unmitigated effect of the Project (including cumulative effects) will need to be taken into account by the examining authority and Secretary of State. As outlined in the Ørsted IPs' accompanying submissions, this level of effect has the potential to impact the future viability of their assets. Therefore, the unmitigated loss which would need to be evaluated by decision makers is the total loss of the renewable generation from all of the assets at their earliest possible decommissioning dates.

Shepherd & Wedderburn LLP

18.02.2025

Appendix 1



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07. August 2024

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Consultation on the draft site development plan 2024 (FEP-E)

Dear [REDACTED]

dear Sirs/Madams,

We are pleased to take the opportunity to submit a statement on the draft of the spatial development plan (June 2024).

We would like to thank you for this opportunity and request that you consider the following points.

I. Areas

BP supports the FEP's target installed capacity of 2 GW per area. We therefore do not agree with demands for smaller areas (including 1 – 1.5 GW).

The reasons for this are:

- Greater economies of scale with 2 GW of land lead to lower electricity generation costs.
- It is doubtful that the diversity of actors will be achieved by smaller areas.
- The interfaces will be simplified if only one operator has to connect to the standard 2 GW grid connection points of the transmission system operators (TSOs).

II. Yield over performance

When determining areas, greater consideration should be given to the efficiency of electricity generation, so that higher electricity yields can be generated on the areas through less wake effect.

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A sole focus on capacity/output stands in the way of the successful expansion of offshore wind energy.

We therefore reject a peripheral development of the shipping route SN10 (consisting of areas N-9.4, N-9.5, N-12.4, and N-12.5).

If it remains a peripheral development, measures must be taken to reduce the yield losses to the areas already allocated. Among other things, a change in the chronological order of the tendering of the areas, i.e. a delayed tendering of the areas along the SN10 (cluster N-9 – N-13) and instead an advance of the areas northwest of the SN10, could be considered.

This could significantly reduce the expected strong shading effect on clusters N-9, N 12 and N-13, at least temporarily. Another possibility could be to reduce the power density of the areas.

III. Regarding Chapter 6.2 Interface between Transmission System Operators and Offshore Wind Farm project sponsors concerning transmission voltage (66kV vs. 132kV)

We welcome the fact that the introduction of the new standard for internal parking cabling of 132 kV will – as before – be valid from 2032 and recommend the addition that the use of 66 kV cables will remain as an option after 2032, deviating from the now limited possibilities of deviation according to Chapter II 6.13 FEP-E 2024.

In view of the delays in the grid connection systems communicated in recent months, it is also necessary to clarify that in the event of delays in a grid connection system, the original commissioning date is to be used as the decisive factor for determining the applicable standard. So if a grid connection system is to be connected before 2032 according to the site development plan (FEP), but falls into the period 2032 and later due to delays, 66kV should continue to be the transmission voltage.

This is also supported by the fact that such a fundamental change in the design of the platform is associated with additional implementation risks on the part of the network operators, which are transferred to the OWP developer in the further course of the project.

IV. Acceleration surfaces

We welcome the efforts to define areas to be put out to tender in the future as acceleration areas, which will enable planning approval procedures and shorten approval processes for offshore wind projects. For the areas N11-1 and N12.2 approved by BP in 2023, we would like a clarification that the transition from the planning approval procedure to the planning approval process is an *an* option.

V. Various points on Chapter 7 “Planning Principles”

Chapter 7.1.8 Transport Logistics Concept

We recommend that existing offshore wind farms and already allocated areas be granted grandfathering protection so that the economic viability of the offshore wind farms can be maintained with the funds previously calculated.

Chapter 7.2-b No impairment of the safety and ease of maritime traffic

Quote from the FEP-E, Page 30: “The structure must be designed and constructed according to the state of the art in such a way that, in the event of a ship collision, the ship's hull is damaged as little as possible and the structure does not collapse onto the ship; this also includes the construction and operational vehicles used during construction and operation”.

To this end, we are faced with questions as to how this can be ensured and how the Federal Maritime and Hydrographic Agency envisages implementation. Accordingly, we ask for clarification, either by deleting the sentence or by adding a “if possible”.

Regarding Chapter 7.3 Aviation security

BP is against limiting the maximum height of wind turbines. Therefore, we advocate for the reversal of the deletion of the clarifying sentence “This is not associated with a restriction on the height of wind turbines,” as written in the reasoning section of the preliminary draft of the FEP-E. We support the BDEW's statement on this FEP chapter.

In the affected area of the North Sea alone, eleven areas and thus 19.5 GW will be auctioned from 2023 to 2025. For these eleven areas, decisions regarding the turbine size must be made promptly after the project award.

Since future turbine designs that may be eligible for the named 19.5 GW are likely to exceed 1,000 ft of blade tip height, uncertainty is a major concern on this issue. The clarification of this issue is of great urgency and relevance.

Regarding 11., 7.9 Communication and surveillance (b)

While BP clearly supports the development of a mobile network in offshore wind farms, we clearly oppose the solution proposed in the FEP-E. We advocate placing the hardware for the mobile network centrally on the Transmission System Operator converter station. The responsibility for the construction of a mobile network should also not be delegated to the wind farm operators, but should remain in the hands of the mobile network operators (as is customary and sensible on land).

VI. Transitional provisions

In principle, the introduction of the transitional provisions according to chapter V, sentences 1 and 2. These lead to greater investment and legal certainty for the project developer, because there is already certainty about a large part of the planning principles to be observed for the application at the time of the award.

However, we advocate the granting of grandfathering for approved offshore structures and their ancillary facilities and for areas that have already been awarded.

We therefore ask that the exception under sentence 3 a) be deleted, as the purpose of this provision is not quite understandable to us, because a reference to the state of the art in science and technology is dynamic anyway. It is therefore possible that the provision under (a) is only of a clarifying nature.

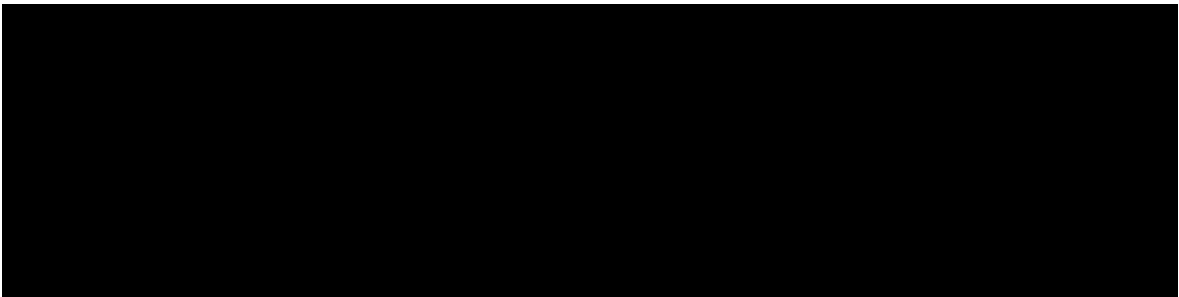
If the exception according to sentence 3 a) remains, we ask that it be left at the state of the art and that the state of the art be deleted. The state of science is undefined and leads to unpredictable investment and legal uncertainties.

In addition, we ask for a list of which planning principles are affected that are related to the state of the art.

We ask that it be made clear in the exception under sentence 3 c) that this exception is only to be applied in principle. This adjustment would allow the new rules to be deviated from in justified individual cases for reasons of protection of legitimate expectations.

We will be happy to answer any questions you may have.

With kind regards,



THIS IS TO CERTIFY

that the foregoing

document

is a true and faithful translation of the attached copy
in the German language.

Viby, 18/2 2025



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Konsultation Entwurf Flächenentwicklungsplan 2024 (FEP-E)

Sehr geehrter
sehr geehrte Damen und Herren,

gerne nehmen wir die Möglichkeit wahr, eine Stellungnahme zum Entwurf des Flächenentwicklungsplans (Juni 2024) abzugeben. Wir bedanken uns für diese Gelegenheit und bitten um die Berücksichtigung der nachfolgenden Punkte.

I. Flächen

bp unterstützt die im FEP angestrebte zu installierende Leistung von 2 GW je Fläche. Wir stimmen somit Forderungen nach kleineren Flächen (u.a. 1 – 1,5 GW) nicht zu. Die Gründe hierfür sind:

- Größere Skaleneffekte bei 2 GW Flächen führen zu geringeren Stromgestehungskosten.
- Es wird bezweifelt, dass die Akteursvielfalt durch kleinere Flächen erreicht wird.
- Die Schnittstellen werden vereinfacht, wenn nur ein Betreiber an die standardmäßigen 2 GW Netzanschlusspunkte der Übertragungsnetzbetreiber (ÜNB) anschließen müssen.

II. Ertrag über Leistung

Bei der Festlegung von Flächen sollte die Effizienz der Stromerzeugung stärker berücksichtigt werden, so dass durch weniger Abschattungseffekte höhere

...

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Stromerträge auf den Flächen generiert werden können. Eine alleinige Fokussierung auf Kapazität / Leistung steht dem erfolgreichen Ausbau der Offshore Windenergie entgegen.

Wir lehnen daher eine Randbebauung der Schifffahrtsroute SN10 ab (bestehend aus den Flächen N-9.4, N-9.5, N-12.4 und N-12.5).

Sollte es bei einer Randbebauung bleiben, müssen Maßnahmen ergriffen werden, um die Ertragsverluste auf die bereits vergebenen Flächen zu reduzieren. U.a. käme eine Änderung der zeitlichen Reihenfolge der Ausschreibung der Flächen, sprich eine zeitlich verzögerte Ausschreibung der Flächen entlang der SN10 (Cluster N-9 – N-13) und stattdessen ein Vorziehen der Flächen nordwestlich der SN10, in Betracht.

Dadurch könnte der zu erwartende starke Verschattungseffekt auf die Cluster N-9, N 12 und N-13 zumindest zeitlich deutlich reduziert werden. Eine weitere Möglichkeit könnte sein, dass hier eine Reduzierung der Leistungsdichte der Flächen vorgenommen wird.

III. Zu Kapitel 6.2 Schnittstelle zwischen ÜNB u. OWP-Vorhabensträgern bzgl. Übertragungsspannung (66kV vs. 132kV)

Wir begrüßen, dass die Einführung des neuen Standards für Innerparkverkabelung von 132 kV - nach wie vor - ab dem Jahr 2032 Gültigkeit erhält und empfehlen die Ergänzung, dass auch nach 2032 eine Verwendung von 66 kV-Kabeln als Option bestehen bleibt, abweichend von den nun eingeschränkten Möglichkeiten der Abweichung nach Kapitel II 6.13 FEP-E 2024.

In Anbetracht der in den vergangenen Monaten kommunizierten Verzögerungen bei den Netzanbindungssystemen bedarf es zusätzlich einer Klarstellung, dass bei Verzögerungen eines Netzanbindungssystems das ursprüngliche Inbetriebnahmedatum als ausschlaggebende Größe für die Ermittlung des anzuwendenden Standards heranzuziehen ist. Wenn also ein Netzanbindungssystem gemäß FEP vor 2032 angeschlossen werden soll, aber durch Verzögerungen in die Zeit 2032 und später fällt, sollte weiterhin 66kV die Übertragungsspannung bleiben. Hierfür spricht auch, dass auf Seiten der Netzbetreiber eine solch fundamentale Änderung im Design der Plattform mit zusätzlichen Realisierungsrisiken verbunden ist, welche sich im weiteren Projektverlauf auf den OWP-Entwickler übertragen.

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IV. Beschleunigungsflächen

Wir begrüßen die Bestrebungen zukünftig auszuschreibende Flächen als Beschleunigungsflächen zu definieren, wodurch Plangenehmigungsverfahren ermöglicht und Genehmigungsprozesse für Offshore Wind Projekte verkürzt werden. Für die im Jahr 2023 bp bezuschlagten Flächen N11-1 und N-12.2 wünschen wir uns eine Klarstellung, dass der Wechsel von Planfeststellungs- zum Plangenehmigungsverfahren eine *Wahlmöglichkeit* ist.

V. Diverse Punkte zu Kapitel 7 „Planungsgrundsätze“

Kapitel 7.1.8 Verkehrslogistikkonzept

Wir empfehlen, dass bestehende Offshore-Windparks und bereits bezuschlagte Flächen einen Bestandsschutz erhalten, damit die Wirtschaftlichkeit der Offshore-Windparks mit den bisher kalkulierten Mitteln aufrechterhalten werden kann.

Kapitel 7.2-b Keine Beeinträchtigung der Sicherheit und Leichtigkeit des Schiffsverkehrs

Zitat aus dem FEP-E, Seite 30: „Die bauliche Anlage muss nach dem Stand der Technik in einer Weise konstruiert sein und errichtet werden, dass im Fall der Schiffskollision der Schiffskörper so wenig wie möglich beschädigt wird und die Anlage nicht auf das Schiff stürzt; dies schließt die bei Errichtung und Betrieb eingesetzten Arbeitsfahrzeuge mit ein“.

Hierzu stellen sich uns Fragen wie dies sichergestellt werden kann und wie das BSH sich die Umsetzung vorstellt. Dementsprechend bitten wir um Klarstellung, entweder durch Streichung des Satzes oder durch Hinzufügen eines „wenn möglich“.

Zu Kapitel 7.3 Luftverkehrssicherheit

bp spricht sich gegen eine Begrenzung der maximalen Höhe von Windturbinen aus. Daher befürworten wir, dass die Streichung des klarstellenden Satzes „Eine Beschränkung der Höhe von WEA ist damit nicht verbunden“, wie im begründenden Teil des Vorentwurfs des FEP-E geschrieben, rückgängig gemacht wird. Wir unterstützen hier die Stellungnahme des BDEW zu diesem FEP-Kapitel.

Im betroffenen Gebiet der Nordsee werden von 2023 bis 2025 allein elf Flächen und somit 19,5 GW verauktioniert. Für diese elf Flächen müssen zeitnah nach dem

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Projektzuschlag Entscheidungen hinsichtlich der Turbinengröße gefällt werden. Da zukünftige Turbinendesigns, die evtl. für die benannten 19,5 GW in Frage kommen 1.000 ft Blattspitzenhöhe wahrscheinlich überschreiten werden, stellt die Unsicherheit bei diesem Thema ein großes Problem dar. Die Klärung dieses Thema ist von hoher Dringlichkeit und große Relevanz.

Zu Kap. II., 7.9 Kommunikation und Überwachung (b)

Während bp den Aufbau eines Mobilfunknetzes in Offshore Wind Parks klar unterstützt, wenden wir uns deutlich gegen die im FEP-E vorgeschlagene Lösung. Wir plädieren dafür die Hardware für das Mobilfunknetz zentralisiert auf der ÜNB-Konverterstation zu platzieren. Die Verantwortung für den Aufbau eines Mobilfunknetzes sollte auch nicht an die Windpark-Betreiber delegiert werden, sondern in den Händen der Mobilfunknetz-Betreiber bleiben (so wie es auch an Land üblich und sinnvoll ist).

VI. Übergangsregelung

Grundsätzlich wird die Einführung der Übergangsregelungen nach Kap. V, Satz 1 und 2 begrüßt. Diese führen zu mehr Investitions- und Rechtssicherheit für den Vorhabenträger, weil somit bereits zum Zeitpunkt des Zuschlages Gewissheit über einen Großteil der für die Antragstellung einzuhaltenden Planungsgrundsätze besteht.

Jedoch plädieren wir für die Gewährung von Bestandsschutz für zugelassene Offshore-Bauwerke und deren Nebeneinrichtungen und für bereits bezuschlagte Flächen.

Wir bitten daher darum, die Ausnahme nach Satz 3 a) zu streichen, da für uns der Zweck dieser Regelung nicht recht verständlich ist, weil ein Verweis auf den Stand von Wissenschaft und Technik ohnehin dynamisch ist. Möglicherweise hat die Regelung unter (a) daher nur klarstellenden Charakter.

Sollte die Ausnahme nach Satz 3 a) bestehen bleiben, bitten wir darum es bei dem Stand der Technik zu belassen und den Stand der Wissenschaft zu streichen. Der Stand der Wissenschaft ist undefiniert und führt zu unvorhersehbaren Investitions- und

...

Rechtsunsicherheiten. Zudem bitten wir um eine Auflistung, welche Planungsgrundsätze betroffen sind, die einen Bezug zum Stand der Technik haben.

Wir bitten darum, bei der Ausnahme nach Satz 3 c) klarzustellen, dass diese Ausnahme nur grundsätzlich anzuwenden ist. Diese Anpassung ließe zu, dass im begründeten Einzelfall aus Vertrauensschutzgründen von den neuen Regeln abgewichen werden könnte.

Für Rückfragen stehen wir Ihnen gerne zur Verfügung.

Mit freundlichen Grüßen



Appendix 2

BSH trims lease plots to tackle wake effects

Germany's Federal Maritime and Hydrographic Agency BSH has outlined plans to reduce the size of upcoming offshore wind lease areas to tackle wake effects and boost electricity yield.

The agency has reduced the expected capacity of two areas, N-9.4 and N-9.5, by 50% to 1GW each, according to an updated site development plan (FEP). The move will help mitigate wake effects between wind farms.

Industry has been calling for changes to the FEP as some sites that have already been tendered, as well as future plots, may be affected by double-digit hits to yield from growing wake effects in the busy North Sea.

"We welcome the decision of the BSH to put new areas with a lower power density out to tender in order to reduce wake effects," an EnBW spokeswoman told reNEWS.

"As a result, more energy can be generated per turbine, which leads to a reduction in energy costs."

Federal Network Agency BNetzA published the tender for area N-9.4 in the German North Sea in late January, with the auction for N-9.5 expected in 2028.

The BSH may also opt



MORE EFFICIENT: Proposed North Sea zones

Photo: BSH

to draw a broader lease map with varying turbine densities depending on wind conditions, an industry source told reNEWS, noting that "all details for the sites that were visible for 2035-2037 have been scrapped".

Overplanting has also been introduced for both N-9.4 and N-9.5, which will allow developers to increase the installed capacity by 20% compared to the allocated grid connection capacity.

This move came as a surprise to the industry, which had previously kept installed capacity in line with network availability.

Overplanting helps to increase the efficiency of the grid connection but comes with additional costs for wind farm operators, as it requires more investment,

according to experts. "So far, BSH has only discussed this with the transmission system operators and not with the rest of the sector," an industry source told reNEWS.

"We'll need to discuss the details with authorities – and maybe some compensation for the (power) that operators will 'lose' when the grid cannot take the electricity."

According to the BSH, the next update of the land development plan will focus on reducing costs by increasing the transmission capacity of offshore grid connection systems from 2GW to 2.2GW and lowering power density in more areas.

German offshore wind industry associations meanwhile called for reliable expansion targets following the FEP publication.

"The new area development plan from the responsible federal office offers less clarity on the proposed 20GW expansion by the mid-2030s than the previous one. The new government must provide this clarity immediately," said the statement from BWE, BWO, VDMA Power Systems, WAB, WindEnergy Network and the Offshore-WindEnergie Foundation.

Appendix 3

Resource and Constraints
Assessment for Offshore Wind

Characterisation Area Report
Irish Sea

17

Characterisation Area Report: 17 – Irish Sea

38255-TCE-REP-022 Characterisation Area Report: 17 – Irish Sea		
Version	Status	Issue date
1.1	Draft	July 2018
1.2	Draft	November 2018
1.3	Final	September 2019

The information included in this report should be read in conjunction with the *Resource and Constraints Assessment for Offshore Wind: Methodology Report* and the *Summary Stakeholder Feedback Report*. The trigger distance for constraints to be included in the constraints analysis section of this report is 1 nautical mile (NM).

The Crown Estate has undertaken the analysis in this report using the evidence available to it, internal expertise and support from external advisers where appropriate. The analysis does not obviate any potential need for any Habitat Regulations Assessment (HRA) or any project level consideration of the potential impact of development. The analysis does not supersede any statutory policies or marine plans. The analysis, including the data and information contained in this document, presents a point in time assessment with changes likely to both the presence and nature of constraints.

This report is provided for information purposes only and no party may rely on the accuracy, completeness or fitness of its content for any particular purpose. The Crown Estate makes no representation, assurance, undertaking or warranty in respect of the analysis in the report including all data and information contained in it.

Receptor rating		Area rating	
Receptor assessed but no interaction noted		Receptor assessed but no interaction noted	
Interaction acceptable with best practice/accepted mitigation		The constraint will present the need to implement best practice/accepted mitigation measures to enable acceptable development within the whole area	
Interaction acceptable with moderate mitigation		The constraint will present the need to implement moderate mitigation measures to enable acceptable development within the whole area	
Interaction acceptable with significant mitigation		The constraint will present the need to implement significant and/or strategic level mitigation measures to enable acceptable development within the whole area	
Significant/insurmountable issue that would be challenging to mitigate within the area of influence of a receptor		Significant/insurmountable issue that would be challenging to mitigate for any development within the whole area	
No data coverage across the area		No data coverage across the area	

Constraints analysis

Note that in addition to The Crown Estate leases/licences within this table, The Crown Estate has also identified key resource areas (KRAs) which may be suitable for the future development of different marine sectors. Information about overlapping KRAs that overlap this characterisation area is described in a latter section of this document.

Exclusions model – Hard constraints			Receptor rating	Area rating
	Present	Commentary		
The Crown Estate agreements	Pipelines: there are numerous active and inactive pipelines intersecting the southern and eastern parts of the characterisation area landing into North Wales and Barrow.	The pipelines have been removed from the characterisation area and will need to be avoided; this should be possible with best practice/accepted mitigation. However, the large number of pipelines may be a constraint on the area available for new arrays.		
	Telecoms and interconnector cables: there are numerous active and inactive cables intersecting the southern and central parts of the characterisation area landing at various points on the English coast.	The cables have been removed from the characterisation area and will need to be avoided; this should be possible with best practice/accepted mitigation. However, the large number of cables may be a constraint on the area available for new arrays. Since cable crossings require cable protection (which may have adverse environmental effects), crossings should be minimised where practicable.		
	Walney Wind Farm (1 and 2) and associated OFTO cable infrastructure, as well as proposed extension areas (3 and 4) are all within the central, eastern parts of the characterisation area.	The cumulative impact of offshore wind farm (OWF) developments and associated cable infrastructure will need to be considered in this area as there may be concerns around wind resource and proximity to existing sites. There will need to be a 5 km buffer around existing offshore wind projects – any new wind developments within 5 km will need the permission of the incumbent party. Cumulative pressures around landing locations for export cables may also cause a concern. Since cable crossings require cable protection (which may have adverse environmental effects), crossings should be minimised where practicable.		
	West of Duddon Sands Wind Farm and associated Offshore Transmission Owners (OFTO) cable infrastructure is within the central, eastern edge of the characterisation area.	The cumulative impact of OWF developments and associated cable infrastructure will need to be considered in this area as there may be concerns around wind resource and proximity to existing sites. There will need to be a 5 km buffer around existing offshore wind projects – any new wind developments within 5 km will need the permission of the incumbent party. Cumulative pressures around landing locations for export cables may also cause a concern. Since cable crossings require cable protection (which may have adverse environmental effects), crossings should be minimised where practicable.		
	Ormonde Wind Farm and associated OFTO cable infrastructure is within the central, eastern edge of the characterisation area.	The cumulative impact of OWF developments and associated cable infrastructure will need to be considered in this area as there may be concerns around wind resource and proximity to existing sites. There will need to be a 5 km buffer around existing offshore wind projects – any new wind developments within 5 km will need the permission of the incumbent party. Cumulative pressures around landing locations for export cables may also cause a concern. Since cable crossings require cable protection (which may have adverse environmental effects), crossings should be minimised where practicable.		
	Barrow Wind Farm and associated OFTO cable infrastructure is within the central, eastern edge of the characterisation area.	The cumulative impact of OWF developments and associated cable infrastructure will need to be considered in this area as there may be concerns around wind resource and proximity to existing sites. There will need to be a 5 km buffer around existing offshore wind projects – any new wind developments within 5 km will need the permission of the incumbent party. Cumulative pressures around landing locations for export cables may also cause a concern. Since cable crossings require cable protection (which may have adverse environmental effects), crossings should be minimised where practicable.		
	Gateway Gas Storage Project open disposal site is within the eastern, central part of this characterisation area.	This would need to be avoided and may need a buffer distance around it; liaison with the customer is required.		
	Aggregates area 457: active dredging site located within the southern part of this characterisation area.	Active dredging site within the characterisation area – this would require a 2 km buffer around it and negotiations with the customer.		
	Other energy infrastructure	There are 24 active platforms in or within 1 NM of the area, as well as two wellheads and one manifold. These are distributed through the centre of the area and running down to the south-eastern edge.	There are potential conflicts between oil and gas activity and offshore wind energy, with existing development standing off by 4 km to development. The potential offshore wind capacity in the southern part of the area could be greatly inhibited by the presence of oil and gas infrastructure, but there is still some capacity. Overall only 32% of the area is within the 0-3 NM and 3-6 NM helicopter consultation zones for existing platforms, mainly due to the fact that there is no oil and gas infrastructure in the northern part of the characterisation area.	
Navigation	Some of the Liverpool Bay traffic separation scheme intersects with the area.	The scheme means that traffic is concentrated into defined routes due to the volume of vessels and for safety reasons. Any impact on the traffic separation scheme should be avoided where possible, although there is significant potential elsewhere in the characterisation area for this not to be an issue.		

	There is significant navigational dredging adjacent to the area at ports of Workington and Barrow.	Impacts on ports' dredging operations and access to maintained channels should be avoided by appropriate siting within the area.				
Social	None within the trigger distance.					
Restrictions model – Soft constraints					Receptor rating	Area rating
Economic tier						
Navigation	The area is within 1 km of the Port of Liverpool, Port of Barrow and Whitehaven Harbour authority areas	There is no direct overlap, but approaches to these ports should be maintained. The scale of the area means that the impacts on navigation should be easily mitigatable through appropriate siting.				
	There are numerous disposal sites in the area, four of which are linked to navigation interests.	These features do not pose a significant impact and should be mitigatable through appropriate siting.				
	There is significant traffic exiting Barrow and Heysham which traverses the area. This splits into three forks going to and from the Isle of Man, north to Scotland and west to Northern Ireland.	This could pose some issues as traffic is of sufficient volume to be likely to cause some restrictions on development in the area.				
Subsurface	None within the trigger distance.					
Fishing	See assessment below.				N/A	
Environmental tier						
<p>The assessment of the sensitivity of Marine Protected Areas (MPAs) to pressures caused by offshore wind development and operation is assessed in a separate spreadsheet which will be made available as part of the Round 4 evidence base. Commentary has been noted in the relevant characterisation document where MPAs either overlap or are within 1 NM of the characterisation area and have been assessed as a yellow rating or above. For more information on the methodology for this assessment, please refer to the methodology report.</p> <p>Royal Society for the Protection of Birds (RSPB) note the presence of the west coast flyway across this characterisation area. It is important for the migration of internationally important populations of waterbirds, many of which are features of Special Protection Area (SPA)/Ramsar sites along the flyway.</p> <p>Assessments of Annex II species have not been made as part of the characterisation process. Such assessments will need to be undertaken at project level for individual developments within the characterisation area.</p> <p>The Wildlife Trusts (TWT) note that harbour porpoise and bottlenose dolphin are key Annex II species to consider for this characterisation area.</p> <p>TWT also note that around 30 species of shark are found in the Irish Sea and that impacts on these will also need to be considered for developments within this characterisation area.</p>						
Type of designation		Name of designation	Designated features/species	Conservation objectives	Commentary	
European marine designations	Special Areas of Conservation (SACs)	Drigg Coast (400 m)				
	SAC	Shell Flat and Lune Deep (1.3 km)	Subtidal sandbanks Reefs	Conservation objectives for both reef and sandbank features are to maintain the features in their current favourable condition.	<p>The reef feature is located within the Lune Deep section of the site, a deep-water channel containing boulder and bedrock reef. The sandbank feature is within the Shell Flat section of the site (which is also part of the Liverpool Bay SPA and is important for supporting Diver/Scoter populations). The distance between the SAC and the characterisation area means that impacts on these features are likely to be limited to cabling impacts. It is considered that the potential impact of cabling on Shell Flat sandbanks is mitigable and the potential impact of cabling on Lune Deep reefs is probably avoidable.</p> <p>It is noted in the advice on operations that the Walney 2 export cable runs through the northern tip of Shell Flat, and that damage</p>	

					<p>was caused to the feature by trenching - the damage is recorded as 'significant but temporary'. Potential future exposure of trenched cables is noted as a concern.</p> <p>Consideration should be given to the SNCB's report on cable sensitivity entitled 'Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas'.</p>		
Harbour Porpoise SAC	None within the trigger distance						
Sites of Community Importance (SCIs)	None within the trigger distance						
Ramsar	None within the trigger distance						
Special Protection Areas (SPAs)	Morecambe Bay and Duddon Estuary	<p>Little egret (non-breeding)</p> <p>Whooper swan (non-breeding)</p> <p>Pink-footed goose (non-breeding)</p> <p>Common shelduck (non-breeding)</p> <p>Northern pintail (non-breeding)</p> <p>Eurasian oystercatcher (non-breeding)</p> <p>Ringed plover (non-breeding)</p> <p>European golden plover (non-breeding)</p> <p>Grey plover (non-breeding)</p> <p>Red knot (non-breeding)</p> <p>Sanderling (non-breeding)</p> <p>Dunlin (non-breeding)</p> <p>Ruff (non-breeding)</p> <p>Black-tailed godwit (non-breeding)</p> <p>Bar-tailed godwit (non-breeding)</p> <p>Eurasian curlew (non-breeding)</p> <p>Common redshank (non-breeding)</p> <p>Ruddy turnstone (non-breeding)</p> <p>Mediterranean gull (non-breeding)</p> <p>Lesser black-backed gull (non-breeding)</p> <p>Lesser black-backed gull (breeding)</p> <p>Herring gull (breeding)</p> <p>Sandwich tern (breeding)</p> <p>Common tern (breeding)</p> <p>Little tern (breeding)</p>	Maintain/restore as appropriate. Conservation Advice Package currently under development.	<p>This site is an amalgamation of two former SPAs - Morecambe Bay SPA and Duddon Estuary SPA. The SPA area itself has been excluded from the characterisation area, although they share a boundary. Many of the birds at the site are wintering waders and wildfowl which do not feed at sea and are therefore less at risk from array development within the characterisation area (although they are likely to be exposed on passage). The foraging areas for breeding tern species are included within the designation area. Tern species could be a concern in relation to this SPA, especially since there are a number of existing wind farms in the area which may already be located in tern feeding areas (the SPA designation has been updated since consent was granted for the majority of these wind farms, and terns may therefore pose more of an HRA issue for future developments). It may be sensible to liaise with Natural England to identify whether they have concerns over cumulative impacts on terns (and other species) from this site, particularly lesser black-backed gull and herring gull as these have been an issue at other Irish Sea wind farms in the past.</p> <p>Natural England have commented that cable landfall through this site could have significant impacts on habitats which support birds, especially saltmarsh.</p>			

			Waterbird assemblage Seabird assemblage				
		Liverpool Bay / Bae Lerpwl	Common scoter (wintering) Red-throated diver (wintering) Little gull (wintering) Waterfowl assemblage (all seasons) Little tern (breeding) Common tern (breeding)	Draft revised conservation objectives (July 2016) indicate that populations should be stable or increasing and that the supporting habitat should be maintained (this includes areas which are of importance for little gull, and to protect important foraging areas for little tern and common tern).	Common scoter and red-throated diver are sensitive to displacement from offshore wind projects, and gulls and terns are sensitive to collision risk. The exclusion of the majority of the SPA area from the characterisation area will go a long way to mitigating impacts on these species. However, it should be noted that displacement may occur for up to 12 km away for red-throated diver and they are also sensitive to displacement by increases in boat traffic. This will need to be taken into account for impact assessments. This site crosses the border between England and Wales. Advice should be sought from both Natural England and Natural Resources Wales. RSPB note that whilst common and little tern from this site tend to be associated with shallow inshore waters, offshore wind development in the North Wales, Irish Sea or Anglesey characterisation areas could have an impact on them. RSPB note that there are significant numbers of cormorant within this site (as well as the overlapping Puffin Island/Ynys Seiriol SPA) and that these should be considered as part of any impact assessment. Natural England are concerned about potential cumulative impacts on scoter and diver at this site from existing wind farms in this area, combined with development in the Irish Sea characterisation area and a potential extension to Gwynt y Môr.		
	Potential Special Protection Area (pSPA)	Solway Firth	(all wintering) Whooper swan Barnacle goose Pink-footed goose Pintail Scaup Oystercatcher Golden plover Knot Redshank Bar-tailed godwit Curlew Red-throated diver Common scoter Goosander Waterbird assemblage	All features have a conservation objective to maintain them in favourable condition.	The pSPA is a marine extension (and site name change) to the terrestrial Upper Solway Flats and Marshes SPA. Red-throated diver, common scoter and goosander are added to the designation, along with other named species within the waterbird assemblage. The northern part of the characterisation area intersects the outer reaches of the marine extension which is of importance for red-throated diver and common scoter. These species would also be vulnerable to disturbance if cabling activities were carried out within the site or if vessel traffic were to increase. Avoiding construction within this section of the characterisation area would reduce the risk to site features, and since the species are wintering there may be an opportunity to reduce impacts by seasonal restrictions on working.		
Marine Conservation Zones (MCZs)		Cumbria Coast	High energy intertidal rock Honeycomb worm (<i>Sabellaria alveolata</i>) reefs Intertidal biogenic reefs Intertidal sand and muddy	The general management approach for the site is to maintain all features in favourable condition. Razorbill	This site is designated for its rocky shore habitats. The majority of the site is excluded from the characterisation area, but it is in a location which may mean that cables could be run through the site (although the rocky nature of much of the shoreline may make it a less suitable landfall site). The advice on operations for		

		sand Intertidal under boulder communities Moderate energy infralittoral rock Peat and clay exposures Razorbill (<i>Alca torda</i>)	are to be recovered to favourable condition.	the MCZ indicates that many of the features within the site are sensitive to impacts of cabling, but impacts on the site should be mitigable (or avoidable) through choice of landfall location and cabling methodology. The razorbill feature was added following consultation on Tranche 3 MCZs.		
	West of Walney	Sea pens and burrowing megafauna Subtidal mud Subtidal sand	The general management approach for the site is to restore all features to favourable condition.	This site intersects much of Walney Wind Farm and the entire Ormonde Wind Farm. These sections of the site are obviously excluded from the characterisation area, and much of the remainder of the MCZ is also excluded. Cabling could potentially run through the site, and the features within it are likely to be sensitive to some impacts of cabling. The features within the site are not currently in favourable condition so it may be difficult to mitigate impacts. Consideration should be given to the SNCB's report on cable sensitivity entitled 'Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas'.		
MCZs	West of Copeland			Assessed as low risk; details available in separate spreadsheet.		
Sites of Special Scientific Interest (SSSIs)	Silver Tarn; Hollas and Harnsey Mosses (1.2 km), Drigg Coast (400 m)			Assessed as low risk; details available in separate spreadsheet.		
SSSI	St. Bees Head (10 m)	Maritime cliff and slope Geological/Earth Heritage Black guillemot (breeding) Fulmar (breeding) Guillemot (breeding) Kittiwake (breeding) Puffin (breeding) Razorbill (breeding) Shag (breeding)	All features are in favourable condition	Terrestrial and geological features are not exposed to offshore activities. These features could be affected by cable routes through the site, but the impacts are likely to be mitigable/avoidable. There is the potential for birds from this SSSI to interact with offshore arrays since many of them feed offshore. The SSSI is not protected by an overlapping SPA. Impacts on the birds would need to be considered at project level, but could probably be mitigated by array placement/turbine design.		
Spawning and nursery grounds		There are a large number of overlaps in the area (up to nine) with the data showing this area to be important for spawning and as a nursery for juvenile fish. There are also high-intensity cod spawning grounds and herring spawning grounds to the west of the area.		Noise disturbance has the potential to be an issue with the potential for seasonal restrictions on piling during breeding. It will depend on whether the spawning grounds are still active and their precise locations, which may need to be determined by surveys. Cod are particularly sensitive to noise impacts.		
Social tier						
Royal Yachting Association (RYA) Automatic Identification System (AIS) intensity		Some traffic exits Liverpool and heads along the boundary of the area; there is also significant activity around Whitehaven		Not the level of density that would be a concern and easily mitigatable.		
Marinas		Whithaven Marina within 1 km of the area		Not a significant issue due to the spatial flexibility in the area.		
Bathing beaches		Seven bathing beaches within 1.5 km along the coast		Not a significant issue due to the spatial flexibility in the area.		

Visibility from sensitive receptors	See visual analysis below.			
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Review layers

Visibility from landscape designations and from the coast

The bands of significant visual impact are taken from the OSEA3¹ environmental report. It should be noted that these bands were challenged through the statutory stakeholder engagement by the Statutory Nature Conservation Bodies (SNCBs) so further analysis and engagement should be conducted to understand the visual constraint in potential development areas more fully.

The visibility from landscape designations analysis has been conducted using designations which include protections for landscapes and settings namely: National Parks, Areas of Outstanding Natural Beauty (AONBs), Heritage Coasts and World Heritage sites. For more information on these, please consult the methodology report. The analysis draws on visibility from these designations but not the sensitivity of them to offshore wind developments. Proposals should draw on the relevant management plans or local policies to fully understand the level of constraint that exists in the vicinity of these landscape designations. As such, more analysis is required to fully understand the potential constraint.

	Band of significant visual impact	% of overlap with the characterisation area	Commentary	Area rating
Medium sensitivity receptors	0-13 km (3.6 MW turbines)	26%	A significant proportion of this area is all contained within 30 km of the coast. Note that the western boundary of the area is visible from the Isle of Man.	
	13-20 km (4-8 MW turbines)	11%		
	20-30 km (10-15 MW turbines)	27%		
High sensitivity receptors	0-30 km	64%		

Visibility of sea surface from landscape designations	Receptor rating	Area rating
Relevant designations include: <ul style="list-style-type: none"> • Lake District National Park • Solway Firth AONB • Arnside and Silverdale AONB • Forest of Bowland AONB • St Bees Head Heritage Coast 	<p>The visibility between these sites and the characterisation area presents a significant potential risk with the north-eastern portion of the area particularly sensitive. Cumulative impacts with the existing projects in the area could exacerbate sensitivities. The southern section of the area looks relatively less constrained.</p> <p>Natural England considers that offshore wind development within this characterisation area may result in significant visual impacts to the Lake District National Park and the St Bees Head Heritage Coast.</p>	

Ornithology outside of Special Protection Areas (SPAs) for high-risk species

Joint Nature Conservation Committee (JNCC), Natural England and Royal Society for the Protection of Birds (RSPB) advise that there are a number of information sources which should be taken into consideration in the assessment of potential impacts from offshore wind development in this characterisation area. These are:

- Site Information Centres on the JNCC website (<http://jncc.defra.gov.uk/page-6895>) which provide up-to-date information on protected areas, their features and status.
- Marine Ecosystems Research Programme (MERP) seabird distribution maps (https://marine-ecosystems.org.uk/Research_outcomes/Top_predators)
- Future of the Atlantic Marine Environment (FAME) and Seabird Tracking and Research (STAR) tracking data from the RSPB (<https://rspb.maps.arcgis.com/apps/Cascade/index.html?appid=d6c3aa1ec7184a2895a01cebf451c7b3>)
- Wakefield, E., Owen, E., Baer, J., Carroll, M., Daunt, F., Dodd, S., Green, J., Guilford, T., Mavor, R., Miller, P., Newell, M., Newton, S., Robertson, G., Shoji, A., Soanes, L., Votier, S., Wanless, S. & Bolton, M. (2017) Breeding density, fine-scale tracking, and large-scale modeling reveal the regional distribution of four seabird species. Ecological Applications <https://doi.org/10.1002/eap.1591>
- Cleasby, I.R., Owen, E., Wilson, L.J., Bolton, M. (2018) Combining habitat modelling and hotspot analysis to reveal the location of high density seabird areas across the UK: Technical Report. RSPB Research Report no. 63

¹ BEIS (2016), OSEA3 Environmental Report. Crown copyright 2016, p 291. URN 16D/033.

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- Sansom, A., Wilson, L.J., Caldow, R.W.G. & Bolton, M. 2018. Comparing marine distributions maps for seabirds during the breeding season derived from different survey and analysis methods. PLOS ONE <https://doi.org/10.1371/journal.pone.0201797>
- Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W.G. & Hume, D. 2014. Mapping Seabird Sensitivity to Offshore Wind Farms. PLoS ONE 9(9): e106366. doi:10.1371/journal.pone.0106366
- Thaxter, C.B., Ross-Smith, V., Bouten, W., Clark, N., Conway, G., Rehfish, M. & Burton, N. (2015) Seabird–wind farm interactions during the breeding season vary within and between years: A case study of lesser black-backed gull *Larus fuscus* in the UK. *Biological Conservation* 186: 347-358

Species	Site	Commentary on coverage	Area rating
Lesser black-backed gull	Ribble and Alt Estuaries SPA	<p>The lesser black-backed gull's mean maximum seaward foraging range extends 141 km from the Ribble and Alt Estuaries SPA, wholly encompassing the Irish Sea characterisation area. Two other characterisation areas lie within this foraging range, as well as a high level of existing offshore wind development; cumulative collision risk effects are therefore likely to be a key consent consideration for any development in this characterisation area.</p> <p>Summer density of the lesser black-backed gull is concentrated closer to shore around the SPA colony and in the central part of the Liverpool Bay region. Lesser black-backed gull density is highest in the eastern part of the Irish Sea characterisation area; locating any development west of this and toward the north of the characterisation area would help to minimise any impacts on this SPA colony.</p> <p>RSPB advise the use of the British Trust of Ornithology's (BTO) tracking data for lesser black-backed gull from colonies in the north-west of England to assist with impact assessments.</p>	Yellow
Lesser black-backed gull	Morecambe Bay and Duddon Estuary SPA	<p>The lesser black-backed gull's mean maximum seaward foraging range extends 141 km from the Morecambe Bay and Duddon Estuary SPA, wholly encompassing the Irish Sea characterisation area. Two other characterisation areas lie within this foraging range, as well as a high level of existing offshore wind development; cumulative collision risk effects are therefore likely to be a key consent consideration for any development in this characterisation area.</p> <p>Summer density of the lesser black-backed gull is concentrated closer to shore around the SPA colony, and in the central part of the Liverpool Bay region. Lesser black-backed gull density is highest in the eastern part of the Irish Sea characterisation area; locating any development west of this and toward the north of the characterisation area would help to minimise any impacts on this SPA colony.</p> <p>RSPB advise the use of BTO's tracking data for lesser black-backed gull from colonies in the north-west of England to assist with impact assessments.</p>	Yellow
Lesser black-backed gull	Bowland Fells SPA	<p>The Bowland Fells SPA is situated inland of the Morecambe Bay and Duddon Estuary SPA. The lesser black-backed gull mean maximum seaward foraging range extends 141 km from the SPA, encompassing the North Wales characterisation area. The North Wales characterisation area also lies within this foraging range, as well as a high level of existing offshore wind development; cumulative collision risk effects are therefore likely to be a key consent consideration for any development in this characterisation area.</p> <p>Summer density of the lesser black-backed gull is concentrated closer to shore around the SPA colony, and in the central part of the Liverpool Bay region. Lesser black-backed gull density is highest in the eastern part of the Irish Sea characterisation area; locating any development west of this and toward the north of the characterisation area would help to minimise any impacts on this SPA colony.</p> <p>RSPB advise the use of BTO's tracking data for lesser black-backed gull from colonies in the north-west of England to assist with impact assessments.</p>	Yellow
Herring gull	Morecambe Bay and Duddon Estuary SPA	<p>The herring gull's mean maximum seaward foraging range extends 61 km from the Morecambe SPA, overlapping the eastern and central parts of the Irish Sea characterisation area. The remainder of the characterisation area lies within the maximum range (92 km). Given the existing offshore wind development within the herring gull range, the cumulative impacts of development within the Irish Sea area with other offshore wind development are likely to be a consent consideration.</p> <p>Summer density of the herring gull within its foraging range is highest close the coast and around the SPA colony; the northern and more western parts of the characterisation area have lower herring gull densities. Locating any development in the north and west of the area, and beyond the herring gull's mean maximum foraging range (i.e. more than 61 km) would help to minimise any impacts on the Morecambe Bay and Duddon Estuary SPA colony.</p>	Green
Sandwich tern	Morecambe Bay and Duddon Estuary SPA; Dee Estuary SPA	<p>The sandwich tern's mean maximum seaward foraging range extends 49 km from the Morecambe Bay and Duddon Estuary SPA and Dee Estuary SPA. The central and southern parts of the Irish Sea characterisation area overlap the Morecambe Bay and Duddon Estuary foraging ranges, while the south-eastern corner of the area overlaps the Dee Estuary foraging range. Given the restricted foraging range of the species, the cumulative impacts of development within this characterisation area with other offshore wind development are likely to be of less concern than with other sandwich tern colonies.</p>	Green

	<p>Summer density of the sandwich tern tends to be concentrated closer to the coast; locating any development in the Irish Sea area to the north and south-west of the characterisation area, and beyond the sandwich tern's mean maximum foraging range (i.e. more than 49 km) would help to minimise impacts on these SPA colonies.</p> <p>The sandwich tern colony at the RSPB Hodbarrow reserve has increased significantly in recent years with around 1800 pairs nesting in 2018. RSPB consider that the protection of this recovering colony is an important issue to address in development of this characterisation area.</p>	
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Ministry of Defence (MoD) activity

Issues when using 250 m tip heights		Issues when using 350 m tip heights	Receptor rating
Air traffic control (ATC)	Warton Aerodrome ATC radar concerns. Great Dunfell radar concerns.	Warton Aerodrome ATC radar concerns. Great Dunfell radar concerns.	
Air defence radar (ADR)	No ADR concerns.	No ADR concerns.	
Threat radar	No threat radar concerns.	No threat radar concerns.	
Low flying	No low flying concerns, however, there will be a lighting requirement.	No low flying concerns, however, there will be a lighting requirement.	
Ranges, danger and exercise areas	<p>Concerns at both heights relating to Danger Areas D406, D406B, D406C and Eskmeals Range covering the northern section of the characterisation area. Concerns due to the potential physical impact of development. Long-range military firing is conducted in this area and the area is littered with ordnance; turbines within this area would constrain firing tests. Concerns also about the impact the turbines would have on the marine radar systems at the range.</p> <p>Concerns at both heights relating to Danger Area D405 Kirkcudbright, which is on the northerly edge of the characterisation area. Turbines in the northern part of the proposed area which fall within the danger area would be a concern. Military firing practice takes place here and turbines within the range would be incompatible with the range's activities.</p> <p>Unexploded ordnance (UXO) should be taken into account. The MoD would need to review routes to ensure highly surveyed routes are not obstructed by either cables or turbines. Routing cables through and coming ashore at the Eskmeals Range would be a concern.</p>	<p>Concerns at both heights relating to Danger Areas D406, D406B, D406C and Eskmeals Range covering the northern section of the characterisation area. Concerns due to the potential physical impact of development. Long-range military firing is conducted in this area and the area is littered with ordnance; turbines within this area would constrain firing tests. Concerns also about the impact the turbines would have on the marine radar systems at the range.</p> <p>Concerns at both heights relating to Danger Area D405 Kirkcudbright, which is on the northerly edge of the characterisation area. Turbines in the northern part of the proposed area which fall within the danger area would be a concern. Military firing practice takes place here and turbines within the range would be incompatible with the range's activities.</p> <p>UXO should be taken into account. The MoD would need to review routes to ensure highly surveyed routes are not obstructed by either cables or turbines. Routing cables through and coming ashore at the Eskmeals Range would be a concern.</p>	
Area commentary			Area rating
<p>ATC and danger area concerns. The danger areas cover large amounts of the northern section of the characterisation area and will inhibit development opportunities within these.</p> <p>There will be a lighting requirement and consideration of UXO as per standard industry practice.</p>			

Fishing activity

Gear type	Location and comments	
Mobile gear	<ul style="list-style-type: none"> There is a large <i>Nephrops</i> fishery in the eastern Irish Sea. Activity in the Solway Firth and Irish Sea primarily from ports at Annan, Kirkcudbright, Whitehaven and Maryport. The <i>nephrops</i> fishery is also targeted by vessels from Kilkeel, Ardglass and Portavogie and the Irish Republic. Scallops are also targeted in the area. There used to be a significant cod fishery in the area, which may return as a result of the cod recovery plan. 	
Static gear	<ul style="list-style-type: none"> Potting and netting take place in the inshore waters off Barrow and further north. 	
General	<ul style="list-style-type: none"> Isle of Man waters in this area only allow vessels to fish inside their waters if they demonstrate a presence in the area during a reference period. This restricts the potential grounds for many vessels and impacts fishing practices all around the coast, especially for the scalloping fleet. A primary <i>Nephrops</i> muddy habitat is off the Cumbrian coast and south of the Isle of Man. Approximately 12% of the <i>Nephrops</i> fishery area may be lost by designation of the West of Walney Recommended Marine Conservation Zone (rMCZ). This would increase the risk of significant cumulative/in-combination impacts on the remaining fishery from offshore wind development in the area. 	
Area commentary		Area rating
There is potential for development in the area, assuming good engagement with local fisheries.		Yellow
Feedback from North Western Association of Inshore Fisheries and Conservation Authorities (IFCA) has indicated that development over fishing grounds in the Irish Sea would be a significant concern due to the current levels of cumulative pressure in the area.		

Future oil and gas

Licensing round	Commentary	Receptor rating	Area rating
28th and 29th rounds – central part of the area	Two new blocks (110/12b and 110/13c) licensed via 28th Round. They overlap with the existing 0-3 NM and 3-6 NM helicopter consultation zones for existing platforms, so present a low additional constraint.	Green	Green
30th round – southern tip of the area	In the 30th offshore licensing round there are five licences which overlap with the Irish Sea characterisation area. They are located in the central and eastern part of the characterisation area and may present a significant additional constraint. However, not all of these licenses will require platforms.	Yellow	Green
31st round – central area	In the 31st offshore licensing round there are nine licences which overlap with the Irish Sea characterisation area. They are located in the central part of the characterisation area and may present a significant additional constraint.	Yellow	Green

Marine plans

North West Marine Plan (in progress)	Spatially explicit policies	Issues	Area rating
	The policies for the North West Marine Plan have not yet been produced. Therefore the Marine Policy Statement is the default position, which does not provide any spatial prescription for marine activities.	There are currently no spatial restrictions on where any future offshore wind developments could be located.	Green

The Crown Estate key resource areas (KRAs) for other sectors

KRA category	Where	Commentary	Receptor rating	Area rating
Cables	Intersects the proportion of the area within 12 NM.	This KRA is significant in size and does not give a strong enough signal to be seen as a significant constraint to development in this area.	Green	Green
Carbon Capture Storage (CCS) stores	Overlaps with the Hamilton field, both of which have been economically appraised through the Energy Technologies Institute (ETI) Strategic Site Appraisal (SSA) work. The area also intersects a number of Moderate and Limited rated stores. These are distributed across the area.	This site has been identified as a commercially viable storage option, so is a sensitive receptor that should be considered in development plans. However, there are other opportunities in the area.	Orange	Green
CCS infrastructure	Wide coverage across the area.	This KRA is significant in size however there is significant opportunity for potential deployment of CCS infrastructure from industrial hubs along the west coast, transporting captured CO2 through the characterisation areas to potential stores in the Irish sea. Proposals should consider potential impacts on these potential infrastructure corridors that may be developed in the near to medium term.	Yellow	Green
Minerals	Covering the inshore waters around Mersey Bay.	Small market currently but this will increase in the future (maybe 5-10 years). There is an area of good potential resource between the Gwynt y Mor and Burbo Bank Wind Farms that should be avoided if possible.	Orange	Green
Pipelines	Only slightly covering the eastern part of the area within 12 NM.	This KRA is significant in size and does not give a strong enough signal to be seen as a significant constraint to development in this area.	Green	Green
Sandscaping	Coverage to the south of the area.	This KRA is significant in size and does not give a strong enough signal to be seen as a significant constraint to development in this area.	Green	Green
Tidal range	Coverage to the north of the area around the Solway.	There have been a number of proposals in this area, but overlaps are minimal and there is significant development potential elsewhere in the area so as to avoid interactions.	Orange	Green
Tidal stream	No interaction.		Light Green	Light Green
Wave	No interaction.		Light Green	Light Green

National Air Traffic Services (NATs) radar overlap

% Overlap with Primary Surveillance Radar (PSR) assessment buffer (200m turbines)	Commentary	Area rating
97.66%	Intersection throughout the area, so a further risk assessment will be required with only site-specific mitigation options available rather than siting.	Orange

Water Framework Directive (WFD)

Water body details						
	Type	Is it heavily modified	Overall status	Ecological status	Chemical status	Target date to achieve good status
Cumbria	Coastal	No	Good	Good	Good	2015
Solway Outer South	Coastal	No	Moderate	Moderate	Good	2027
% of the area covered	Spatial overlap with the area					Area rating
9%	The characterisation area mainly intersects in the Solway estuary, but the overlap also extends down the Cumbrian coast.		This area intersects only unmodified water bodies, which are in good to moderate overall condition. The overall overlap with the characterisation area is minimal and should not present a significant constraint to development.			

Marine Cultural Heritage

Heritage asset type	Where	Commentary on sensitivity from offshore wind development	Receptor rating
Maritime archaeology and wrecks	Significant potential throughout the characterisation area, but particularly where there are known wrecks in the waters off the Isle of Man, in proximity to Barrow-in-Furness and situated along shipping routes from Ireland and the Isle of Man into Lancaster and the Port of Liverpool.	<p>There is potential for maritime archaeological material from the Palaeolithic period to the present day to be present and to be affected by OWF development in the Irish Sea characterisation area. The area contains many wrecks, obstructions and historic losses, with particular concentrations in the waters off the Isle of Man close to Barrow-in-Furness, along shipping routes and on the approaches into the Port of Liverpool. Ships have been lost due to the numerous navigational hazards in the area. There is particular potential for the recovery of wrecks associated with local fishing, trade and industry from the 18th century onwards. The area also played a significant role in 20th century military conflict, with numerous important shipping and supply routes from Liverpool, Ireland and the west coast of Scotland to the Atlantic. In addition to military and trade vessels, early forms of watercraft are likely to have been utilised to traverse the coastal waters of the characterisation area in the late Palaeolithic and early Mesolithic periods.</p> <p>A number of established procedures exist to ensure that any historic wrecks, both known and unknown, and associated remains, are identified as part of any proposed OWF development and impacts are mitigated and minimised.</p>	
Aviation archaeology	Potential for the recovery of aviation archaeological remains throughout characterisation area and particularly in the waters off the Merseyside area.	<p>Despite not being an area of high concentration for crashed aircraft remains, the Irish Sea characterisation area has some potential for the recovery of crashed aircraft and associated material from airborne military conflict in the Second World War. The skies above the area saw conflict, with aircraft involved in protecting merchant shipping and passenger vessels in the Irish sea and to the north-west of England, and defending important centres and strategic locations along the coast including the Merseyside area and the north west of England. Very few known aircraft wrecks have been identified in the area due to the difficulty of identifying these sites on the seabed. However, the historic records attest to the high number of losses in the area which indicate the potential for aircraft wrecks. If present, any remains may be identified or impacted upon by wind farm development.</p> <p>Whilst existing standard mitigation measures may be utilised for specific projects in the area, further site-specific mitigation may be required, including the excavation and recovery of significant remains that are encountered and where impacts are unavoidable. However, it should be noted that this is an extreme example and would only be undertaken following significant discussion with advisors and in rare cases where preservation <i>in situ</i> was not a feasible option.</p>	
Submerged prehistoric landscapes	Potential across the characterisation area, with enhanced potential in areas close to the coast in the north, and geomorphological features such as the palaeochannels being worked by the marine aggregate industry in the south.	<p>During periods of lower sea level caused by three major glaciations (the Anglian, Wolstonian and Devensian), the Irish Sea characterisation area would have been covered by ice, so there is limited potential for the recovery of prehistoric archaeological material from these periods. Any remains would be expected to be associated with geomorphological features such as palaeochannels and valleys, and the geological deposits from these periods. Surviving <i>in situ</i> archaeological material may be preserved, but is likely buried under glacial sediments, with the potential for derived archaeological material from the period. As such, there is some potential for the survival of sediments and secondary context artefactual material in areas where glacial activity has not eroded earlier sedimentary deposits.</p> <p>There is particular potential for the recovery of material associated with the late Upper Palaeolithic and the Mesolithic periods in the southern part of the Irish Sea characterisation area and in areas closer to the coast or palaeolandscape features. Much of the Irish Sea characterisation area would have been exposed and potentially habitable during the Late Palaeolithic and Early Mesolithic periods, following the retreat of the Devensian ice sheet. This area contained geomorphological and landscape features, such as those identified in the West Coast Palaeolandscape Project, that may have been utilised as favourable locations by human ancestors during the Mesolithic period. Significant deposits and possible finds may therefore be anticipated in association with the early Mesolithic channel systems and other geomorphological features that were present and exposed prior to marine transgression. As such, there is the potential for remains from this period to be present and impacted by OWF development in the characterisation area.</p>	

	<p>A number of established procedures exist to ensure that any submerged prehistoric landscapes, associated geographical and geomorphological features, and associated deposits, features and finds are identified as part of any proposed OWF development and impacts are mitigated and minimised.</p>	
Area commentary		Area rating
	<p>There are a range of known heritage assets and the potential for recovery of further remains across the characterisation area, with particular potential for the recovery of significant historic wrecks associated with trade and military functions, and prehistoric archaeological remains from the early Mesolithic period. The application of standard mitigation measures on a strategic and project specific basis will minimise the risk to underwater cultural heritage in this area.</p>	

Glossary of acronyms and abbreviations

ADR	Air Defence Radar
AONB	Area of Outstanding Natural Beauty
ATC	Air Traffic Control
BTO	British Trust of Ornithology
CCS	Carbon Capture Storage
ETI	Energy Technologies Institute
FAME	Future of the Atlantic Marine Environment
HRA	Habitat Regulations Assessment
IFCA	Association of Inshore Fisheries and Conservation Authorities
JNCC	Joint Nature Conservation Committee
km	Kilometre
KRA	Key Resource Area
m	Metre
MCZ	Marine Conservation Zone
MERP	Marine Ecosystems Research Programme
MoD	Ministry of Defence
MPA	Marine Protected Area
MW	Mega watt
NATS	National Air Traffic Services
NM	Nautical Mile
OESEA3	Offshore Energy Strategic Environmental Assessment 3
OFTO	Offshore Transmission Owners
OWF	Offshore Wind Farm
pSPA	Potential Special Protection Area
PSR	Primary Surveillance Radar
Ramsar	Ramsar Convention on wetlands of international importance especially as waterfowl habitat, also known as the 'Convention on Wetlands'.
rMCZ	Recommended Marine Conservation Zone
RSPB	Royal Society for the Protection of Birds
RYA AIS	Royal Yachting Association (RYA) Automatic Identification System (AIS)
SAC	Special Area of Conservation
SCI	Site of Community Importance
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SSA	Strategic Site Appraisal
SSSI	Site of Special Scientific Interest
STAR	Seabird Tracking and Research
TWT	The Wildlife Trusts
UXO	Unexploded Ordnance
WFD	Water Framework Directive