To:
John Wheadon, Head of Energy Infrastructure Planning Delivery
4th February 2025
Department for Energy Security and Net Zero,
3-8 Whitehall Place, London, SW1A 2EG

From:
Orsted Hornsea Project Four Limited
5 Howick Place,
London,
SW1P 1WG

The Hornsea Four Offshore Windfarm Order 2023 (the Order)

Response to Letter dated 7 January 2025 regarding the Approval of the Kittiwake Compensation Implementation and Monitoring Plan under Part 2 of Schedule 16 of the Order

Dear Mr Wheadon

Orsted Hornsea Project Four Limited (the Applicant) writes in response to the Secretary of State's letter dated 7 January 2025 which sought updates and information regarding the provision of kittiwake compensation and the content of the Kittiwake Compensation Implementation and Monitoring Plan (KCIMP).

The Applicant has provided the updates and information sought below, utilising the headings in the 7 January letter for ease of reference.

Feasibility of other onshore artificial nesting structure (ANS)

The Applicant considered other onshore locations for the ANS, as set out in section 4.3 (site selection) of the KCIMP. Site selection was carried out considering ecological, land acquisition and technical constraints, as further explained below, culminating in the selection of the Hartlepool ANS for delivery of an onshore ANS.

The Applicant is clear that the selection of the Hartlepool ANS and the sharing of ANS with Hornsea Three is permitted by the Order and in accordance with the information presented and available at the time of the Secretary of State's decision making. An onshore ANS is a permitted compensation measure under Part 2 of Schedule 16 of the Order and the Hartlepool ANS is within the area of search identified in the Hornsea Four Kittiwake Compensation Plan (KCP) [**REP7-091**]. As evidenced in the KCIMP submitted for approval (see e.g. section 5.2 "Hartlepool Capacity"), there is sufficient capacity at the Hartlepool ANS to deliver the compensation requirements for Hornsea Four alongside Hornsea Three. Therefore, whilst the feasibility of other onshore (and offshore) structures were considered as set out in this letter, there is no legal impediment to the

sharing of the Hartlepool ANS in fulfilment of the obligations under the Order, and no rational basis on which to conclude otherwise. The sharing of the Hartlepool ANS therefore remains the Applicant's proposed compensation measure for kittiwake.

The approach to site selection of an onshore ANS is further detailed in section 3.4.4 of the KCP, in B2.7.3 Volume B2, Annex 7.3: Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) : Onshore Artificial Nesting: Ecological Evidence [**APP-189**], in B2.7.5 Volume B2, Annex 7.5: Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) : Artificial Nesting: Site Selection and Design [**APP-191**] and in G6.3 Kittiwake Onshore Artificial nesting Structure Site Selection and Evidence on Nesting Limitations update [**REP6-031**].

The detailed contents of those documents are not repeated here, however in summary:

1. Utilising the site selection work carried out for Hornsea Three, the Applicant identified two preferred search zones within which further work was undertaken to establish a specific site on which artificial nests will be developed, as specified in paragraph 3.4.4.2 of the KCP;
2. The preferred zones for installing an onshore ANS were identified utilising ecological criteria, as specified in paragraph 3.4.4.4 of the KCP;
3. The Applicant then progressed to the next phase of the site selection process to engage with landowners and finalise site selection based on required outcomes, as specified in paragraph 3.4.4.5 of the KCP.

As part of that next phase, the Applicant continued to carry out site selection within the preferred search zones, specifically considering land availability, planning requirements, ecological favourability and engineering constraints, working closely with Hornsea Three and in discussion with stakeholders given the commonality in the compensation requirements.

The conclusion of the next phase of work was that the Hartlepool site was preferred for the reasons set out below. Other sites were considered albeit the details of those are commercially confidential. This includes one site where an exclusivity agreement was entered into between the Applicant and the landowner, however on further investigation it was found to be overall less preferred than Hartlepool based on the site selection criteria.

Hartlepool was identified as the preferred location for the onshore ANS as:

1. It is within the Hornsea Four area of search which had been examined and consulted upon throughout the DCO process for Hornsea Four;
2. The Hornsea Three OOEG agreed (during meetings on Hornsea Three) that the Old Hartlepool Yacht Club has strong potential for colonisation by kittiwake, given its very close proximity (30 m) to an existing kittiwake colony which occupies the walkway to the lifeboat (Hornsea Three OOEG meetings on 07/07/2021 and 29/09/2021);

3. Sufficient nesting space was available at that location to meet Hornsea Four's compensation requirements;
4. Land rights and planning permission were already secured to deliver the ANS at Hartlepool, significantly reducing delivery risk and lead in times compared to alternatives;
5. The location was within the existing Ørsted portfolio, meaning engineering constraints were fully understood and known to be acceptable;
6. It was understood that stakeholders were likely to be concerned about multiple onshore ANS across different developers, therefore utilising spare capacity at Hartlepool avoided the need to introduce any further onshore nesting sites.

Following this site selection process, the Applicant selected the Hartlepool ANS as its preferred location for delivery of an onshore ANS in accordance with the requirements of the Order. Hartlepool is suitable to deliver the measure, appropriate ecologically and likely to support successful compensation.

Feasibility of the offshore ANS

The Applicant commenced work to deliver an offshore ANS for Hornsea Four during the pre-application and pre-consent phase of Hornsea Four, which indicated that an offshore ANS was feasible from an ecological, technical and commercial perspective. The Applicant continued its work to deliver an offshore ANS, which increasingly demonstrated that the delivery of an offshore ANS within the site selection area was technically complex and ultimately commercially unjustifiable when an onshore ANS could be delivered to meet the compensation requirements of the Order. A chronology of the evolution of the feasibility of a new offshore ANS is set out below.

1. The Applicant commenced site selection in September 2021 identifying two proposed locations for offshore ANS based predominantly on ecological criteria and estimated water depths whilst also seeking to mitigate impacts on other seabed users.

2. Between January and July 2022, the Applicant undertook technical engineering work for the proposed locations, specifically carrying out geophysical and geotechnical surveys of the seabed to enable design of the foundations. Those surveys identified that the seabed characteristics allowed for a variety of foundation types including monopile and gravity-based solutions upon which to install the Artificial Nesting Structure Topside (ANS Topside).

3. In August 2022 during the consenting process, the Applicant anticipated that the provision of an offshore ANS would total approximately [redacted] to develop, construct and operate as set out in Table 1 of the Derogation Funding Statement [**REP7-037**].

4. Between August and October 2022, the Applicant's delivery team undertook a further assessment of supply chain availability, engineering solutions, and potential outcomes of the DCO, all set against the challenging schedule for

delivery. It was identified that the supply chain was heavily constrained in delivering a single one-off offshore structure, with the limited availability of designers, fabrication slots, transport and installation solutions all being flagged as delivery risks.

5. The conventional monopile foundation was restricted due to limited fabrication slots as the supply chain serviced demand for wind turbine foundations as well as the need for bespoke transport and installation solutions to cater for the smaller dimensions. It would not be possible to exploit synergies in delivering concurrently or in sequence with other Ørsted portfolio projects in the region as there were none.

6. The gravity-based foundation offered a solution that was de-linked from the conventional monopile supply chain, this significantly derisked fabrication but relied upon the availability of a Heavy Lift Vessel for installation. Therefore, in October 2022 the Applicant's delivery team engaged the supply chain in planning for the Engineering, Procurement, Construction and Installation of a gravity-based foundation. The design of the gravity-based foundation and ANS Topside were undertaken separately, both at risk, pending the outcome of the Hornsea Four DCO, expected in February, but received in July 2023.

7. In July 2023 the Applicant entered into an Agreement for Lease with The Crown Estate for the offshore ANS at two locations.

8. The Applicant sought approval for all works during the first OOEG Meetings held in Q2 2023. The ANS Topside required further redesign to meet OOEG requirements. Throughout 2023 the design, fabrication, transport and installation were matured and optimised, focussing on Safety, Compliance, Schedule and Budget. By October 2023 it was evident that the delivery cost had far exceeded the initial budgeting in seeking the fulfilment of the relevant Order requirements and satisfying OOEG requirements.

9. Revisiting options, it was determined that the cost of delivery for single monopile and gravity-based foundations was similar, with an increased risk that the monopile supply chain (fabrication, transport and installation) would be unable to accommodate one-off units of significantly different characteristics from that of the wind turbine foundations being delivered in the Region. The majority of costs were attributed to specialist vessel mobilisation and demobilisation fees with no economies of scale to absorb these one-off costs.

10. In December 2023 the Applicant achieved a fully costed schedule for delivery of one offshore ANS in Q3 2026. Based on the Best and Final Offer of the Engineering, Procurement, Construction and Installation (EPCI) contract and accrued costs up to December 2023, the Applicant was forecasted to spend over [redacted] to deliver a single offshore ANS.

The offshore ANS would provide a minimum 750 nests as required within the Order, equating to a unit cost of approximately [redacted] **per nest** (excluding operation, maintenance and decommissioning costs).

This cost was approximately double the initial assumptions against which the Applicant started in November 2020, not accounting for operation, maintenance and decommissioning costs. Ultimately, market forces, and the need to ensure value for money for both the Applicant and UK consumer required the Applicant's delivery team to significantly reduce costs and identify alternative solutions.

The Applicant reviewed its options for delivery of kittiwake compensation in accordance with the terms of the Order to be compared against the offshore ANS. As set out in the KCIMP, spare capacity was identified at the Hartlepool ANS which could deliver the Applicant's compensation requirement in accordance with its legal obligations and ecological objectives.

It is noted that the Hartlepool ANS has a total accrual of approximately [redacted] to deliver 1,384 nests, equating to a unit cost of approximately [redacted] per nest, (excluding operation, maintenance and decommissioning costs).

The Hartlepool ANS will also be delivered in Q1 2025 and enables the Applicant to take immediate benefit of 750 nests in fulfilment of the obligations set out within the Order.

With such a significant saving identified and with the legal pathway secured to meet the requirements of the Order, further work on the offshore ANS could not be justified. The gravity-based foundation was terminated on completion of the Detailed Design, the ANS Topside was terminated on completion of the FEED. Engagement with the supply chain ceased in December 2023.

In parallel to pursuing a new offshore ANS, the Applicant continued to pursue delivery of a repurposed offshore structure. The Applicant engaged with the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), DESNZ and other key stakeholders including the OGA (oil and gas authority), TCE and platform owners for approximately two years (2021 – 2024) to find a regulatory pathway to enable the repurposing of an offshore oil and gas platform as an ANS. The Applicant identified the Wenlock Normally Unmanned Installation (NUI) (now owned by Energean) as a suitable option for repurposing to an ANS due to its existing kittiwake colony, manageable size, favourable decommissioning schedule (2025) and positive outcome of the engineering lifetime assessment enabling compliance with the obligations set out within the Order.

Whilst significant work was undertaken to seek to identify a route to transfer regulation of the platform that was acceptable to all regulatory parties, ultimately it was not possible to do so primarily following engagement with DESNEZ and OPRED. In October 2024, due to programming requirements and the need to ensure delivery of Hornsea Four and appropriate decommissioning of the Wenlock platform, the Applicant and Energean decided to pursue alternative pathways. The Applicant is therefore pursuing an onshore ANS at Hartepool, and Energean is proceeding with the Wenlock

Decommissioning programme. In December 2024 the Applicant was notified of a change in responsibility for Wenlock operations and maintenance with the confirmation of the Wenlock Decommissioning Programme proceeding. The latest scope is understood to comprise the complete decommissioning and removal of Wenlock as described within the Wenlock Decommissioning Programme. Works to remove the topside are understood to be scheduled for late 2025.

As demonstrated above, the Applicant has invested significant cost and resource (at risk) to seek to deliver an offshore ANS, in close liaison with the OOEG. Work has been undertaken over several years however the unavoidable and substantial commercial implications of delivering an offshore ANS versus an onshore ANS for Hornsea Four could not be ignored. Delivery of kittiwake compensation at the Hartlepool ANS is firmly within the scope of the Order requirements and is therefore being pursued by the Applicant.

NE's alternative proposal

The Applicant held three 'ANS Strategy' calls with OOEG members from NE and RSPB. These were held as confidential meetings separate to the OOEG due to confidential discussions relating to HOW03 securing the lease for Hartlepool. In summary, the Applicant set out the challenges the offshore ANS strategy was facing. NE suggested an alternative approach whereby as an interim approach Hornsea Four could use nest space at Hartlepool and then deliver an offshore structure ahead of operation. The Applicant considered this option, but it did not resolve the issues expanded on below. At the subsequent OOEG #5, the Applicant confirmed the proposal to deliver kittiwake compensation at the Hartlepool Old Yacht Club site with success allocated proportionally between the Hornsea Four and Hornsea Three projects. NE's position regarding not being in support of onshore delivery of kittiwake compensation for the project remained the same.

Whilst the Applicant welcomes NE's efforts in seeking to propose solutions, the Applicant does not consider NE's alternative proposal of the Applicant delivering both the Hartlepool ANS and the offshore ANS to be necessary or proportionate given the requirements of the Order.

As demonstrated above, the Applicant has carried out extensive work regarding the delivery of an offshore ANS and ultimately this has been demonstrated to be commercially unviable when compared to the onshore ANS option. The Order is clear that an onshore ANS can be delivered to meet the compensation requirement for kittiwake, and the KCIMP submitted for approval demonstrates why the Hartlepool ANS is preferred and fulfils the ecological compensation requirements.

It is noted that the Applicant has not proactively engaged with the respective supply chains since receipt of the Best and Final Offer for the EPCI of the offshore ANS in December 2023. The ability to resume the EPCI of an offshore ANS would remain heavily dependent upon the availability of the supply chain, specifically the availability of the fabrication yard and that of the Heavy Lift Vessels required for the installation.

These specialist vessels are typically secured several years in advance of the planned works and are reliant upon being in the Region to undertake such a one-off activity.

The majority of costs are anticipated to still be attributed to the specialist vessel mobilisation and demobilisation fees; it is anticipated that the Applicant would be unable to exploit the economies of scale and synergies in delivering concurrently or in sequence with other Ørsted portfolio projects in the region. Therefore, if the Applicant were to re-engage, it is expected that the costs of delivery would significantly exceed the [redacted] calculated in December 2023.

Therefore, NE's suggested alternative proposal of "do both" an onshore ANS and offshore ANS is not supported by the Applicant. The proposal would not resolve the substantial commercial implications of delivering an offshore ANS which cannot be warranted given the availability of the onshore ANS at Hartlepool to meet the requirements of the Order. Any such requirement for the Applicant to provide an offshore ANS as an additional measure to an onshore ANS would be without any legal basis and would be unreasonable.

The development of an offshore structure

The Applicant has signed an option agreement with another developer for up to 700 nests on a prospective offshore ANS, which is proposed as an adaptive management measure for Hornsea Four. As part of the agreement, the Applicant has shared information with the other developer to support the prospective ANS design based on its work to date. The option agreement provides for 700 multispecies nests for Hornsea Four, meaning there is flexibility in whether the nests could be utilised for either kittiwake or guillemot adaptive management, as required.

Specific details of the agreement cannot be disclosed for confidentiality reasons. The Applicant will at a future date and in consultation with the OOEG under the KCIMP, decide whether the option for up to 700 nests will be needed depending on the success of the onshore ANS and in consideration of other adaptive management measures.

The Applicant has comfort that the proposed timings for the construction of the prospective offshore ANS align with Hornsea Four's expected timings should the Applicant need to provide adaptive management measures, however ultimately the option is dependent on the other developer building the prospective offshore ANS. Therefore, as a risk mitigation measure the Applicant has included other adaptive management measures within the KCIMP, as set out in sections 8.3 and 8.4 of the KCIMP.

Appendix A – colony growth scenarios

The Applicant has taken a precautionary approach in the Hornsea Four KCIMP, by assuming that Hornsea Three requires 25% of the capacity of the Hartlepool ANS to deliver its compensation requirement. This is precautionary, as the evidence submitted with the Hornsea Three NMC demonstrates that the other three ANS already commissioned for Hornsea Three could (alone and cumulatively) meet the entire

compensation requirement for Hornsea Three. An alternative would have been for the Applicant to consider that Hornsea Three required 0% of the nesting space at Hartlepool (as per the evidence in the Hornsea Three NMC documents). That would have been an inherently less conservative approach to calculating the compensation availability than assuming Hornsea Three requires 25% of the nesting space at Hartlepool, which was the Applicant's approach in the KCIMP.

Even utilising this precautionary and conservative assumption of a Hornsea Three requirement of 25% of the nesting space at Hartlepool, the Hornsea Four KCIMP evidences that there is still sufficient capacity to meet the entirety of the Hornsea Four compensation requirement at Hartlepool.

Further information is provided below:

Each of the four ANS being commissioned for the Hornsea Three kittiwake compensation measure are designed to accommodate a minimum of 467 breeding pairs of kittiwake i.e. each has the potential to deliver the upper end of the Secretary of State's impact estimate for Hornsea Three. There will be two structures comprising a single ANS at the Old Hartlepool Yacht Club site, consisting of a tower containing 850 nest spaces and huts containing 534 nest spaces, having a total site capacity of 1,384 spaces. The three ANS nearshore structures now in situ off the East Suffolk coast each provide space for 504 breeding pairs of kittiwake for Hornsea Three compensation.

Appendix A: Design Report (document reference: 07559813_A) of the Hornsea Three Kittiwake Implementation and Monitoring Plan provides a detailed overview of the design. Modelling presented in both Appendix 3 of the application to make a second non-material change to Hornsea Three (hereafter Hornsea Three NMC) and, Appendix A of the Hornsea Four KCIMP, were conducted on the assumption of the above-described nest space availability at each ANS.

The colony growth models presented were identical for both documents other than the additional inclusion in Hornsea Four KCIMP of the growth rate of the kittiwake colony at Marsden Cliff as the basis of a second real example from the east coast of England. That KCIMP was also able to include an additional year's census and productivity data i.e. 2022, into the first real example of colony growth, that from Coquet Island. The parameter values used throughout the modelling were identical between the two documents other than:

1. the use of a more precautionary upper value starting colony size of 20 breeding pairs of kittiwake for the KCIMP as opposed to 25 breeding pairs in the Hornsea Three NMC; and,
2. as an example of a "high" productivity, 1.38 fledglings per nest presented in the KCIMP as opposed to 1.27 fledglings per nest in the Hornsea Three NMC.

The key differences associated with the growth and productivity scenarios of the Hornsea Three NMC and Hornsea Four KCIMP were how the modelled outputs i.e. the annual productivity of breeding kittiwake, were apportioned over time to compensate

for the mortality at Hornsea Three and for the KCIMP, also Hornsea Four at Hartlepool ANS.

In the Hornsea Three NMC, the information illustrates, for each growth and productivity scenario at the nearshore ANSs that the productivity of breeding kittiwakes at one ANS could fully compensate for the mortality at Hornsea Three without any input from Hartlepool ANS. This was demonstrated both individually and with the three ANS each contributing 33.3%.

In the Hornsea Four KCIMP, three different methods were employed to allocate the contribution of nests and productivity at Hartlepool ANS between Hornsea Three and Hornsea Four.

The KCIMP demonstrated, through these examples, when success would be achieved by apportioning the productivity of breeding kittiwakes at Hartlepool ANS to fully compensate for the mortality at Hornsea Four and to compensate for 25% at Hornsea Three.

This was a precautionary approach which assumed the three other structures for Hornsea Three were only cumulatively delivering kittiwake productivity to cover 75% of Hornsea Three's compensation requirement. As demonstrated in the Hornsea Three NMC however, the evidence demonstrates that this is highly precautionary and conservative, and that the other three structures for Hornsea Three (alone and cumulatively) could meet the entire compensation requirement for Hornsea Three.

Contact Information

If you have any queries in relation to the KCIMP or the contents of this letter, please do not hesitate to contact [redacted]@orsted.com) or [redacted]@orsted.com).

On behalf of Orsted Hornsea Project Four Limited.

[redacted]

[redacted]
Environment Specialist