# Energy Island North Sea

## Scope Report – Bat Field Surveys

Energinet

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# Contents

# 1        Project introduction and background

With the Climate Agreement for Energy and Industry of the 22nd of June 2020, the majority of the Danish Parliament decided that Denmark will become the first country in the world to develop two energy islands. One of the islands will be located in the North Sea ("Energioe Nordsoen") with a capacity of 3 GW offshore wind surrounding the island. This island can be further scaled up to allow for grid connection of up to 10 GW offshore wind on the island. It is expected that Energioe Nordsoen will be in full operation by 2033.

The Danish Energy Agency (DEA) has ordered Energinet to initiate the Strategical Environmental Assessment (SEA) and associated technical reports based on field studies including field studies of birds within the investigation area for the planned energy island area and export cable as well as the area around the island. The field studies will be the foundation in the baseline descriptions of presence and densities of bat in the following bird impact assessment as part of the EIA for Energioe Nordsoen.

This report includes a detailed description for the bat field surveys including passive acoustic monitoring within and around the investigation area for Energoe Nordsoen.

# 2        Expected bats in the investigation area for Energy Island North Sea

All bat species migrate between summer and winter habitats. There is good evidence of bat migration across the southern parts of the North Sea, but there is little systematic data on potential migration of bats across the North Sea northwest and west of Denmark. Bats are recorded in low numbers on oilrigs in the northern reaches of the North Sea, which may indicate migration between southern Norway, Denmark and The British Isles. Bats recorded at the installations in the North Sea comprises primarily nathusius' pipistrelle (Pipistrellus nathusii), parti-coloured bat (Vespertilio murinus) and noctule (Nyctalus noctula). An artificial island and other infrastructures, e.g. wind turbines, are likely to attract migrating bats in their vicinity. Therefore, the impact could be on a large part of the population migrating across the North Sea and an accurate picture of the abundance and distribution of species is crucial to understanding the potential effects of construction and/or operation of the Energy Island and associated structures. A dedicated bat survey is needed to obtain this information and are presented as part of this scoping report.

# 3        Surveys, data collation and analysis design - bats

The data collection for bats is to:

• Carry out relevant field surveys of bats within the investigation area by means of passive acoustic monitoring by use of bat detectors on buoys to quantify the abundance, distribution, and possible migration of bats at sea.

### 3.1        Passive Acoustic Monitoring (PAM) of Bats Offshore
Bats may occur in the whole of the investigation area in the North Sea. To record the abundance and patterns of migrating bats bat detectors will be used for long-term passive acoustic monitoring (PAM). A total of 8 bat detectors will be deployed on the surface buoys holding the pods used to monitor cetaceans and at nearby structures (e.g. oil platforms) if we may get access. The microphone for the bat detectors will be positioned ca. 2 m above the water. The pods will be distributed across the investigation area (see Figure 1) and though the marine mammal programme have

more than 8 stations the bat detectors will only be placed on 8 of them. The exact buoys will be chosen in the spring after experiences about the loss of marine mammal stations etc. have been obtained. An total coverage of the whole investigation area, and especially the site for the proposed energy island, will though be ensured in the process.
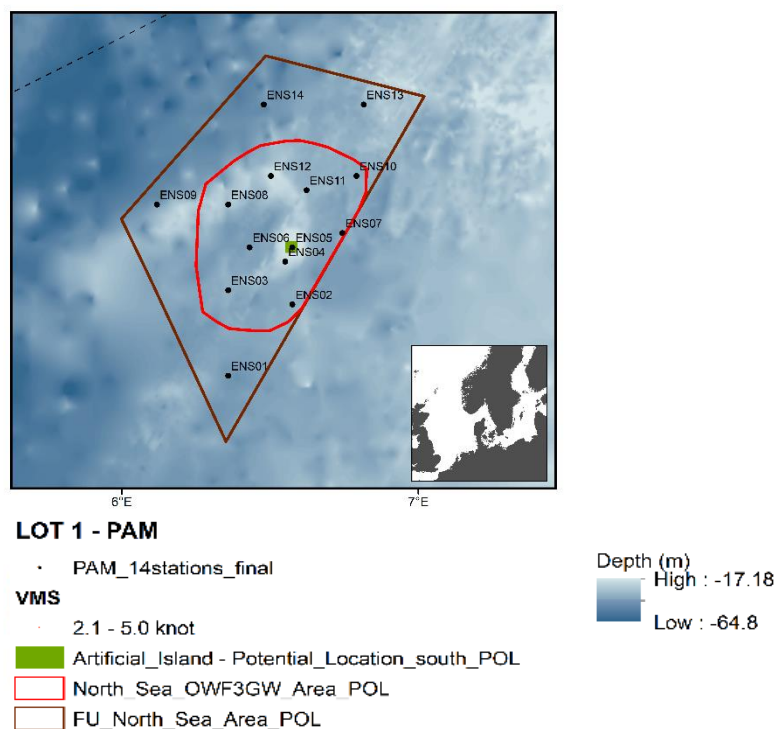


*Figure 1: Overview of the suggested PAM program for marine mammals with eight stations in the investigation area. Left map shows the distribution of PAM stations with respect to bathymetry. To the right is shown VMS data (2018-2020) from vessels moving with 2-5 knots (estimated speed for trawling activity showing Danish (orange) and foreign trawl activity (red). As can be seen, especially the shallow area is at risk for trawling of equipment.*

The deployment of several bat detectors to increase the probability of collecting sufficiently representative data on bats presence across the whole investigation area will enable us to describe temporal and spatial presence of bats, and if possible, estimate relative density with small confidence intervals. Secondly, this robust study design with several detectors also reduces the risk that essential data is lost due to loss of equipment because of fishing activities in the survey area. Besides deployment of 8 bat detectors on the marine mammal buoys and a possible nearby solid structure, two LiDAR buoys will be present in the survey area with bat detectors installed. Data from these will be gathered and included in the data pool and analysis.

The bat detectors will be deployed, serviced and retrieved along with the service of the marine mammal PAM-equipment. Bat presence and behaviour will be recorded acoustically with autonomous static ultrasound detectors capable of real-time, full-spectrum recordings with high sampling rates. The detectors are deployed ultimo-March (February)  - mid-May and mid-August - mid-October to cover the bat migration periods, and programmed to record bats calls from sunset to sunrise.

A semi-automate approached will be applied to identify bats. Initially, recordings are filtered with automatic sound analysis software to extract recordings with bat calls, which subsequently will be identified to species/genus manually by persons with long-standing experience in the bio-acoustic analysis of bat calls to avoid misidentifications of species. Species are identified based on the species-specific characteristics of their echolocation calls. Simultaneously, the calls are coded for explorative behaviour (approach phase), foraging (buzzes) or social calls. No automated identification software is sufficiently accurate for species identification, as they fail to embrace the huge plasticity of individual species' calls. Similar it will not be possible to determine densities of bats in the area only bat activity. From this estimates of rough bat densities can be made from the temporal spread of the bat detections.

Species-specific temporal and spatial variations in presence and abundance of bats in the investigation area, call frequency per night and hour, activity maxima, etc. are computed to assess the importance of the investigation and project areas for migrating bats and the potential risk from the infrastructures. Weather parameters will be included in the analyses as explanatory variable in bat activity and migration patterns.

# 4    Technical report

The technical report on bats will comprise the following information:

• Non-technical summary
• A thorough method description including a description of all relevant project and model assumptions (specification of wind turbines, Energy Island size and other relevant parameters).
• A description of baseline situation of bats in the North Sea based on literature and surveys conducted as described above.
• Sensitivity analysis of impacts on bats and possible cumulative and transboundary impacts.
• Proposals for measures to mitigate adverse impacts, as appropriate
• Identification of possible data and knowledge gaps of importance for the future environmental assessment to be conducted by the future concession holder.
• Proposal for a monitoring programme to supplement the baseline surveys, as appropriate.