Energistyrelsen

Summary of the main findings of the market dialogue on preliminary site investigations for the Energy Islands in the North Sea and the Baltic Sea.

Kontor/afdeling
Center for Vedvarende Energi / Energiøer

Dato
21-10-2021

J nr. 2020 - 10467

/SHKF

The Danish Energy Agency (DEA) has conducted a market dialogue for potential tenderers and relevant market operators on the geophysical, geotechnical and environmental site investigations for the Energy Islands in the North Sea and the Baltic Sea.

Based on political agreements, Energinet is, on behalf of DEA and the Ministry of Climate and Energy, undertaking site investigations for the energy islands in the North Sea and the Baltic Sea. The results from the site investigations are expected to inform future tenderers of energy islands and reduce potential risks.

The market dialogue has given the opportunity for the market and potential tenderers to provide feedback, input and recommendations on the main elements of the site investigations and the time schedule for these.

As part of this market dialogue, the Danish Energy Agency published a discussion paper containing background information on the status of the planning of the energy islands. Attached to the invitation to the market dialogue was an overall description of the survey program and time schedule from Energinet, who is responsible for the site investigations.

The Danish Energy Agency has encouraged all relevant market operators and potential tenderers to submit their written recommendations and answers to the questions raised in the discussion paper.

The following market operators have participated in the market dialogue through written inputs:

- Atkins
- Copenhagen Infrastructure Partners
- DGE Group A/S
- DHI A/S
- Eiffage Génie Civil Marine (EGCM)

Energistyrelsen

Carsten Niebuhrs Gade 43
1577 København V

T: +45 3392 6700
E: ens@ens.dk

www.ens.dk

- FORCE Technology
- Jan De Nul Group
- VindØ Consortium
- Wind Denmark
- Ørsted

The main findings from the market dialogue are outlined in the following sections. The findings will be a part of further analysis regarding the procurement framework of the project.

In the invitation to the market dialogue, the Danish Energy Agency included four questions to the market operators to respond to. The summary of the main findings is divided into sections according to these questions.

1. Do you see a need to include further parameters or themes to the geophysical, geotechnical and environmental site investigations for you to participate in the tenders for the Energy Island Project?

There has been a general acknowledgement from the market operators to the overall principles of the site investigation programme. In addition to a standard environmental programme offshore, the market operators recommend considering including an assessment for bats in relation to the North Sea developments. It is unknown if bats migrate that far offshore, though it is recommended to include bats in the environmental assessments.

For the offshore wind farm sites in the Baltic Sea it is recommended by the market operators to initiate environmental investigations for the distribution of long-tailed duck (havlit) and for the identification of a potential buffer zone to minimize potential impact from offshore wind farms in the area. The concern relates to the newly proposed bird protection area close to the proposed wind farm sites where long-tailed duck is included in the designation.

The market operators recommend using seabed data available from the oil and gas exploration as a desktop-based exercise to inform the planned surveys.

The market operators recommend considering site investigations covering both a north and a south location of the island in the North Sea. The extended survey programme would reduce risk in the tendering process, in case the seabed conditions would prove less suitable for one of the locations. The market operators underline the importance of finding the optimal location for the future energy island in the North Sea. It is therefore essential that the geophysical and geotechnical site investigations provide sufficient detailed information on the seabed and ground conditions, in order to find the most appropriate island location.

The Danish Energy Agency's response:

- *Surveying of bats is included in the survey programmes in the North Sea and the Baltic Sea. The surveys will be conducted for a two-year period in the Baltic Sea and one year in the North Sea with the option of extending the survey with one additional year.*
- *The bird survey programme in the Baltic Sea includes observations of the long-tailed duck*
- *The DEA will take the suggestion of using existing data from platforms to inform the design of the survey programme in the North Sea under advisement.*
- *The survey programme includes a more detailed and high-resolution survey of one location for the artificial island (the southern location which was agreed upon in the political agreement from February 2021) spanning 2.5 km x 2.5 km. A more generic survey programme covers the rest of the survey area (the site for offshore wind turbines and array cables).*

2. Is the planned duration of the site investigations appropriate for the specific topics?

The market operators request more detailed information on the site investigation programme. The information should include, but not be limited to:

- Specification on which site investigations are carried out, where and when.
- Information on survey methodology.
- Timeschedule for data release from MetOcean data, environmental investigations and geophysical and geotechnical surveys on the island area(s) in the North Sea
- How are the consenting process and the Strategic Environmental Assessment process

To develop the best possible project the market operators have a request to gain access to the various data as soon as possible. Given the tight timeline towards the bidding process, gradual data release should be pursued. Early assess to data will inform developers early in their design process.

In relation to UXO surveys, it is recommended by the market operator, to consider a full coverage UXO survey (e.g. cable routes and offshore construction sites).

The market operators recommend gathering sufficient site-specific environmental data (birds, marine mammals, fish and benthos) to assess seasonal variation and year to year variation in the abundance of individuals.

Currently the Benthic flora and fauna surveys are planned for Q2 of 2022. A market operator note that a single survey period, as currently proposed, would only provide limited data of benthic communities as seabed conditions and ecological communities can fluctuate during the year as well as between years. The information gathered during a single survey period, may hence not be robust enough to inform an EIA or design of the island, particularly with regards to its location. To mitigate the risk of delays in the very tight time schedule from award to the island being operational, the market operator recommends considering an extension of the survey period for benthic flora and fauna.

Current fish surveys are planned for late spring and early winter of 2022. A market operator note that fish populations and communities can change during the year as well as between years with some years showing a 'boom' population. Hence, only surveying during a single year may not elucidate average fish populations or their use of the area. This may present a problem if fish surveys are based on a particularly good (or poor) year resulting in an artificially high or low results that then may impact upon both mitigation requirements and monitoring comparisons. To mitigate the risk of delays in the very tight time schedule from award to the island being operational, the market operator recommends considering an extension of the survey period for fish and fish populations.

In relation to the bird monitoring programme, it is recommended by the market operator to include both radar-based measurements of flying birds and ship-based line transect surveys of local seabirds. Radar-based monitoring can be undertaken from existing platforms as well as ships. The scope for the ornithological assessment needs to take the migratory bird species into account.

It is recommended by the market operators to leave measuring equipment for marine mammals (e.g. C-POD) on the site after completed investigations, to be taken over by winning tenderer and to allow more data to be collected for the project specific EIA if needed.

The Danish Energy Agency's response:

- *The DEA understands the operators' request for more detailed information on the site investigation programme and will, therefore, publish scoping reports for the various types of surveys on the DEA's website before the end of the year.*
- *Data from the preliminary site investigations will be published continuously on the DEA's website. A list of the expected deliveries and timeline is expected to be published in November 2021 on:* https://ens.dk/ansvarsomraader/vindenergi/udbud-paa-havvindmoelleomraadet/danmarks-energioeer/preliminary-site

- *A desktop-based study of UXO risk and mitigation measures related to the project will be provided for the offshore wind farm site. There will not be performed any UXO surveys for this site. In addition to the desktop-based risk study, a high-resolution geophysical UXO survey will be performed for the artificial island site spanning 2.5km x 2.5km. The UXO survey will be followed by ROV inspections and possible disposal of UXOs*
- *The survey programme for benthic flora and fauna has been designed based on the National Monitoring Program for the Aquatic Environment and Nature's (NOVANA) guidelines (soft-bottom guidelines).*
- *The fish survey programme has been designed based on existing knowledge on spawning and nursery grounds in the North Sea and Baltic Sea. Furthermore, the technical reports will combine the data from the field surveys with existing knowledge to ensure that the natural variation is accounted for as much as possible.*
- *The bird survey programme already includes radar-based measurements from a stationary platform in the North Sea (Siri). In addition to this, bird surveys include ship-based observations and digital-based aerial surveys.*
- *It is unfortunately not possible C-PODs on site after the investigations as the equipment is now owned by Energinet. Furthermore, the current survey permit only allows for preliminary site investigations, not continued monitoring.*

3. Is the scope for MetOcean and seabed investigations appropriate?

The market operators have provided detailed specifications and technical input to consider in the scope for MetOcean and seabed investigations.

In addition, the market operators recommend deploying the two measuring buoys for a longer period, so that they are covering the planning, design, construction and potential operation phases. At the time when the winning market developer has been identified, the market developer can take over the responsibility for the buoys. The location of the buoys would most appropriate be on the proposed island locations, or W-NW of the island, due to predominant wind and wave directions.

The seabed investigations should include: data acquisition at the site(s), analyses of bathymetry data, analyses of geotechnical and sediment data, numerical modelling of sediment transport capacity and synthesis of results into risk-maps of seabed mobility.

Sediment quality analysis, possible chemical contamination, and particle size distribution and density/porosity determination should be included, possibly as part

of the benthic flora and fauna sampling and characterization for the EIA and other study purposes.

A sufficient number of boreholes and in-situ tests shall be carried out in order to define the best location for the island, avoiding buried channel, geological heterogeneous areas, diapir zone, as well as to reduce the geohazards as much as possible. It is mentioned by a market operator to consider using sonic drilling technology and potential gamma-gamma logging in boreholes to capture densities.

As part of the MetOcean survey, it is recommended to include a sediment study that assess potential impact on sediment transport in coastal areas. This study would be of important use in the EIA process.

It is recommended by the market operators, that measurements, interpretations and analyses are continuously made available to the bidders.

The Danish Energy Agency's response:

- *The specifications are taken into considerations by Energinet and the Danish Energy Agency when tendering for the MetOcean and seabed investigation surveys*
- *Two FLiDAR buoys are located W-NW of the island. Two wave buoys and one bottom mounted unit (for current measurement) are located on the proposed island locations. The FliDAR buoys will collect data for a two-year period.*
- *It is unfortunately not possible to transfer ownership of the equipment used on site after the investigations as the equipment is not owned by Energinet. Furthermore, the current survey permit only allows for preliminary site investigations, not continued monitoring.*
- *Sediment transports are handled under the environmental survey scope. Here modelling is undertaking, investigating the potential sedimentation caused by the presence of an artificial island.*
- *Data from the preliminary site investigations will be published continuously on the DEA's website. A list of the expected deliveries and timeline is expected to be published in November 2021 on:* https://ens.dk/ansvarsomraader/vindenergi/udbud-paa-havvindmoelleomraadet/danmarks-energioeer/preliminary-site

4. Would you expect to undertake additional site surveys prior to future tender and/or construction of an artificial island or offshore wind farms?

The market operators expect the planned geophysical and geotechnical investigations hereunder number of boreholes to be sufficient to prepare the tender proposal, so that the tenderers are not required to carry out further site

investigations during the tender period. Enough boreholes and in situ tests will have to be carried out.

As part of the detailed design and construction of the island, some market operators expect supplementary site investigations to be carried out post-award and prior to the construction phase. Based on the current program, the market operators do not expect to have to do additional geophysical survey post award. However, further geotechnical surveys for the specific detailed design of the energy island are expected by some market operators, based on the current scope of the surveys undertaken by Energinet.

It is expected by some market operators to undertake post construction surveys. These will be defined during the construction phase.

Additional comments

Pre-investigations of sand extraction areas

The North Sea Energy Island will be built as an artificial. There has been a recommendation from the market operators to add site investigations to potential sand extraction areas to the survey programme.

Site investigations are recommended to be carried out by the State, and preferable soon to allow sufficient time for the extraction license process. The market operators recommended including site-specific investigations on soil content and analysis, as well as environmental data to be used in the EIA as part of the application for an extraction license. It is crucial for the developer of the artificial island to have as short a distance from the resource extraction site to the island location to shorten the construction period and costs of the reclamation works.

The market operators also recommended to include information and environmental assessment on the sand extraction in the Strategic Environmental Assessment.

The Danish Energy Agency's response:

- *The DEA has contracted GEUS (Geological Survey of Denmark and Greenland) to carry out a desktop-based assessment of potential resource extraction sites. Upon completion of this study in Q1 2022, the DEA expects to carry out limited preliminary geotechnical investigations of 2-3 potential extraction sites.*

Dumping sites

It is recommended by the market operators that the State identify dumping sites for disposal of unsuitable soils (e.g., fine grained soils extracted from borrow sites at

the island location) and perform an environmental baseline monitoring campaign for these dumping sites.

The Danish Energy Agency's response:

- *The DEA will take this recommendation under advisement.*

Pre-investigations for 10GW in the North Sea

The market operators recommend considering expanding site investigations in the North Sea to include up to the 10GW. The information will be needed to assess the general ground conditions and reduce the overall risks on time and costs related to the realization of the 10GW offshore wind developments.

The Danish Energy Agency's response:

- *The programme for the preliminary site investigations has been designed based on the political agreement from November 2020 in which the parties agreed to initiate site investigations for an Energy Island with a capacity of 3 GW.*

Survey scope and survey results

The market operators state that it would be useful for them in the bidding process, to receive further information on the detailed scope of works for the site investigations, and a detailed timeline for survey work and data release for the North Sea Energy Island.

The market operators recommend an early release of the geophysical and geotechnical data, which will allow the developer to prepare the development process efficiently and in due time for the bidding process.

The market operators recommend data from environmental surveys to be published regularly throughout the survey period to allow bidders to incorporate any new information into the technical island design. Early access to all survey data is requested by the market operators and results should be made available continuously throughout the pre-investigation phase.

The Danish Energy Agency's response:

- *The DEA understands the operators' request for more detailed information on the site investigation programme and will, therefore, publish scoping reports for the various types of surveys on the DEA's website before the end of the year.*
- *Data from the preliminary site investigations will be published continuously on the DEA's website. A list of the expected deliveries and timeline is expected to be published in November 2021 on:* https://ens.dk/ansvarsomraader/vindenergi/udbud-paa-havvindmoelleomraadet/danmarks-energioeer/preliminary-site

The further process

The feedback received from the market operators during the market dialogue has been examined, and the relevant findings will be incorporated in the further considerations and preparations of defining the scope of work for the geophysical, geotechnical and environmental site investigations for the Energy Islands in the North Sea and the Baltic Sea.

The Danish Energy Agency expects to publish the scoping reports for the preliminary site investigations on their website before the end of the year. Furthermore, a list of data-deliveries and expected deadlines for publishing of these will be available on the DEA's website in November 2021.

Potential tenderers and relevant market operators should stay updated on information about the preliminary site investigations on:
https://ens.dk/ansvarsomraader/vindenergi/udbud-paa-havvindmoelleomraadet/danmarks-energioeer/preliminary-site