

Memorandum

Date
20 September 2019

Ref. no. 2019-610.

/JEL

Guidelines for completing environmental assessments for Thor offshore wind farm

Energinet is to complete environmental studies and surveys in territorial waters to develop a site for the Thor offshore wind farm of 800-1,000 MW, corresponding initially to an area of 440 km². The offshore wind farm is to be established in the North Sea off Thorsminde in an area demarcated by the coordinates noted in annex 1. There will also be environmental surveys of an area for cable corridors to route cables onshore from the offshore wind farm to the coast. There is a map of both areas in annex 1.

Energinet is to complete environmental assessments of the Thor offshore wind farm project, see *Executive Order no. 1225 of 25 October 2018 on environmental assessment of plans, programmes and specific projects* (miljøvurderingsloven) and *Executive Order no. 1476 of 13 December 2010 on impact assessment regarding international nature conservation sites and protection of certain species during projects to establish etc. electricity production plant and electricity supply grids at sea* (habitatbekendtgørelsen vedrørende havet) and *Executive Order no. 1595 of 6 December 2018 on designation and administration of international nature conservation sites and protection of certain species* (habitatbekendtgørelsen vedrørende land).

Procedures in connection with preparation of an SEA and related environmental impact assessments (EIA)

The process for environmental assessments process for Thor offshore wind farm is to include:

1. Completion of a Strategic Environmental Assessment (SEA) that meets the requirements in the Act on the Environmental Assessment of Plans and Programmes (Danish SEA Act)
2. Completion of additional environmental surveys and studies in addition to the requirements imposed for an SEA in order to provide critical data and information to be used in connection with final EIA approval of the specific project

Energistyrelsen

Carsten Niebuhrs Gade 43
1577 København V

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

www.ens.dk

3. An EIA of the specific project onshore from the first landfall in the beach zone and onwards to the onshore substation as well as onwards to the 400 kV transmission grid in Idomlund.
4. An EIA of the *specific project* offshore and up to the first landfall in the beach zone is to be carried out after the deadline for bidding (expected end of 2021), after a concession winner has been appointed and there is a specific project. The concession winner is to complete the project-specific EIA.

Points 1, 2 and 3 above will be the responsibility of Energinet before the deadline for bidding, and the environmental studies and surveys for the offshore wind farm are expected to be completed by 1 April 2021. The concession winner will subsequently carry out the project-specific EIA before the offshore wind farm can be established. Energinet will carry out the EIA for the onshore project before deadline for bidding.

Guidelines for the SEA (environmental report)

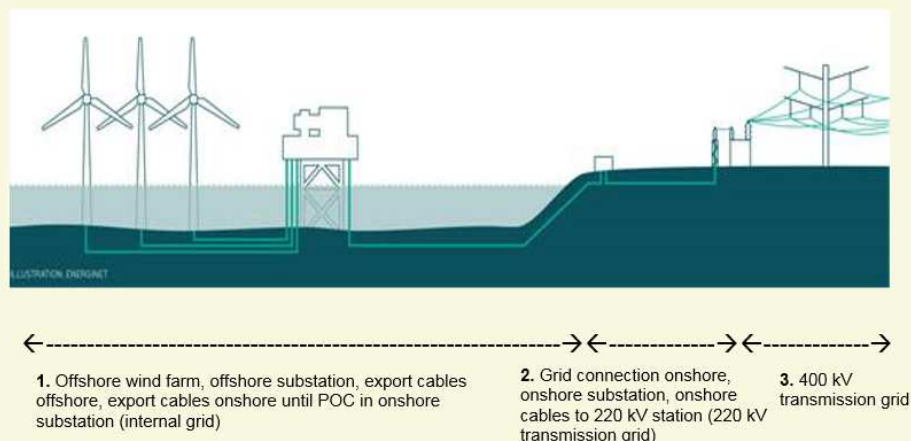
According to point 1 above, an SEA is to be completed in compliance with the Danish SEA Act. The Thor offshore wind farm project consists of offshore-based installations (offshore wind turbines, transformer substation and export cables) and onshore-based installations (onshore cables and onshore substation). According to section 8 of the Danish SEA Act, an SEA of the *plan* for the offshore windfarm project should be completed initially.

In this context, the *plan* for the project comprises the framework for the tendering procedure for the offshore wind farm, i.e. the mandate from the Energy Agreement of 29 June 2018 on the establishment of an offshore wind farm and the political decisions on the selected preliminary survey area offshore Thorsminde in the North Sea and inclusion of the routing onshore in the tendering procedure for the offshore wind farm, as well as the decision on flexible farm size of 800-1,000 MW made at the meeting of the parties to the agreement on 28 February 2019.

The *SEA of the plan* includes the whole project, i.e. the offshore wind turbines, the offshore transformer substation, the cables routing offshore to the landfall in the beach zone, the cables routing onshore onwards to the onshore substation as well as onwards to the 400 kV transmission grid in Idomlund, i.e. points 1 and 2 in figure 1.

Figure 1

Grid connection for Thor Offshore wind farm onwards to the transmission grid



According to section 12 of the Danish SEA Act, in its environmental assessment of the plan, Energinet shall prepare an environmental report which, on the basis of the information mentioned in annex 4 of the Danish SEA Act, assesses the likely significant impacts on the environment of implementing the plan, and reasonable alternatives taking into account the objectives and the geographical scope. Prior to initiation of the environmental assessment, the scope of the environmental report will be defined in accordance with section 11 of the Danish SEA Act, including consultation with the relevant authorities on the content of the environmental report. The Danish Energy Agency considers it appropriate also to carry out a public consultation, even though there are no statutory requirements for this, as this will contribute to greater transparency and greater public involvement.

The environmental assessment of the *specific project* offshore and up to the first landfall in the beach zone, see section 15 of the Danish SEA Act, will be carried out after the deadline for bidding (expected end of 2021), when a concession winner has been appointed and there is a specific project from the contractor. This also means that the environmental assessment, see section 20 of the Danish SEA Act, will be prepared by the concession winner with regard to the project offshore and up to landfall in the beach zone.

An environmental assessment must be prepared for onshore installations, i.e. from landfall in the beach zone and up to the 400 kV grid, see section 20 of the Danish SEA Act, with the Danish Environmental Protection Agency as the planning authority. Energinet will complete an EIA report for all of this area, but will only have to use the approval (licence) from the coastal substation and up to Idomlund. The remaining part of the onshore installation from landfall and up to the coastal substation has a valid approval (licence) which the concession winner will use later.

The environmental assessment of the plan for the offshore installations as well as the environmental assessment of the specific project for the onshore installations is to be prepared in collaboration with the relevant planning authorities for offshore and onshore, respectively. The environmental assessment of the *plan* for the offshore wind farm project is to cover the total environmental impacts (i.e. including any cumulative effects) of the installations offshore as well as onshore.

In order to describe the potential environmental impacts, Energinet will prepare a project description for the offshore wind farm project on the basis of input from the Danish Energy Agency. The project description will contain an overall description of the expected elements and dimensions of the offshore wind farm such as turbine height (tip-height), rotor-diameter, number of turbines, foundation types, as well as a description of the offshore transformer substation, onshore substations and other significant parts of the installation. Energinet will contact relevant market players to identify the scenarios (in terms of number and height of turbines, foundation types etc.) considered possible in establishing the technical installation.

Prior to the environmental assessment of the plan for the offshore installation, the Danish Energy Agency will submit a “scoping opinion”¹ to Energinet in accordance with section 11 of the Danish SEA Act. The scoping opinion will include comments from the relevant authorities in relation to what the SEA is to include. Annex 2 also lists topics to be addressed in the environmental report.

Guidelines for supplementary environmental assessments to the SEA (background reports)

As stated in point 2 above, in addition to the requirements for an SEA, further environmental assessments should be completed in order to provide critical data and information for use in connection with later final EIA approval of the specific project. In this context, Energinet will provide environmental assessments of *example projects* for an offshore wind farm in the area to identify the possible significant environmental impacts. The purpose of the supplementary environmental assessments is primarily to act as a risk-mitigation measure for possible bidders for the offshore wind farm. The supplementary environmental assessments should generally cover the topics below. Note that analyses of other authorities’ interests at the site (shipping routes, Defence, etc.) have already been carried out through a consultation of relevant authorities.

Birdlife and nature

- Potential impacts on birdlife from an offshore wind farm in the area in terms of collision, displacement from foraging, breeding and resting areas, as well as barrier effects. The studies will support an assessment of impacts on

¹ Afgrænsningsudtalelse

birds at population level in relation to national and international conservation obligations. Endangered species in the area, such as scoters and divers, are likely to be in particular focus. A bird survey was initiated by the Danish Energy Agency in autumn 2018. The results of the survey will be available in July 2019 and will probably make up the basis for the assessments of impacts on birdlife. However, it will be necessary to decide whether there is a need for supplementary surveys after the results have been analysed.

- The surveys will cover the benthic fauna and flora communities in the area, as well as fish and marine mammals. The surveys will support assessments of the impacts of the offshore wind farm project from physical disturbances such as sediment spread, visual and acoustic impacts (including underwater noise) on species in relation to displacement from, and exploitation of, breeding and foraging areas (including whether areas to which species are displaced meet the necessary requirements) and migration patterns for relevant species.

Visualisations

- Studies of the likely visual impact of the offshore wind farm (i.e. different park layouts) from relevant points (representative points on the coast and the points at which the visual impacts are expected to be largest) will be completed using virtual technology. Visualisations will be completed of the turbines with day and night marking for aircraft and shipping, simulated in clear and foggy weather. The studies will form the basis of an assessment of the landscape and visual impacts.

Safety of navigation

- A risk assessment will be completed for navigation in the area. The risk analysis for navigation will, as a minimum, identify possible scenarios that are likely to entail a risk to safety of navigation in accordance with guidelines from the Danish Maritime Authority. The analysis should include measures around the offshore wind turbines to prevent collision by shipping, including drifting ships, and the significance of altered traffic patterns in the surrounding areas, including the significance of new traffic patterns for safety of navigation. The Danish Maritime Authority will be involved in the risk assessment for navigation.
- The risk assessment of the safety of navigation should also include the effect of the design of the turbine foundations on a ship hull in the event of collision, including different types of ship, sea depths, weather conditions, etc. As far as possible, these should be drawn up so that the worst case and best case can be outlined for further use in the environmental

assessment report in relation to the specific arrays in relation to risks to shipping and choice of turbine foundations etc.

Radio links and radar

- Radio links and radar installations that may be affected by the wind farm will be mapped and likely significant impacts will be identified.

Fisheries

- The studies and surveys behind the EIA-report will include a statement of the landings and the value of fisheries in the area, and they will support an assessment of possibilities for the fishing industry to exploit the fish resource, including an estimate of financial losses in the short and long terms. The studies will also form the basis of an assessment of the impact of a future offshore wind farm on spawning areas and other disturbance that can affect fish stocks in the area such as noise and sediment spread. There will also be an assessment of possible impacts in the operating phase linked to infrasound and magnetism. The consequences for the fishing industry of the establishment of cables between the turbines should also be included in the studies, including with a view to identifying particularly important areas.
- The background reports regarding fisheries interests should include the following, unless otherwise agreed with the Danish Fisheries Agency:
 - VMS data for the affected ICES rectangles (vessels over 24 metres since 2007, vessels over 15 metres since 2009 and vessels over 12 metres since 2012) organised after type of gear or fishing.
 - Landings from the rectangle in species/weight and value.
 - Statement of the species/weight and value for smaller vessels <10 metres in the waters (nearest ports).
 - Statements should cover a 10-year period.
 - Reporting should contain the most important trawl lanes² for the area.
 - Detailed chart of sandeel banks

Marine archaeology

Surveys are to be carried out of marine archaeology, shipwrecks, etc. to support assessments in the EIA-report in relation to impacts on archaeology and cultural heritage, including identifying areas in which establishment should not take place because of these considerations. Note that in connection with parallel activities in form of the preliminary site-investigations (seabed surveys) undertaken by Energinet, similar requirements for such marine archaeology surveys have been required, and it is thus possible to coordinate these.

Noise

² Slæbestreger

- Investigations in relation to underwater noise are to be carried out so that the EIA-report can analyse the expected noise effects, including description of a worst-case situation.

Cumulative impacts

- As the cumulative impacts are an important parameter in an environmental assessment, the surveys and studies Energinet is to provide will support assessment of the cumulative effects of the project for the following aspects:
 - Possible cumulative impacts with regard to the part of the project to be established onshore.
 - Impacts in the construction and operating phases, for example on birds and harbour porpoises, from other approved or planned offshore wind farms or other plans/programmes or projects at sea, for example impacts on foraging or breeding areas, habitat loss, barrier effects, migration routes or similar.

The scoping of the environmental assessment (environmental report) on the plan will be on the basis of a consultation with the authorities concerned, resulting in a scoping opinion from the Danish Energy Agency.

Reporting and processing of data

As the studies and surveys are completed, and the results and data become available, they will be published on the Danish Energy Agency website so that they are accessible for all tenderers at the same time. All further disclosure of these results is to be in writing and made available to all tenderers at the same time. Furthermore, Energinet will submit the results to the Danish Energy Agency.

All raw data collected in preliminary surveys, including environmental studies relating to aspects of nature and the environment will, if possible, be made available to the public via the joint public databases (The Danish Natural Environment Portal - Miljøportalen.dk) as well as the specialist data centres under the Ministry of Environment and Food of Denmark.

The environmental studies and surveys for the offshore wind farm are planned for completion by 1 April 2021.

Annex 1: Coordinates and maps of the survey areas for Thor

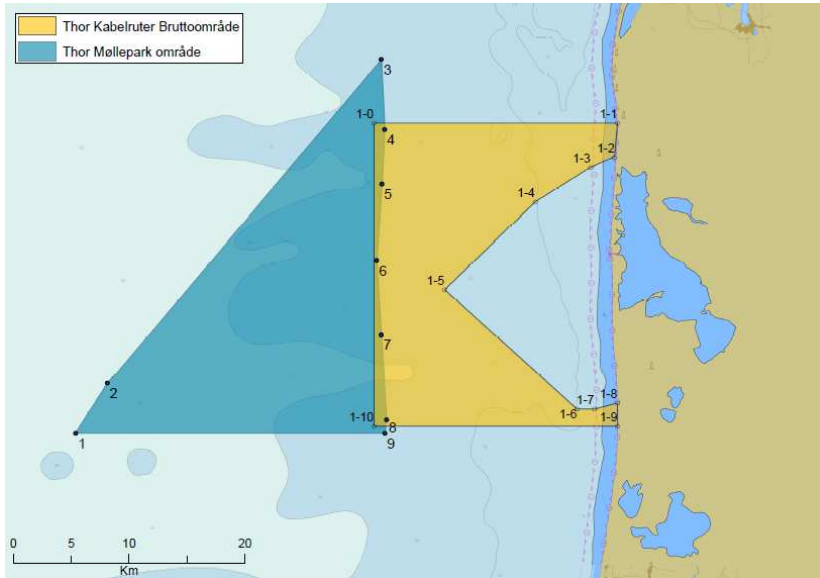
Table 1: Coordinates of the preliminary survey area for Thor offshore wind farm

ID	ETRS89 DD		ETRS89 DD.MM.mmm		ETRS89 UTM32N M	
	Longitude/Længdegrad	Latitude/Breddegrad	Longitude	Latitude	East	North
1	7,37527099527	56,22516400880	7° 13.509'	56° 22.516'	399264	6232328
2	7,41794495319	56,26473800340	7° 15.884'	56° 25.76'	402011	6236670
3	7,79155806732	56,51981447110	7° 31.188'	56° 47.493'	425649	6264590
4	7,79808758220	56,46551858210	7° 27.931'	56° 47.885'	425945	6258540
5	7,79548377560	56,42317368530	7° 25.390'	56° 47.729'	425702	6253830
6	7,79029845219	56,36382128860	7° 21.829'	56° 47.417'	425266	6247230
7	7,79809456873	56,30639174510	7° 18.383'	56° 47.885'	425636	6240830
8	7,80764520109	56,24053203080	7° 14.431'	56° 48.458'	426100	6233490
9	7,80559140018	56,23006715360	7° 13.804'	56° 48.335'	425953	6232328

Table 2: Coordinates of the preliminary survey area for cable corridors

Datum: ETRS89				
Projection: UTM Zone 32N				
POINTID	LAT	LONG	EASTING	NORTHING
No.	DD MM.mmm	DD MM.mmm	Metres	Metres
1-0	56° 28.222' N	7° 46.956' E	425,000.0	6,259,096.0
1-1	56° 28.394' N	8° 7.438' E	446,034.6	6,259,096.0
1-2	56° 26.826' N	8° 7.234' E	445,787.7	6,256,189.6
1-3	56° 26.326' N	8° 5.233' E	443,719.4	6,255,288.4
1-4	56° 24.676' N	8° 0.605' E	438,919.8	6,252,293.5
1-5	56° 20.548' N	7° 53.124' E	431,102.7	6,244,753.9
1-6	56° 15.082' N	8° 4.369' E	442,550.0	6,234,442.6
1-7	56° 15.094' N	8° 5.821' E	444,049.8	6,234,444.9
1-8	56° 15.379' N	8° 7.738' E	446,036.8	6,234,948.5
1-9	56° 14.293' N	8° 7.763' E	446,036.8	6,232,934.0
1-10	56° 14.122' N	7° 47.404' E	425,000.0	6,232,934.0

Figure 1: Location of the preliminary survey area for Thor offshore wind farm



Annex 2: Annex 4 of the Act on the Environmental Assessment of Plans and Programmes (Danish SEA Act) on topics for the environmental report

Information mentioned in section 12

(Annex 1 to the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment)

The information to be provided pursuant to section 12(1), subject to section 12(2) and (3), is the following:

- a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;
- b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;
- c) the environmental characteristics of areas likely to be significantly affected;
- d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;
- e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;
- f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including churches and their surroundings, architectural and archaeological heritage, landscape and the interrelationship between the above factors;
- g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;
- h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;
- i) a description of the measures envisaged concerning monitoring in accordance with section 14;
- j) a non-technical summary of the information provided under the above headings.