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# **ENERGY ISLAND BORNHOLM**

## **SCOPING REPORT – MARITIME TRAFFIC AND SAFETY OF NAVIGATION**



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## 1. SUMMARY

This scoping report defines the work to be carried out in relation to assessment of the maritime traffic and safety of navigation as input to the Strategic Environmental Assessment for Energy Island Bornholm. The report defines the area to be assessed, the data to be used, as well as the overall methodology for performing HAZID workshop, consultation of the users of the water and a risk assessment.

## 2. INTRODUCTION

The energy islands mark the beginning of a new era for the generation of energy from offshore wind, aimed at creating a green energy supply for Danish and foreign electricity grids. Operating as green power plants at sea, the islands are expected to play a major role in the phasing-out of fossil fuel energy sources in Denmark and Europe.

After political agreement on the energy islands have been reached, the Danish Energy Agency plays a key role in leading the project that will transform the two energy islands from a vision to reality. The islands are pioneer projects that will necessitate the deployment of existing knowledge into an entirely new context.

In the Baltic Sea, the electrotechnical equipment will be placed on the island of Bornholm, where electricity from offshore wind farms will be routed to electricity grids on Zealand and neighbouring countries. The offshore wind farms will be established approximately 15 km south-southwest of the coast and will be visible to the naked eye, but not dominate the horizon. The turbines off the coast of Bornholm will have an installed production capacity of up to 3,8 GW including overplanting (see Figure 2-1).

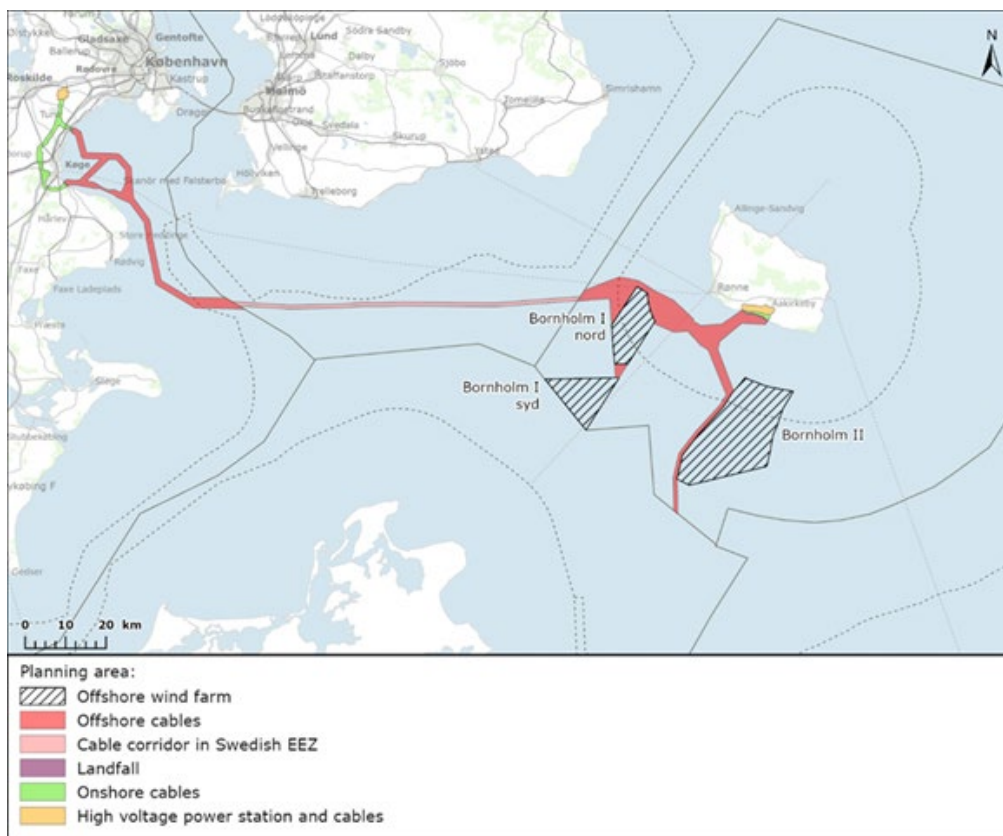


Figure 2-1 Energy Island Bornholm.

This report defines the scope of work involved with the assessment of the maritime traffic and safety of navigation in relation to the strategic plan for Energy Island Bornholm and as background for a future EIA for a concrete project.

### 3. AREAS OF INVESTIGATION

What is geographically included in the assessment of maritime traffic and safety of navigation.

#### 3.1 Area of interest and level of knowledge

The area of interest for the assessment of maritime traffic and safety of navigation includes:

- The area for "marine undersøgelser" including the 3 areas with turbines
- Cable corridors to Bornholm
- Cable corridor to Sealand (DC)

The investigation is performed at plan level but assumes that Energinet provides one layout of turbines as basis for a quantitative estimation of collision frequencies.

#### 3.2 Other structures, objects and conditions

The assessment will include effects from other existing offshore windfarms in the area as well as potential effects on the ship traffic from other planned windfarms. The windfarms to be included will be settled by the project and Energinet. Hence selecting which structures to include is not within the scope of this WP.

The assessment will address potential transboundary effects. Foreign maritime authorities may be invited to participate in the consultation / HAZID-workshop which is to be conducted as part of this WP. This is to be clarified by Energinet, and contact details will be provided to Ramboll. A more detailed follow-up process with foreign authorities will not be included, and only effects of the Energy Island Bornholm will be assessed.

Ship traffic arriving to and departing from Rønne harbour will together with the nearby Traffic Separation Schemes (TSS) be covered in the assessment. A navigation chart is shown in Figure 3-2, which marks the locations of Rønne and the relevant TSSes in the Baltic Sea west of Bornholm.

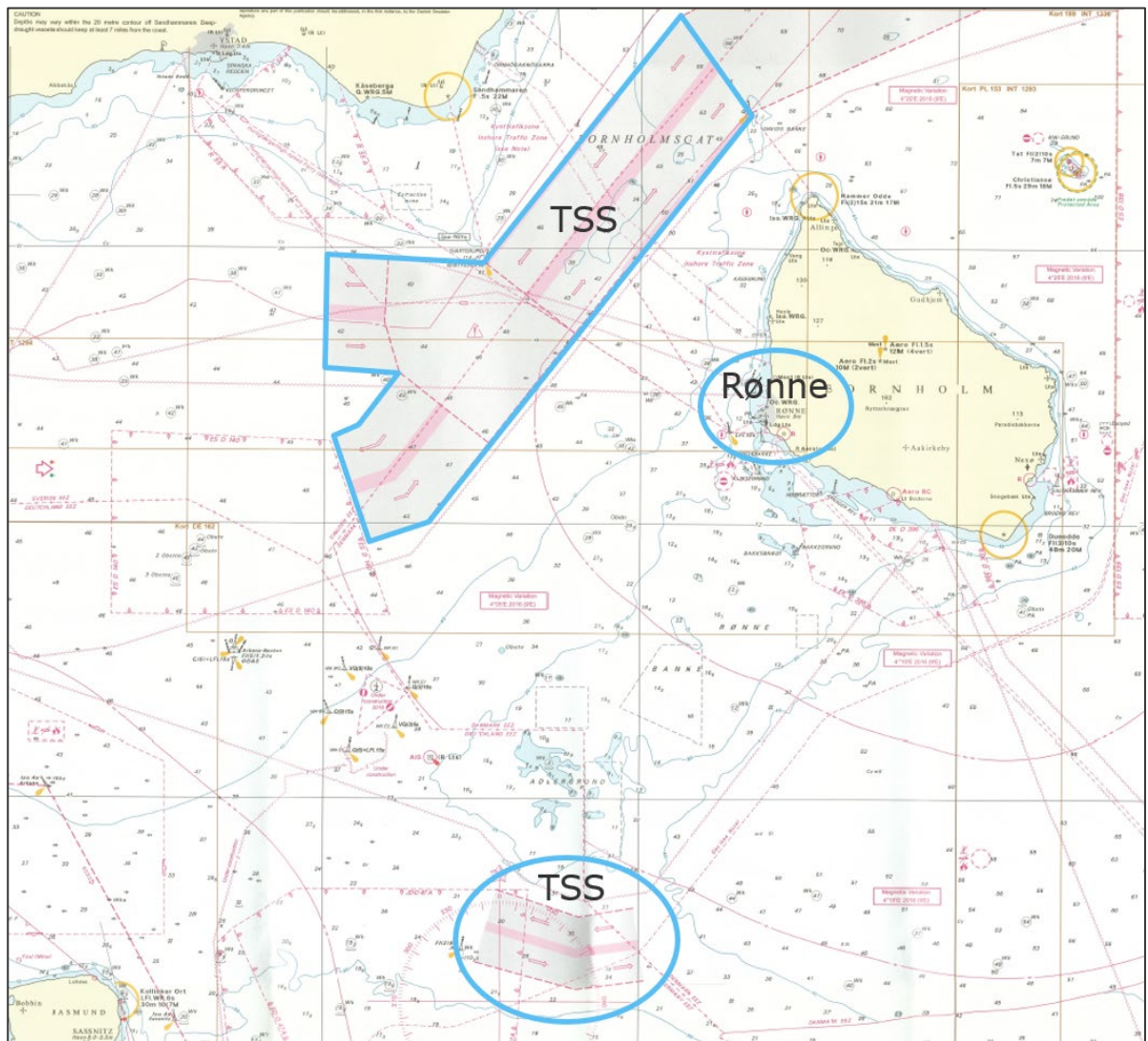


Figure 3-1 The Danish navigational chart for the Baltic Sea around Bornholm, December 2016, ©Geodatastyrelsen – 320-0147, with markings of Rønne and the nearby TSS.



## 4. METHODOLOGY

The overall methodology for the WP is described in the following subsections.

### 4.1 Data and background material

The analysis is based on available AIS-data from the Danish Maritime Authority (DMA). The following data forms the background for the analysis.

#### 4.1.1 Ship traffic data

For the analysis of ship traffic in the area, we use

- A full year of ship registrations (AIS data), 1<sup>st</sup> of January to 31<sup>st</sup> of December 2019, from the period before the COVID-pandemic.
- HELCOM or other reports indicating general traffic development in the Baltic Sea. No traffic forecasts are performed, but possible trends are commented upon based on available literature.

#### 4.1.2 Background maps and documents

The following documents are used in addition to available ship traffic data:

- Navigational charts covering the area southwest of Bornholm.
- Requirements from the Danish Maritime Authorities
- Guidelines for safety distances as relevant, e.g.,
  - o Dutch whitepaper – Assessment Framework for Defining Safe Distances between Shipping Lanes and Offshore Wind Farms
  - o PIANC, MarCom WG Report no 161 – 2018, Interaction between offshore wind farms and maritime navigation
  - o WSV Generaldirektion Wasserstraßen und Schifffahrt, Richtlinie Offshore Anlagen zur Gewährleistung der Sicherheit und Leichtigkeit des Schiffsverkehrs, v. 3.0, July 2019

### 4.2 Ship traffic analysis

The ship traffic routes sailing through or passing by will be analysed based on AIS (Automation Information System). The AIS-data will cover the investigation area and surroundings for a full year from the 1<sup>st</sup> of January to 31<sup>st</sup> of December in 2019. This is the latest year of ship traffic AIS-data unaffected by the COVID19 pandemic and therefore assumed to be representative of the actual degree of traffic and hence optimal data for the assessment.

The ship traffic will be analysed quantitatively using the IALA recommended software IWRAP.

The ship traffic patterns within and around the investigation area will be included in the study. These will be used to identify ship traffic densities, ship types, length, speeds, and future navigational changes. The ship traffic analysis will also focus on the shipping and ferry lanes, transboundary and cumulative impacts.

Fishing vessels will be included in the analysis of the ship traffic, but only addressed in relation to navigational safety. Hence, commercial interests are not included in this WP.



### **4.3 Stakeholder engagement**

The performed ship traffic analysis will be the baseline study for a consultation of the users of the waterway where identification of hazards and other relevant thoughts during the construction, operation and decommission phase for the Energy Island Bornholm will be given from several relevant stakeholders. The relevant stakeholders are users of the waterway potentially being affected by construction, operation and/or decommissioning of the Energy Island Bornholm.

The hazards identified will cover ship traffic in relation to wind turbines, platforms and cables to Bornholm as well as the DC cable between Bornholm and Zealand.

The consultation will be conducted as an online meeting and HAZID workshop. The stakeholders are given the opportunity to send in written comments before the workshop. This allows stakeholders to discuss internally in their organizations and give a more detailed input on hazards and their suggestion to mitigation (impact and risks) only related to navigational safety. This also ensures correctness of statements from the stakeholders.

The inputs from the stakeholders will be collected in a short HAZID report containing a list of participants, input from the stakeholders and identified hazards.

The identified hazards will be used in the technical report as background for the assessment of the consequences for the plan on the maritime traffic, risk of collisions as well as potentially new traffic routes impacting on the safety of navigation.

Primary stakeholders are identified based on list from the Danish Maritime Authority (Søfartsstyrelsen). Fishermen, pleasure boats, commercial ships, ferries, Danpilot – and potentially other authorities, e.g., Kystdirektoratet. Foreign maritime authorities may be invited for the HAZID, but further stakeholder management is not included in the WP. The list of stakeholders will be agreed with Energinet and DMA.

### **4.4 Assessment of maritime traffic and safety of navigation**

We perform a quantitative assessment of the collision frequency between ships and between ships and turbines for the operational phase.

The modelling is based on one layout of the area (wind turbine locations) provided by Energinet. Collisions towards wind turbines and platforms during the construction and decommissioning phases are assumed to be as during the operational phase or less. Collision scenarios with vessels engaged during construction and decommissioning are described and evaluated based on relevant HAZID input from the maritime stakeholders.

Collision assessments are therefore done quantitatively for the operational phase, but qualitatively for the construction and decommissioning phases.

A specific assessment is done for the DC cable between Bornholm and Zealand in relation to possible influence from DC field.

The frequency modelling is performed quantitatively, and the risk is assessed in line with DMA's scheme for addressing hazards for construction works at sea. We suggest using the DMA scheme, even though this is aimed at the construction phase, but it is the best fitted authority acceptance criteria we have identified. This to get a semi-quantitative assessment of the consequence sizes.

The risk and impact assessment is documented in a technical report as background for the Strategic Environmental Impact Assessment and for subsequent detailing in connection with a concrete project.

AIS data used for the analyses can be provided to Energinet as CSV files from IWRAP.

#### CUMULATIVE EFFECTS

Existing and possible windfarms in the area are included into the HAZID workshop and identification of possible hazards.

#### CROSS BOUNDARY EFFECTS

We assume no specific dialog with Swedish and German stakeholders, but include hazards as identified by Danish stakeholders that may impact Swedish or German waters and/or the international ship traffic passing the area. Energinet may decide to invite foreign authorities to the HAZID identification.

## 5. DELIVERABLES

The WP will deliver

- The present Scoping Report
- HAZID report documenting of the HAZID workshop
- Technical report on Maritime Traffic and Safety of Navigation

The HAZID report and the Technical Report are delivered in Danish and afterwards translated into English.

The Scoping Report and the Technical Report are part of the milestone deliveries as given in the next section.

## 6. MILESTONES

The milestones for this WP are given below.

Work package	Milestone No.	Milestone	Deadline
WP M	M66	Scoping report, 1 <sup>st</sup> draft	Q3, 2021 (Sept)
WP M	M67	Scoping report, final version	Q4, 2021 (Dec)
WP M	M68	Technical report, 1 <sup>st</sup> draft	2022 (ultimo)
WP M	M69	Technical report, final draft incl. appendices and data (input to SEA)	2022 (ultimo)
WP M	M70	Final version (including English version)	2022 (ultimo)