

Application procedure requirements for concession to anchor and use a floating offshore wind turbine with pumping package in the Bornholm Basin

- based on national legislation and the Espoo (EIA) Convention



Technical report no.9

Malin Ödalen

C105
Rapport
Gothenburg 2013

Department of Earth Sciences
University of Gothenburg



GÖTEBORGS UNIVERSITET

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fakulteten

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Abstract

In the BOX-WIN project, one aim is to construct a full-scale Demonstrator consisting of a deepwater pump powered by a floating wind turbine and test it in the Bornholm Basin. Such a test requires concession to anchor and use the facility. The main parts of the Bornholm Basin are located within the Danish Exclusive Economic Zone (EEZ), and it is likely that the chosen location will be within this zone. The project is also likely to have transboundary impact and it is thus expected that the Espoo (EIA) Convention will apply. Therefore, this report focuses on the guidelines for formulation of an application for concession following Danish procedure and with regard to the Espoo Convention.

It is concluded that an application regarding any project which includes the use of an offshore wind turbine within the Danish sea territory or EEZ should be directed to the Danish Energy Agency, which issues the necessary permits and organises contacts with other concerned authorities (“one-stop-shop”-principle). This type of project can be authorized according to an “open-door” procedure, where the initial application concerns permission to conduct preliminary investigations. The permits for establishment of the facility and for use of wind energy are applied for after these investigations have been finished.

Previous applications that have been accepted through the “open door” procedure can be used as templates for the formulation of the application. However, the use of a floating wind turbine instead of a bottom fixed structure partly modifies the questions that should be answered by the preliminary investigations. Overall, the unique purpose of the project calls for additional information to be added to the application, such as information on the environmental benefits of the project. The transboundary effects and the expected application of the Espoo Convention should also be highlighted.

If an alternative configuration which does not include a wind turbine would be used for the Demonstrator, the application should be directed to the Danish Coastal Authority, which gives permission for establishments on the Danish sea territory. The application should follow the template for applications regarding large establishments on the sea territory available on the website of the Coastal Authority. If the facility is to be located outside of the Danish sea territory but within the Danish EEZ, it is recommended that the application is written in dialogue with the Coastal Authority and the Danish Environmental Protection Agency.

Sammanfattning

Ett av syftena med BOX-WIN projektet är att konstruera en fullskalig Demonstrator, bestående av en djupvattenpump som drivs av ett flytande vindkraftverk, och att testa denna i Bornholmsbassängen. För att genomföra ett sådant test krävs koncession för att ankra och använda anläggningen. Huvuddelen av Bornholmsbassängen ligger inom dansk ekonomisk zon (EEZ) och det är troligt att anläggningen skulle placeras inom denna zon. Det är också troligt att projektet kommer att ha gränsöverskridande miljöpåverkan och därför är det förväntat att Esbokonventionen kommer att tillämpas. Med denna utgångspunkt fokuserar föreliggande rapport på riktlinjerna för formulering av en koncessionsansökan som följer danska bestämmelser och som tar den förväntade tillämpningen av Esbokonventionen i beaktande.

För ett projekt som inkluderar användande av havsbaserad vindkraft ska ansökan riktas till danska Energistyrelsen, som utfärdar de nödvändiga tillstånden och organiserar kontakten med andra berörda myndigheter ("one-stop-shop"-princip). Denna typ av projekt kan godkännas genom en "öppen dörr"-procedur, där den initiala ansökan endast gäller tillstånd till förundersökningar i det tänkta området. När dessa undersökningar är slutförda görs ansökningar om tillstånd för uppförande av anläggningen samt för utnyttjande av vindenergin.

Tidigare ansökningar som har accepterats genom "öppen dörr"-procedur kan användas som mallar för formuleringen av ansökan. Dessa rör dock bottenfasta strukturer och frågeställningarna i de tänkta förundersökningarna blir därför något modifierade då man använder ett flytande vindkraftverk. I allmänhet innebär projektets unika karaktär att kompletterande information om t.ex. projektets miljömässiga fördelar bör uppges i ansökan. De gränsöverskridande effekterna och den förväntade tillämpningen av Esbokonventionen bör också belysas redan i den initiala ansökan.

Om Demonstratorn får en alternativ utformning, där någon annan energikälla än vinden används, ska ansökan istället riktas till det danska Kustdirektoratet (*dk. Kystdirektoratet*), som utfärdar tillstånd för uppförande av anläggningar på det danska sjöterritoriet. Ansökan bör då följa mallen för ansökningar för uppförande av större anläggningar på sjöterritoriet som finns tillgänglig på Kustdirektoratets webbsida. Om anläggningen ska placeras utanför det danska sjöterritoriet men inom den danska ekonomiska zonen rekommenderas att ansökningsprocessen skrivs i dialog med Kustdirektoratet och den danska Miljöstyrelsen.

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Preface

In 2008, Formas and Naturvårdsverket (Swedish EPA) announced available funding for research on the possibility to use deepwater oxidation as a mean to combat eutrophication in the Baltic Sea. Two projects, BOX, “Baltic deepwater OXYgenation” and PROPPEN were funded at the end of December 2008. These projects have shown that phosphorus leakage from anoxic bottoms in small coastal basins may be stopped by oxygenation. BOX has shown that this also is true for the Baltic proper. The BOX-WIN project “winddriven oxygenation by pumping and generation of electrical power” builds on BOX.

Results from the BOX-WIN project will be presented in a series of reports from the Department of Earth Sciences at the University of Gothenburg. A wide range of subjects are covered by BOX-WIN. Technological, environmental, economical and legal facts and circumstances must be considered to develop and locate a full-scale Demonstrator composed of a self-supporting, floating wind turbine unit with a generator producing electric power for deepwater oxygenation by pumping and for delivery to the grid. The Demonstrator will be developed for the Bornholm Basin, which at times has anoxic water in its deepest parts. The Demonstrator developed by BOX-WIN will hopefully be built to conduct tests in the Bornholm Basin. This would be an important step towards installation of a regional system of full-scale floating wind turbine units with pumps in the Bornholm Basin. An updated list of BOX-WIN reports is included at the end of the report.

The present report “BOX-WIN Technical report no. 9 – “Application procedure requirements for concession to anchor and use a floating offshore wind turbine with pumping package in the Bornholm Basin – based on national legislation and the Espoo (EIA) Convention” is written by Malin Ödalen. The work is funded by the Baltic Sea Action Plan under the Nordic Investment Bank.

Gothenburg 19 June 2013

Anders Stigebrandt

1. Introduction

In the BOX-WIN project, one aim is to construct a full-scale Demonstrator consisting of a deepwater pump powered by a floating wind turbine and test it in the Bornholm Basin.

The purpose of the Demonstrator test is to show that it works as intended, with respect to electricity production and pumping. It will pump down so called “winter water”, see Ödalen and Stigebrandt (2013a)⁽¹⁾, from an inlet above the halocline to an outlet above the sea floor. During windy days, electric power to the pumps will be delivered by a wind turbine, which will be integrated with and atop of the Demonstrator and which will also be connected to the on-shore grid. All excess electricity will be sold. During calm days, electricity for running the pumps will be bought from shore.⁽²⁾

Before the Demonstrator is realized, an application for concession to anchor and use the Demonstrator is necessary. This application should be directed to the concerned authorities in the country where the Demonstrator is to be tested and needs to be outlined to meet national, as well as local and international, legislations and application procedures.

As the main parts of the Bornholm Basin are located within the Danish Exclusive Economic Zone (EEZ), with limited parts belonging to the Swedish and Polish EEZs, this report will examine the application procedures and the limiting legislations for this type of project in Denmark, primarily. These details are given in section 2. Corresponding details for Sweden are given in Appendix A. Possible limitations due to requirements within the Espoo (EIA) Convention will also be examined (see section 3).

Finally, an outline of the application for concession of a Demonstrator will be presented, with special regard to the unique objective of this project – to test oxygenation of deepwater by artificial deepwater ventilation. Due to the findings in Ödalen and Stigebrandt (2013b)⁽³⁾, where all the further investigated sites of interest are found to be located within the Danish EEZ, the guidelines for the formulation of the application will mainly follow Danish procedure.

In Eriksson and Kullander (2013)⁽²⁾, five alternative pump configurations are evaluated in addition to the original Demonstrator configuration suggested by BOX-WIN. Not all of these alternative configurations include the use of wind energy. Therefore, the starting-point and procedure in the application process would be different should one of these alternatives be used instead. An alternative application outline for these alternative configurations is presented along with the outline presented for the original Demonstrator configuration.

To achieve a noticeable effect on the oxygen levels in the Bornholm Basin, a system including several pumping units would be required. In general, the application outlines for the Demonstrator and alternative configurations should also be applicable in the case where

construction of a pumping system is proposed. If any special considerations or additions should be made in such a case, this is noted in the presentation of the basic outline.

2. Danish legislation and permit application procedure

2.1. Procedure for establishment of offshore wind turbines

Since the right to use energy from wind and water in Danish territorial waters and within the Danish EEZ exclusively belongs to the Danish government, anyone else who seeks to use this energy needs to apply for permission.⁽⁴⁾ Any matter relating to offshore wind turbines in Danish territorial waters or within the Danish EEZ, see Figure 1, is administered by the Energy Agency (dk. *Energistyrelsen*), which issues the necessary permits and organises contacts with all other concerned authorities according to a “one-stop-shop”-principle. The permits are granted in accordance with the Electricity Act (dk. *elforsyningsloven*) when other relevant authorities have been contacted to ensure that there are no obstructions for the realization of the project.^(5,6,7)

Offshore wind turbine projects may be authorized based on a direct request from the project developer to establish a facility in a specific area. This is called an “open door” procedure (dk. *åben dør-procedure*).⁽⁵⁾ In the initial phase, permission is given for undertaking preparatory investigations and in the next step, construction of the facilities is granted. The use of wind energy also requires a specific permit, which is issued provided that the conditions given in the permission for establishment of the facility are fulfilled.^(6,8) Details of the different steps are given below.

The application for authorization of preliminary investigations shall contain at least the following parts

- Project description
- Extent of preparatory investigations
- Number and size of wind turbines
- Intended geographical location of the project

An “open door”-project is not presumed be approved in areas where wind farms are already planned. Plans for future wind farm projects in Denmark are summarized in the report *Fremtidens Havmølleplaceringer 2025*⁽⁹⁾. For the Bornholm Basin, east of Bornholm Island, no such plans had been presented by the time of publication of this report.

Before the establishment of offshore wind turbines, thorough geophysical and geotechnical investigations of the seabed must be performed. An extensive EIA is also compulsory.⁽⁵⁾ According to the Danish Proclamation 815 on EIA (dk. *Bekendtgørelse 815 om VVM*)⁽⁷⁾, the

EIA must ‘identify, describe and evaluate’ the consequences of the project in relation to the factors

1. humans, fauna and flora,
2. seabed, water, air, climate and landscape,
3. material assets and cultural heritage, and
4. the interaction of these factors

The EIA must also contain suggestions on how to limit the identified environmental consequences and alternative geographical locations for the project.⁽⁵⁾ Previous EIAs made for bottom fixed offshore wind turbines in Denmark have not pointed to any significant negative consequences for the environment.⁽⁶⁾

Appendices to the above mentioned proclamation 815 describes in further detail the criteria on which the Energy Agency bases the decision that an EIA is required for a project, and what topics should be discussed in this EIA.

When preliminary investigations have been completed and the project is to proceed with an application for approval of establishment of the facility, this request should contain a ‘full description of the anticipated scope, size, geographical location, turbine coordinates, connection to the power distribution grid, cable routing etc. and the results of the extensive initial investigations.’⁽⁵⁾ If permission for establishment of the wind power facility is granted, thorough documentation during the realization of the project is required in order to ensure that the permit conditions are fulfilled. When these conditions are fulfilled, a permission to use the wind energy can be issued. The application for such a permit can be made at the earliest when construction has begun and at the latest two months before the facility is expected to be operational.⁽¹⁰⁾

Energinet.dk, which is a non-profit enterprise owned by the Danish Ministry of Climate, Energy and Building (dk. *Klima-, Energi- og Bygningsministeriet*), are responsible for the development of the infrastructure for electricity and gas transmission in Denmark.^(11,12) They own the energy transmission systems in Denmark and, in offshore wind projects, they are responsible for bringing any produced energy to the onshore grid. Hence, they will also be the owners of the sea cable connecting the establishment to the grid.

A particular provision in Danish law stipulates that the owner of a wind power facility funded by any other than the Government is obligated to grant at least 20% of the ownership to the local inhabitants. Anyone over the age of 18, who is registered at an address not more than 4.5 km from the facility, or within the municipality where the facility is built, has the right to buy shares.

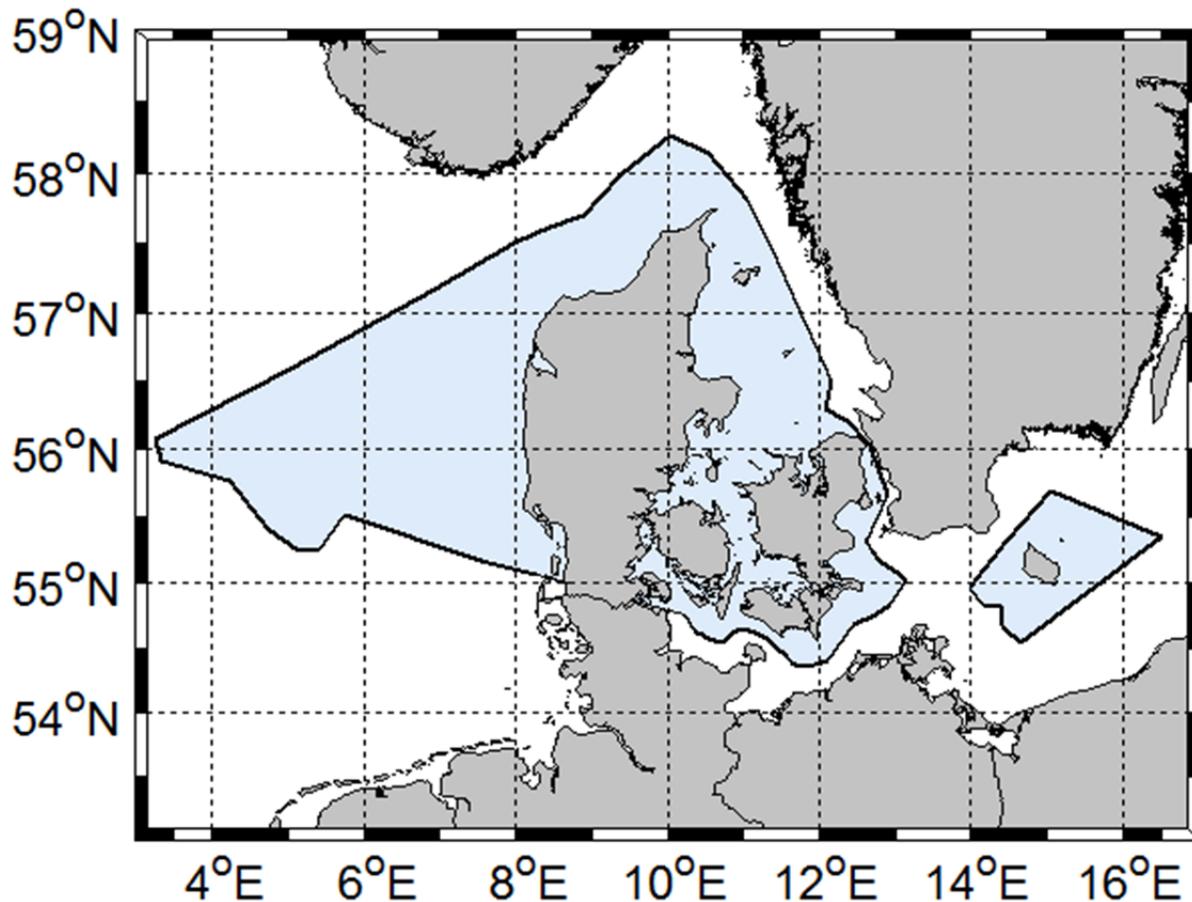


Figure 1. The extent of the Danish Exclusive Economic Zone (EEZ) around Denmark and Bornholm (light blue areas).⁽¹³⁾

2.2. Examples of previous applications regarding offshore wind turbines

Examples of “open door” applications for establishment of offshore wind farms that have been approved are the applications for Sprogø^(14,15) and Avedøre Holme.⁽¹⁶⁾ These applications both refer to bottom fixed structures, but can be used as guidance for the formulation of an application concerning a floating wind turbine. To the application for approval of establishment of the Sprogø wind farm, an EIA⁽¹⁷⁾ with additional material⁽¹⁸⁾ and a published copy of the permit for establishment⁽¹⁰⁾ are attached.

In the initial applications for commencing preparatory investigations for both Sprogø⁽¹⁴⁾ and Avedøre Holme⁽¹⁶⁾, the documents begin by an explanation of how these projects will be of benefit to society, besides the obvious increase in electricity production. Then, the precautions for causing as little disturbance as possible to the surroundings are explained, i.e. how to avoid undesirable visual effects and environmental problems, and how to manage interactions

with maritime traffic. An important part of these applications is the presentation of environmental issues that the preliminary investigations are expected to address, and the extent of the resulting EIA. Finally, the realization of each project is visualized, partly by the presentation of a time plan, but for Sprogø also by a concluding account of the economic conditions.

After the preparatory investigations have been authorized and conducted, separate applications for permission to physically establish the facilities are submitted. In the second application, the purpose, placement and technical issues of the project are briefly described. The environmental consequences are discussed in detail in the enclosed EIA.^(15,17)

No published applications regarding floating wind turbines in Danish territorial waters or within the Danish EEZ are currently available, but the approved application for the current HYWIND-project in Norway exemplifies specific assessments concerning floating facilities of this type.^(19,20) Unlike bottom fixed offshore wind turbines, which are often built close to shore, floating turbines are expected to cause limited disturbance in the form of noise and visual effects. This fact is emphasized in the HYWIND-application.

The application procedure is somewhat different in Norway compared to Denmark; here, the project developer applies for authorization to establish the facility and commits thereby, if the permit is granted, to perform the essential preliminary investigations. The HYWIND-application⁽¹⁹⁾ is therefore somewhat more detailed than the Danish primary applications, which only concern permission to conduct preparatory surveys. In the initial evaluation of environmental consequences for the HYWIND-project, the project developer refers to EIAs performed for establishment of Danish bottom fixed offshore wind farms. Though the HYWIND-application concerns the establishment of a floating wind turbine, the consequences can be considered as similar.

2.3. Procedure for alternative configurations lacking wind turbines

If the Demonstrator configuration does not include the use of wind energy, the application for concession will mainly concern the anchoring of the facility and the environmental aspects, local as well as transboundary, of the pumping. In this case, the application should be directed to the Danish Coastal Authority (*dk. Kystdirektoratet*), who is responsible for all matters regarding anchoring of facilities within the Danish sea territory.⁽²¹⁾

An application template can be downloaded from the website of the Coastal Authority⁽²²⁾ and the application will be treated according to the Act on Coastal Protection.⁽²¹⁾ In this case, the Coastal Authority will initiate contacts with other concerned authorities. The official turnaround time for the application should be no longer than 13 weeks. For details on the recommended application contents, see section 5.2.

If the facility is to be placed outside of the Danish sea territory, but within the Danish EEZ, the application should be formulated in dialogue with the Coastal Authority and the Danish Environmental Protection Agency (EPA, *dk. Miljøstyrelsen*), who normally handle establishments with transboundary environmental effects (see section 3).⁽²³⁾

3. Espoo (EIA) Convention

In the Espoo (EIA) Convention⁽²⁴⁾, henceforth called the Convention, the main focus is on transboundary environmental impact of activities that are likely to be associated with negative environmental effects. It is stated that projects involving such activities shall be preceded by an extensive EIA and, if the project is likely to have transboundary impact, the Party of origin is obliged to inform and consult with any other Parties that may be affected by the activity and/or its consequences. The concerned Parties may also determine whether a monitoring program shall be implemented when the project has been realized.

The contracting Parties to the Convention (e.g. Denmark and Sweden) agree to add EIA as a demand in the granting procedure for projects that may have negative, transboundary environmental consequences. Consequently, the requirements in the granting procedures described in the previous sections are similar to the minimal demands of an EIA documentation described by the Convention. These minimal demands are (*quoted list*)⁽²⁴⁾:

- (a) A description of the proposed activity and its purpose;
- (b) A description, where appropriate, of reasonable alternatives (for example, locational or technological) to the proposed activity and also the no-action alternative;
- (c) A description of the environment likely to be significantly affected by the proposed activity and its alternatives;
- (d) A description of the potential environmental impact of the proposed activity and its alternatives and an estimation of its significance;
- (e) A description of mitigation measures to keep adverse environmental impact to a minimum;
- (f) An explicit indication of predictive methods and underlying assumptions as well as the relevant environmental data used;
- (g) An identification of gaps in knowledge and uncertainties encountered in compiling the required information;
- (h) Where appropriate, an outline for monitoring and management programmes and any plans for post-project analysis;

- (i) A non-technical summary including a visual presentation as appropriate (maps, graphs, etc.).

The list of activities that are concerned by the Convention (see Appendix I of the Convention⁽²⁴⁾) includes project types that have already been realized in various forms, and therefore are known to have a potentially negative and transboundary environmental impact. Geoengineering projects of the BOX-WIN type are not mentioned. However, the list is only a guide to activities where the Convention should automatically be applied and is not exclusive⁽²⁵⁾. Thus, any project that may cause significant transboundary impact, either short or long range, requires application of the Convention. Whether such impact is likely should be assessed during the initial investigations associated with the project.

In Denmark, any project that is likely to have transboundary environmental impact needs to be authorized by the EPA, which is a part of the Danish Ministry of the Environment (*dk. Miljøministeriet*).⁽²³⁾

An important aspect of the Convention is that the public in the country where the project is realized as well as in other countries affected by the transboundary effects shall be allowed to participate in the EIA process. This right entitles the public to have access to information, such as the EIA documentation, and to communicate their opinions. According to the document on the practical application of the Espoo Convention,⁽²⁵⁾ the rules on public participation are in agreement with the UNECE Convention on access to information (the Aarhus Convention, 1998).

In the final decision on whether a project is to be realized, the opinions of all affected Parties should be taken into account.⁽²⁵⁾

4. Discussion and conclusions

In accordance with current legislation, an application for projection and future establishment within the Danish or Swedish (see Appendix A) EEZs of a Demonstrator based on a floating wind turbine should be written using the same template as for bottom fixed wind turbine structures. Investigations concerning environmental impacts of bottom fixed wind turbines can be used as a basis to recognize the general issues that should be included in an EIA for a floating wind turbine. The specific conditions of the construction area for a floating wind turbine, such as greater water depth, will however contribute to additional or partly modified questions. In this matter, the HYWIND project description⁽¹⁹⁾ can contribute further to the angles of approach.

Due to the unique construction of the Demonstrator, i.e. the combination of a floating wind turbine and a pumping unit, and the unique purpose to oxygenate the deepwater by the aid of pumping devices, the initial application should also include a more thorough analysis of e.g.

environmental consequences and project benefits than those that have been presented in applications regarding establishment of conventional wind turbine parks or the HYWIND project.

The pumping adds several new environmental aspects to consider. Due to water movements and since EEZ borders are cross-basin, many of these environmental effects are likely to be transboundary. Hence, the Espoo (EIA) Convention will be applicable in this case. The application for concession should be directed to the Party of origin, thus the country where the project is to be realized, which according to Ödalen and Stigebrandt (2013b)⁽³⁾ will be Denmark. The Party of origin then has the responsibility of adapting the process to the requirements of the Convention and to initiate contact with other affected Parties.

It may be appropriate to consider the transboundary effects already in the early stages of the application process, to indicate that the project is well prepared to handle the forthcoming environmental investigations with respect to the Convention. In the case where a system of pumps were to be built in the Bornholm Basin, the application of the Convention could however be associated with similar problems as those identified by Hernández (2008)⁽²⁶⁾ for the Nord Stream project. He concludes that problems that may occur during the realization of such mega projects could be due to the large number of countries involved and the lack of focus on strategic issues related to economy and politics in parallel to the environmental issues.

In the preliminary investigations of sites of interest for the location of a Demonstrator, all the examined sites are found to be within the Danish EEZ.⁽³⁾ Therefore, assuming that a Demonstrator configuration which is based on an offshore wind turbine is used, the initial application for concession should be written according to the Danish “open door” procedure and directed to the Energy Agency. The applications made for Sprogø⁽¹⁴⁾ and Avedøre Holme⁽¹⁶⁾ described in Section 3.2 may be used as examples of the recommended basic structure of the initial application for authorization of preliminary investigations.

The unique character of the Demonstrator implies that the initial application needs to contain more information than these applications, because they both concern conventional, bottom-fixed wind turbines. For example, the project background needs to be thoroughly described. Additional information on the planned approach for handling environmental investigations, awareness of environmental issues that need to be further examined and results of the already performed initial studies and process modelling could also be provided. In preparation of the expected application of the Espoo Convention, an introduction to environmental and economic consequences of the other proposed measures to target eutrophication as well as the “no action”-alternative for the Baltic Sea also needs to be included in the application.

In the case where the Demonstrator configuration is altered so that the project no longer involves use of wind energy, the required contents of an initial application are expected to be

similar as for the original configuration. Though, in this case, the application should primarily be directed to the Danish Coastal Authority. Their application template is constructed with the assumption that the applicant seeks direct permission to establish the facility, not only to undertake preliminary investigations. However, the information requested in the template does not require that a complete EIA investigation has been performed prior to the application. For a project of this type which is not located on the Danish sea territory but within the Danish EEZ, it is recommended that the application is made in dialogue with the Coastal Authority and the EPA.

5. Application guideline

5.1. Pumping which includes the use of wind energy

It is recommended that the application for establishment of the Demonstrator, based on the original configuration suggested by BOX-WIN which is based on a floating wind turbine, is written according to the Danish “open door” procedure for establishment of offshore wind turbines. This procedure is separated into two phases; a preliminary application for authorization of preliminary investigations; and, after the preliminary investigations have been completed, an application for permission to establish the facility.

Based on previous applications made according to the “open door” procedure and on the unique character of the Demonstrator project, the initial application for authorization of preliminary investigations for the Demonstrator should include

- 1) *Project background and formal request for authorization to begin preliminary investigations* – The project background, reasons for carrying out the project and a general plan (location, benefit to society and the environment, time plan) should be briefly introduced and then followed by a formal request for authorization to begin the preliminary investigations for the project;
- 2) *Description of the current situation in the area* – Description of the conditions in the area prior to establishment of an oxygenation device (i.e. the Demonstrator);
- 3) *Project description* – Specific description of location, size, areal extent, design etc. of the offshore wind turbine(s), visual effects, water depth, cable route, production efficiency. For the Demonstrator, this section should also include a more thorough description of the project background (e.g. why the idea should be tested in the Bornholm Basin) and expected benefits to society and the environment, including an introduction to environmental and economic consequences of the other proposed measures to target eutrophication as well as the “no-action” alternative for the Baltic Sea;
- 4) *Preliminary investigations and EIA* – Description of planned and initiated investigations, such as visualization, traffic intensity, cables and other installations on

the bottom in the chosen area and a list of planned issues to be investigated in the EIA. In this section, the expected application of the Espoo (EIA) Convention should also be highlighted;

- 5) *Time schedule* – Short description of the expected stages of the project, from application for authorization in the current Step 1, through the time expected for the execution of preliminary investigations (date for when these investigations should be finished), to application for approval of establishment (Step 2) and finally by when establishment should have been approved;
- 6) *The technical and financial capacity of the project developer* – Short description of the financial guarantees for the project. This step is not mandatory in the application in this first step, but has been included in other applications written according to the “Open door” procedure;
- 7) *Appendices* - Appendices may include visualization of the project, such as design drawings, concept description and construction plan and schedule.

The subsequent application for permission of establishment should be brief and concise and give an overall description of the project implementation⁽¹⁵⁾, including

- a. project background;
- b. location, coordinates of establishment;
- c. companies involved in establishment;
- d. life span of establishment;
- e. construction (wind turbine, substructure, anchoring etc. including drawings);
- f. cable route.

An extensive EIA-report should be given in a separate document which is provided together with the application and referred to in the application document as the basis for approval of the establishment of the project. This EIA-report should show that all identified environmental issues have been evaluated.

5.2. Pumping which does not include use of wind energy

Any matter which regards establishment or anchoring of a facility within the Danish sea territory is handled by the Danish Coastal Authority. According to the application template for concession for anchoring and use of larger establishments on the sea territory⁽²²⁾, such an application should include

- A. *Information about the applicant and company ownership*, such as company name, contact information and registration numbers;
- B. *Representative details*, name and contact information of any representative, such as a contractor or counsellor;

- C. *Formal consent of official publication of application*, agreement that the application may be published on the website of the Coastal Authority and made accessible to local inhabitants and other stakeholders;
- D. *Location of the establishment*, location description by e.g. coordinates;
- E. *Project description*, such as the project background and purpose, design, dimensions and materials of construction, description of expected effects on currents and e.g. hydrographic properties, description of expected effects on the natural environment including protected areas and culturally important areas, use of natural resources, risk evaluation, expected waste production and other pollution. This section should also include descriptions of the expected geographic scope and transboundary character of the effects, the expected complexity and probability of the effects, as well as the duration, frequency and reversibility of the effects. This information will be used as a basis for the subsequent EIA investigation.
- F. *Description of working methods*, such as preparatory work, methods for anchoring etc.;
- G. *Dredging plans*, if the establishment requires any dredging on the sea territory;
- H. *Filling plans*, if the establishment requires any filling on the sea territory;
- I. *Required appendices*, including scaled site maps and sea charts where the establishment position is marked, design drawings and dimensions of construction, overall plan for establishment, investigation of land ownership and consent declarations by any land owners affected by the establishment. Any investigations regarding effects on water circulation should also be included;

This application template should be used if the configuration of the Demonstrator is altered so that the concept does no longer include use of wind energy. The applicant may choose whether to submit the application via the Coastal Authority online service, or whether to send in a scanned electronic copy or a paper copy of the application.

If the location of establishment in this case is not within the Danish sea territory but within the Danish EEZ the application should be written in dialogue with the Coastal Authority and the EPA. However, it is expected that the application should include similar information as listed above and in section 5.1.

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Appendix A - Sweden

A.1. Swedish legislation and recommendations for permit application

All activities on the continental shelf in Swedish territorial waters (up to 12 nautical miles from shore) and within the Swedish EEZ, see Figure A1, are controlled by the Environmental Code (s. *Miljöbalken*). This is to avoid damage to the marine environment. As the exploitation rights for the continental shelf in general accrue to the state, a license is required for exceptions concerning these exploitation rights. In the permit-granting process, the Environmental Code is applied. A license application for the initiation of preparatory investigations on the continental shelf, such as for the possibilities for construction of an offshore wind turbine with pumps such as the Demonstrator, should go through the Ministry of Industry (s. *Näringsdepartementet*).^(A1,A2)

The laws that primarily regulate such establishments are

- **(1966:314)** Act on the Continental Shelf and **(1966:315)** Proclamation concerning the Application of the Act (1966:314) on the Continental Shelf.
- **(1992:1140)** The Swedish Exclusive Economic Zone Act and **(1992:1226)** Proclamation concerning the Swedish Exclusive Economic Zone

The Proclamation concerning the Application of the Act (1966:314) on the Continental Shelf^(A3) states that “Permission to explore the continental shelf or to exploit its natural resources is notified by the Government” and a permit application for such activities should, according to the proclamation, consist of (*quoted list in free translation*)^(A4)

1. particulars of the domicile and postal address of the applicant and, when the applicant is a foreign company, of any branch office which the applicant has or intends to establish in Sweden for the intended activity;
2. particulars of the nature and extent of the intended activity and of the area and the period to which the application relates;
3. a program of operations for the activity;
4. the particulars needed to assess how the general rules of consideration of Chapter 2 of the Environmental Code will be observed;
5. particulars of the measures which the applicant considers necessary to prevent pollution of water and interference with navigation, fisheries and other public and private interests;
6. particulars of the applicant’s technical and financial capacity to undertake the activity;
7. a map, prepared in accordance with the instructions of the Geological Survey of Sweden, and a description of the area to which the application relates;

8. any certificate which the applicant wishes to rely on to substantiate particulars referred to in points 3-6.

The application must include an Environmental Impact Assessment (EIA), see Chapter 6 of the Environmental Code for procedure description, and at least six copies of the application documents must be provided.

If the intended activities involve installation of submarine cables the application should also contain details on the cable route in the continental shelf area, including any potential environmental consequences of the installation and appropriate actions to limit such consequences.

According to the Act (1966:314) on the Continental Shelf^(A1,A4) a permit for activities on the continental shelf is only granted if the applicant, through economic surety, can guarantee the removal of all facilities and installations including a restoration of the area after the permit expires.

The supervisory authority designated by the Government is entitled to unlimited access to the information and documents they need in order to supervise the activities. The supervisory authority also has the right to visit the facilities. In addition, the geological results of the activities are to be shared with the Geological Survey of Sweden (SGU). The law also states that the facilities should be protected by being surrounded by a security zone of at most 500 m from its outer side.

In the Swedish Exclusive Economic Zone Act (1992:1140)^(A2), the same general demands as in the Act on the Continental Shelf are stated, but with the addition that permits are required for the construction or use of artificial islands. A floating offshore wind turbine would be considered to be such an island.

When formulating an application for the construction of a Demonstrator, regardless of the chosen configuration or the number of pumps, the recommendation is to write the application according to the above listed points from the Proclamation concerning the Application of the Act (1966:314) on the Continental Shelf. An extensive EIA should be included in the application and in this assessment, the chapters/articles from the Environmental Code that may be administered during the license granting process should be considered. Since Sweden is a Contracting Party to the Espoo (EIA) Convention^(A5), the application should also highlight the transboundary issues of the project. The application should then be sent to the Ministry of Industry without further inquiries addressed to other ministries.^(A6)

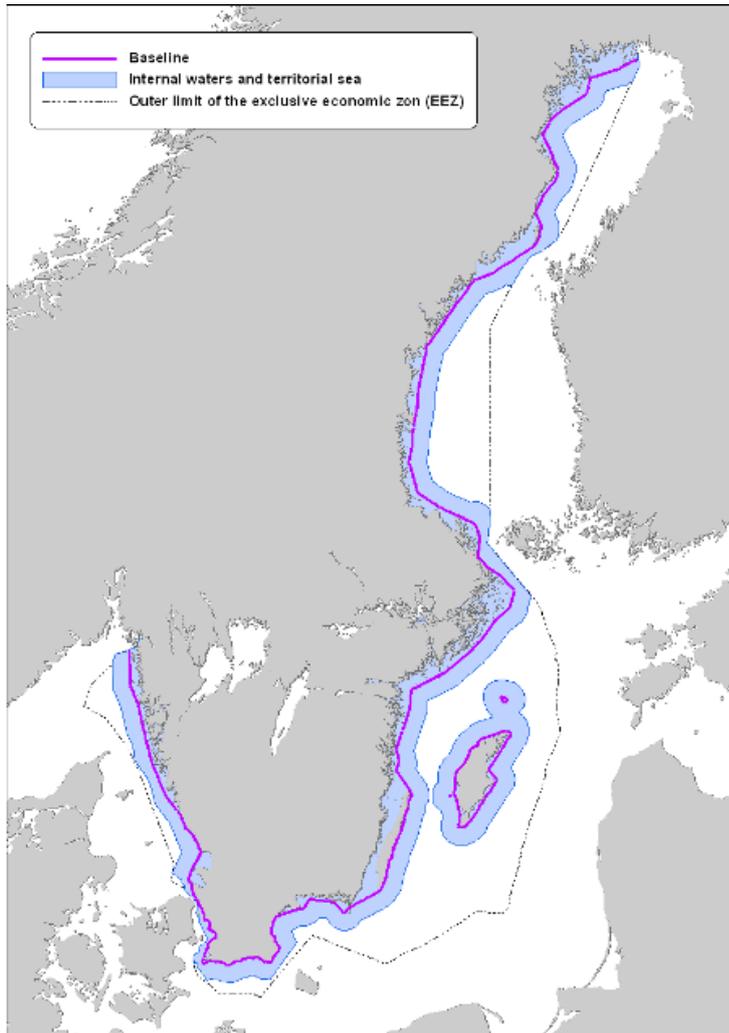


Figure A1. Swedish territorial waters (marked in blue) and the outer limit of the Swedish Exclusive Economic Zone (dashed black line). (Image source: Sjöfartsverket, Sweden)

Acknowledgements

This work was funded by the Baltic Sea Action Plan under the Nordic Investment Bank. The author would like to thank solicitor Hans-Göran Jansson for interesting discussions and valuable input regarding the Swedish procedure; Anne-Mette Hjortebjerg Lund at the Danish Nature Agency for helpful guidance in identifying concerned Danish authorities; and BOX-WIN project leader Anders Stigebrandt for insightful remarks regarding the angles of approach of the work and for valuable comments on the text.

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