10 NOVEMBER 2021
DANISH ENERGY AGENCY, ROYAL DANISH EMBASSY
IN VIETNAM, ELECTRICITY & RENEWABLE ENERGY AUTHORITY

# Input to Guidance note for authorities' appraisal of offshore wind applications in Vietnam

A229935-003 FINAL REPORT

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# CONTENTS

# ABBREVIATION LIST

| | |
|---|---|
| CAPEX | Capital expenditure |
| DEVEX | Development expenditure |
| EEZ | Exclusive economic zone |
| EREA | Electricity and Renewable Energy Authority |
| EIA | Environmental impact assessment |
| EVN | Vietnam Electricity |
| ITT | Invitation to tender |
| LCoE | Levelized cost of electricity |
| MOC | Ministry of Construction |
| MOD | Ministry of National Defence |
| MOIT | Ministry of Industry and Trade |
| MONRE | Ministry of Natural Resources and |
| MOT | Ministry of Transport |
| OPEX | Operating expenditure |
| PPA | Power purchase agreement |
| PPC | Provincial People's Committee |
| PQ | Prequalification |
| SEA | Strategic environmental assessment |

# 1 Introduction

# 1 Introduction

This memo provides a practical 'checklist' of the most critical pre-conditions, elements, and criteria in the evaluation of an application for offshore wind development in Vietnam.

It is part of the output of a study commissioned by DEA and EREA under the DEA Offshore Wind Development framework agreement aiming to accelerate offshore wind development in emerging markets. It is delivered by the renewable energy consultancy consortium consisting of COWI, DTU, EA Energy Analyses and local consultants based in Vietnam Mr. Do Dang Phu, Mr. Saurabh Mathur, and Mr. Le Quang Huy.

This memo is intended to support the Vietnamese authorities in handling offshore wind applications.

It is necessary for the Vietnamese authorities to define areas which they want to have reserved for offshore wind development in a Maritime Spatial Plan, and further detailed in a Site Development Plan to get in control of unsolicited applications and the market to secure a sustainable development of offshore wind.

The best setup for taking control with the emerging offshore wind market is a strategy allowing for unsolicited applications for the first few wind farms followed by offshore wind tenders based on a well-planned site development strategy.

This is to get the regulations, collaboration processes with relevant ministries and authorities, application handling etc. in place and will incentivise the exploitation of the Vietnamese offshore wind resources at a reasonable pace with enough market security and room for attractive investors and project developers.

Until the Maritime Spatial Plan is in place, it is even more important to control the unsolicited applications by conditions in any given permits, which is also why this 'check list' is developed.

## 1.1 Definitions

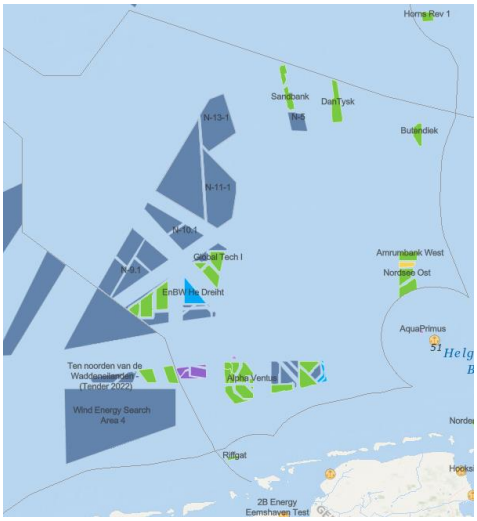
In this document the following nomenclature is applied:

- The *Regulatory Body* is the leading ministry in Vietnam responsible for convening and chairing an Offshore Wind Development Committee comprising representatives from all relevant authorities involved in offshore wind planning and permitting, including the military. The Regulatory Body is also responsible for running a secretariat for managing regulations and handling applications and tenders for development of offshore wind. The Regulatory Body act as a single point of contact for project developers and investors towards the different relevant Vietnamese ministries and authorities.
- The *Maritime Spatial Plan* is a plan developed by the Vietnamese authorities to align areas for different interests at their sea, and where areas for offshore wind development have been reserved.

- The *Site Development Plan* is a plan defining individual concession areas within the areas reserved for offshore wind in the Maritime Spatial Plan.
- The *preliminary site investigation area* is the concession area appointed for development of an offshore wind farm in the Site Development Plan. When the Tender process is in operation, this is conducted by the Regulatory Body in the Site Pre-assessment phase. For unsolicited applications, it will be the developer who shall undertake this task for its site proposal after being granted permission to do so.
- The *gross project site* is the area selected by the Concessionaire within the preliminary site investigation area in which the Concessionaire is free to optimise the project site (the Concessionaire's preliminary site investigation area)
- The *project site* is the area for the construction of the Offshore Wind Farm defined by the Concessionaire within the gross project site. The project area for the site is determined based on a given turbine density [MW/km²] and the Offshore Wind Farm's minimum and maximum capacity [MW].

The different plans and area definitions above are shown in Figure 1.


Maritime Spatial Plan




Site Development Plan with gross project sites


Gross project sites & project sites with turbine layouts

*Figure 1 Images of Plan and site definitions for the German North Sea*

# 2 Handling of Offshore Wind Projects

# 2 Handling of Offshore Wind Projects

This section presents a description of the steps to be followed for unsolicited applications and tenders, respectively for development of offshore wind farms in Vietnam.

For the open-door procedure for the unsolicited applications, the Regulatory Body should use the first couple of wind farm projects to get their regulation handling in place, while supporting the project developer obtaining all permits and approvals with the relevant authorities and while clarifying how expenses with transmission and connection to the onshore grid, procurement, compensation of landowners and fishermen, etc. shall be handled onwards.

For the Vietnamese authorities it is important to have areas reserved for offshore wind farms in the Maritime Spatial Plan to take control of the opportunities and to control the build out of offshore wind fits with the national grid and demand for power.

## 2.1 Unsolicited Applications

The open-door procedure for unsolicited applications allows the project developer to build an offshore wind farm by their own initiative.

The project developer should enter a project agreement with the authorities containing detailed terms and conditions in relation to the project as further detailed in section 2.1.2.

The type of financial subsidy to be provided for open door applicants should be agreed upon in advance e.g., as a floating FIP, FIT or market price.

The awarding criteria would often be lowest cost of electricity (unit price/kWh). Setting requirements for the first offshore wind farms are a delicate balance as too strict requirements will increase risks for the developers leading to delays or to developers leaving the market. Predictability and risk alleviation are the key factors in the permitting steps. This is even more so in the first offshore wind farms that will have to work through regulatory and market insecurity, consequently higher renumeration should be expected.

### 2.1.1 Site Selection

The selection of a site for offshore wind farm development via open-door applications, in general, is unrestricted, in the sense that the interested party can select any site which is not already reserved for other purposes. This is however very difficult in Vietnam, as there is no such publicly available overview.

The project developer submits an unsolicited application for the site survey permit in a specific site selected by them, which is why it is important for the Vietnamese authorities to get an overview of the sites relevant for offshore wind farms via Maritime Spatial Plan to avoid that this unsolicited development is getting out of control.

Nevertheless, all other potential conflicts of interest shall be considered, for instance, with fisheries, natural reserves, marine routes, oil, and gas zones, etc.

Health, safety as well as environmental and social impact living up to international criteria shall also be accounted for.

### 2.1.2 Project Agreement

The Concessionaire should be awarded a time-limited and progress-required project agreement, granting it exclusivity in the development process but also contractually binding them to the effective construction, connection of the offshore wind farm to the transmission grid onshore and delivery of power, as per the terms of reference agreed upon in negotiations of the project agreement.

The project agreement should contain detailed terms and conditions in relation to key permits and licences, any subsidy regime, grid connection, defective performance, decommissioning, transfer of the concession, liability, and compensation for delayed grid connection.

The awarded party should also be granted exclusive access to all the permits and licences required during the project development, provided that the respective requirements and deadlines of each are fulfilled accordingly.

### 2.1.3 Permits and Requirements

The list of permits to be obtained during the project development and the processes for acquiring those, including a non-exhaustive list of relevant documents and approvals is provided in Section 3.

## 2.2 Offshore Wind Tenders

The tendering system is understood to be the most effective approach for increasing market competition and reducing offshore wind prices in the long term. Nevertheless, several key aspects from the whole tendering process shall be clarified and defined before its introduction in the Vietnamese market, from the preliminary stages until the contract award.

Until the tendering system is in place, it is necessary to have a transition phase, where the developer is granted exclusivity for a certain area allocated for site surveys as well as an opportunity to sell this right to another party, if he decides not to progress the project development any further. Selling the opportunity can be allowed subject to approval of the Vietnamese authorities.

The descriptions and recommendations in this memo are inspired by the Danish tendering model (unless otherwise noted) and it shall be noted that tenders can be conducted in many ways.

Likewise, the required documents from both the tender and the development stages shall be defined under a framework that renders the process as smooth as possible. These are listed and discussed in the following sections.

In this memo it is assumed that the Regulatory Body is in operation, however until it is in place, any improvements on transparency and simplicity will significantly improve the implementation of offshore wind in Vietnam.

The Regulatory Body should also be acting as a single point of contact in the tender process for transparency and simplicity for developers and investors.

The Regulatory Body is responsible for issuing all the permits and licenses, including the related documents and approvals to the project developer at the relevant project stage and under fulfilment of the pre-established conditions and deadlines.

In this regard, the Regulatory Body approaches all the relevant stakeholders and obtain all the documents and approvals required for issuing each permit. This interaction is exclusively between the Regulatory Body and the interested parties, e.g., agencies and ministries. Hence, the project developer is solely required to address the Regulatory Body during the project development. In the active phases, such as site investigation, construction and operation, interaction with relevant additional/other authorities will still be necessary.

The tendering system will simplify the permitting process currently in force in Vietnam. For instance, a decision on investment and the investment registration certificate is obsolete, given that the financial assets of the developer are already verified from the prequalification stage and further validated as a liability when the concession agreement is signed. Likewise, a PPA with EVN is granted as part of the concession agreement and not as a separate procedure. The current PPA needs major changes to be sufficient in a proper Concession Agreement.

Furthermore, most of the official requirements are managed by the Regulatory Body itself. In this regard, the preliminary studies (and consequently, the pre-feasibility study report) and the SEA are done by the body or a third authorized company working on its behalf, which further reduces the risk and liability of the project developer, as well as makes the overall development process more straightforward.

### 2.2.1 Tendering procedure

The tendering procedure is presented in Figure 2 and further elaborated in the following sections.

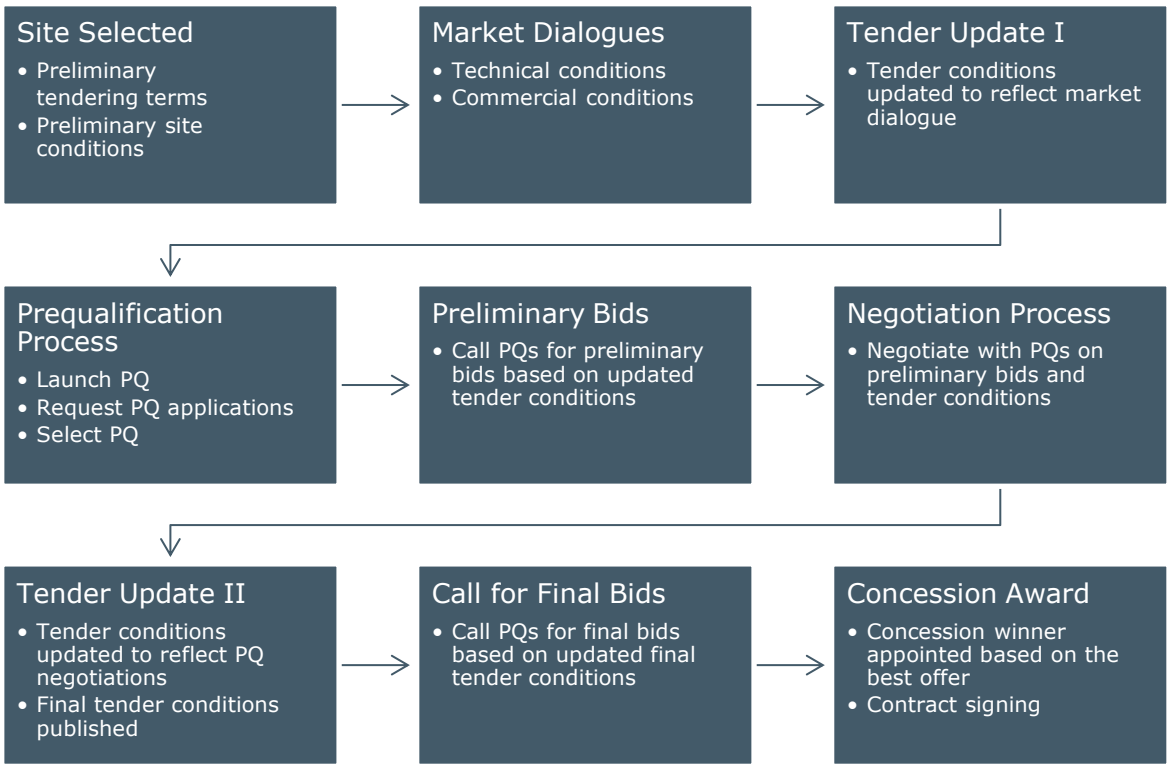



*Figure 2. Tendering procedure*

### 2.2.2 Site Development Plan

The selection of the sites to be tendered is made within the framework of a site development plan. In that regard, the Regulatory Body shall define all areas to receive new offshore wind farms based on a thorough assessment of the Vietnamese EEZ, wind maps, and potential zones with conflicts of interest.

Once all concerns are clarified, the Regulatory Body shall define the sites with estimated LCOE and prioritized realization periods starting from the lower end of LCOE, and access to grid connections for all sites before they are tendered.

Within the site development plan, the Regulatory Body executes the Site Pre-assessment phase for the prioritized sites including preliminary site investigations, as described in section 3.1, before calling for the tenders.

### 2.2.3 Pre-tender Market Dialogue

The tender shall be initiated with a technical and market dialogue with potential project developers and investors potentially participating in the process.

Such dialogues take place after the first terms and conditions of the tender process are drafted and published together with the results of the preliminary investigations preferably in a specific digital tender platform. These dialogues aim at reducing commercial risks by allowing the tenderers to debate on the terms and conditions. The tender terms and conditions shall be amended according to the findings of the dialogue, where possible and agreed to by the authorities. This process brings both transparency

and engagement to the tender as well as attractive conditions for the tenderers, who then tend to significantly reduce their bids.

### 2.2.4 Prequalification (PQ)

The participation in the tenders shall be conditioned to the fulfilment of pre-established requirements, therefore limiting it to institutions or consortiums which prove sufficient liability for the development of the project during its design life. These shall include, but not be limited to:

- **Financial Performance**
  The government examines the bidders' minimum annual turnover covering at least the expected overall project expenditure (DEVEX, CAPEX, and OPEX).
- **Debt/equity Rating**
  The government uses pre-defined ratios or long-term ratings approved by an internationally recognized institution to assess the liquidity and credit rating of the bidders.
- **Previous References**
  The government examines previous project references of developers who have already built and commissioned one or more offshore wind farms. For the case of consortiums, where not all the members might have previous experiences, at least one of them shall fulfil this requirement. This avoids issues outcoming from inexperienced project developers leading the development process while allowing the introduction and participation of new players in the market.

A prequalification round shall be executed before the official invitation to tender, in which the interested parties shall submit the above-mentioned references following a request by the regulations in the official announcement of the tender. After the pre-established deadline for submission, the Regulatory Body shall evaluate the submitted documents and approve the participation in the tender process from the parties which comply with all the conditions. To limit the work of the Regulatory Body also the number of prequalified parties can be limited, provided this limitation is announced early in the process and prior to the prequalification.

### 2.2.5 Invitation to Tender (ITT)

Once the prequalification round is finalized, an Invitation to Tender (ITT) shall be issued to all the prequalified developers. The ITT document, at minimum, should consist of the following information:

- Invitation letter for participation in the tendering process
- Project details consisting of site information including, but not limited to, site location, environmental data collected previously, copies of surveys conducted, etc.
- Draft of concession agreement consisting of general conditions and particular conditions, clearly specifying the responsibilities and scope of work for both parties
- Draft of Power Purchase Agreement

For transparency it is also beneficial to include the following further information:

- Draft permits for site investigations, construction, and land use
- Draft licences to operate and produce power

The ITT documentation is designed to provide the developers a comprehensive set of information that forms the basis of the proposal by developers. The developers should also be encouraged to ask for clarifications during the tendering process. It is suggested that pre-bid meetings, as well as site visits, are organised during the tendering process.

One important notice is that it can be a lengthy process reaching this stage, often taking one to two years from the preliminary investigations. This often implies more costs carried by the Regulatory Body. Such costs could be reimbursed from the winning concessionaire, assuming it is mentioned in the tender terms and conditions.

### 2.2.6 Tender Dialogue with Prequalified Developers

After the prequalification, the tender process is initiated with the invitation to tender. In the tender process it is recommended to request the prequalified developers to submit their preliminary bid based on the updated tender terms and conditions from the Pre-tender Market Dialogue.

Each prequalified developer is then invited for a dialogue/negotiation on their specific preliminary bid for further clarification of terms and conditions. These tender dialogues/negotiations also aim at reducing commercial risks by allowing the tenderers to debate further on the terms and conditions in the tender and their bids, which shall be amended according to the findings of the dialogue, where possible and agreed to by the authorities.

After negotiations with all prequalified developers, the tender terms and conditions shall be updated again to provide all tenderers equal conditions for their final bids.

This process brings further transparency and engagement to the tender as well as more attractive conditions for the tenderers, which is pivotal allowing for further reduction of their bids.

### 2.2.7 Final Bids

After the Tender Dialogue, all prequalified developers shall be requested to submit their best and final offer (BAFO) based on the updated the updated tender conditions from the Tender Dialogue.

### 2.2.8 Tender Award

The main awarding criteria will be the lowest cost of electricity (unit price/kWh).

The winning tenderer shall be awarded a concession agreement, granting it exclusivity in the development process but also contractually binding them to the effective construction, connection of the offshore wind farm to the transmission grid onshore and delivery of power, as per the terms of reference agreed upon in the final tender submission.

The awarded party is also granted exclusive access to all the permits required during the project development, provided that the respective requirements and deadlines of each are fulfilled accordingly.

### 2.2.9 Permits and Requirements

The list of permits to be obtained during the project development and the processes for acquiring those, including a non-exhaustive list of relevant documents and approvals is provided in Section 3.

# 3 Offshore Wind Farm Permitting

# 3 Offshore Wind Farm Permitting

The offshore wind farm permitting applies for both the unsolicited applications through the open-door procedure as well as for the tendering system. The activities can be undertaken either by the authorities or the developers. However further detailing and information provided about the project delivered by the authorities will de-risk the project for the developers and hence lower bids can be expected.

## 3.1 Site Pre-assessment Phase

The purpose of the site pre-assessment phase is to gain critical knowledge of the site for risk-mitigation as much as possible and cover both environmental risks as well as site development risks. This is to have a proper basis for further development of the site and selecting the gross project site area within the concession area defined in the Site Development Plan.

Hence a permit to conduct the preliminary site investigations for the site pre-assessment phase is required.

Environmental risk assessments shall supplement the Strategic Environmental Assessment, focussing on topics such as bird surveys, safety of navigation, radio links and radar, fisheries, marine archaeology, noise, and cumulative impacts.

Site development risks include wind resources, geophysical and geotechnical analyses of the seabed as well as metocean data collection and environmental assessments.

### 3.1.1 Required Permits

- Permit to conduct preliminary site investigations

### 3.1.2 Important Pre-conditions, Elements and Criteria in Permit

A permit template inspired by DEA model licence for preliminary site investigations undertaken by the Concessionaire is included in Appendix A.

This permit template can also be used for inspiration for this Site Pre-Assessment phase, where the preliminary investigations are focussing on the same scope on a more high-level and covering the larger area.

From this permit template in Appendix A the following important pre-conditions, elements and criteria are highlighted, although focus should be on all terms and conditions.

- Time frame for the permit validity
- Planned activities and deliverables
- Area for preliminary site investigations
- Turbine density in MW/km²
- Wind farm capacity range from [XX] to [XX] MW
- Requirements to handover of data and processed data obtained by the preliminary site investigations to the Regulatory Body

- Potential lease fees and related conditions
- Consequences of violation of permit conditions

### 3.1.3 Required Documents

The following documents, but not limited to, shall be prepared before the preliminary site investigation:

- Site Investigation Plan including environmental impact and other users interests at the area of investigation
- HSE plan for the activities
- Supervision plan
- Necessary approvals for the activities from other authorities such as MOC, MOD and MOT

The following documents can be delivered as an outcome of the site investigation:

- Seabed Hazards Assessment
- Archaeological Resources Assessment
- Water Quality Assessment
- Biological Resources or Habitat Assessment
- Threatened and Endangered Species Assessment
- Social and Economic Resources Assessment
- Costal and Marine Uses Assessment
- Other Resources, Conditions and Activities Assessment
- Geophysical studies
- Geotechnical studies
- Metocean data

### 3.1.4 Consequences of violation of permit conditions

During the site pre-assessment phase, breaches in permit conditions can be typically handled via fines. In severe cases, the permit for investigations and surveys can be revoked. Failure to deliver appropriate documentation will delay the handover of the concession.

## 3.2 Handover of Concession

Once the preliminary investigations are finalized, the pre-feasibility study report is submitted and approved, and the project is listed in the PDP, the project developer can be granted a concession agreement containing the current land-use permit listed in the Vietnamese permitting framework.

Based on the current experience from nearshore projects in Vietnam, the following approvals are required:

- An approval of plans for compensation, support for land clearance and resettlement construction is required from the PPC and MONRE for each element group of the project (e.g., substation, transmission lines, wind turbines, expansions, etc.).

- Decisions on territory acquisition and renting onshore. In both cases, the PPC of the province where the project is located or has resources (e.g., cable corridors, onshore stations, etc) shall issue an official approval.
- Sea area allocation for offshore installations by MONRE.
- Consent on the exploitation of natural resources (wind energy) by MONRE and EVN.

All the approvals shall be included in the concession agreement, issued by the Regulatory Body.

### 3.2.1 Consequences of violation of permit conditions

There are not envisioned to be any consequences during this phase.

## 3.3 Site Assessment Phase

The site assessment phase is used by the Concessionaire to gain further detailed and critical knowledge of the site for risk-mitigation and to have a proper basis for further development of the site and selecting the optimal layout of the wind farm within the gross site area and thereby reaching the optimal LCoE.

Hence a permit to conduct its site investigations for the site assessment phase is required.

Therefore, this phase also covers both environmental risks as well as site development risks. Environmental risk assessments shall further supplement the Strategic Environmental Assessment, focussing on topics such as bird surveys, safety of navigation, radio links and radar, fisheries, marine archaeology, noise, and cumulative impacts. Site development risks also supplement the findings in Site Pre-assessments phase re more detailed information regarding wind resources, geophysical and geotechnical analyses of the seabed as well as metocean data collection and assessments.

### 3.3.1 Required Permits

- Permit to conduct offshore site investigations

### 3.3.2 Important Pre-conditions, Elements and Criteria in Permit

A permit template inspired by DEA model licence for preliminary site investigations undertaken by the Concessionaire is included in Appendix A.

The important pre-conditions, elements and criteria are similar to the ones highlighted for the Site Pre-assessment phase cf. section 3.1.2.

### 3.3.3 Required Documents

Also, the required documents and deliverables are similar to the Site Pre-assessment phase cf. section 3.1.3.

## 3.4 Project Development Phase

The project development phase is used by the Concessionaire amongst other things to define the net project area, finding the optimal layout of turbines, cables and substation(s) in the wind farm within the gross project site area, designing the components which form part of the wind farm including cables, supporting structures for turbines and substations, onshore cable routing and buildings, and planning of fabrication and installation activities.

In this phase further geotechnical site investigations will be necessary to verify design assumptions on the individual positions as well as site investigations for the installation and construction activities. Hence a permit to conduct its additional site investigations for the project development phase is required unless it is already covered by the site investigation permit in the Site Assessment phase cf. section 3.2.

Before the Concessionaire can proceed to the construction phase, it is recommended to require a certification according to IECRE of its technical design by an independent accredited third party, such as a certification body.

This phase also covers both environmental risks as well as site development risks. Environmental risk assessments shall further supplement the Strategic Environmental Assessment, focussing on topics relevant for the fabrication and installation activities. Site development risks also supplement the findings from the site assessments phase with more detailed information about geophysical and geotechnical analyses of the seabed at the individual positions and potentially more installation specific metocean data collection and assessments.

### 3.4.1 Required Permits

- Position specific site investigations (can potentially be covered by the previous site investigation permit)

### 3.4.2 Important Pre-conditions, Elements and Criteria in Permit

A permit template inspired by DEA model licence for preliminary site investigations undertaken by the Concessionaire is included in Appendix A.

The important pre-conditions, elements and criteria are similar to the ones highlighted for the Site Pre-assessment phase cf. section 3.1.2.

### 3.4.3 Required Documents

Also, the required documents and deliverables for the site investigation are like the Site Pre-assessment phase cf. section 3.1.3.

Also, for the development the Concessionaire should be required to deliver a full design and manufacturing quality documentation in accordance with IECRE 502 or similar international scheme for certification covering, but not limited to:

- Wind Turbine Design Package

- Wind Turbine Foundation Design Package
- Onshore and Offshore Substation Design Packages
- Onshore and Offshore Cables Design Packages
- Grid Connection Design Package1
- Certification Body Statement of Conformity

Additionally, the following should also be delivered:

- SEA
- EIA

### 3.4.4 Consequences of violation of permit conditions

During the development phase, detailed designs and manufacturing plans are approved. Dependent on the severity, consequences of violations could be the delay of construction permitting. This will cause knock-on effects and impose the threat of severe financial penalties, as vessels must typically be booked far in advance and carry substantial day-rates.

This also emphasizes that uncertainty and delays related to the permitting process will potentially have a high impact in the Concessionaires costs. Therefore, it is strongly recommended to relieve the Concessionaire's costs due to delays caused by the Authorities, which will be out of its control.

## 3.5 Construction Phase

In the construction phase, the Concessionaire is responsible for administrating the fabrication of the offshore wind farm components onshore, as well as their transportation, installation, and assembly at the site. This includes foundations and substructures, wind turbines, substations, inter-array and export cables.

Once the land use rights are secured, the construction of the offshore wind farm elements can only start after a construction permit is granted by the Regulatory Body (on behalf of MOC). The document validates, for instance, the project location, routes of array cables and transmission lines, generation density and offshore wind farm capacity.

Further than the construction permit, a series of documents and approvals are required at this stage, as described in the following sections.

### 3.5.1 Required Permits and Approvals

- Approval of SEA and EIA
- Approval of technical design
- Approval of fabrication plans including plans for QHSE
- Construction Permit
- Land use permit

[1] The grid connection design package shall document that the wind farm comply with the prevailing grid codes.

- Permit for construction activities for foreign contractor, in case a foreign institution is developing or investing in the project.

### 3.5.2 Important Pre-conditions, Elements and Criteria in Permit

A permit template inspired by DEA model licence for Construction undertaken by the Concessionaire is included in Appendix B.

From this permit template important pre-conditions, elements and criteria are highlighted, although focus should be on all terms and conditions.

- Time frame for the permit validity including rights regarding other activities at sea that impact on the construction
- Planned activities and deliverables
- Areas for Construction Activities
- Turbine density in MW/km²
- Number of wind turbines and turbine type, substations, cable layout etc.
- Wind farm capacity [XX] MW
- Requirements to handover of data and processed data obtained during the construction phase to the Regulatory Body such as pile driving records, bolt tensioning records, grout curing records, non-conformances and design changes Supervision plan
- HSE plan
- Decommissioning plan
- Decommissioning guarantee
- Consequences of violation of permit conditions (stop work instructions, fines)

### 3.5.3 Required Documents

For the construction phase, the Concessionaire should be required to deliver a full documentation in accordance with IECRE 502 cf. ref. [1] or similar international scheme for certification covering, but not limited to:

- Construction Plan containing
  - Operator's contact information
  - construction concept plan
  - Commercial lease compliance statement
  - Location plat/map
  - Environmental impact minimization efforts report
  - Anthropogenic conditions and hazards report
  - Environmental conditions and hazards report
  - Shallow hazards report
  - Biological survey report
  - Archaeological resources report
  - Overall site conditions assessment report
  - Structural and project design, fabrication, and installation concept report
  - Construction environmental and pollution control report
  - Cable and power line concept report
  - List of generated waste
  - List of chemical products used

  - Vessel concept report
  - HSE plan
  - Construction schedule
- Decision on investment
- Evidence that the project developer or the involved parties have the competencies to construct the offshore wind farm, e.g., through previous references from the company, as well as certificates from the design managers.
- Technical design certified by an independent internationally accredited organization
- Approval of the technical design
- Results of both SEA and site-specific EIA
- Consultation responses from surveys with the local population (e.g., through the corresponding PPC)
- Supervision plan
- Decommissioning plan
- Decommissioning guarantee

### 3.5.4 Consequences of violation of permit conditions

During active construction, fines can be imposed for violations. Depending on the severity, these could escalate in proportion for serious HSE and environmental issues occurring during installation. In certain cases, stop work orders should be considered, which would impose severe financial penalties, or delaying the operation permit until adequate remediation is performed.

## 3.6 Operation Phase

In the Operation phase, the Concessionaire shall initiate and execute the operation and maintenance of the offshore wind farm.

There are mainly two licences required during that stage. Firstly, the license to operate the offshore wind farm allowing operation and maintenance of the wind turbines, substations, and cabling. Then, the license to generate electricity allowing the offshore wind farm to not only produce electricity, but also allows it to supply electricity to the grid onshore under the fulfilment of specific requirements.

### 3.6.1 Required Licences

- Licence to operate the wind farm
- License to generate electricity

### 3.6.2 Important Pre-conditions, Elements and Criteria in Licence

DEA has prepared model licences for operating offshore wind farms and generating electricity which can be distributed upon request.

From these licence templates important pre-conditions, elements and criteria are highlighted, although focus should be on all terms and conditions.

- Time frame for the licence validity

- Planned activities and deliverables
- Areas for operation and maintenance activities
- Turbine density in MW/km²
- Number of wind turbines and turbine type, substations, cable layout etc.
- Wind farm capacity [XX] MW
- Requirements to handover of data and processed data obtained during the operation phase to the Regulatory Body such as production data, weather data, measurement data verifying design assumptions for turbine operation, scour measurements etc., non-conformances and documentation for permitted design changes
- Decommissioning guarantee
- Consequences of violation of licence conditions

### 3.6.3 Required Documents

- Operation and Maintenance Plan
- HSE Plan
- Specific staff training pursuant to ref. [2] as listed below:
  - Legal documents related to regulating and operating the power system
  - Structure of the operational and dispatching organization of the national electricity system
  - Composition, operational principles of the main equipment of electricity systems
  - Operational principles and technology of power plants
  - Main types of electrical diagram of power plants: main characteristics, operational principles, and operational coordination
  - Operational principles, remote control of control centre (for power plants remotely controlled and operated from control centres)
  - Operational principles of protective relays, automation, measurement, and control equipment of the electrical system in power plants and substations
  - Protective principles for key items of power plants and power stations
  - Knowledge of dispatching and operating power plants and substations
  - Basic knowledge of control systems, information technology systems, remote terminal unit RTU/ Gateway in power plants and substations, and SCADA systems serving the dispatching and operation works
  - Operational modes of power plants in electric power systems, frequency regulation, voltage regulation, reserve power allocation
  - Procedure for coordinating operations, switching, and fault clearance in power plants and substations.
- Production documentation
- Operation and maintenance documentation
- Site survey documentation
- Non-conformance reports
- Documentation for any changes to the technical design and O&M plans including permits to do so by the Regulatory Body

### 3.6.4 Consequences of violation of permit conditions

During this phase, fines should be imposed for non-compliance with permit conditions.

## 3.7 Decommissioning Phase

In the decommissioning phase, the Concessionaire shall initiate and execute the decommissioning of the offshore wind farm, according to the agreement with Regulatory Body. This should define clearly if the offshore wind farm is to be removed in full or in part and in accordance with a stipulated timetable.

Fulfilling these conditions is necessary to have the adequate financial guarantee for the decommissioning of the offshore wind farm released.

The construction licence and the electricity production authorisation usually include conditions under which the owner of the wind farm (the licensee) is obliged, at its own account, to restore the area to its former condition, including remediation and clean-up of the area, as well as proper disposal of the components in accordance with the regulations in force at the time of decommissioning. This indicates that further requirements may apply pursuant to the decommissioning plan prepared by the owner of the wind farm at the time of construction which is subject to the approval of the Regulatory Body.

### 3.7.1 Required Permits

- Decommissioning Permit

### 3.7.2 Important Pre-conditions, Elements and Criteria in Licence

There is currently not much experience with decommissioning of offshore wind farms internationally and further development in these requirements is to be expected, why the below list is non-exhaustive.

As for the other permits, there are some important pre-conditions, elements and criteria which should be considered.

- Time frame for the permit validity
- Planned activities and deliverables
- Area for decommissioning activities
- Specification of disposal components and how they will be disposed or recycled
- Requirements to handover of data and processed data obtained during the decommissioning phase to the Regulatory Body such as documentation that disposal has been delivered at relevant receivers for further treatment, photo documentation that e.g., monopiles have been cut off in accordance with agreement, what and where components are left on site, if any and non-conformances with the agreements
- Decommissioning guarantee
- Consequences of violation of licence conditions

### 3.7.3 Required Documents

- Decommissioning Plan containing
  - Operator's contact information
  - Decommissioning concept plan
  - Location plat/map
  - Environmental impact minimization efforts report including recycling of components

  - Anthropogenic conditions and hazards report
  - Environmental conditions and hazards report
  - Shallow hazards report
  - Biological survey report
  - Overall site conditions assessment report
  - Technical decommissioning report
  - Decommissioning environmental and pollution control report
  - List of generated waste
  - Disposal plan for generated waste
  - List of chemical products used
  - Vessel concept report
  - HSE plan
  - Decommissioning schedule
- Evidence that the project developer or the involved parties have the competencies to decommission the offshore wind farm, e.g., through previous references from the company, as well as certificates fulfilling international standards, if any.
- Technical decommissioning design certified by an internationally accredited organization
- Approval of the decommissioning design and decommissioning plan
- Approval of site-specific decommissioning EIA
- Supervision plan
- Decommissioning guarantee

### 3.7.4 Consequences of violation of permit conditions

The consequences during this phase can be handled by utilizing the decommissioning guarantee, which should be large enough to ensure decommissioning of the site.

# 4 References

# 4 References

[1] IEC, IEC System for Certification to Standards relating to Equipment for use in Renewable Energy applications (IECRE System), Project Certification Scheme, International Electrotechnical Commision, 2018.

[2] A. Agut, T. Han, V. Mai and P. Cattelaens, "Wind Power Investment Guidelines for Vietnam," MOIT/GIZ, Hanoi, 2016.

# Appendix A. Template for Preliminary Site Investigations Permit

# Appendix A Template for Preliminary Site Investigations Permit

This appendix contains the template for a permit for preliminary site investigations.

The formulations in this appendix are inspired by the Danish model for tendering of large offshore wind farms and in this case currently ongoing Thor OWF project. However, the same issues and topics should be considered and addresses in case of unsolicited applications through the open-door procedure.

# Appendix B. Template for Construction Permit

# Appendix B Template for Construction Permit

This appendix contains the template for a Construction Permit.

The formulations in this appendix are inspired by the Danish model for tendering of large offshore wind farms and in this case currently ongoing Thor OWF project. However, the same issues and topics should be considered and addresses in case of unsolicited applications through the open-door procedure.