



Deliverable 2.5.

“Report on general regulation aspects (Demo2)”



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Project full title:

Demonstration of two floating  
wind turbine systems for power  
generation in Mediterranean

# Deliverable Nº 2.5.

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**“Report on general regulation aspects (Demo2)”**

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## Brief Summary

D.2.5 contains main regulation aspects that DEMO2 must fulfill in terms of administrative authorizations, general and specific legislation, project execution approval, certifications, environmental impact, safety aspects, etc.

# TABLE OF CONTENTS

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- 1. EXECUTIVE SUMMARY ..... 2**
- 2. ACRONYMS ..... 3**
- 3. PERMITTING PROCEDURE..... 4**
  - 3.1 ADMINISTRATIVE AUTHORISATION.....5
  - 3.2 ENVIRONMENTAL AUTHORIZATION.....6
  - 3.3 CONCESSION / OCCUPATION OF THE MARINE AND TERRESTRIAL PUBLIC DOMAIN .....8
  - 3.4 PROJECT EXECUTION APPROVAL AND COMMISSIONING CERTIFICATE .....8
  - 3.5 REGISTRATION IN THE SPECIAL REGIME FOR ELECTRICITY PRODUCTION.....9
  - 3.6 NAVIGATIONAL SAFETY .....9
  - 3.7 AVIATION SAFETY .....10
    - 3.7.1 INFORMATION TO INCLUDE IN THE COMMUNICATION ..... 11
    - 3.7.2 APPLICATION FORM..... 12
    - 3.7.3 DELIVERY OF THE DOCUMENTATION..... 13
  - 3.8 HEALTH AND SAFETY PLAN .....14
  - 3.9 FLOATING OFFSHORE WIND FARM CERTIFICATIONS .....14

## 1. EXECUTIVE SUMMARY

The objective of this document is to describe the main regulation aspects that an offshore floating wind turbine demonstration project must fulfill in order to get administrative authorizations.

Within the regulatory framework four well-differentiated subjects cover offshore wind projects in Spain. One "umbrella" regulation establishes the procedure to follow for project applications. This leads to the other three ones which are related with electricity generation and market, with obtaining the permits for the occupation of the site and with covering the environmental issues.

According to the former those projects generating electricity in Spanish territorial waters shall follow the indications of the Royal Decree 1028/2007, of July 20, *establishing the administrative procedure for processing applications for the authorization of electricity generating facilities in territorial waters* which sets the rules, procedure and criteria for consenting offshore wind renewable projects, including demonstration projects under certain conditions.

Secondly the Spanish Regulation currently applicable in relation to electric energy generation installations is the Law 54/1997, of November 27, *on the Electricity Industry*, the Royal Decree 1955/2000, of December 1, *which regulates the transmission, distribution, marketing, supply and authorization procedures for electric power facilities* and the Royal Decree 661/2007, of May 25, *regulating the activity of electricity generation under the special system regime*.

Thirdly the occupation of the Marine-Terrestrial Public Domain has to comply with the Spanish Coastal Law 22/1988 of July 28 and its Rules of Procedure described in the Royal Decree 1471/1989 of December 1 from the Ministry of Public Works and Urban Affairs that approves the General Regulation to develop and implement Law 22/1989 on Coasts.

Lastly the legal framework for the regulation of the Environmental Impact Assessment (EIA) procedure shall be in accordance with the Legislative Royal Decree 1/2008, of January 11, *passing the consolidated text of the Law on the Environmental Impact of Projects*.

Additionally the document presents the certifications that the demonstration project will need in compliance with Certification Bodies and international standards when exist.

## 2. ACRONYMS

AESA: Agencia Española de Seguridad Aérea. *Spanish Agency of Aviation Safety*

AHV: Anchoring Handling Vessel

DGMM: Dirección General de Marina Mercante. *General Directorate of Merchant Navy on Navigational Safety, Navigation and Safety at Sea*

EIA: Environmental Impact Assessment

MSL: Mean Sea Level

NTS: Non-Technical Summary

RD: Royal Decree

RDL: Legislative Royal Decree

### 3. PERMITTING PROCEDURE

The Permitting Procedure to get the project execution approval of a floating offshore wind turbine demonstrative project within Spanish waters shall comply with the existing regulatory framework.

The Royal Decree 1028/2007<sup>1</sup> establishes that the General Spanish State Administration, through the Ministry of Industry, Tourism and Trade and its Directorate of Energy Policy and Mining is empowered for the administrative authorization of the construction of any installation placed at the sea after consultation with the corresponding Spanish Autonomous Regions affected. Therefore in Spain the Ministry of Industry, Tourism and Trade is the single window as it is designated as the public body with jurisdiction to grant facility authorizations.

All the applicable national regulations are brought together in one administrative proceeding according to the RD 1028/2007 and this procedure includes the application for the following key authorizations/permits:

- Area reservation (*not for demonstration projects*).
- Obtaining the administrative authorization.
- Obtaining the approval for the project execution.
- Registration in the Register of Power Production in the Special Regime.

#### **Licensing Approving Authorities**

This Royal Decree determines the conditions and criteria necessary to obtain the permits from the different governmental bodies involved resulting in:

- Ministry of Industry and Tourism through the General Directorate of Energy Policy and Mining delivering the permits for construction, extension and closure of the project.
- Ministry of Agriculture, Food and Environment delivering (1) permits for the occupation of the Marine and Terrestrial Public Domain permits<sup>2</sup> through the General Directorate of Coasts and (2) acting as Environmental Body within the Royal Decree. In fact, previously to the

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<sup>1</sup> Royal Decree 1028/2007, 20 July 2007 on establishing the administrative procedure for processing applications for the authorization of electricity generating facilities in territorial waters

<sup>2</sup> Law 22/1988 on Coasts

administrative authorization<sup>3</sup>, the Environmental Body should decide whether or not the project will be subject to an Environmental Impact Assessment procedure.

- Ministry of Public Works through the General Directorate of Merchant Navy authorizing the necessary activities within this Royal Decree when affecting Navigational Safety, Navigation and Safety at Sea.
- Competent Harbor/Port Authority delivering authorization or permit in case of occupation of the Port Public Domain.
- Ministry of Agriculture, Food and Environment adopting proper measures in relation with Fisheries when affected.

Besides the key authorizations needed there are some other permits which are described in this document such as aviation and navigational safety.

### 3.1 ADMINISTRATIVE AUTHORISATION

The procedure to obtain the administrative authorization is explained in the Royal Decree 1028/2007. According to the Royal Decree the Ministry of Industry and Tourism is empowered to deliver permits through a simplified procedure for offshore wind energy installations aiming at researching, innovating and demonstrating technology with a nominal capacity under 10MW. In this sense DEMO 2 matches these conditions.

As a consequence the "Area Reservation" as understood and described in the RD 1028/2007 is not necessary since the test site area for the demonstration project has not the same status as the "marine wind areas" for commercial offshore wind projects for which an area reservation is necessary.

Once all the assessments and studies in the area are finished, the promoter will apply for the administrative authorization. This application will content the following aspects:

- Environmental Impact Assessment (see section 3.2)
- Marine-terrestrial public dominion occupation project (see section 3.3)
- Application for the inclusion in the Special Regime.

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<sup>3</sup> Article 24 of the Royal Decree 1028/2007

According to the Royal Decree a resolution is due to be published within 45 days after publishing the Environmental Impact Assessment.

For the case of the DEMO 2 planned to be installed within the test site (PLOCAN) the Occupation of the Public and Terrestrial Public Domain shall be requested by the owner of the site.

Subsequently the developer of the offshore wind turbine will be responsible for the elaboration of the documentation describing the project and in collaboration with the owner of the site to define the scope of the Environmental Statement.

### 3.2 ENVIRONMENTAL AUTHORIZATION

In order to obtain consents in relation to the Environmental Impact Assessment (EIA) the Spanish Legislation states in the RD 1028/2007 that Renewable Energy Projects shall comply with the Law of Environmental Impact Assessment RDL 1/2008<sup>4</sup>.

According to the RDL 1/2008 any private or public project shall be subject to an EIA in accordance with the decision of the Environmental Body who will determine whether or not the project is due to be subject to an EIA process in the following cases:

- Projects included in Annex II of the RDL 1/2008.
- Projects not included in Annex I which may affect directly or indirectly Natura 2000 sites.

The decision of the Environmental Body must be motivated, public and according to the criteria in Annex III of the RDL.

Spanish Autonomous Regions' legislation can establish either through a case-by-case analysis or thresholds definition if projects shall be subject to EIA in accordance to criteria from Annex III. For the case of Canary Island and complementary to the national legislation the regulatory framework for EIA is the Law 11/1990.<sup>5</sup> This law considers three different categories of assessment from less to major intensity of the studies depending on the nature of the project:

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<sup>5</sup> Ley 11/1990, de 13 de julio, de prevención del impacto ecológico. Article 20



- *Evaluación Básica de Impacto Ecológico* (Basic Environmental Impact Assessment)
- *Evaluación detallada de Impacto Ecológico* (Detailed Environmental Impact Assessment)
- *Evaluación de Impacto Ambiental* (Environmental Impact Assessment)

According to the Law the Ministry of Environment will be the competent Environmental Body for the approval of any project when those are to be permitted by the Spanish Government, being this case of an offshore wind demonstration project.

In cases of projects not listed in Annex II or that not affect Natural 2000 the Autonomous Region will determine the Environmental Body with competences on their territory.

For the event of demonstration projects such as an offshore floating wind turbine these could be included in epigraph 4c of Annex II "*Wind farms no included in Annex I*".

Hereafter the developer (according to Article 16) will request for the obligation or not to proceed in compliance with the whole EIA process by submitting to the competent Environmental Body a request on the necessity or not for the project to follow the EIA process according the Annex III criteria. This application will include an **environmental report** with the at least the following information:

- Project description detailing characteristics, location and site layout.
- Main alternatives studied.
- Environmental impacts analysis and environmental inventory.
- Precautionary, Mitigation, Compensatory and Corrective measures to be undertaken for the protection of the Environment.
- Environmental Monitoring Plan to guarantee the performance of all the indications and measures to protect the Environment.

When projects shall be approved by the Spanish Government the application and documentation are due to be submitted to the Ministry of Industry and Tourism. Once this body is in conformity with the documentation will forward it to the Environmental Body to reach a decision on whether or not the project shall initiate the proceeding for EIA.

For the case of demonstration projects of offshore wind it is not expected that the EIA process will be required by the Administration. Therefore a detailed Environmental Statement would be sufficient to get the environmental permits and approval for the project in compliance with the RD 1028/2007.

### 3.3 CONCESSION / OCCUPATION OF THE MARINE AND TERRESTRIAL PUBLIC DOMAIN

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This concession is competence of the General Directorate for Energy Policy and Mining. The resolution must be published in three months once the permit has been applied. As it was mentioned before or the case of the DEMO 2 planned to be installed within the test site (PLOCAN) the Occupation of the Public and Terrestrial Public Domain shall be requested by the owner of the site.

The procedure to obtain the permit for the occupation of marine-terrestrial public property or dominion is according to the Royal Decree 1955/2000 and the article 70 of the Law 22/1988 on Coasts.

The applicant shall submit the following documentation:

- Documentation proving legal, technical and economic and financial capacity for the project execution
- Layout and location of the installation and zone to be occupied.
- Justification of the necessity of occupation.
- Technical Project Summary containing the following:
  - o Description of the project with a declaration by the applicant that the project is in compliance with the Law 22/1988 on Coasts.
  - o Maps and graphic information (i.e. pictures of the site)
  - o Budget
- Deposit Lodge Certificate
- Economical and Financial Study
- Environmental, Coastal Dynamic Studies if the current legislation requires.

### 3.4 PROJECT EXECUTION APPROVAL AND COMMISSIONING CERTIFICATE

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The administrative procedure is established in Title VII of the Royal Decree 1955/2000 being competence of the General Directorate for Energy Policy and Mining. The applicant shall submit the following documentation<sup>6</sup> :

- Certification of the legal, technical and economical capacity of the applicant
- Technical Project Report addressing:
  - o Layout of the project

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<sup>6</sup> After that the 2nd section of the RD 1955/2000 describes the sequence of the approval procedure

- Object
- Main characteristics
- Maps
- Budget
- Offprints for any other competent authorities
- Others under request

The article 132 indicates that once the project is executed should apply for the corresponding Commissioning Certificate. This application shall enclose the certificate of the work completion certificate. The Commissioning Certificate should be extended in a month period, having the possibility of obtaining a previous Commissioning Certificate for testing.

### 3.5 REGISTRATION IN THE SPECIAL REGIME FOR ELECTRICITY PRODUCTION

The procedure to register the offshore wind turbine demonstrator in the Special Regime Register is explained in the Royal Decree 661/2007 being competence of the General Directorate for Energy Policy and Mines. In the next illustration it is shown an overview of the Spanish planning method:



The application should include:

- Accreditation that the installation can be registered in the Special Regime.
- Calculation of the electricity production and other characteristics of the installation.
- Related information of the applicant.

### 3.6 NAVIGATIONAL SAFETY

In order to get the authorization from the General Directorate of Merchant Navy on Navigational Safety, Navigation and Safety at Sea (DGMM) the following documentation shall be included in the application:

- **Technical Project Report** detailing particular marine operations, procedures and certifications:
  - Towing. Towing-out and sea towing must be described in the report fulfilling DGMM requirements in terms of marking and intact and damage stability criteria.

Additionally shelter ports must be proposed along the towing route if applicable minimizing navigation risk and assuring that an emergency plan is correctly described and the structure has all the safety and security means.

- Load-out. This operation must be adequately described since there is a direct link to navigation risk even though it takes place in harbor. Mooring to the dock or connection to the tugs for towing out must be described.
- Certifications. Marine warranty surveyor is normally needed being the responsible for giving green light to start the operations themselves after ensuring that safety and security protocols fulfill the criteria approved by the correspondent Certification Body for all the operations.

### 3.7 AVIATION SAFETY

The Spanish Agency of Aviation Safety (AESA) is the State Body ensuring that civil aviation standards are observed in all aeronautical activity in Spain with competences in oversight, inspection, planning and management of Air Transport, Aviation Safety, Air Navigation and Airport Security.

AESA also assess the risks in Aviation Safety through hazard detection and risk analysis and has responsibility on the use of Spanish Airspace.

When comes to wind farms AESA takes responsibility on the risk assessment of the elements for the air navigation.

Once any developer is planning a wind farm there are **two scenarios** when the developer must consult and communicate AESA about the project in order to get AESA's approval and authorization:

1. When any windmill is projected within the safeguarding zones independently of its height (Decree 584/72).
2. When windmills placed out of safeguarding zones have a maximum height exceeding 100m (article 8 of the Decree 584/72).

When any of the former scenarios occur the approval procedure will be performed according to the *Guide of Lighting of Wind Turbines and Wind Farms of AESA*. This means to submit a report including the description of the project and the application form to attach to the Official Request.

If any Municipality where the project is intended is affected by safeguarding zones the application form and maps must be submitted to them who will forward the information to the Regional Authorities and them to AESA. On the contrary if the Municipality is not affected by safeguarding zones the documentation can be submitted directly to AESA.

It is important to remark that if during the different phases of the project (i.e. assembly, final installation) any of the former two scenarios happen in different Municipalities separate documents must be submitted to AESA.

For example the assembly could be performed in a port which is distant from the final location if so, the developer will have to communicate AESA about the assembly and the towing and installation in two different application forms although all this documentation can be attached in the same Official Request/Communication. Therefore the Official Request will ask for:

- Authorization for the installation of the floating wind turbine at any location (example of harbor and final site).
- AESA to inform regarding the lighting and beaconing corresponding to any location.
- AESA to inform on the procedure for lighting and beaconing during the towing.

### **3.7.1 INFORMATION TO INCLUDE IN THE COMMUNICATION**

Following the procedure to inform AESA about the project some documentation has to be submitted as a Non-Technical Summary (NTS) describing the project and an application form summarizing the project details such as duration of the project, coordinates, maximum height, etc.

#### **Non-Technical Summary**

Being offshore floating wind turbines a cutting edge technology it is recommended that the report includes representative images of the main elements to enable AESA to assess the project properly avoiding further clarifying consultations and so inducing to shorten the approval lead time by skipping prolonged feedback among the developer and AESA.

#### **Location**

The offshore floating wind turbine location should be shown in a map describing the site and the surrounding area (coordinates, distance to shore, bathymetry, etc.).

#### **Elements Of The Installation**

It is important to include in the document the main elements of the offshore floating wind turbine.

- Turbine: details of its power, dimensions, number of blades, tower, etc.

- Mooring System: description of the type of mooring system proposed (i.e. drag anchors and chains) indicating the final lengths of the lines and dimensions of the anchors.
- Cabling.

### Manufacturing, Assembly And Commissioning

In this section the developer will explain where is made the manufacturing of the foundation and how is the assembly of the wind turbine and the floating foundation performed. The final load out process and cranes or ancillary equipment will be described.

### Towing

The towing of the offshore wind turbine to its final location should be briefly described indicating the route from the harbour and if it will pass through safeguarding zones different to those covered by the application.

### Anchors Installation

To install the anchors and to deploy the chain lines there are several options depending on the use of specific vessels such as the Anchoring Handling Vessels, (AHV) or a combination of a tug with a barge.

### Operation And Maintenance

Since the operation of the offshore wind turbine will be temporary in this section the expected life-time of the project should be indicated. For that period of time operation and maintenance activities will be performed.

### Decommissioning

Once the life-time of the project is expired the removal of the offshore wind turbine will be carried out so how this process will be conducted should be described including the removal of the mooring system.

## **3.7.2 APPLICATION FORM**

AESA provides an application form in its webpage to fill with the following information:

### Inquirer

details of the Company. In this case it is necessary to indicate the details of the legal representative.

### Type of request:

In the application form there are two different requests:

- **Authorization** to build, erect or install.

- **Information request:** regarding Aviation Safety and safeguarding zones. If the applicant will to install or build within safeguarding zone shall request for the mandatory authorization.

### Information of the Installation

In the request the applicant must detail the type of installation to be built (from a sorted list which includes "Wind Farm"), the kind of use that the installation will have and if it is temporary (indicating for how long) or permanent.

Any ancillary equipment needed during the construction or installation (i.e. cranes, bulldozers) must be itemized with their maximum height. For the case of cranes, besides the maximum height the turning radius shall be specified.

### Location

The coordinates of the final location shall be referred to the Datum ED50, ETRS89 or WGS4 indicating the Municipality:

- The installation must have identification.
- Coordinates in UTM or Latitude/Longitude but never both.
- Requested Height: the maximum height including any element overhanging (i.e. lighting conductor, antennas).
- Height referred to the Mean Sea Level (MSL).

## **3.7.3 DELIVERY OF THE DOCUMENTATION**

All the information and the documents together with the application form have to be submitted in digital format.

Maps and layouts shall be submitted in DWG format files (or equivalent) or in its absence as PDF files recorded in a CD or other digital storage device.

**It is mandatory** to submit:

- Scaled Front View Map with the location and layout indicating the shape and orientation of the installation.
- Contour Map of the installation (cross-section and elevation).

Some optional documentation can be submitted such as Aviation Safety Study, Description of the materials and/or Screening Study,

5. Ubicación de la solicitud	Datum* <input type="text"/>		Municipio/s* <input type="text"/>						
	La ubicación de la instalación o construcción solicitada deberá indicarse bien en coordenadas UTM bien en coordenadas geográficas, nunca en ambas.								
	Identificativo*	Coordenadas UTM			Coordenadas Geográficas		Altura solicitada(m.)*	Cota (m.s.n.m.)*	Altura edificio(m.)
		UTM X*	UTM Y*	Huso	Longitud*	Latitud*			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	

  

6.Documentación asociada	Documentación obligatoria:	Plano(s) de situación a escala, indicando forma en planta y orientación de la construcción. Número de planos* <input type="text" value="2"/>		
	Documentación opcional:	Plano(s) acotado(s) de la planta y el alzado. Número de planos* <input type="text" value="2"/>	Estudio aeronáutico de seguridad <input type="checkbox"/>	Estudio de apantallamiento <input type="checkbox"/>

  

Fecha (dd/mm/aaaa)	Nombre y firma peticionario (o representante)	Sellos obligatorios en caso de afección por servidumbres aeronáuticas	
		Sello del ayuntamiento	Sello de la delegación o subdelegación
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

AESA. Servidumbres Aeronáuticas. Avenida General Perón, nº 40. Edificio Mapfre. CP: 28071. Madrid  
servidumbres.aesa@fomento.es  
Tel: 91 396 8320 Fax: 91 770 5457

### 3.8 HEALTH AND SAFETY PLAN

According to the Royal Decree 1627/1997 of October 24th on Health and Safety at work it is mandatory the elaboration of a **Health and Safety Plan** which shall aim to:

- Guarantee the health and safety of the workers
- Avoid actions or dangerous situations.
- Establish responsibilities and liabilities on Health and Safety matters.
- Determine the costs of the different protection and safety measures.
- Define the type of measures to adopt in function of the risk level.
- Description of the works and Risk Analysis,
- Health and Safety Instructions through the Project life-cycle
- Etc.

### 3.9 FLOATING OFFSHORE WIND FARM CERTIFICATIONS

There is a series of certificates that a demonstrative project of offshore floating wind turbines need. Nowadays the industry and Certificate Bodies are working on specific standards to cover the project certification of floating wind farms since up to date there are only project certification standards for bottom-fixed wind farms:

- IEC61400-3



- DNV-OS-J101
- GL (IV Part 2)
- ABS #176

This forms the background for the new floater standards issued by ABS, NKK, GL and for the standard to be issued by DNV later in 2013 which covers specific topics that must be applied to floating wind turbines not being covered by current bottom-fixed standards. The need of developing specific standards for floating offshore wind farms comes from the necessity of providing evidence to stakeholder (Public authorities, Insurance Companies, developers, etc.) that a set of requirements laid down in standards are met during design and construction and maintained during operation. Additionally and as explained before, floating platforms require specific requirements which are partly covered by Oil & Gas industry standards, considering these completely different safety factors and philosophy which would lead offshore wind market to unfeasible technology, economically speaking.

As an example, the DNV "Standard for design of floating wind turbine structures" will contain normative requirements that shall be satisfied in design of floating wind turbine leading to:

- Expert / industry consensus on design principles
- Experience from the industry reflected in the contents
- Innovative designs and solutions
- Economically optimized designs

As an example below some technical issues covered by the standard are shown

- Safety philosophy and design principles
- Site conditions, loads and response
- Materials and corrosion protection
- Structural design
- Design of anchor foundations
- Stability
- Station keeping
- Control system
- Mechanical system
- Transport and installation
- In-service inspection, maintenance and monitoring
- Cable design (structural)

- Analysis guidance for coupled analysis

The certification of an offshore floating wind farm will have to pass different phases attending to the different components and phases<sup>7</sup> of the project:

- Phase I – Verification of Design Basis
- Phase II – Verification of design
- Phase III – Manufacturing Survey
- Phase IV – Installation Survey (linked to marine operations of section 3.7)
- Phase V – Commissioning Survey
- Phase VI – In-Service

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<sup>7</sup> These phases are commonly described in standards for bottom-fixed wind turbines; however they can be used as the preliminary path to follow for floating wind turbines certification.