

Owner:
Eoliennes Offshore du Calvados

Public debate / March-July 2013

OWNER'S DOCUMENT SYNTHESIS OF THE COURSEULLES-SUR-MER OFFSHORE WIND FARM



The Courseulles-sur-Mer offshore wind farm project, with Fécamp, Saint-Nazaire and Saint-Brieuc, has been selected by the Government throughout a national tender. This project, presented at the public debate, comprises 75 units of the 6 megawatts Alstom wind turbine for a total power of 450 megawatts. The closest turbines are located at 10 km from the shore.

EDITORIAL

THE OFFSHORE WIND TURBINE ACTIVITY, AN ECONOMICAL OPPORTUNITY FOR THE TERRITORY

« Basse-Normandie has all the necessary assets to be an appropriate offshore wind farm territory. The region is renowned for its natural wealth and its marine and industrial activities. Furthermore, its antiquity from the Second World War makes it a well-known historical site and an important tourist attraction.

The Courseulles-sur-Mer offshore wind farm project is an economical opportunity for the territory, inducing employment and training opportunities. Moreover, it constitutes an important growth lever regarding the local and regional marine sector as well as the industrial network.

This debate period is a key moment within the project planning. It enables the owner to create discussion about the project and find out together the main issues and stakes. »

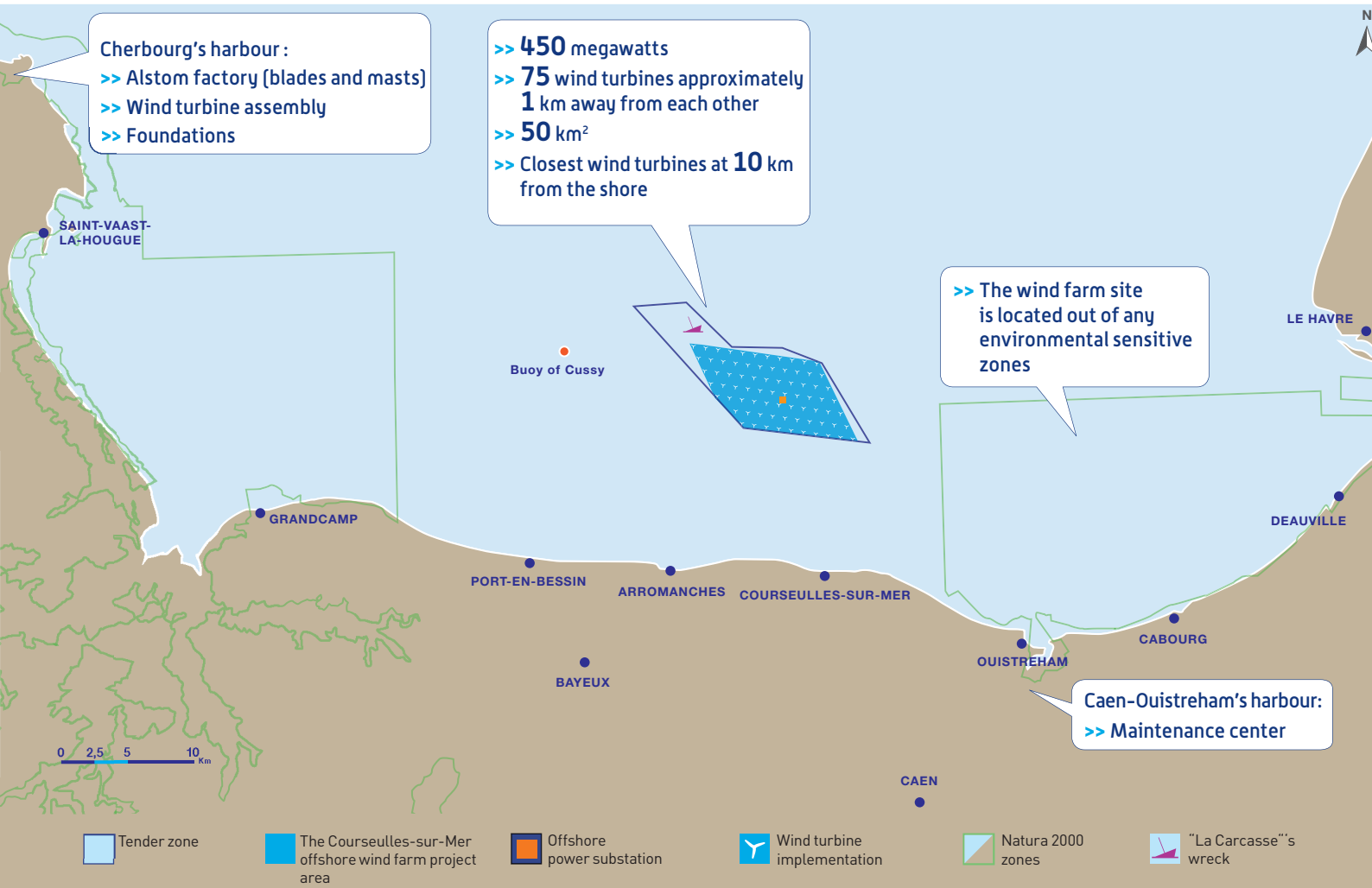
Yvon André

Eolien Maritime France and Eoliennes Offshore du Calvados Chief Executive Officer.

PROJECT STAGES



THE PROJECT PRESENTED AT THE PUBLIC DEBATE



WIND TURBINE LOCATIONS DEFINED WITH THE TERRITORY ACTORS

- >> A limited hold on the marine public area, away from the most abundant scallop fields.
- >> The wind turbines positions optimize the projects insertion and reduce their visibility from the shore and from the site of Arromanches.
- >> Power cables layout designed according to professional fishermen' recommendations.

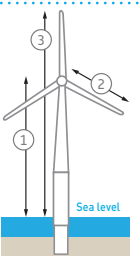
THE WIND FARM THEORETICAL SCHEME

The electrical connection

The wind farm will be connected to the power transmission grid via a submarine and an underground cable by RTE, the transmission system operator. (Estimated cost: circa 150 million Euros).

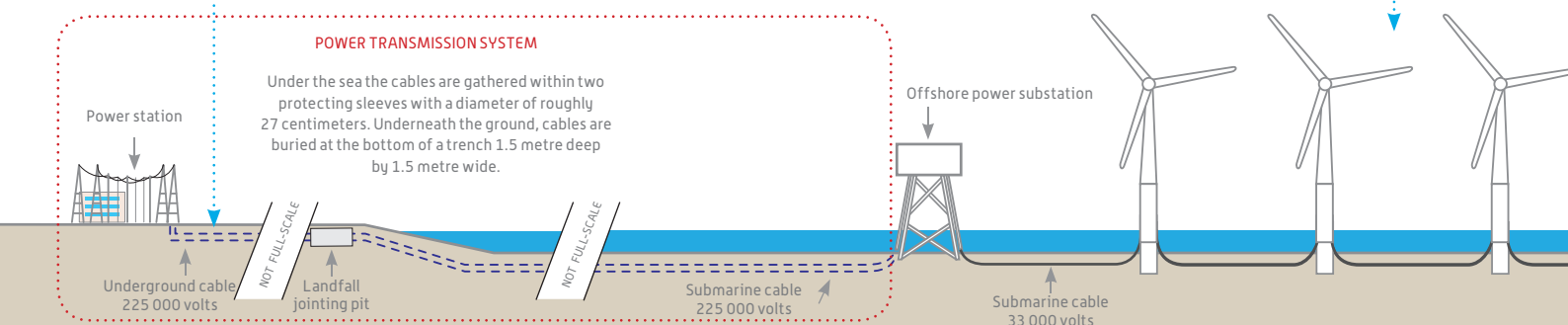
The Alstom Haliade 150 wind turbine (source Alstom)

- >> Unit electric power: 6 megawatts
- >> Nacelle's height ①: 100 metres
- >> Blade's length ②: 73.5 metres
- >> Tip height ③: 175 metres
- >> Foundation: Monopile



POWER TRANSMISSION SYSTEM

Under the sea the cables are gathered within two protecting sleeves with a diameter of roughly 27 centimeters. Underneath the ground, cables are buried at the bottom of a trench 1.5 metre deep by 1.5 metre wide.



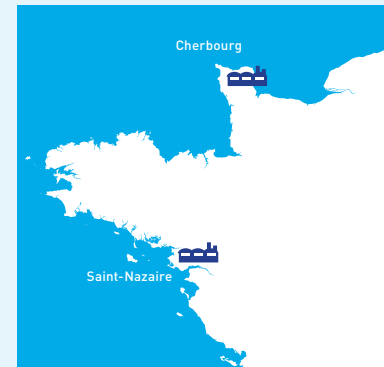
A project respectful to natural environment and History

The project is based on **several studies evaluating the surrounding physical and biological environment**, carried out in office studies as well as by environmental protection associations.

These studies pointed out the major issues of this area and enabled us to acquire valuable technical and environmental knowledge. Some additional environmental studies are currently ongoing (fishery resources, marine mammals...).

The coastline retains the memory of the Battle of Normandy. The owner will respect **the memory of this important historical site** especially the Normandy landings beaches.

FOCUS ON ALSTOM



Alstom, partner of the owner, plans to create four manufacturing plants in France to build the wind turbines.

>> Two plants in Saint-Nazaire to produce generators and nacelles.

>> Two plants in Cherbourg to produce blades and masts.

With a production capacity of 100 wind turbines per year dedicated to the French and overseas market, these plants would create approximately 1000 direct and 4000 indirect jobs.

A suitable project according to fishermen and other sea users

Fishing is an essential and emblematic activity in Basse-Normandie. In the Seine bay, it is mainly practiced in the ports of Saint-Vaast-la-Hougue, Grandcamp-Maisy, Port-en-Bessin, Courseulles-sur-Mer, Ouistreham, Trouville and Honfleur.

The wind farm implementation, the wind turbine alignments and the power cables position between the wind turbines have been specifically designed to respect the fishing activities and other usages of the sea, subject to further official authorisation.

The wind farm is therefore located outside the main scallop fields.

KEY FIGURES

>> WIND TURBINES WILL BE ON-LINE **90%** OF THE TIME.

>> POWER PRODUCTION IS EQUIVALENT TO **38%** OF FULL POWER PRODUCTION TIME.

>> ANNUAL POWER PRODUCTION OF **1 500** GIGAWATT-HOUR.

>> WIND TURBINES RUN BETWEEN **10 AND 90** KM/H WIND SPEED

>> THE AVERAGE WIND SPEED AT THE NACELLE HEIGHT IS **30** KM/H

>> AN INVESTMENT OF **1,8** BILLION EUROS

A new dynamic for local industry

On the scale of the three owner's parent company projects and considering all the work involved; foundation's construction, onshore assembly and offshore implementation of the wind turbines should consequently **create 1600 jobs. 400 of them dedicated to the Courseulles-sur-Mer project.**

Each offshore wind farm will require **one hundred engineers, technicians and sailors** for operation and maintenance. A maintenance station will be created on the Caen-Ouistreham's harbour especially for the Courseulles-sur-Mer project.

Employment, training and integration as fundamental to the project

A recruitment campaign will be run to attract qualified labor during all the project lifetime (welders, boilermakers, crane operators...). The owner plans to work with local partners in employment, training, and integration to promote jobs creation in the offshore wind industry. Specific training programs and simplified recruitment process for unemployed people will be put in place.



WHY THIS PROJECT ?

>> The French development objectives for renewable energy

France has set up an objective to significantly develop its renewable energies resources to provide **23% of the total energy consumption by 2020**. Wind energy represents almost a quarter of this objective. To achieve this, a new national wind farm fleet of 25 000 megawatts, including 6000 offshore, will be installed to cover nearly 10% of the national power consumption in 2020 (2,2% in 2011).

Altogether, the program of 6000 megawatts of offshore wind energy will reduce the emission of 16 million tons of CO₂ per year. According to the Energy Ministry, it will cost, an extra 25 Euros per household per year.

>> The French offshore wind energy, an emerging sector of high potential

>> The State's tender:

In 2012, the Government selected 4 offshore wind farm projects through a tender process: Fécamp >498MW, Courseulles-sur-Mer >450 MW, Saint-Brieuc >500 MW and Saint-Nazaire >480 MW.

>> Offshore wind energy's growth :

The owner's parent company, Eolien Maritime France, chosen to lead the projects of Saint-Nazaire, Fécamp and Courseulles-sur-Mer along with its partner Alstom, wants to be involved in the creation of an industrial sector. They plan to **create around 7000 jobs**.

This tender would allow the French industrial actors to develop new core competencies (engineering, manufacturing, installation and maintenance of wind turbines, foundations and cables) and compete within new markets in France and abroad.

AN EXPERIENCED OWNER

This project is led by reputed companies within the renewable energy sector. As part of the Eoliennes Offshore du Calvados Company, they share experience and financial strength in order to develop a project aware of territory issues, to ensure a competitive and high quality project.

>> **EDF Energies Nouvelles**: EDF's subsidiary, one of the world leaders in the renewable energy sector.

>> **Dong Energy**: World leader in the offshore wind turbine energy sector owned by the Danish State at 80%.

>> **wpd Offshore**: A major wind energy company in Europe.

The **Alstom Group**, a worldwide leader in the power production equipment industry, is the exclusive partner for the wind turbines supply.

Edited by :

EOLIENNES OFFSHORE DU CALVADOS, owner, company settled by Eolien Maritime France and WPD Offshore for the implementation and operation of the Courseulles-sur-Mer offshore wind farm.
Eolien Maritime France owned by EDF Energies Nouvelles and Dong Energy.

The owner's document for the public debate can be downloaded from the website www.debatpublic-eolien-en-mer-courseulles.org