

## FRENCH REGULATIONS ON OFFSHORE WIND TURBINES

**Shearman & Sterling LLP**

*As the construction of the first offshore wind project is about to begin in France, it can be useful to have a look at the regulations applicable to wind turbines at sea. The turbines are not only a power plant, they are also subject to specific regulations due to their location at sea, on the public domain, and possibly one day, outside the limits of the territorial sea.*

Even more than onshore, the installation of wind turbines at sea, appears to be a new idea in France and raises many concerns. Indeed, there is quite a competition between the different uses of the sea: commercial fishing, sailing, maritime trade routes, seaside tourism anxious to retain an “*breathhtaking view*”, environmental concerns for the preservation of a marine ecosystem which fragility is pointed out by scientists... For all these reasons the French government selected only one project out of the eleven bids received under the tender procedure for offshore wind power launched in 2004. The sole project accepted during the tender, which will be the first offshore wind turbine project in France since no "spontaneous" project was built in the meantime, is expected to start rising from the sea in the coming months.

However, the idea to build wind turbines offshore is not that new. The first offshore wind turbines have been in use since 1991, off the coast of Denmark. In 18 years, the offshore sector has gradually developed and reached 1,463 MW installed worldwide at the end of 2008<sup>1</sup>. Offshore wind farms are mainly located in Europe, in particular in the North Sea and the English Channel where the seabed is not too deep and auspicious to the installation of such projects. In France, the construction of the first offshore wind farm will begin in 2009 off the Albâtre coast in Normandy. Enertrag obtained a building permit in September 2008 for the construction of 21 wind turbines, each with a capacity of 5 MW, which amounts to a total capacity of 105 MW, in the territorial sea off the town of Veulettes-sur-mer. A dozen other projects are currently under review and may reach more than 3,000 MW installed in France in 2015<sup>2</sup>.

French regulations applicable to offshore wind turbines are similar to those governing the installation and operation of land-based wind turbines. Nevertheless, the legal regime of offshore wind turbines presents some particularities precisely because they are installed at sea and to take into consideration the existence of shared uses of the sea. Moreover, it is important to note that the legal regime that applies to offshore wind turbines still needs to be

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<sup>1</sup> Source: *Le journal de l'éolien*, hors série n°4/2009

<sup>2</sup> Ibidem

perfected and that the bills drafted during the *Grenelle de l'environnement* could introduce some changes.

## **I. The installation of an offshore wind farm**

### **A. Choosing the appropriate site**

When selecting an area for an offshore wind farm, both the technical aspects and the possibility of benefiting from EDF's obligation to buy the electricity produced by the wind farm must be taken into consideration. Pending the development of floating wind turbines<sup>3</sup> for which depth of the seabed will be less of an issue, the main technique currently used for offshore wind farms is the same as the technique used on land. The rotor and blades are attached to the top of a tower which is itself secured into the ground. The tower can consist of a single shaft or a tripod<sup>4</sup> to spread the weight of the turbine evenly and to be more resistant to winds and water currents. Therefore, it is necessary to find areas where the seabed is not too deep in order to install a wind farm. The Veulettes-sur-mer wind turbines will be located at a distance of 6 to 11 km from the coast and will reach the seabed 20 meters deep under the surface. Undersea topography offers a range of possibilities, such as the surprising Arklow Bank wind farm in Ireland which is located 10 km from the coast but built on a sand bank only 5 meter deep below the surface. For such technical reasons, the sites currently considered for the construction of offshore wind turbines in France are mainly located in the English Channel or in the North Sea. Neither is as deep which as the Atlantic Ocean, where only three projects are currently under review. No project based in the Mediterranean was selected. This is, among other reasons, due to the steep drop of the seabed close to the coasts. In addition, wind studies based both on records of the weather at sea and measuring masts on the coast are very useful in selecting areas which are most favorable to the installation of wind farms.

Offshore wind farms are located in the public maritime domain<sup>5</sup> or in the exclusive economic zone (EEZ)<sup>6</sup>. However, pursuant to Article 10 of Law n° 2000-108 of February, 10, 2000, only wind farms that are located in a wind development zone can benefit from EDF's obligation to purchase the electricity. Wind development zones are proposed by the municipalities and defined by the *Préfet*. But the application of such procedure at sea is complicated as it is difficult to define the territorial limits of each municipality at sea. Furthermore, even though the *Préfet* remains responsible for the use of the public maritime domain within the boundaries of territorial sea, he is not competent in the EEZ. Therefore, the wind development zone system is not relevant for wind turbines at sea.

Moreover, in the case wind power projects are not situated within a wind development zone nor in an area which is interconnected with the metropolitan continental network, Article 2 of

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<sup>3</sup> Like the WINFLO project (Wind turbine with Innovative design for Floating Lightweight Offshore) presented in autumn 2008 by a consortium which included in particular Nass&Wind Offshore and the French DCNS.

<sup>4</sup> the Bard Engineering "tripiles"

<sup>5</sup> The maritime public domain is defined by Article L.2111-4 of the General Code for Public Entities. It includes the seabed and underground resources of territorial waters, *i.e.* the 12 nautical miles from the high water line or baselines defined by Decree of October 19, 1967.

<sup>6</sup> The Exclusive Economic Zone (EEZ) extends over 188 nautical miles from the territorial water limits. While France has sovereign rights over this area pursuant to Law n° 76-655 of July 16, 1976, the seabed and underground resources do not belong to the State and are considered to be outside the maritime public domain.

Decree n° 2000-1196 of December 6, 2000 states that only facilities with a capacity of less than or equal to 12 MW can benefit from the purchase obligation. This requirement is not favorable to offshore facilities which should be able to reach a production volume well above 12 MW, in order for the project to be profitable. The Bill on a National Commitment to the Environment (called "*Grenelle II*" bill) currently under review before the Senate will allow for the possibility for offshore wind turbines to benefit from a purchase obligation. This bill provides for the abolition of the double above-mentioned requirement and redefines the purchase obligation to include all wind farms located "*in the public maritime domain or in exclusive economic zone*"<sup>7</sup>

The *Grenelle II* provides for a consultation forum for each coastline, the aim of which is to identify the maritime areas most suitable for the establishment of wind turbines at sea. In March 2009, a consultation was launched by the Minister of the Environment with the *préfets* of the Bretagne, Pays de la Loire, Haute-Normandie, Aquitaine and Provence-Alpes-Côte d'Azur regions.

It should be noted that the Veulettes-sur-mer wind farm project will benefit from EDF's electricity purchase obligation irrespective of the above-mentioned conditions since it was selected through Government tender.

## **B. Permits**

Three main types of authorization are required for the construction of wind turbines at sea: a building permit pursuant to building regulations, an authorization pursuant to water regulations, and a public domain concession according to domain public regulations.

As with land-based wind turbines<sup>8</sup>, the construction of offshore wind farms requires a building permit if the tower of the turbines are 12 meter high or higher. Moreover, for towers that exceed 50 meter, Article L. 553-2 of the Environmental Code requires that an impact study be carried out and that the project be submitted to a public inquiry. Building permits are issued by the *Préfet*, who can overrule the investigating commissioner's unfavorable opinion by issuing an administrative order duly substantiated ("*arrêté motivé*").

Within territorial waters, the construction of wind farms, including laying tower foundations, burying power cables and, where appropriate, building a platform for an electrical transformer, is subject to water regulations and to authorizations provided for by Articles L.214-1 et seq. of the Environmental Code. Section 4.1.2.0 of Article R.214-1 of the Environmental Code concerning water ("*Port planning and other works made in contact with the marine environment and having a direct impact on the environment*")<sup>9</sup> applies in particular. When the total budget of the construction works exceeds €1.9 million, an authorization is required.<sup>10</sup> If the cost ranges from €1.6m and €1.9 m, a declaration prior to the beginning of the construction is necessary. Where an authorization is required under

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<sup>7</sup> Please note that the different texts, including the version of the "*Grenelle II*" draft law submitted to the Senate on January, 12, 2009, only mention the maritime public domain and the EEZ

<sup>8</sup> See, BDEI n° 5/2006, n° 210, Sandrin A., "*Overview of the Regulations applicable to wind turbines*".

<sup>9</sup> This is notably defined as "coastal waters from the seashore up until the external boundaries of territorial waters."

<sup>10</sup> This is the case for the Veulettes-sur-mer wind farm project which received authorization by an order of the *Préfet* on January, 14, 2008, pursuant to Article L.214-3 of the Environmental Code

water regulations, the application file, which includes an environmental impact study,<sup>11</sup> is submitted to the *Préfet* (Environmental Code, Art. R.214-6). The application is subject to a public inquiry. The *Préfet's* order authorizing the project contains some technical instructions relating to the operation of the facility. These may include monitoring the environmental impact of the works, the operation of the wind farm and the decommissioning of the turbines. Lastly, pursuant to Article L.214-3-1 the operator is under an obligation to clean-up the site once it is no longer in operation.

It should be noted that under Article L.214-1 of the Environmental Code, authorizations or declarations required under the water regulations does not apply to *classified installations for the protection of the environment*. Therefore, if these wind turbines become considered as classified installations, a modification which may be introduced by the "*Grenelle II*"<sup>12</sup> bill, the obligations described in the above paragraph may no longer apply to the construction of offshore wind farms.

The third main authorization regime applicable to the construction of wind farms in territorial waters is the concession for the use of maritime public domain, which applies to territorial waters beyond ports. Pursuant to Decree n° 2004-308 of March 29, 2004, such concessions can be granted for a maximum of 30 years. Applications must be submitted to the *Préfet*. They are then subject to an administrative procedure and to the opinion of the maritime *Préfet*, who is the highest military authority representing the Government at sea (Decree n° 2004-112, February 6, 2004 on the organization of the State at sea). The application is also submitted for advice "*to the municipalities and cooperation administrations which have a territorial interest and to the municipalities and cooperation administrations in which jurisdiction the operation appears likely to affect a significant effect*" (Decree n° 2004-112, Art. 6). Finally, the concession project is the subject to a public inquiry<sup>13</sup> before it can be approved by the *Préfet*. If the investigating commissioner or the investigation commission issues an unfavorable opinion, the *Préfet* can still approve the maritime public domain concession by an administrative order duly substantiated. The concession order must include a convention indicating the subject of the maritime public domain concession and the technical prescriptions that the concessionaire must follow.

Thus, the concession agreement with Enertrag<sup>14</sup> (for the Veulettes-sur-mer project) covers an extendable two-year period for the construction work; it requires that the identification of the wind farm on maritime charts, and sets the fees which apply to the concessionaire. Lastly, the convention provides for financial guarantees to ensure the remediation of the site.

It should be noted that, for consistency's sake, the public inquiry may be conducted jointly in consideration of the water regulations and of the regulations relating to public domain

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<sup>11</sup> In terms of constructions on the maritime public domain, only modernization works are exempt of the environmental impact study procedure (Env. Code Art. R.122-5). Pursuant to that same article, this requirement is can be added to the obligation to conduct an environmental impact study for permits to build wind turbines with tower over 50m high.

<sup>12</sup> The project does not state whether all the turbines will become classified installations or if offshore turbines will be left out of the new regime.

<sup>13</sup> Procedure provided for by Articles R.11-14-3 to R.11-14-15 of the Expropriation Code.

<sup>14</sup> Prefectoral order of July 16, 2008 concerning maritime public domain concessions beyond ports in favor of CECA SAS, Centrale Enertrag Côte Albâtre for the installation of a offshore wind farm of the coast of Veulettes-sur-mer. This order is published in the Collection of Administrative acts of the Seine-Maritime *Prefecture* and is available on the *Prefecture's* website.

concessions. The procedure for processing the building permit application is entirely different.

However, even though it remains, at this stage, a theoretical issue, it should be pointed out that there are very little provisions under French law governing facilities built beyond the territorial waters. Since public domain concessions would not be applicable outside the territorial sea, several questions arise. Would the installation of wind turbines in this area be considered as an exploitation of the continental shelf according to Law n° 68-1181 of December 30, 1968, concerning the exploration and exploitation for the French continental shelf and its natural resources? Is Law n° 90-1143 of December 21, 1990 concerning the security of maritime navigation and fixed platforms located on the continental shelf, applicable to wind turbines, including floating turbines? The development of offshore wind turbines, if it were to go beyond the limits of territorial waters, would require a regulatory solution to its issues.<sup>15</sup>

Lastly, once construction is completed, offshore wind farms (just like land-based projects) are subject to an authorization to operate a facility producing at least 4.5 MW of electricity, pursuant Decree of September 7, 2000. Such authorization is issued by the Minister of Energy.

## **II. The economics of an offshore wind project**

The economics of a wind project, particularly at sea, includes the costs that the operator will bear for the construction as well as the operation of the wind farm. It includes the purchase of the necessary equipment, financial guarantees and any fees and taxes that are applicable pursuant to the regulations. In return, the operator's income is drawn from electricity produced by the wind farm and sold at a price which is also defined by regulation.

### **A The cost of setting up a project**

While the purchase of machinery and the cost of the construction works are obviously borne by the future operator of the site, the responsibility for certain other expenses related to the project is not clearly defined. In general, connecting a wind farm to the energy "delivery point" (i.e. a large transformer) falls under the operator's responsibility according to the contract entered into with the electricity grid operator. An estimate, called a technical and financial proposal (or "*PTF*" in French), is drawn up and taken into account by the future operator in his comprehensive study of a future site. The further the point of delivery is located from the project's site, the more the connection will cost; which makes the entire project more expensive. Part of the works can be done by the grid operator. In the case of Veulettes-sur-mer, RTE-EDF Transport obtained a declaration of public utility by an order of October 29, 2008 for the creation of a subterranean electrical connection of 90,000 volts for the connection of the offshore wind farm. This declaration of public utility implies modifying the local planning documents accordingly. However, it seems that the cost of these works will be borne by the wind farm operator.<sup>16</sup>

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<sup>15</sup> See also, Roche C., « *Et pourtant elles tournent: la réglementation applicable aux éoliennes offshore* », AJDA, October 1, 2007, pp.1785-1792.

<sup>16</sup> See the declaration of Philippe Gouverneur, general manager of Enertrag France in *Usine Nouvelle*, April 28, 2008.

But downstream of the energy delivery point, the cost of any work is to be covered by the grid operator. In practice, are these costs entirely reimbursed by the public electricity service compensation, pursuant to Article 5 of Law n° 2000-108 of February 10, 2000?<sup>17</sup> There is no doubt that the modernization of electricity grids so as to accommodate the electricity produced by wind farms entails major technical challenges and significant financial costs for network operators.

## **B. Taxes and Fees**

The public domain concession agreement defines the fees that the concessionaire has to pay to the government for setting up a wind farm on the maritime public domain. For offshore wind farms, these fees are made up of two components: a fixed part, related to the facilities' ground surface, and a variable part based on revenue drawn from the wind farm.

According to Decree of April 2, 2008 which establishes the fees payable for the occupation of the public domain of the State by wind energy facilities and their ancillary equipment, the fixed component of the fees, which is due as of the notification of the authorization to occupy the public domain, amounts to €1,000 per wind turbine and €1 per linear meter of cable. A 50% rebate per linear meter of connection cable is granted to wind farms which have been a maritime public domain concession (as opposed to inland public domain). The variable part of the fees, which is due at the end of the 3-year period from the notification of the order (to allow time for the wind farm to be built and begin operating) amounts to €6,000 per MW installed, or €4,000 per MW in the maritime public domain. In the case of the Veulettes-sur-mer project, which will consist of 21 wind turbines and more than 19 km of cable, a "rent" of over €450,000 per year will be paid to the government by the concessionaire.

In addition, section 1519B of the Tax Code establishes an annual tax on electricity production facilities which use mechanical wind energy located in inland waters or territorial waters, payable to the municipalities.<sup>18</sup> Pursuant to Decree n° 2008-294 of April 1, 2008 this fee amounts to €2,492 megawatt installed per annum, indexed to the index value of total GDP. This tax does not have to be paid for the year in which the wind farm starts operating.

Pursuant to section 1519C of the Tax Code, and under the conditions set out in Decree n° 2008-851 of August 26, 2008, half of the proceeds of this tax go to the municipalities from which the wind farm is visible, and the other half goes to the Departmental Council (*conseil général*) which places it in a local fund for fishing and sailing.

Other taxes, not specifically related offshore wind turbines, can naturally also apply, such as corporation taxes.

## **C. Financial guarantees**

Law n° 2005-781 of July 13, 2005 has created the obligation for wind farm operators to establish financial guarantees to cover the decommissioning and rehabilitation of the site at

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<sup>17</sup> Article 4 of the ministerial order n° 2004-90 of January 28, 2004 relating to the compensation of electricity utility charges, essentially provides for, as a cost overrun due to the renewable energy purchase obligation, "*the difference between the cost price of the electricity paid on performance of the relevant contract and the cost resulting from the purchase of the same amount of electricity at the applied sales price.*"

<sup>18</sup> Provisions added by way of Article 76 of Law n° 2005-1720 of December, 30, 2005 (*loi de finances rectificative*).

the appropriate time. Now part of Article L.553-3 of the Environmental Code, this requirement applies right from the start of construction to the decommissioning of “*facilities located on the public maritime domain*”.<sup>19</sup> The amount of these financial guarantees is to be determined by a decree which has still not been adopted. The “*Grenelle II*” bill provides for the withdrawal of Article L.553-3 of the Environmental Code, and thus the elimination of the guarantees it requires. This amendment would be understandable if wind turbines became classified facilities,<sup>20</sup> and, with respect to offshore wind farms if the following statement actually applied: “*guarantees will be provided for in accordance with Article 8 of Decree n° 2004-308 of March 29, 2004 for maritime public domain concession beyond the ports*”<sup>21</sup>. However, Article 8 of Decree of March 29, 2004 only provides for the possibility, not the obligation to impose financial guarantees. The amounts and basis of calculation for these guarantees are left up to the discretion the *Préfet*.

In the case of the Veulettes-sur-mer project, the maritime public domain concession agreement, published by order of the *Préfet* dated July 16, 2008, requires that the concessionaire provide financial guarantees, which amount “*will be calculated at the time of the publication of the implementing decree of Law on Energy n° 2005-781 of July 13, 2005*” pursuant to Article L.552-1 of the Environmental Code. This is a strange mixture of references including the guarantees set out in Article L.552-1 established by Law of July 22, 1987<sup>22</sup> and those of Article L. 553-2 established by Law of July 13, 2005, neither of which obtained an implementing text explaining how financial guarantees are to be calculated if they are imposed on wind turbines! This point needs to be clarified as the construction of the Veulettes-sur-mer project is about to begin, without the guarantees required by law due to a lack of application decree.

#### **D. Rate applicable to the contract entered into with EDF**

According to Article 10 of Law of February 10, 2000, EDF and all non-nationalized electricity distributors are obliged to buy electricity generated by facilities producing renewable energy, under the conditions specified by decree. In practice, this obligation is recognized by a certificate issued to the operator by the *Préfet*, which entitles a wind farm to benefit from the purchase of electricity. Once this certificate issued, the operator can request EDF or a local non-nationalized distributor to sign a purchase agreement for the electricity produced by his turbines. The current price at which EDF is to purchase electricity from

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<sup>19</sup> Financial guarantees can be established during the course of the operations for land-based turbines. In any event, there is no provision on financial guarantees concerning offshore wind turbines.

<sup>20</sup> The “classified” wind turbines would then be subject to financial guarantees like the Seveso II facility, the quarries and waste storage facilities, pursuant to Article R. 516-1 of the Environmental Code?

<sup>21</sup> Draft law on the national commitment for the environment, Article 34, statement of reasons.

<sup>22</sup> Law n° 87-565 of July 22, 1987 concerning the organization of civil security, the protection of forest against fires and the prevention of major risks. Article 53 (now Env. Code, Art. L.552-1) provides for a general obligation to constitute financial guarantees for “*works and facilities risks the consequences of which are manifestly disproportionate to the value of the locked-up capital.*”

When a Representative at the *Assemblée nationale* questioned the lack of implementation texts for Article L.552-1 of the 1987 law, the Minister of Interior replied that the texts concerning the Seveso II facilities had been adopted and that the regulation on dangerous conduits was currently being reviewed. She did not seem to envisage the possibility for applying this article to offshore wind turbines (Question n° 806, reply published in the *Journal Officiel on* February 24, 2009)

offshore wind farms was made public by the orders issued on November 17, 2008 and December 23, 2008:<sup>23</sup> €0.13 per KW/h for the first 10 years. At the end of the first 10-year period, the facility's annual production of reference is determined by calculating the average of the median eight years.<sup>24</sup> For the last 10 years of the contract, which lasts 20 years for offshore wind turbines (as opposed to land-based turbines which are subject 15-year contracts) the purchase price is determined based on this annual production reference. For offshore wind farms, the tariff ranges from €0.3 to €0.13 per kW/h. This price is applicable to the contracts for which a completed contract application was received by EDF in 2007. For subsequent applications the tariff decreases each year. Moreover, electricity prices set by contract are indexed on an annual basis to an index close to the consumption index.

According to the press statement by the Minister of Industry on September 14, 2005, the Veulettes-sur-mer wind project, which was chosen following a invitation to tender and therefore which is not subject to a tariff order, will receive around €100 per MW/h produced (about €0.10 kW/h). It important to note that the Electricity Regulation Committee, in its opinion of October 30, 2008 on the draft decree relating to the conditions for the purchase of electricity generated by facilities using the mechanical wind energy, recommended that the installation of wind turbines on the maritime public domain or in areas previously defined by the government be determined exclusively on the basis of calls for tenders in order to ensure genuine price competition.

### **Conclusion**

Despite the launch of an initial project, it appears that French legislation applicable to offshore wind turbine still needs to be perfected and completed. The issue of financial guarantees, whether imposed under public domain regulations or under environmental regulations, is not solved. The construction, though theoretical, of wind farms in the EEZ beyond the limits of territorial waters and on the public domain, would raise more questions than the regulations currently in place are able to answer. There are also other technical challenges to renewable energies in sea. A tariff order was already issued on March 1, 2007 for turbines located on or under the surface of the water which draw energy from swell waves and marine currents. After the "*Sabella*" pilot project in Bénodet, do the authorities have all the tools they need to accommodate a marine current turbine farm like the one that EDF is planning to install off the coast of Paimpol?

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<sup>23</sup> Probably due to a technical error, the ministerial order of November 17, 2008, published in the *Journal Officiel* on December 13, 2008 does not include the table which actually defines the applicable tariffs. This table was published by an order dated December, 23, 2008. Please note that the table concerning land-based wind turbines was corrected and published again in another ministerial order dated December, 23, 2008.

<sup>24</sup> The best year and worst year, as far as production is concerned, are not taken into account in this calculation.