



## WINFLO

### **DEEP-WATER OFFSHORE WIND TURBINE FLOATING ON A SEMI-SUBMERSIBLE PLATFORM ANCHORED USING CATENARY MOORING CABLES**

Existing offshore wind turbines have been developing fast over the last few years and are the product of technologies designed for land-based installations. Their fixed foundations are positioned on the seabed and cannot be installed in depths of over 50m. The floating wind turbine offers the chance to go beyond this limit and, consequently, to position turbines further from the shore, minimise conflicts of use and take advantage of a more plentiful and consistent source of wind energy. The WINFLO offshore floating wind turbine project involves major industrial players from the shipbuilding, oil and gas and wind power industries. It will lead to a virtually full-size prototype, capable of generating 2.5MW, which will be installed off the coast of Brittany and connected to the electricity grid. The project includes perfecting a turbine housing specifically for offshore use that is both lightweight and able to withstand the stress inflicted by the sea and the hostile environment. The turbine will be installed on a semi-submersible platform attached to the seabed using catenary cables. This technology, dubbed Free Floating Platform (FFP), as well as featuring a more lightweight construction for the anchoring and flotation system, will make it easy to detach and tow the turbine for maintenance purposes. Equipped with a remote monitoring system, WINFLO will benefit from new e-maintenance technologies which have been developed for today's shipbuilding sector and which will be tested for the first time in the industrial maintenance of wind turbines at sea. The challenge of the project, aside from exploiting the energy resource, is to develop a new industrial and services sector.

#### Partners

##### Companies

Nass & Wind, Lorient [Project Developer]  
Naval Group, Brest, Lorient et Nantes  
Indret  
SAIPEM, Brest et Lorient  
Setec in Vivo, La Forêt-Fouesnant  
Vergnet, Ormes

##### Research centers

ENSTA Bretagne, Laboratoire LBMS, Brest  
Ifremer, Brest

#### Funders

- FEDER  
- Ademe

#### Labelisation

21/11/2008

#### Overall budget

37,4 M€