

# Invest in Bretagne

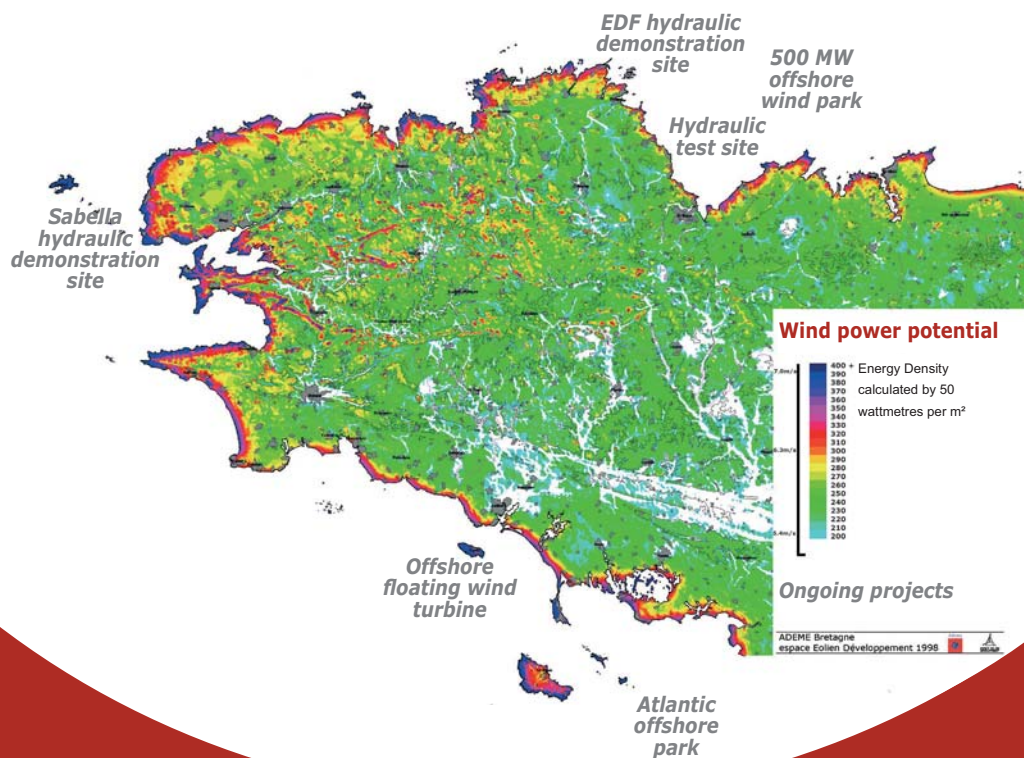


**Natural resources**

**Industrial know-how**

**Research & Development**

**Maintenance**



## Bretagne Wind & Marine Energies facts & figures

- With **350** large onshore wind turbines, Bretagne is the 3<sup>rd</sup> French region for wind energy (637 planned)
- **475 MW** of installed capacity (1,047 MW planned)
- Support from the Breton authorities striving to achieve a **1,000 MW** capacity by 2010
- A potential maintenance market of **600** wind turbines
- **0,5** gigawatt offshore wind park installed by 2015

**Bretagne,  
Land of excellence & innovation in  
Wind & Marine Energies**



## Higher education and research centers

- Cachan National Graduate School
- EMC<sup>2</sup>: Metallic Blocks and Complex Composites
- EME: European School for Environmental professions
- Ifremer
- Irma, Regional Institute of Advanced Materials
- University of Bretagne Occidentale (Master of marine energies)
- University of Bretagne Sud

## Many active organizations

- ADEME Bretagne: regional branch of the French Agency for Environment and Energy Management
- AILE: local agency for energy in Bretagne
- Avel Pen Ar Bed: association promoting wind power and other renewable energy sources in Bretagne
- Bretagne Pole Naval: Maritime cluster
- CIELE: Information Centre for energy and environment
- CLER: Network of professionals in the renewable energy sector
- IPANEMA: Partnership Initiative for the Marine Energies Development
- Pôle Mer: Sea Innovation & Business Cluster

## Events

- Carrefour des Gestions Locales de l'eau, conferences and exhibitions about water, January 2012, Rennes
- Safer Seas, international conferences, workshops, exhibitions dedicated to maritime security, May 2012, Brest
- Salon Européen du Littoral, conferences and exhibitions about littoral, 5>7 October 2011, Lorient
- Itech'Mer, sea industries meeting-place, 27>29 October 2011, Lorient
- Sea Tech Week, international marine science and technology week (conferences, round tables, trade show, events, tours), 8>12 October 2012, Brest

## Bretagne Wind & Marine industry: key sectors

**Thanks to extensive experience in the nautical field, Breton companies have developed knowledge and expertise ready to be used in wind turbine design, manufacturing and maintenance**

### • Manufacturing of wind turbine towers

- S.E.M.A.: tower manufacturer

### • Manufacturing of major composite materials

- CDK: high-specificity composite materials
- Coriolis: industrial solution for the creation of composite parts (automatic fibres positioning)
- Lorima: potential blade supplier that manufactures carbon masts (up to until 100 meters) in a 38 meter long furnace
- Multiplast: high-performance industrial tool (carbon, composite, mould), 50 m long oven

### • Research and development capacities for materials and blade design

- HDS: composite pieces design
- IRMA (Regional Institute of Advanced Materials)
- Jules Verne Wind Tunnel: section of 26 m<sup>2</sup> at a 83 m/s speed ready to be used for wind turbine applications
- Pôle Mer, EMC<sup>2</sup> (competitiveness clusters): national enterprise hubs for metallic blocks and complex composites
- University of Bretagne Sud: R&D pole focusing on composite materials

### • Offshore specialists (platform design, installation, maintenance, specialized boats, etc.)

*Aker Yards, DCNS, ICCAP, Ifremer, Institut de la Corrosion (Corrosion Institute, Technopôle Brest Iroise), IXSEA, LEDU, SOFRESID (groupe SAIPEM-ENI): engineering office expert in off-shore infrastructures...*

### • Maintenance

*Atelier Composite de la Baie, CAMKA System, NKE, Windtechnics...*

### • Impact studies on meteorology

*Actimar, Espace Eolien Développement, ETD, In Vivo Environnement, Metestrategy...*

### • Development, construction and operation of wind farms

*EDF Energies Nouvelles, Eole Generation, GDF Suez, Iberdrola, IEL, Juwi Energie Eolienne, Nass & Wind Offshore, Nordex, POWEO, P&T Technologies, Quénéa, Sinerg, SPEE, Syscom, Vestas...*

### • Wind/current turbine manufacturer

*Blue H, DCNS, Sabella, Windcap...*



## Wind power & marine energies in France: capacity targets and feed-in tariffs

The national objective is to increase the wind power capacities from 2,100 to 13,500 MW by 2010. A law voted in July 2006 clearly defines the selling price of produced energy.

Energy Type	Installed Capacity Regional Targets	National Feed-in Tariffs
Onshore Big Wind	1,800 MW by 2020	8.2 c€/kWh/10 years then 2.8 to 8.2 c€/kWh
Offshore Big Wind	500 MW by 2015 1,000 MW by 2020	13 c€/kWh/10 years then 3 to 13 c€/kWh
Offshore Hydraulic	1-3 prototypes by 2013 1 test center by 2015	6.07 c€/kWh + (0.5 c€ to 4.18 c€) depending on capacity and regularity over 20 years 15 c€/kWh sites in the sea
Inland Hydraulic	Support for innovation	6.07 c€/kWh + (0.5 c€ to 4.18 c€) depending on capacity and regularity over 20 years

## Rance 1st tidal power plant

World's first electrical generating station powered by tidal energy, opened in 1966. 24 turbines producing yearly 600 million kWh, thanks to a 240 MW installed capacity.

## Looking forward

- Maintenance required for existing onshore and offshore wind turbines
- Future development of off-shore turbines
- High potential of tidal current energy (EDF, Ifremer, Pôle Mer and EC Nantes are heavily involved in hydraulic turbines and wave energy).

## R&D through the Pôle Mer Bretagne

### Offshore wind energy

**DIWET:** Deep-water offshore wind turbine floating on a semi-submerged platform anchored using a tension leg system.

Breton companies involved: Blue H Technologies, Timolor, Lorima, Actimar, Institute of Corrosion and University of Western Bretagne ([www.bluehgroup.com](http://www.bluehgroup.com)).



**WINFLO:** Deep-water offshore wind turbine floating on a semi-submersible platform anchored using catenary mooring cables.

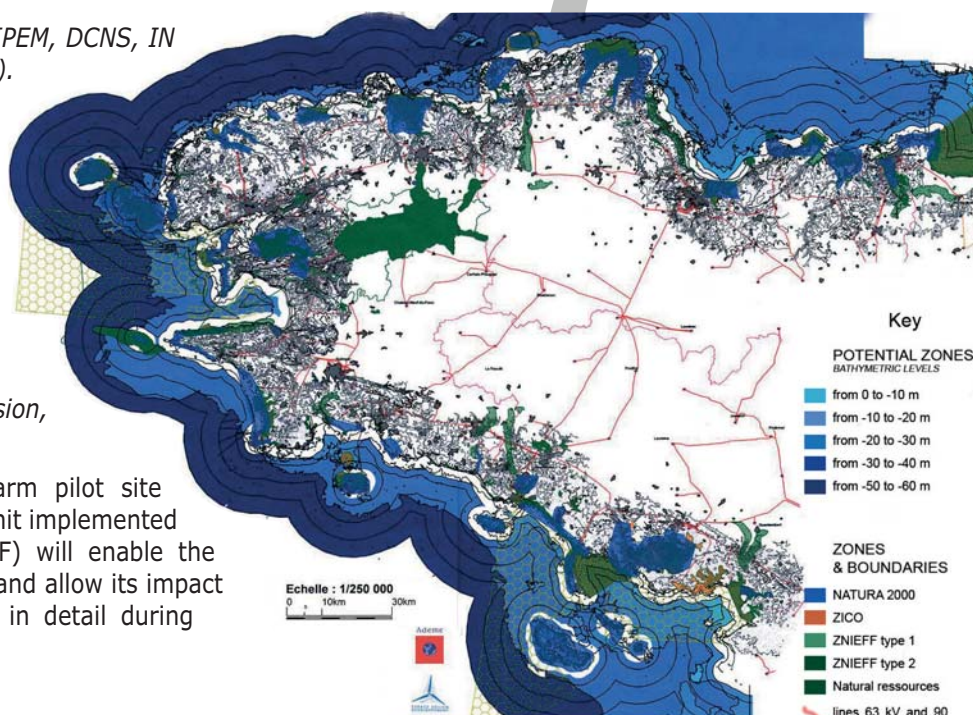
Breton companies involved: NASS&WIND, SAIPEM, DCNS, IN VIVO Environnement ([www.nass-et-wind.com](http://www.nass-et-wind.com)).

### Tidal energy

**MARENERGY:** First 200 kW hydrogenerator – a large-diameter turbine linked to an electric generator – which will transform the kinetic energy of tidal currents into electricity and then convey it by cable to the coast.

Breton companies involved: Hydrohelix Energies, DOURMAP, CIB-Meunier, In Vivo Environnement, SOFRESID, Institute of Corrosion, IRENAV ([www.hydrohelix.fr](http://www.hydrohelix.fr)).

**EDF EN:** First underwater tidal turbine farm pilot site located off the Breton North Coast. This test unit implemented by Openhydro for Electricité de France (EDF) will enable the technology to be tested in real-life conditions and allow its impact on the marine environment to be assessed in detail during various studies.



**2,700 kilometers of coast: a powerful source of blue energy**

# Tax Credit for Research and Development

The Finance Law of 2011 updates the tax credit for R&D in France

Applications can be made simply by completing a straightforward form to be submitted at the same time as the corporate tax return.

## The amount of tax credit given to the company is equal to:

- 40% of R&D expenses the 1st year
- 35% of R&D expenses the 2nd year
- 30% of R&D expenses the 3rd year and for all of the following years
- These rates apply to the first 100 M€ of R&D expenses, over and above this amount the tax credit is equal to 5%

## The R&D expenses

All R&D expenses are taken into account:

- Staff costs (gross wages and social contributions) for researchers, engineers and technicians working directly on research
- Patent filing and maintenance costs
- Amortization of patents acquired for research purposes
- 50% of standardization costs
- Spending on patent defence and technology watch done within the European Union.

# Bretagne International

Bretagne International is a non-profit association of private companies located in Western France. We have been commissioned by the Regional Government of Bretagne to assist Breton companies in their international development, to identify and support foreign companies planning to expand their business into Europe/France through presence in Bretagne.

We provide free confidential assistance through the different stages of your project to expand your business.

## Data collection

- Market validation
- Supplier, partner and customer identification
- Availability and skills of workforce
- Financial incentives
- Cost assessments (salaries, taxes...)
- Labour laws

## Business meetings

Based on your requirements and your project, we tap into our long experience with Breton companies, our excellent knowledge of the regional know-how and the region's economic environment. We will work with you to set up a series of meetings with key business leaders in the region.

## Site proposals

With the support of **Bretagne Développement Innovation**, we can submit to you a selection of sites according to your needs (greenfield, industrial buildings, offices...).

## Assistance before, during and after your installation

We help you with all your administrative formalities:

- Law firm, accounting firm, bank and insurance recommendations
- Capital raising orientation
- Creation of your local structure
- Staff recruitment
- Arrival of your expatriates and their families...

## Bretagne International

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## Meet us at:

- **E-World - Energy & Water**, February, Essen, Germany
- **EWEA**, March, Brussels, Belgium
- **Wasser Berlin International**, March, Berlin, Germany
- **EOW**, November, Amsterdam, The Netherlands

In cooperation  
with

