

# French Technology Platform on marine renewable energies: a set of scientific and technological facilities for an industrial development

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## Abstract

**In 2009, the French government has decided to create a technology platform for marine renewable energies. This project is presented with its focused objectives and its principles: to enhance research and development for the most promising technologies, in response to the fast-track industry needs. The main structure of the platform is explained, some milestones are described and the budget line is exposed. These plans rely on the interaction of three poles: a multidisciplinary research kernel, a set of test sites in adequate locations for the various energy resources and recovery technologies, a resource centre offering services and expertise directed to the expansion of the sector. This initiative is obviously open to European collaboration.**

**Keywords:** Marine renewable energies, technological platform, test sites.

## 1. Context and objectives

In May 2009, the French government has launched a considerable challenge for a sustainable future: marine renewable energies (MRE) shall contribute in 2020 to 3% of the national energy production, i.e. 6000 MW. This goal can be reached under several conditions: facilitating the administrative burden for marine settlements in adequate zones, insuring profitable investments by an attractive price of the marine megawatts, and enhancing the research and development for the most promising technologies. For the latter, the international growth sector on MRE is also in sight, and the French naval, off-shore and energy industry already displays some leading positions and complementary skills, that just need to meet and merge for the greater benefit of an emerging MRE industry.

In this framework, the creation of a technological platform on MRE was decided, and Ifremer appointed as its coordinator, with the mission of building a public-private partnership. This platform must stimulate the French competitiveness, become a melting pot of the technological innovation in favour of the industry, but also promote the arising of these sustainable power generators and ensure their acceptability in the metropolitan and over-sea regions (a key point for France which owns the second exclusive economical zone).

Expected results of this platform are manifold:

- enhanced skills of merged teams from private and public partners, combining researchers, engineers, economists, jurists;
- mutualised numerical tools and testing facilities, inducing lower cost and easier access;
- fit to purpose and fully operational test sites for the various technologies (wave, current, off-shore wind, ...);
- a referenced centre for research and business organizations, at the national and European level;
- improved support for education and training, providing skilled staffs to the sector.

## 2. Structure

The platform will be organized around a central node, located on the campus of Ifremer's Brittany centre in Brest: the management unit and moreover the majority of the research and service teams will be hosted on this site. Hence they will benefit from the vicinity of researchers and engineers already implied in this sector, but also of testing facilities, computational tools and databases. Moreover, Brest gathers 60% of the French oceanographic research and the Brittany region hosts a Marine competitiveness cluster. As a national platform, the networking with teams and staff from other regions will be set up from the beginning, namely along the Atlantic coast, the Mediterranean and also the overseas regions.

Three overarching types of activities suggest the following organization into three interacting poles:

- **a research pole**, with multidisciplinary teams, that will on one hand tackle scientific and technological like: resource assessment, sustainability of producing units, energetic efficiency, commissioning, maintenance, de-commissioning, life cycle, network integration, energetic storage, industrial process... On the other hand, environmental and societal issues will be solved in the fields of: environmental impact, acceptance with respect to other marine activities, law and regulation, cost-benefits analysis, MRE business models in various paradigms, co-products...
- **a management unit for test sites**, covering the various energy resources and recovery technologies: wave, current, floating offshore wind turbines, ocean thermal energy conversion. Ongoing initiatives, e.g. SEM-REV for wave energy, will be supported in order to foster their operational stage as soon as possible in the period 2011-2013. In most cases, the equalization of the initial investment plan is expected to be fulfilled by the funds raised by the platform. A common management scheme will be set up to strengthen the offer of these test sites with respect to: easy regulated access, monitoring (environmental, performance, behaviour, impact...), remote command, expert report on demand, certification...
- **a resource centre**, supporting the industry sector by : easing the access to facilities like numerical modelling, test tanks, material trial, corrosion, bio-fouling, etc.; maintaining an information system archiving technical and regulatory guidelines, geographical information system layers; disseminating for the public at large as well as for the decision makers the major breakthrough of the MRE for efficiency and sustainability; organizing training, especially the transfer of knowledge; providing expertise from regular benchmarking, but also participating to normative working groups at the EU or international level.

These three poles will cooperate since they share the same objective to serve the industrial development of MRE by a fast and direct steering of the research topics, for instance direct feedback from experiments in testing facilities or from demonstrators validated at sea. Likewise, a steady willingness to accelerate the transfer to industry will be promoted by licensing value added products: this process must contribute to the business plan of the platform.

### 3. Schedule and cost estimation

10 years are needed to attain these objectives, to get the first return on investment and to foster sustainable links between industry and public research. This leads to year 2020, where France is engaged in a CO<sub>2</sub> emission reduction plan that comprises the 6 000 MW production from MRE.

In the 2010-2020 period, it is planned to:

- 2010: settle the financing scheme of the platform on a long-lasting basis, based on the public-private partnership. The first research topics will be selected, in close relation with projects on demonstrators for various technologies (a call for tender has been issued by ADEME, the French agency for Energy);
- 2011: on-going research and strong momentum given to build / get operational the test sites. First services provided by the resource center.
- 2013: all test sites operational, feed back from experiments.
- 2013-2020: on-going development of demonstrators, update of testing facilities, expertise for decision makers to select cutting edge technologies.

Every third year, a regular assessment will validate the efficiency of the support given by the platform to the development of the MRE sector, based on consistent indicators.

Over this 10 year period, an overall cost of 150 M€ is estimated in order to: build or complete the test sites, run the three poles with their research and service activities, involving around 50 technicians, engineers and researchers. This amount does not account for the complimentary funding of demonstrators.

With its own legal entity, the platform draws up a business plan that raises progressively less direct public funds, in order to be in fine supported by the industrial sector alone with a tax incentive. A place of common research work, a meeting and spawning nest that becomes the reference for the whole sector.

### 4. No stand alone project

On these sound bases, the European dimension is not going to be missed: many complementarities will become obvious with initiatives in other member states.

For instance, the physical environment, and in some case the biological one (for overseas), bring specificities to the various test sites. The set of European test sites will then be, in the international competition, a trump card providing access to many environmental conditions for the prototypes, especially when monitored by highly skilled staff.

Moreover, the large spread of applied research topics, both at the technical and the socio-economical and environmental levels, imply collaboration and cooperation for the sake of a better efficiency, in the universal spirit of scientific progress. In practice, many of the partners already have ongoing European collaborations, by means of PCRD or Interreg projects. The growth of the platform will increase this trend.

Indeed, the ultimate goal is to tame and exploit, for the benefit of our societies, the huge energetic potential of our oceans!

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### **References**

- [1] Coordinators M. Paillard, D. Lacroix and V. Lamblin. (2009): Marine renewable energies, prospective foresight study for 2030. 320 p., QUAE Editions. ISBN : 978-2-7592-0183-9  
<http://www.quae.com/livre/?GCOI=27380100012570>