

RENEXPO Portugal

Offshore Renewable Energies: Unsolved Problem or Promising Future?



Strategies to develop Ocean Energy in Spain

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SPANISH RENEWABLE ENERGY ASSOCIATION

14 de mayo de 2010, Lisboa

APPA: Spanish Renewable Energy Association

- National Association
- Represents close to 500 producers, businesses and other associations in the renewable energy sector
- Role:
 - Coordinate, represent and defend the interests of the Sector in politics, civil society and to the media
 - Participate in the development of Spanish energy and environmental policy
 - Participate in commissions:
 - Regulation
 - Industry
 - Economy



APPA: Spanish Renewable Energy Association

Other Activities

- Representative in:
 - Spanish National Energy Commission
 - CIEMAT (Center for Environmental and Energy Technology Research)
 - Committee of Agents of the Electricity Market
 - Other public entities (Energy Agencies of the Autonomous Communities)

- Presence in Europe:
 - Member of:
 - ESHA → European Small Hydropower Association
 - EWEA → European Wind Energy Association
 - AEBIOM → European Biomass Association
 - EGEC → European Geothermal Energy Council
 - EU-OEA → European Ocean Energy Association
 - Lobby EU institutions and European parliamentarians



APPA: Spanish Renewable Energy Association

Other Activities

- Provide legal advice and provide specific information to partners:
 - **Internal communication:** Press newsletter, internal newsletter
 - **External communication:** INFO APPA magazine, www.appa.es



APPA Represents:

- Biofuels: Bioethanol and Biodiesel
- Biomass and Biogas
- Geothermal Energy (High & Low Enthalpy)
- Hydropower
- Marine Energy**
- Small-scale Wind Installations
- Solar Photovoltaic
- Solar Thermoelectric
- Wind Energy



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MEMBERS OF MARINE SECTION

- ABENCIS SEAPOWER, SL
- ALEMPARTE-OPT
- BIOPOWER SYSTEMS LTD.
- ELECTRA NORTE, SA
- ENTE VASCO DE LA ENERGÍA-EVE
- FUNDACIÓN ASTURIANA DE LA ENERGÍA - FAEN
- GARRAD HASSAN IBÉRICA, SLU
- HIDROFLOT, SL
- IBERDROLA RENOVABLES, SA
- NORVENTO, SL
- NEO ENERGÍA, SL
- ROBOTIKER-TECNALIA
- SEA ENERGY, SA
- SOCIEDAD PARA EL DESARROLLO REGIONAL DE CANTABRIA-SODERCAN, SA
- WEDGE GLOBAL, SL



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1. Introduction
2. Current regulatory framework
 - Royal Decree 661/2007, regulation of renewable energy.
 - Royal Decree 1028/2007 from offshore installations producing electricity .
 - European Directive on RES (2009/28/CE) Promotion of the use of energy from renewable sources.
3. Regulatory framework: Perspectives
 - Renewable Energy Promotion Plan 2011-2020
4. Ongoing Projects
5. Proposals to make Spain a landmark in marine energy
 - Marine section of APPA



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1. INTRODUCTION

- In Spain, it is a booming industry. We are taking first steps.
- We have potential to be a leader in the development of ocean energy for four main reasons:
 - (i) **Existence of one of the best energy resources in Europe**
 - At least for wave energy (3500km of coastline)
 - Elaborating a map of wave resources (IDAE)
 - (ii) **There is national research and technology in innovation stage**
 - (iii) **The current and future legislative framework already includes wave energy**
 - Royal Decree 661/2007, of Special Regime.
 - Renewable Energy Promotion Plan 2011-2020
 - (iv) **Well proven model of success on RES (wind energy experience)**



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2. CURRENT REGULATORY FRAMEWORK: NATIONAL LEGISLATION

- Royal Decree 661/2007, which regulates the activity of production of electrical energy in a special regime.

- Included in group b.3 with very different technologies.

GROUP B3: facilities that only use as primary energy geothermal energy, wave&tidal energy and ocean currents energy.

Quarterly updates of special regime rates

1st of october 2010

Grupo	Subgrupo	Potencia	Plazo	Tarifa regulada c€/	Prima de referencia c€/
b.3			primeros 20 años	7,2892	4,0672
			a partir de entonces	6,8872	3,2373

- For b.3 group installations it is possible to determine the right of charging a fee for each specific installation, during the first 15 years after it has first been commissioned.
- The calculation of this fee is made from the data obtained in the application form in its Annex VII
- Their developmental difficulties have not been taken into account.



It has not worked for ocean energy



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2. CURRENT REGULATORY FRAMEWORK: NATIONAL LEGISLATION

- Royal Decree 1028/2007 from offshore installations producing electricity

Purpose and scope (designed for Off-Shore Wind Energy)

- Procedures for the approval of power generation facilities in the territorial sea .

Article 32: Other marine generation technologies

- Procedure begins with the application for administrative approval .

2. CURRENT REGULATORY FRAMEWORK: EUROPEAN LEGISLATION

- European Directive on RES (2009/28/EC)

- Directive on the **promotion of the use of energy from renewable sources**.
- For the first time, refers to the use of the oceans.



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□ RENEWABLE ENERGY PROMOTION PLAN 2005-2010

For each technology:

- Analysis of the sector.
- Identification of barriers to development.
- Establishment of measures.
- Setting goals.

Does not include
ocean energy



5.

OBJETIVE ANALYSIS OF TECHNICAL AREAS

- 5.1. *Energía Eólica*
- 5.2. *Energía Hidroeléctrica*
- 5.3. *Energía Solar Térmica*
- 5.4. *Energía Solar Termoelectrica*
- 5.5. *Energía Solar Fotovoltaica*
- 5.6. *Biomasa*
- 5.7. *Biogás*
- 5.8. *Biocarburantes*

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3. REGULATORY FRAMEWORK : PERSPECTIVES

□ Renewable Energy Promotion Plan 2011-2020

Inclusion of other marine technologies (non-wind technologies)

- In general guidelines for development of the new Renewable Energy Promotion Plan 2011-2020, which is being prepared by the Institute for Diversification and Saving of Energy, (IDAE), state:

"It must further the development of mature and more established areas, and incorporate new ones just developed, such as geothermal and wave energy."

- The drafting has begun and it is open to comments and suggestions from the stakeholders involved in the sector
 - Draft Bill APPA-Greenpeace
 - Document delivered to Institute for Diversification and Saving of Energy (Proposal of APPA Marine)
 - The draft has not been published yet. We are waiting to study it and make amendments and comments
 - The final document must be finished by **june the 30th**.
- #### □ REVISION OF THE RD-661/07 (scheduled for late 2010):
- New feed-in tariffs for each renewable technology.



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4. ONGOING PROJECTS

- Public R&D investment:
 - At a national scale is best represented by the **PSE-MAR**, a strategic research project funded by the Ministry of Science and Innovation (MICINN).
 - PSE-MAR aims at:
 - developing three different wave energy converting technologies
 - a test and demonstration site
 - a guidance on non technical issues.

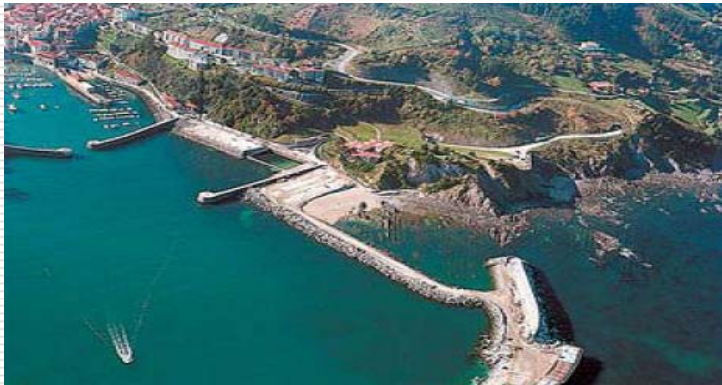
- Demostration Projects:
 - Nereida Project in Mutriku (EVE)
 - Proyecto IBERMAR: Planta Piloto de Santoña (Iberdrola, Sodercan, OPT, IDAE)
 - Others: Hidroflot, Sea Energy, Abencis Seapower, Oceantec...



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4. SOME ONGOING PROJECTS: NEREIDA PROJECT, MUTRIKU



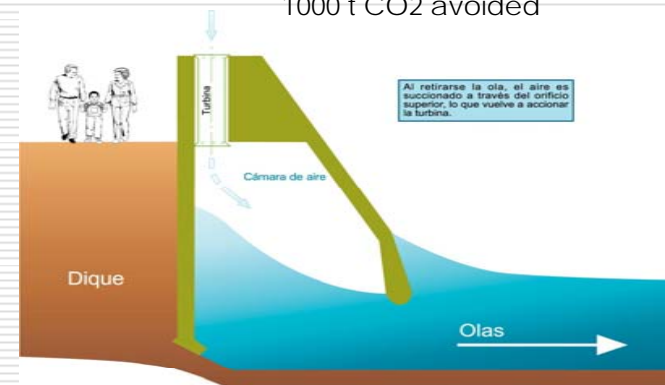
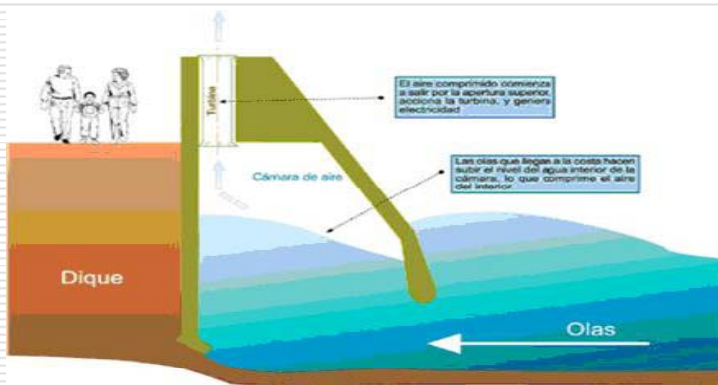
Oscillation Water Column

16 turbines (16 x 30 kW) = 480 kW

Estimation: 960 MWh / year

(consumption equivalent to 1,000 people).

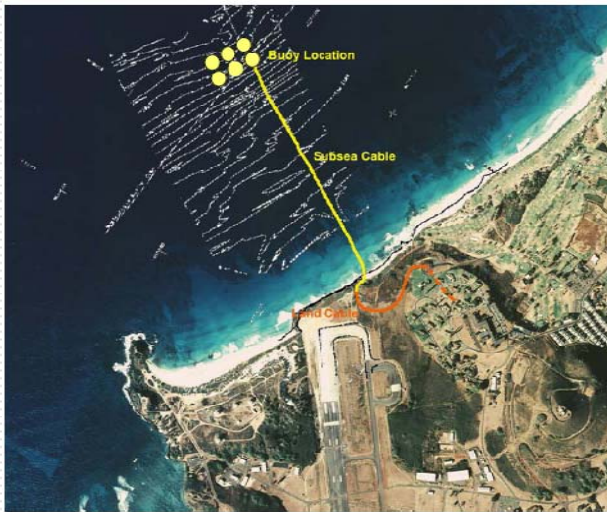
1000 t CO2 avoided



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4. SOME ONGOING PROJECTS: **IBERMAR PROJECT, SANTOÑA**

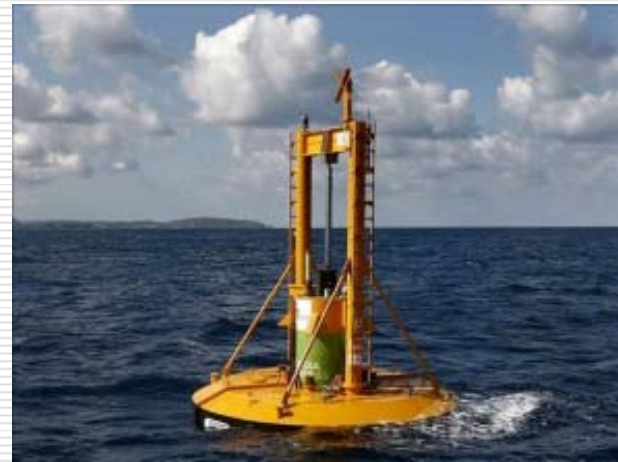


First phase: 40kW buoy installed, the submarine cable and the substation

Second phase:
9 buoys will be placed at a later stage and will have an initial output of 125 kilowatts.

PILOT WAVE PLANT

Distance from coast: 1.5 - 4 km



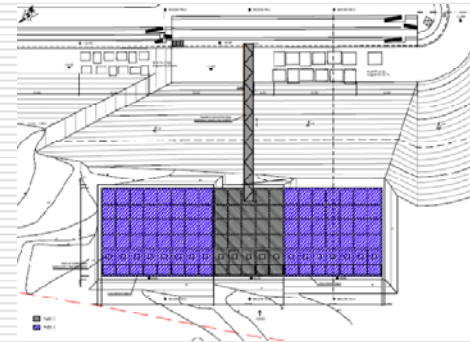
Estimation: once brought into use the 10 buoys, the annual electricity production plant will be equivalent to domestic consumption of 2,500 households.

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4. SOME ONGOING PROJECTS: SEA ENERGY, A GUARDA (GALICIA)

Oscilation Water Column



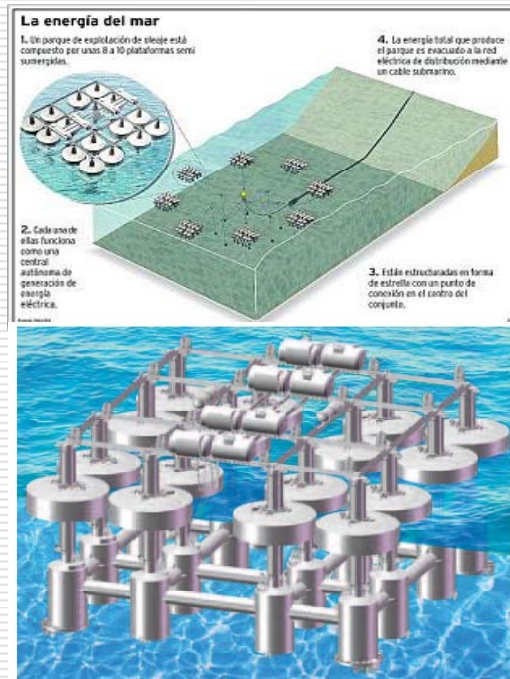
Wave Energy Plant with 20 modules of 20 KW eac. It will use a new turbine developed by a Spanish research team

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4. SOME ONGOING PROJECTS: CALMA PROJECT HIDROFLOT

The prototype is a floating platform with 16 sensors over 40 meters capable of producing 6 MW with the action of waves



Una plataforma polivalente. El movimiento de las boyas, arrastradas por las olas, permite también desalinizar agua

The project is to develop a **pilot infrastructure capturing energy** from the sea, with the patented Hidroflot system.

This **demonstrative prototype (scale 1:1)**

The central base of the wave energy is located **2 miles boat off the coast**, and it will actindependently evacuating all the energy generated by a **submarine cable connection to the network-reception electrical ground**.

The selected location for the installation of the plant production is the **Asturian coast**, occupying an area of **0.090 Km²**

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5. APPA Marine PROPOSAL

- Proposal document of APPA Marine

HOW TO MAKE SPAIN A LEADER IN OCEAN ENERGY

- Harnessing local conditions:
 - Available resource.
 - National Research and technology.
 - Well proven model of success for RES
- Governments support (autonomous and central governments)
 - **Regulatory stability**
 - **Economic incentives**
 - Overcome administrative barriers:
 - **Simplification of administrative procedures and permissions .**
 - National Plans (R&D&D)
 - Planning development program to achieve commercial applications at medium and large scale.



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5. APPA Marine PROPOSAL

CURRENT CONTEXT:

1. Stakeholders

- Private enterprises (grouped within APPA Marine)
- Regional Energy Agencies (EVE, Sodercan, FAEN)

2. Government support

- Elaborating a Map of Wave Resources
- Inclusion of marine technologies in the Renewable Energy Promotion Plan.

3. Technologies “made in Spain”

- There is a strong involvement of Spanish companies in this sector, as evidenced by the various projects that have emerged in different regions:
 - Basque Country, Cantabria, Asturias, Galicia, Canary Islands...

We believe that we must promote the technological development of systems and equipment for the acquisition and processing of wave energy from patents and Spanish technology.



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5. APPA Marine PROPOSAL

CURRENT CONTEXT:

4. Impulse to R&D

4.1 Test Facilities

- Government support (EVE: Biscay Marine Energy Platform; Sodercan: Maritime Engineer Great Tank; Canarias: PLOCAN).
- Essential item for technologists to test their prototypes with a reasonable cost.

4.2 ACCIONA is leading "Marina Project":

- Hosted in the 7th Framework Programme for R&D of the EU. Budget: 12,8 millions €.
- Consortium of companies, research institutes and universities from 12 EU countries .
- The aim is to develop structures on deep water capable of harnessing the wind, waves, tides and currents .

4.3 Iberdrola Ingeniería is leading the Ocean Lider Project

- The world's largest research project of ocean energy
- Budget: 30 million €. Involving 19 companies and 25 research centers



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5. APPA Marine PROPOSAL

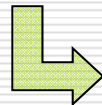
□ POWER GOALS 2020

- Taking the example of estimations of installed capacity in other countries, the proposal could be:

	2005	2010	2012	2014	2016	2018	2020
MARINA	0	10	100	200	300	400	500

□ TARIFF PROPOSAL BY LEVELS

- Experience shows that the development of marine energy in other countries has been due to the fixing of an attractive fee for the exploitation of these technologies.
- If there is no definite price:



uncertainty between developers of marine energy. Nobody invests or endorses a project without knowing the return on the investment. Investors are moving to Scotland, Ireland and Portugal



Does not develop the marine sector in Spain



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5. APPA Marine PROPOSAL

- Therefore we consider it essential to fix a fee to attract investors, to activate the market to allow the development of the sector.
- It is proposed to establish a concrete fee by levels, as exemplified by the experience of Portugal, that provides an attractive and competitive rate initially, which gradually decreases as the power goals are reached.

1. Experimental level:

To reach 50 MW installed : **45c€/kWh**

2. Demonstrative level:

To reach 200 MW installed: around **30 c€/kWh**

3. Commercial level:

Based on 200 MW installed, up to 500 MW projected in 2020



If we miss this train of opportunity, we will be left behind in the European market .



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5. APPA Marine PROPOSAL

RESULTING SCENARIO :

- Reduction of external energy dependence
- Ability to maintain world leadership in renewable energy generation.
- The development of this sector will result in a consolidation of the industry.
- It will have an economic impact:
 - Contribution to GDP, mainly from R&D in this technology and the supporting industry.
 - Generate business opportunities for traditional sectors .
 - Positive environmental and social impact.
 - It will facilitate the generation of skilled employment.



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5. APPA Marine PROPOSAL

STRATEGY TO MAKE MARINE POWER IN SPAIN A PROFITABLE PRACTICE

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Legal Framework:

- That considers developmental difficulties.

Technological Development:

- Coordinate R&D activities.
- Improve spanish technological position.
- Promote the creation of research and demostrative infrastructures.

CONCLUSION:

Spain should explote local features and design a strategy to achieve a legal framework and technological developments that will allow offshore energy to gain considerable significance in the renewable mix in the year 2020 .





SPANISH RENEWABLE ENERGY ASSOCIATION

***THANK YOU VERY MUCH FOR
YOUR ATTENTION***

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