Conferência Anual do Centro de Energia das Ondas
Energias Renováveis Offshore e o seu Potencial nas Regiões Ultra-Periféricas
Legal Framework

• Created: DECREE Nº 5/2008 de 08 de Janeiro
• Base Lease: DECREE Nº 238/2008 de 15 de December
• Concession agreement: RCM Nº 49/2010 de 1 de July

Contract signed on 20 October de 2010
Area = 320 Km$^2$

An open space, on the Atlantic coast, devoted to the development of marine energy.
Contemplating the:

- test (proof of concept)
- Development (pre-commercial)
- Exploitation (commercial)

With feed in Tariff

- differs from other similar spaces due to the possibility of developers continuing developing their projects until it became a wave park.
- No need to move for new location and start a new license process.
Characteristics of grant
(not energy producers)

- Grant for 45 years;
- Authorization for the deployment of connection infrastructure to public electricity network;
- Use of water resources of the public water domain;
- Jurisdiction for the award of licenses and supervision.

One point stop
Development plan-3 phases

**phase 1 (2011-2013)**

- to equip the ZP with electrical connection to the network up to 12MW (4x2MW)
- Aim - ZP ready to receive, in demonstration of concepts scheme, electricity generation equipment (wind and waves) in the summer of 2013

Equip the ZP with a test area
Development plan in 3 phases

**phase 2 & 3 (as needed)**

- Injection up to 80 MW (pre-commercial **phase 2**)
- Injection 250 MW (commercial **phase 3**)

For marine energy systems
What you're we doing

✓ Development plan;
✓ Budgeting;
✓ Scope extension request (floating offshore wind).

Still in 2011

• Geophysical and environmental characterization (running);
• Pilot Zone access regulation (RAZP);
• Basic Engineering studies for infrastructures (running);
  ➢ Offshore electrical connection to the electric network.
Geophysical characterization

• Public service (available free of charge)
• Wave measure
• Geologic seabed profile
• Water Chemistry analyze
• Surface and bottom currents characterization
• Tides
A possible test zone configuration (still under study)
What we already know of PZ

• Good swell, without being too destructive;
• Rare storms, only in winter;
• Good working windows, with swell, without wind, even in winter;
• Good seabed, sand and gravel without outcrops;
• Near Ports and Shipyards.

Example of ZP seabed profile ⇒
Nearest ports:
Figueira da Foz - 35,3 km / 19 MN
Nazaré - 32,5 km / 17,5 MN
to the center of Pilot Zone
Common North Atlantic wave system: The Greenland fetch
Services available near Pilot Zone

- Universities and institutes devote for offshore R&D
- Shipyards
- Electrical industry
- Maritime operators
- Ports
- other
So far (without disclosure)

- 11 technologies demonstrated interest in becoming in PZ, in demonstration of concept scheme;
- Of these, 3 with pre-registration;
- One technology is offshore wind;
What are the advantages of wave energy

- Stability
- Good prevision

Better for grid integration

Good for ultra-periferic regions, special the isolated ones

So:

Looking to Madeira (equal real for other volcanic islands, like Azores)
(nautical chart, next slide)
We can conclude that:

- No seabed for offshore floating devices

The best technology will be, probably, the “near shore devices” or shore devices.

As example:

- Wave roller ([www.aw-energy.com](http://www.aw-energy.com))
- Oyster ([www.aquamarinepower.com](http://www.aquamarinepower.com))
- OWC Pico Power Plant ([www.pico-owc.net](http://www.pico-owc.net))

Which are in a more mature state of development