

Potential impacts of marine energy systems and the problem of sustainable development in coastal zones

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Introduction

- Marine renewable energies (MREs) must be seen:
 - From an energy mix standpoint
 - From a coastal zone management standpoint
- Need for MREs:
 - Context: climate change, Kyoto Protocol;
 - European Council of 8-9 March 2007 : binding target of a 20% share of renewables in overall EU energy consumption by 2020.
- But MREs are also a factor of coastal pressure:
require space.
- Problem: how to assess MREs' impacts on coastal zones? The case of wind farms.

Wind energy

- Wind energy = possible way of increasing renewable share in energy balance.

- France 2006 : 1.3 GW installed capacity, but ...

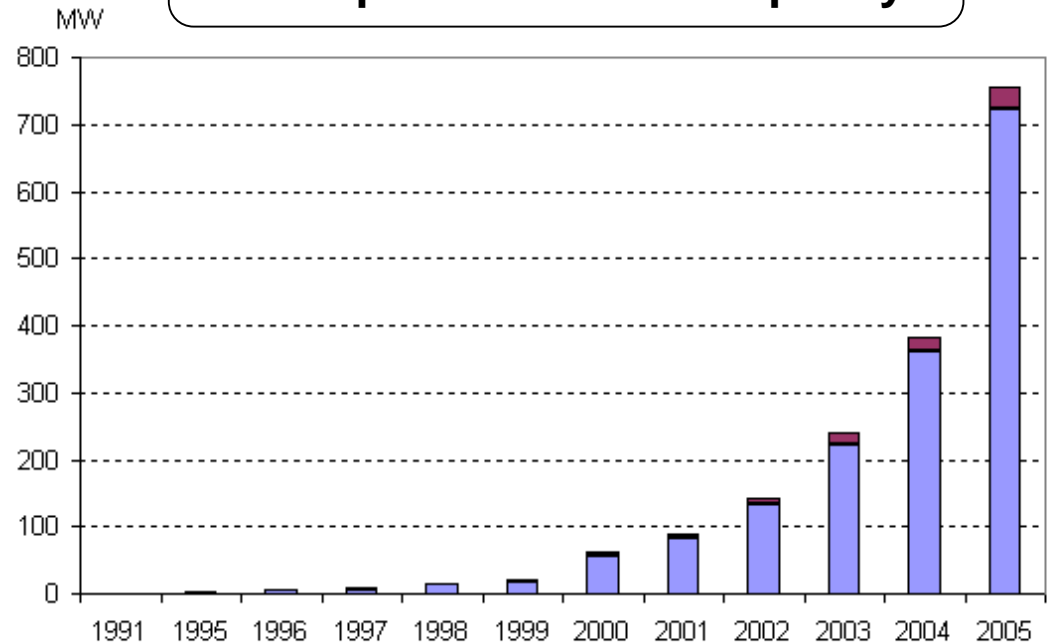
- Germany : 18.5 GW

- Spain : 10 GW

- Denmark : 3.5 GW

- France has the second highest wind power potential in Europe.

France
Wind power installed capacity



■ Mainland
■ Overseas islands
Source : ADEME

Outlook

- How to comply with EU Council's commitment for 2020 ?
- Little margin of manoeuvre in terms of increasing hydro power generation capacity
- Climate change → risk for hydro power in terms of water availability
- An important effort is needed to meet Council's 20% renewable share of energy consumption.

Offshore wind farm project in France

- No offshore wind power plants in France so far but several projects since 10 years
- **Enertrag project** submitted for completion in 2008, off North East Normandy (North France)
 - Installed capacity : 105 MW
 - Generation : 310 GWh
 - 21 wind turbines



Carte de situation du parc éolien offshore



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Impact assessment on coastal zones

context :

- Intense pressure on coastal zones in France like everywhere:
 - Fisheries, aquaculture, aggregates...
 - Tourism and leisure
 - Demography increase
 - Pollution
 - Populations reluctant to let offshore wind farms develop

Impact assessment on coastal zones

Remarks on assessment methodology :

- France: impact studies, under regulation, include:
 - Impacts on Environment (over the life cycle of the plant)
 - Impacts on other coastal zone uses (conflicts)

- Impact studies in monetary value terms are not frequent in France
 - No systematic request from administration
 - **But** economic studies were made on impacts of oil spills.

Impact assessment on coastal zones

Two kinds of impacts

- Impacts on commercial activities: e.g. fisheries, etc.
 - Offshore wind farm area → « MPA », fisheries and navigation.
 - equivalent to a change in business conditions
 - e.g. loss of access to resources and to space
- Impacts on non market activities: e.g. leisure, some forms of tourism, boating
 - Impacts on economic agents' welfare : space , natural landscapes

Impacts on commercial activities

■ Impacts on commercial fisheries

● Loss of available resources ?

Problem: how to value the loss?

- Loss of sales: at what price?
- Change business conditions and running costs → change pricing and earnings.
- Alternative methodology : value loss at compensation costs.

● « Marine Protected Area » effect + « reef » effect

- Models exist to estimate such economic effects
- They require a good knowledge on resources and active cooperation with fishermen.

Impacts on non market activities

- No generally accepted assessment methodology
- Economic assessment methodologies tentatively applied (US, Europe): e.g. facility building projects.
- Aim is to **reveal the value** (cost or benefit) of a given project for stakeholders:
 - Travel cost method: → additional welfare/loss created by the gain/loss of leisure activities.
 - Methodology problems: who are stakeholders (ie populations concerned)? Value of time, etc.
 - Other methodology : contingent valuation method.

Conclusion

- EU commitment further to the Council of March 2007 will probably boost wind farm construction in France.
- How to assess impacts on costal zones?
Methodologies exist but discussions remain

Web site:

<http://www.ifremer.fr/drogm/Realisation/carto/Eolienne/EnergieEolienne.htm>