

Support mechanisms for RES-E in the UE: Lessons from the Spanish experience

Ana Madurga
Department of Renewable Electricity Regulation

amadurga@iberdrola.es

Berlin, November 3rd 2006

IBERDROLA RENEWABLE ENERGIES

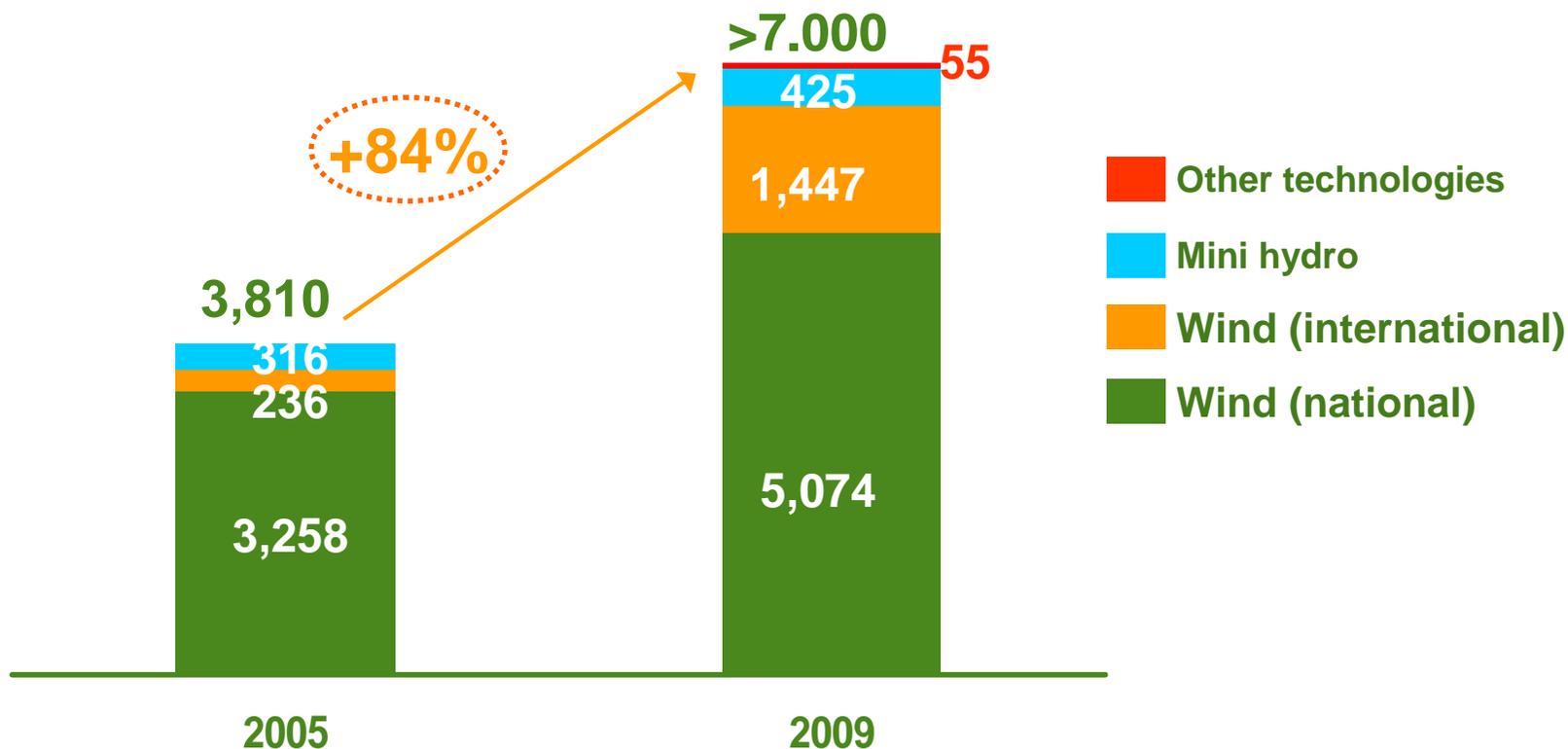


New renewables strategic plan 2007-2009



Growth of 84% in the installed capacity...

Power installed evolution (MW)



... with an average growth of 800 MW annually

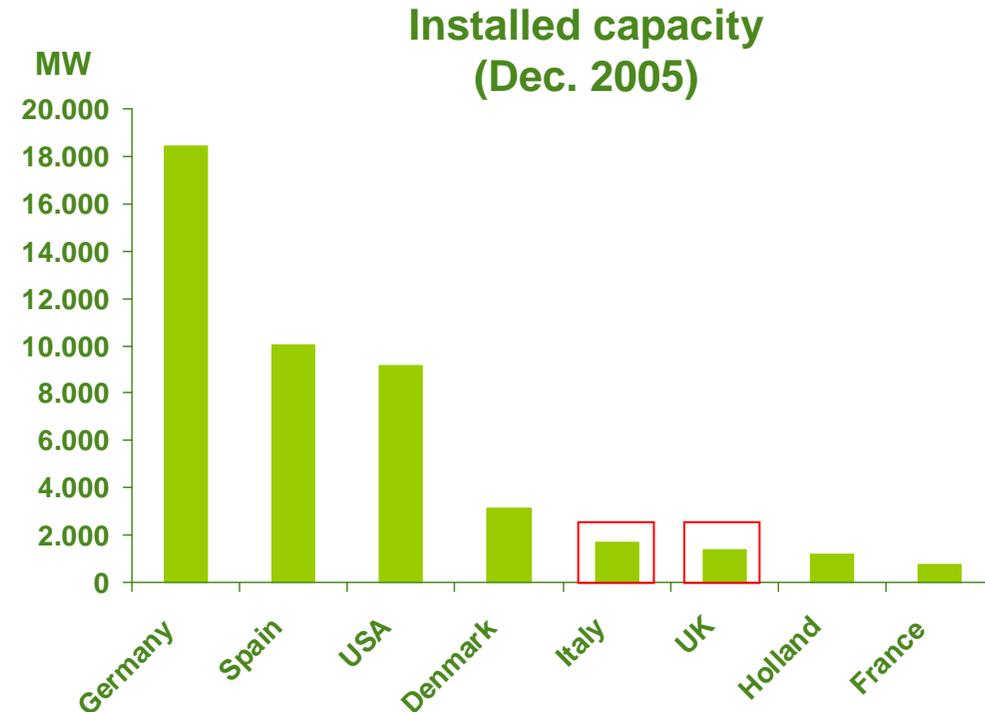
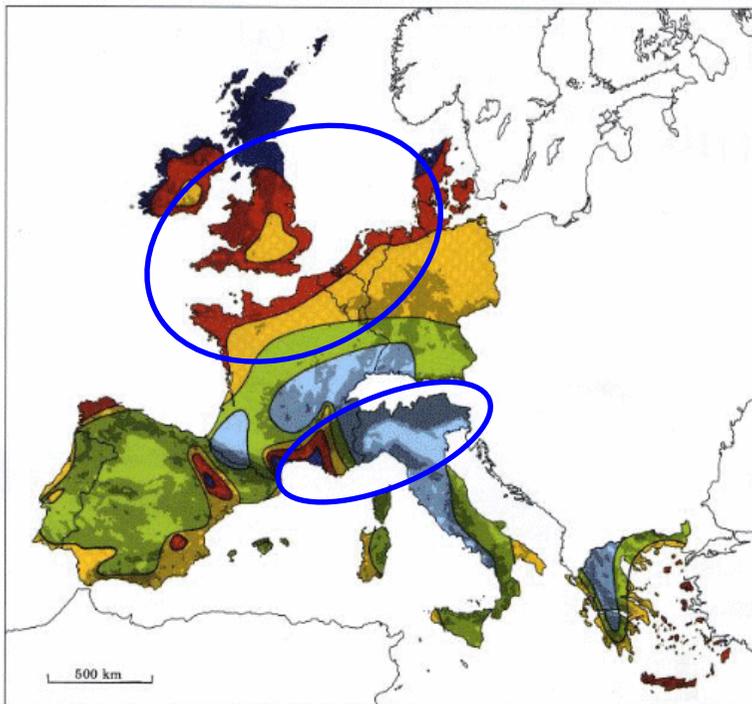
Renewables International expansion



International expansion as growth driver



The countries with the most installed wind capacity are not those with better wind resources, nor are they the largest in terms of surface area



- UK has very good wind resources but has little installed wind capacity
- USA surface area is three times the size of EU-15 surface area, but it has only 25% of its installed wind capacity
- Germany and Spain do not have the best wind resources but they are world leaders in this industry

The key for the development of renewables is political will (backed-up by social support). It would allow an optimal regulatory environment

Support for renewables is determined by:

- Network access
- Guaranteed purchase of all production

Common policy in EU countries

- Economic support

Different systems, different results

Requirements

Without internalising environmental and other costs, renewable generation, a capital intensive business, is more expensive than conventional technologies.

As a result, investment requires support systems.

An effective support framework must be based on three basic pillars:

1. **Predictability:** the system must guarantee the remuneration over the life of the asset (long-term perspective, with profitability over 20 years).
2. **Stability:** the legal framework must be based on criteria of non retroactivity.
3. **Profitability:** defining a sufficiency scenario, necessary for the development of investments.

The choice of the appropriate support model is the **KEY**

Systems based on feed-in tariffs are the most widely used and efficient in the EU

COUNTRY	Installed Capacity (MW)		Support mechanisms	
	In year 2005	End 2005	Feed-in Tariff	Certificates
Germany	1.808	18.428	✓	
Spain	1.764	10.027	✓	
Denmark	22	3.122	✓	
Italy	452	1.717		✓
UK	446	1.353		✓
Netherlands	154	1.219	✓	
Portugal	500	1.022	✓	
France	367	757	✓	
Sweden	58	500		✓
Austria	218	819	✓	
Greece	100	573	✓	
Bélgium	71	167		✓
	5.960	39.704		

- 90,5% of total wind capacity in the EU (39.704 MW) has been installed in countries with feed-in tariff systems*.
- 82,7% of new wind capacity installed in 2005 (5.960 MW) was in countries with feed-in tariffs.
- No significant examples of successful green certificates systems.

* By the end of 2005

FIT: Successful and effective framework

Current support framework for wind energy in Spain



- Established in the 1997 Electricity Law (Special Regime)
- Regulated by the Royal Decree 436/2004
- Payment is indexed to the Tarifa Eléctrica Media – TEM (Average Electricity Tariff)

$$\text{TEM} = \frac{\text{Total estimated cost of the electricity system}}{\text{Estimated demand}} = 76.4 \text{ €/MWh in 2006}$$

- TEM evolution defined by Royal Decree until 2010

Remuneration Options	
Regulated Tariff	Market
% of TEM (80-90%)	+ Market price + Premium (50% of TEM) + Capacity payments - Cost of deviations
↓	↓
Independent of pool prices	Similar to the economic regime for conventional energy + economic incentives

- Remuneration is defined for the entire life of the asset
- Once an option is chosen, the operator must keep it for at least one year
- There are additional revenues by controlling the reactive energy under the grid requirements
- The system can be reviewed every four years, to be applied only to new assets

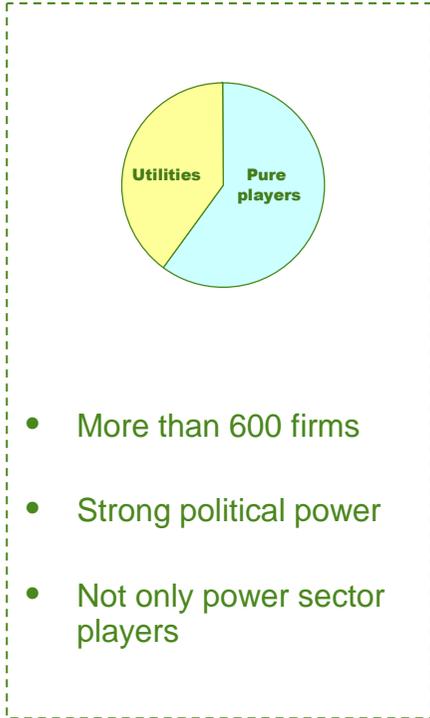
Regulatory Security



Legal Security

- Special regime defined by LAW (1999 electricity law)
- Renewable targets defined by EU directive
- Regulatory developments of the Spanish regime defined by a Royal Decree

Special regime market



Social support

- All political parties
- Region and municipal (income sources)
- General public support
- Ecologist Groups
- Trade Unions

No enemies and great social political and economic support
=
No possible changes with retroactivity effect

The two pillars: co-ordination and optimisation

The European Commission Communication has stated that competing national schemes are healthy at least over a transitional period. No harmonisation appropriate at this stage...

...But a coordinated approach to support schemes based on 2 pillars:

- Cooperation: Sharing of learned lessons
- Optimisation: concerns economic mechanisms and cost-effectiveness but also the removal of administrative and grid barriers.

Improve our systems

How are we trying to do that in Spain?



Improve the quality of the energy:

Real-Time programation: The windfarms have to be able of being managed on real time by a Central Control connected to the System Operator Dispatch (CORE)

Voltage Dips Response: The windfarms must stay connected through the failures of the grid that create voltage dips

Improve the efficiency:

Voices claiming too high prices for wind in the market: cap&floor

Evolution different from TEM