

Regulatory Framework for Renewable Energy Development

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September 27, 2011



GARRIGUES

MEDIO AMBIENTE

- I. BACKGROUND
- II. SOME DATA ON RENEWABLES IN SPAIN
- III. COST EVOLUTION FORECAST
- IV. KEY FACTORS FOR RENEWABLES DEVELOPMENT
- V. SUPPORT MECHANISMS
- VI. OTHER LESSONS

ENVIRONMENT

ADVANTAGES

- Renewable sources
- CO2 free

DISADVANTAGES

- Environmental impact

SEGURIDAD ENERGÉTICA

ADVANTAGES

- reducing energy dependence
- Diversification of sources

DISADVANTAGES

- minor programmability
- limited capacity
- Quality of supply

DESARROLLO ECONÓMICO

ADVANTAGES

- Creation of local economic activity
- Creating jobs

DISADVANTAGES

- Higher generation costs
- The need for a compensation framework support

Looking to the future - Employment generation



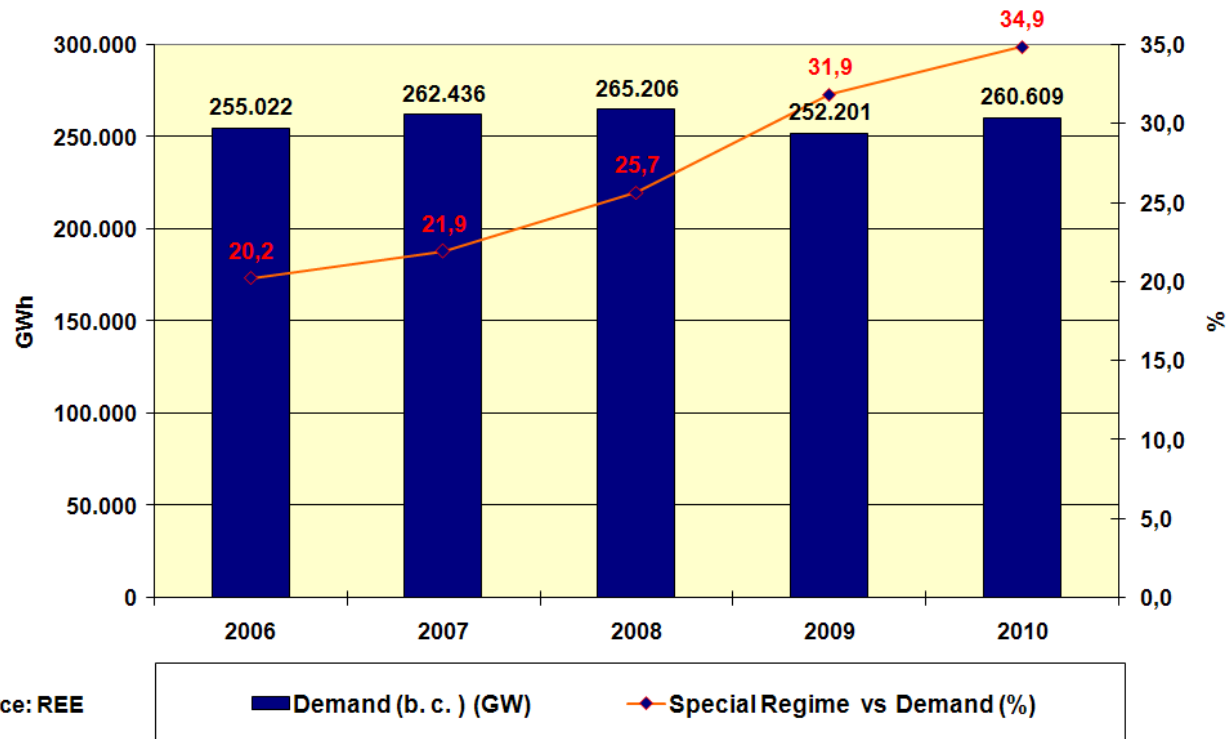
Employment generation								
(Studies review)								
Employment	España			Europa 2008	Europa 2020	Europa 2030	Fuente	Comentarios
	Directo	Indirecto	Total					
Wind	20.800	37.700	58.500	154.100	330.000	377.200	EWA 2007	Main growth in Off shore
Solar PV	17.000	9.800	26.800				ASIF, Anual report 2008	
Total	89.000	99.700	188.700				istas/CCOO, 2007	Approximately 50% increases the numbers of the two previous studies
Total					650.000		European Commission, 2006	>50% in biomass
After this review of studies, we highlight								
1	Renewable energy generates enough jobs. A number could be 3 jobs / MW, but it is a must to keep the growth and leadership for sustainability.							
2	It seems that the greatest growth potential is in off - shore wind power and in biomass							

Production of the Special Regime

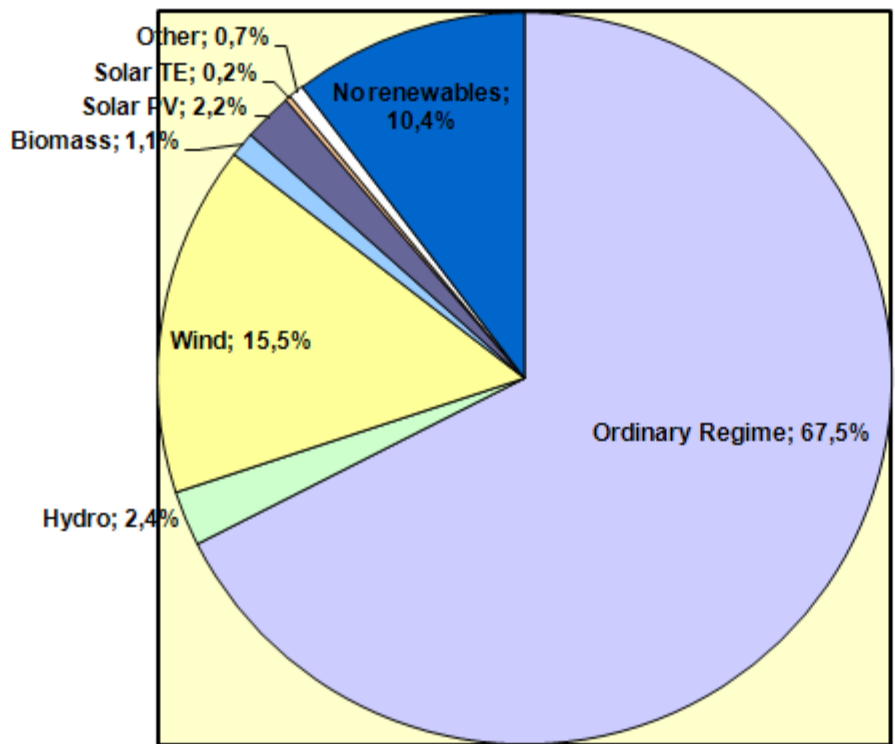


- The special regime production in 2010 was 90,903 GWh, mainly from wind farms and no renewable installations. This production corresponds to 34.9% of total national demand.

Special Regime Energy vs Demand (b. c.)

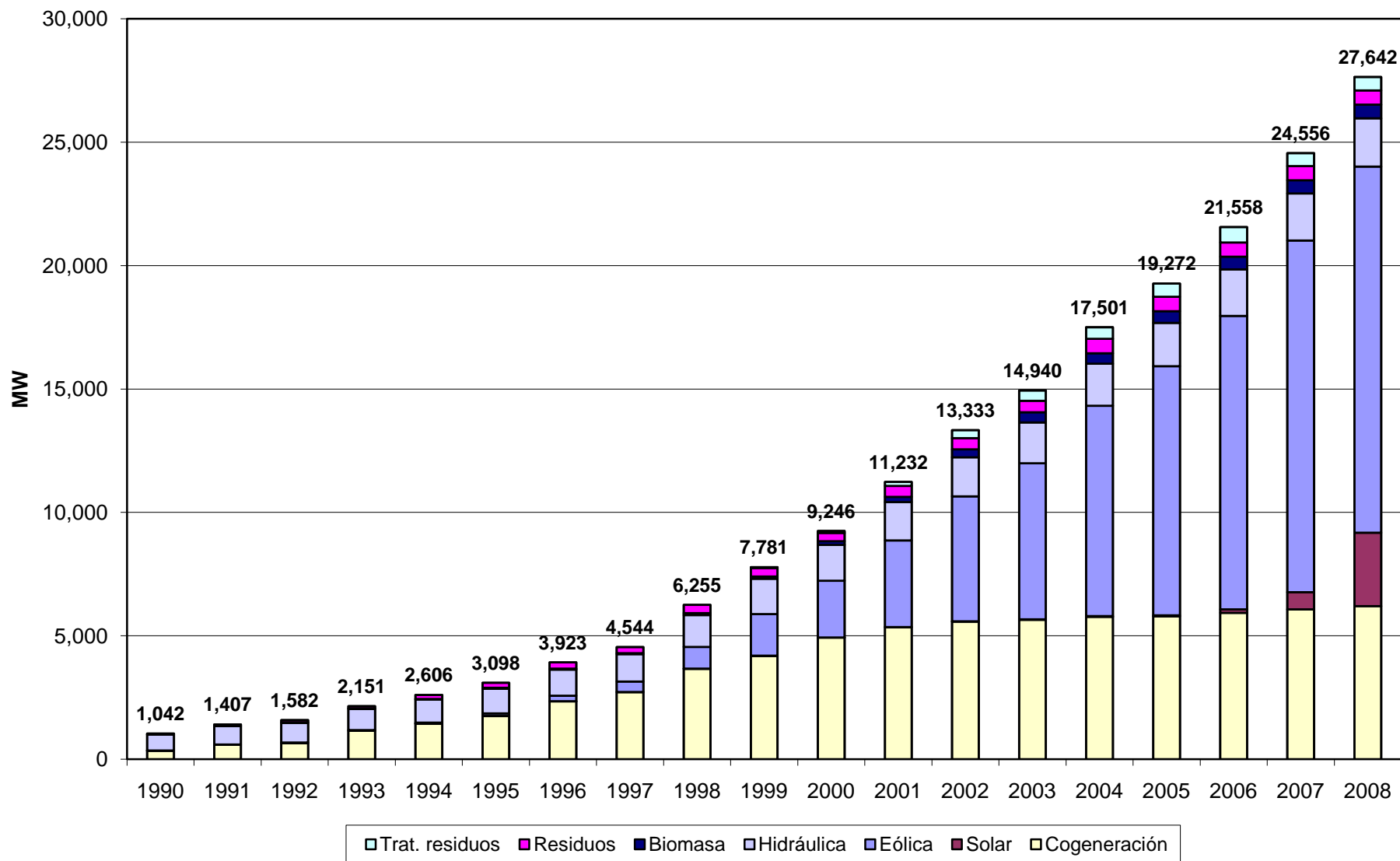


Electricity Balance 2010 by Special Regime Technology

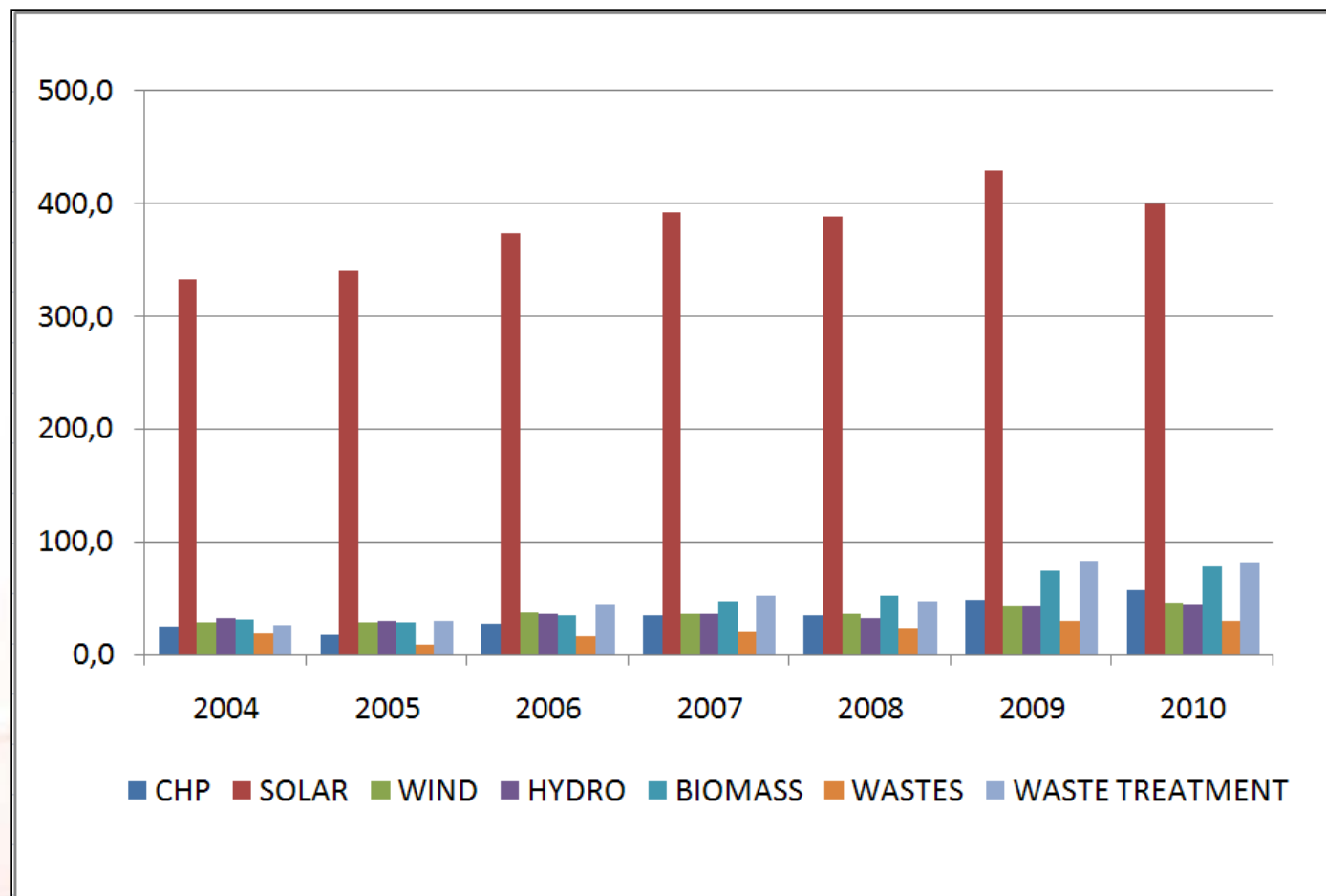


Source: REE

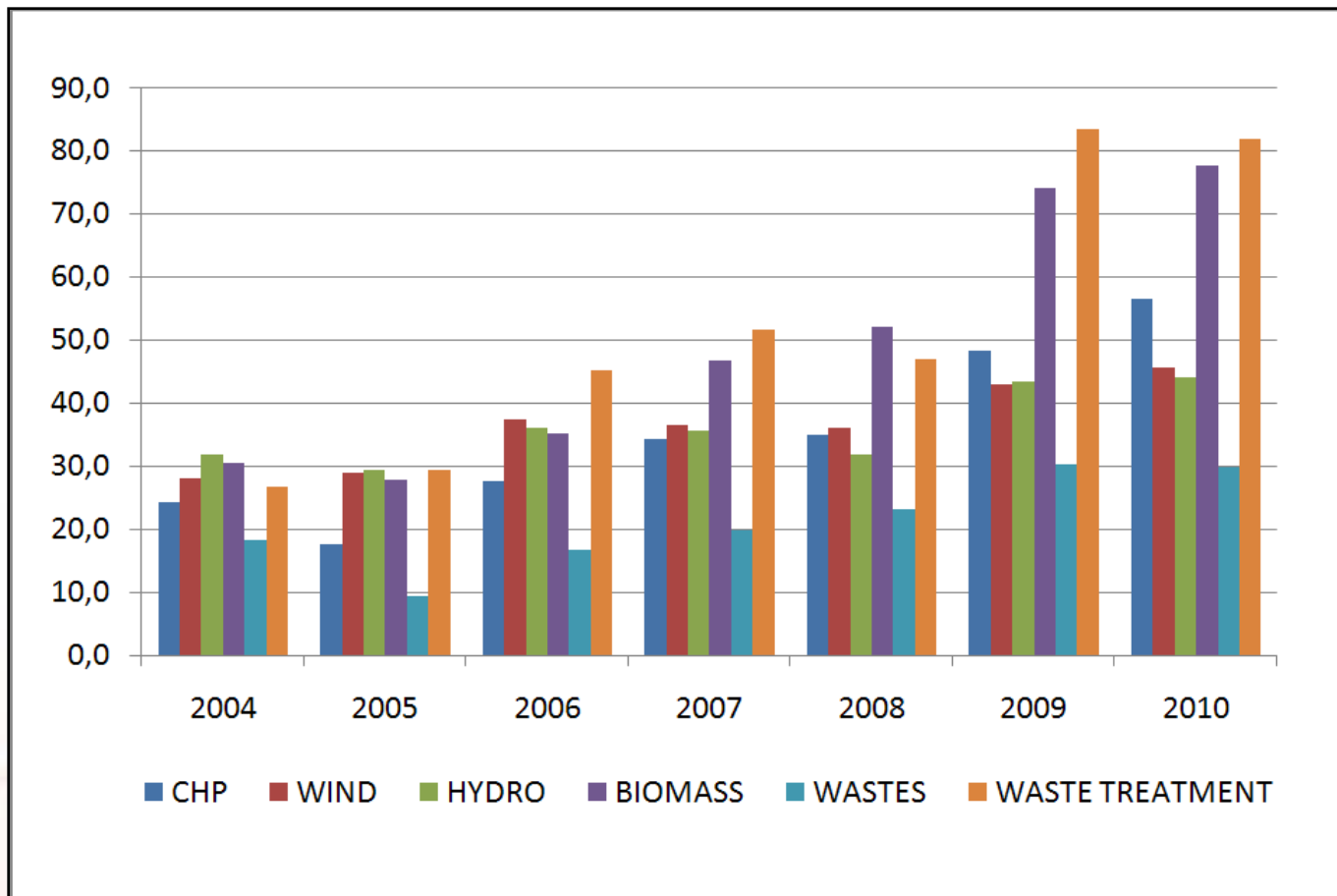
Evolution of the Installed Capacity (by technology)



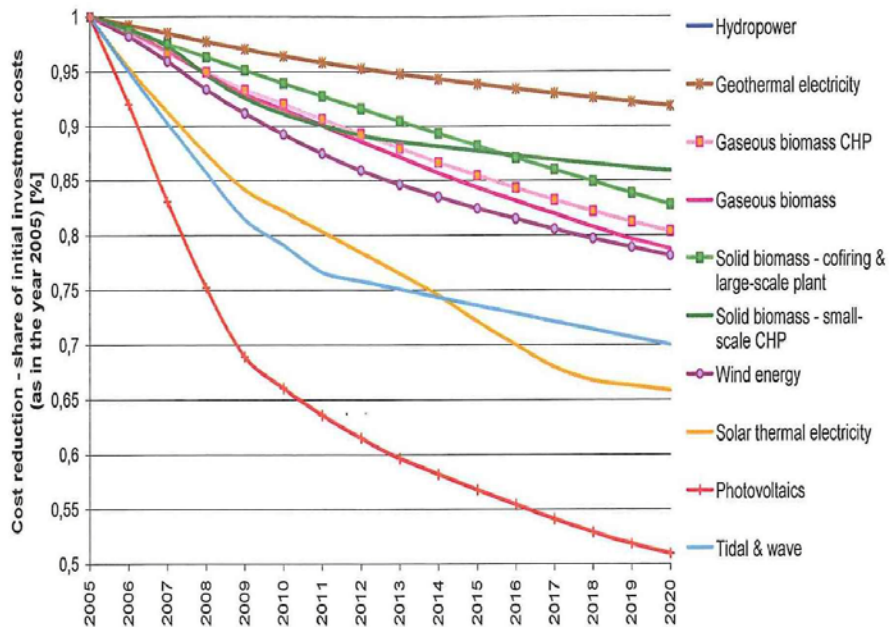
Renewable primes evolution (€MWh)



Renewable primes evolution (€/MWh)

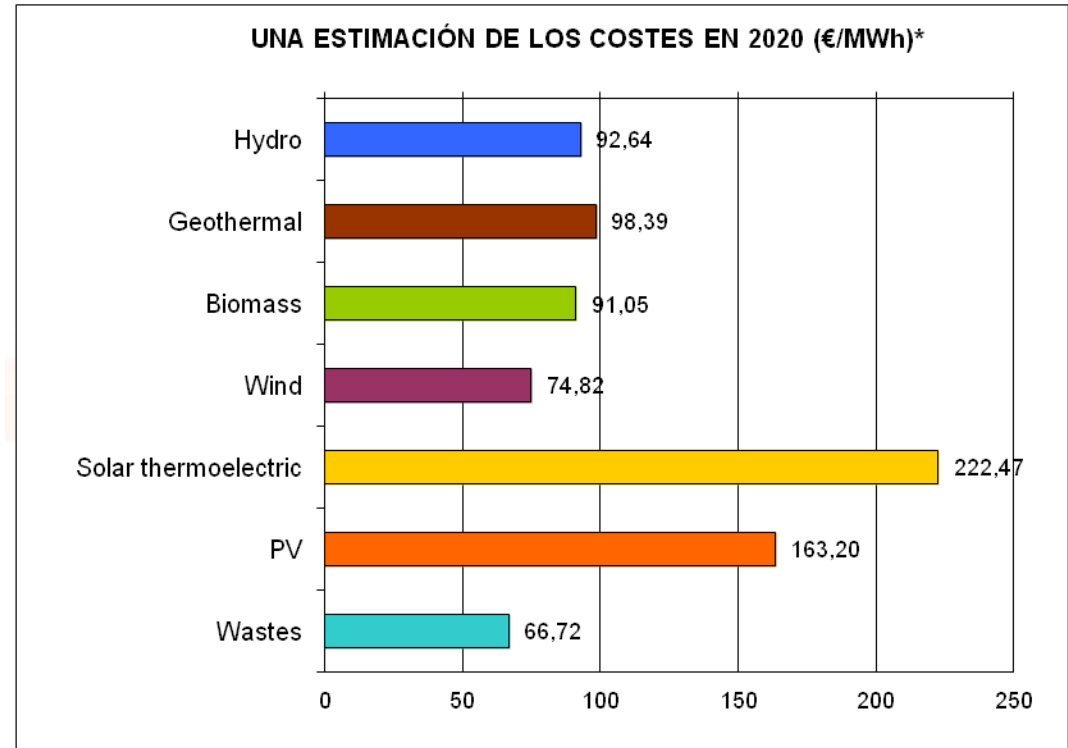


COST REDUCTION FORECAST



Source: European Commission, 2007
Garrigues Medio Ambiente analysis

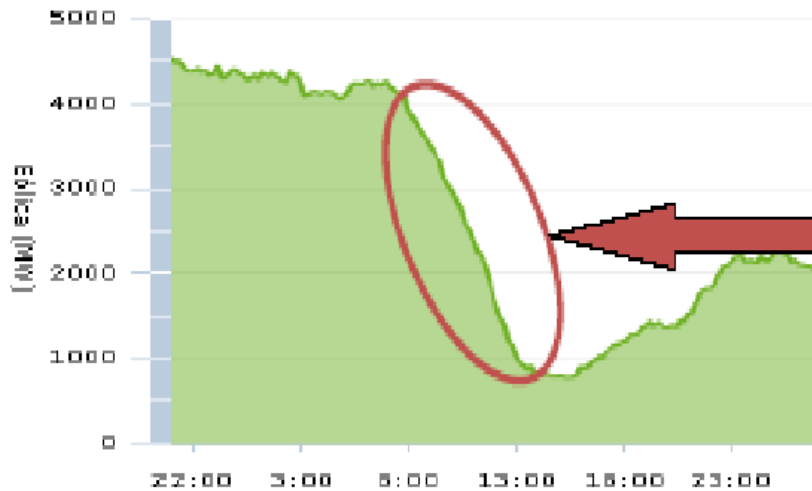
UNA ESTIMACIÓN DE LOS COSTES EN 2020 (€/MWh)*



According the forecast exercise, the wastes and wind generations seems the more competitive ones.

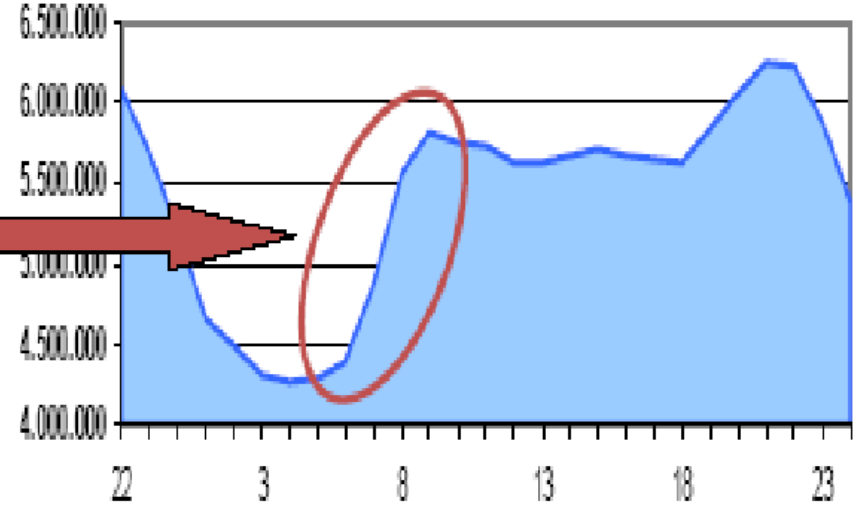
The renewable generation requires a thermal back up capacity

Wind generation, the 23th june



Fuente: REE

Thermal generation, the 23th june



Fuente: Enagás

- Sufficient economic and industrial development
- Availability of resource: wind, solar, biomass.
- Access to a robust and interconnected power grid on the territory
- Long-term compensation framework stable and equitable
- Authorization procedures transparent, swift, objective and fair

Each of these aspects presents different challenges and difficulties ...
... And we have learned some lessons, but there are still many things to solve

- Resource use where it exists versus distributed generation (maximum size of facility).
- Not all resources are equal → need for different approaches in the allocation time:
 - Wind power: is it necessary a maximum size for the facilities? On-shore / Off-shore
 - Photovoltaics: Available in a large part of the territory to promote distributed generation → avoid geographic concentration of facilities
 - Thermo: resource restricted by the need to direct radiation and water availability. Do you store heat or more hybridization with GN?
 - Biomass: The size and location of the plant depend on the availability of the resource.

- Renewable resource and population usually do not match → where there is resource usually there is no grid. Grid access is a scarce.
- The early bird catches the worm.
- The early bird catches the worm ... if you can pay for it.
- Distribution of network access: facility criterion versus ownership criterion.
- How much cost to connect to grid? Need to plan for grid growth and streamline costs to be borne by developers

Feed in tariff

- **Advantages:**

- Clear long-term compensation scheme
- Facilitates third-party financing and market development

- **Disadvantages:** Difficulty in knowing the real costs of each technology and its evolution over time. If the government is wrong in their estimates:

- Excess:

- Accelerated development → not achieved the goal of technological development and cost reduction
- Additional cost of renewable systems throughout the life of the facility.

- Default:

- no technology is developed.

Is the Feed in tariff revised/corrected a solution to these problems?

Auctions

- **Advantages:**

- the regulator sets the amount and the price is set through the auction procedure → increased competition on price formation

- **Disadvantages:**

- Major administrative barriers: public tenders to access to the capacity to install
- Major barriers for independent developers → risk of increasing market power of large players
- Risks associated with the review of remuneration in the case of drastic changes in economic conditions

Green certificates + quotas

- Advantages: The regulator sets the amount and let the market set the price: theoretical increased competition in price formation
- Disadvantages:
 - Developmental delay for uncertainty in compensation
 - The need for a different certificate by technology
 - Risk of overpremiums or subpremiums (high volatility) in medium / long term
 - In practice, the regulator should also set a cap and a floor for green certificates, and a fine for non-target achievement
 - Similar mechanism to the premium cap & floor but with higher costs of system administration (security assurance of origin issue, transfer and cancellation of certificates, etc.).

- Support systems must be flexible:
 - Wind: The premiums must be adjusted with the market price (Cap and floor)
 - Biomass: the system must also support the logistics and safe supply of raw materials
 - Solar PV: The system should place special emphasis on R&D for cost reduction

- Combined cycle: They'll be the backup power. There must be incentives to ensure its profitability despite the low number of hours of operation.
- Hydraulic and pumping: The system must recognize their contributions to the system
- Grid: It is necessary to strengthen it to the massive incorporation of renewable
- Demand management: Encouraging flexible consumption to match as far as possible renewable generation.
- In short, the promotion of renewable energy requires a regulatory framework consistent with the objectives and circumstances of each electrical system

THANK YOU



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