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Spanish coal?: “Gone with the wind...”

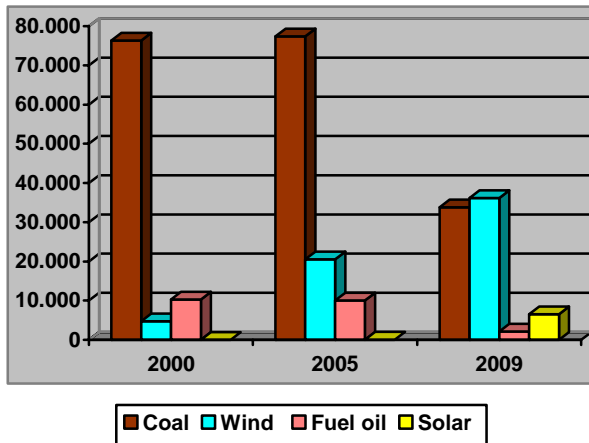
2009: wind power overtakes coal and solar power generates more than oil, while emissions and electricity prices go down

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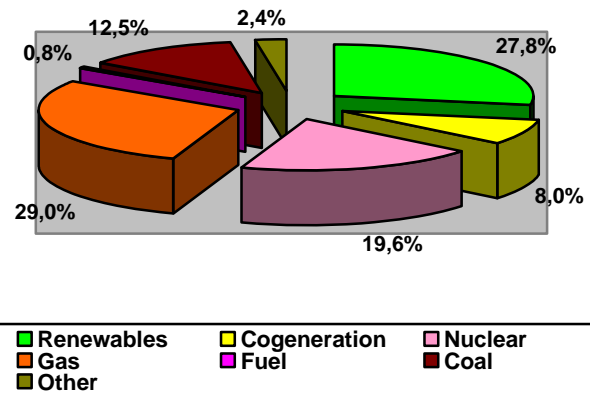
Renewables go up... +63,8% compared to 2005

Despite the economic recession and the growing opposition of some incumbent utilities, **Renewable technologies (RES) in Spain have continued to grow and have achieved a 30,1% demand coverage¹** in 2009 coming from just 18,7% in 2005. The two most remarkable data about this important growth are that this year **wind power has overtaken coal production** (14,5% of total demand vs. 13,6% for coal), and that solar electricity has grown to become an actor in the power sector: about **2,4% of the electricity delivered to the grid was produced with sun rays**. During last summer demand peaks, solar power technologies generated up to 5-7% of the power required by the system. And on the 31st of December a new record was set when 70% of that day's electricity was generated with RES.

Power generation: Coal vs Wind. Fuel Oil vs Solar, GWh (2000,2005,2009)



Total generation* by technology (2009)

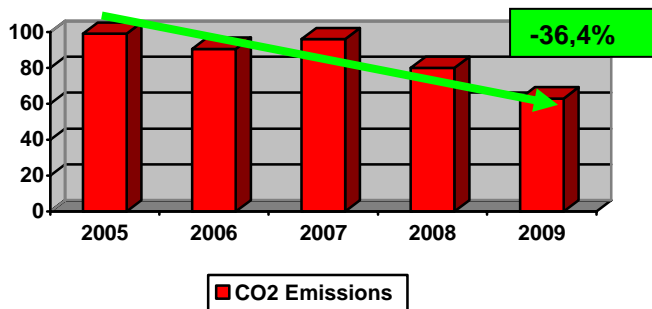


*Total demand is 8% lower than total generation due to exports and transmission losses (Source: Observatorio de la electricidad WWF, REE and CNE)

And emissions go down... -36,4% compared to 2005

Even if 2009 has not been exceptional in terms of rainfall, which always help to reduce emissions by allowing for more hydro production, the combined contribution of more production by other RES and the decrease in power demand (-4,4%) have achieved a remarkable reduction in the CO2 emissions of the power sector: **-21,3% compared to 2008**.

CO2 emissions by the power sector (Mtonnes, 2005-2009)

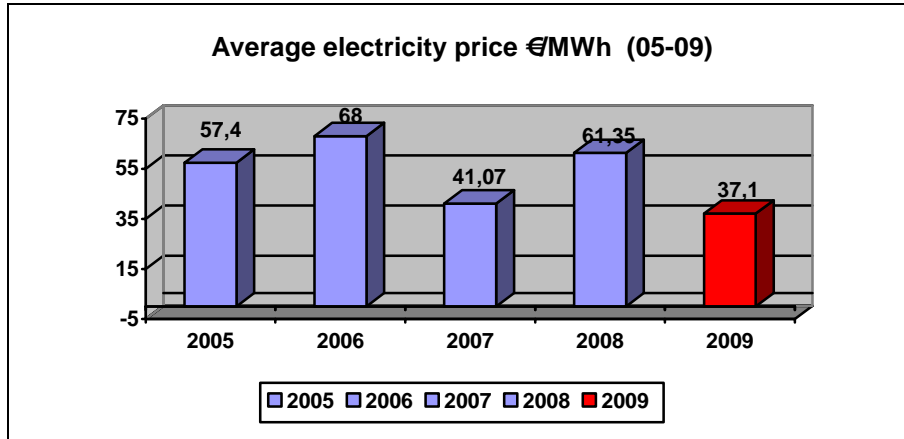


(Source: Observatorio de la electricidad WWF and REE)

And prices also go down...!

-35,3% compared to 2005

The market price of electricity has gone down by 39,5% compared to 2008 and 35,3% compared with 2005. Behind this drop in prices there is a combination of several factors: economic crisis reducing power demand, the ETS Directive, new RES displacing the costliest power plants from the market, and to a certain extent the reduction in international prices of fossil resources.



Source: OMEL and CNE.

Conclusion: a cleaner, cheaper and safer electricity is possible!

Main elements that have worked :

- **A Feed-in tariff system** that attracts power companies to invest in RES plants giving them a medium-long term regulatory framework that has enabled them to secure private financing for the projects. On-time adjustments of the level of the feed-in tariffs are needed in order to integrate technological cost reductions. This will spur further investigation to lower cost. The system has also spurred the development of Spanish RES technology companies.
- **Diversification in the development of RES technologies.** Starting from mainly hydro, first wind and now solar power have become significant players in the Spanish power market.
- **Reduced power demand.** In the Spanish case the reduction in 2009 compared to 2008 was a combination of the economic crisis and efforts by the Government. The identified potential of reduction without net cost for the country is about 20% compared to 2005 consumption. At the moment demand is 0,4% above 2005 data so there is plenty of potential to continue reducing demand.
- **Implementation of an ambitious objective for the power sector in the National Allocation Plan NAP** (ETS framework). The Spanish power sector was allocated a 36,3% reduction in the II NAP (08-12), the highest amongst industrial sectors. In total, the power sector is set to reduce its emissions by 40% compared to the 2005 base level.
- **Relatively high price of CO2 EUAs:** 12,5 €/Ton (Average spot price January-June 09. Source: ECX). Together with the ambitious reduction objective in the NAP II it has prompted power companies to continue shifting production from coal to gas facilities (CCGT).
- **No investment in new nuclear.** Power production by nuclear facilities has reached its lowest level for the last 10 years (-10% compared to the average production for this period) and yet neither the price of electricity, nor the emissions of the power sector have grown. The good thing stemming from the lower nuclear production is that the amount of radioactive residues generated has decreased.

Some “clouds” and the future :

- The “clouds”:
 - o The financial crisis has caused a drop in investment in RES.
 - o Actual over-capacity of the electrical system (the crisis has reduced demand by more than 4%): brand new gas fired CCGT installations are not functioning the expected hours, thus making them not profitable. If more renewable technologies are installed these CCGT installations could become a serious financial problem for the utilities. In some cases, the same utilities that are investing in RES have also invested in CCGT thus a conflict of interests has emerged within the different branches of these utilities.
 - o Accumulated deficit (>20.000 M €) in the power sector (during last five years revenues have not covered the costs for the utilities to generate, transport and distribute the electricity, but the Government has guaranteed that it will pay back the deficit to the utilities during the next fifteen years). Most of the deficit is due to the fact that the electricity prices set by the Government are too low to cover the costs mentioned. Part of the deficit has been attributed to the RES sector, but if the energy imports and the CO₂ avoided by the RES are taken into account, these have actually saved money to the national economy. The new targets for renewables (see point below) are set to increase the amount of money paid to RES owners through the feed-in-tariff system thus becoming a potential factor that could aggravate the deficit for the power sector. Therefore, the sooner the price of electricity is raised to its real cost the earlier will the deficit start shrinking.

- The future:
 - o **The “good news”:** the Spanish Government has made public (in accordance with its draft National Action Plan for RES) its aim to overachieve its target for 2020: instead of the 19,8% objective set in the RES Directive, it has set a 22,7% goal for its final energy consumption. For the power sector this means going from 40% to 42,3%. The aim is to sell the quota above the EU objective to other countries. (WWF Spain has estimated that for the power sector the objective could be as high as 50%).
 - o Also, the Ministry of Industry has extended the current feed-in-tariff system to 2012: wind power is set to achieve 23.000 MW of installed power by 2013 and solar technologies 7.700 MW, of which 2.400 MW are meant to be solar thermoelectric technology. With the combination of these two technologies, solar power could be producing 13.000 GWh equivalent to 5% of total expected demand in 2013. In total, RES could be covering 36,5% of total power demand by that year.
 - o The fact that some big utilities have considerable amounts of wind power makes them “interested parties” in maintaining the actual support system and to improve the management of the contribution by wind power to the electrical sector.
 - o The existence of an important industrial development in the RES sector (also for export) makes it one of the pillars that the Government is using in order to achieve a recovery of the economy. The messages that the USA president, and China are giving on the importance of RES reinforce the orientation of the Spanish Government. Currently, the Ministry of Industry is preparing a National Renewable Plan identifying the potential of RES up till 2030.
 - o Assuming a 1,5% yearly power demand rise for the period 2010-12, with current scenarios for RES, the emissions by the power sector could go down by about 10% by 2013 thus complying with the objective set in the ETS Directive. .

ⁱ All data is referred to the Spanish peninsular power sector. The Canary and Balearic Islands, Ceuta and Melilla are excluded as they have autonomous power systems.