

Economic-Technical feasibility study of the “Sierra de Tineo” wind farm expansion. Tineo – Principality of Asturias (Spain).

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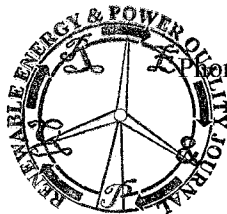
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Abstract. The aim of this work is to explore the possibilities of extending the Sierra de Tineo wind farm. We study the location chosen, the wind resource in the area and simulate the wind regime with computer tools. The economic and sensitivity study of the investment, as well as the new Legislation of the Principality of Asturias is also considered.

Key words.

Wind Energy, legislation, wind resource, economic study, feasibility study.

1. Introduction.

Energy is an essential factor in the forecast for the global economic development. Given the current economic crisis, the energy market presents some problems due to various reasons such as the increasing demand or the fluctuation of energy prices. This has led to the development of energy policies where the prime objectives have focused on energy saving, efficient use and source diversification.

During the last year, the worldwide markets have been characterized by a huge volatility because of the high impact of the financial crisis. This has led to a substantial modification of the sector perspectives, especially in the near future.

According to the World Energy Outlook (WEO-2009), published by the AIE, the global energy demand fell by 1,3% in 2009. This fact, with the low demand forecasts and the liquidity restrictions in the main markets, has led to a sudden decrease of the energetic sector investments.

According to data from Red Eléctrica de España (Spanish Electric Net), the energy consumption during 2009 in Spain decreased by 4,5%. The ordinary regime covered the 70% of the demand, while the special regime the remaining 30%, a 6% higher than the previous year.

The energy strategy of the Spanish Government is summarized in the Plan de Acción Nacional de Energías

Renovables (PANER – Renewable Energy National Action Plan), where it is established, as an aim for 2020, that the renewable sources will represent, at least, the 20% of the final energy consumption. In addition, the Royal Decree 661/2007, of 25th May, regulating the activity of electricity production in the special regime, envisages the development of a Plan de Energías Renovables (PER), for application in the period 2011-2020. This PER will replace the PER 2005-2010 with which Spain has successfully transformed its energy model and also developed a leading industry in some fields.

2. Wind Energy in Spain. “Sierra de Tineo” wind farm.

The development of renewable energies is a priority in the Spanish policy because of its many positive effects on the society as a whole. Spain, with an eolic power close to 20 GW, ranks fourth in installed wind energy behind the United States, Germany and China.

The Spanish region of Asturias ranks tenth and has the 1.9% of the national installed wind power.

Sierra de Tineo wind farm (Figure 1) is composed by 22 turbines of 2 MW of unitary power, which means 44 MW of total power. The expansion of this wind farm is justified as long as a suitable location is found. This location must comply with local legislation, have a good wind resource and be profitable from an economic point of view. The place that we will study is “La Peña los Ourales”, a prolongation to the northeast of the original wind farm.

Sierra de Tineo’s wind farm expansion is in a very advanced stage of processing right now. After the initial report and the urbanistic consultations to the City Council involved, the Department of Industry and Employment of Asturias resolved favorably, allowing the promoter company continue with the process.