

PhD THESIS TITLE

Methodology for the evaluation of the implementation of generation and demand resources distributed in large consumers in competitive markets. Application case.

ABSTRACT:

Worldwide restructuring suffered by electrical sectors together with energy policies that are proposed for the future in Europe aim to an increase of the consumers competitiveness throughout, among other actions, achieving more competitive electricity prices.

This is a critical situation in Spain where the shortcomings of the electricity sector have neither been alleviated under Law 54/1997, which modified the structure of the sector, nor with the successive modifications that have been raised subsequently. The lack of transparency in many processes and the lack of mechanisms for buying and selling electricity have been two key factors in this failure. Furthermore, one of the main reasons for this mismatch is precisely the emergence of a high percentage of renewable energy in the generation and its poor regulatory treatment. As a result, a great uncertainty arises in the owners of renewable generation parks, as far as their remuneration and activity conditions are concerned.

The main objective of this PhD thesis is to develop a methodology that allows industrial consumers for certain characteristics of high energy consumption and the possibility of installing additional renewable generation, to plan and manage in an optimal and dynamic way their resources and energy consumption for the sake of an economic, social and environmental benefit. That implies, basically, knowing the way of consuming energy, the flexibility in the consumption, as well as the external factors that may vary it. Likewise, they need information on the operating costs of the electric power supply system on which they can have influence, and thus face the main challenge, which is to make in advance the decisions that will allow them to optimize energy expenditure by participating, at the same time, in the improvement of social and environmental benefits.

KEY WORDS: Self-consumption, Distributed Generation, Demand Management, Photovoltaic Solar Energy, and active electricity consumers.