

Economic assessment of the participation of wind generation in the secondary regulation market

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Abstract-

The aim of this paper is to analyse the profitability of wind technology as a potential participant in the frequency regulation, specifically in the secondary regulation market. The study is conducted for the Spanish system using existing market rules. However, although this system has some peculiarities the main methodology could be applied in other systems. Firstly, a bibliographical review of the relevant technical possibilities of this technology is carried out. Then, a simulation study based on real data is conducted in order to evaluate the maximum possible incomes. Later, a specific offer strategy is proposed and the income is estimated based on statistical modelling and checked by simulating its performance using the actual and forecasted productions of a wind portfolio. It is concluded that under the current generation structure and regulatory framework in the Spanish system, the incomes obtained from the participation of wind technology would be modest. However, secondary regulation by wind generators might facilitate higher penetration levels of this technology. In the long term, with expected wind generation subsidies much reduced, a greater need for regulation reserves and a possible increase in regulation prices, regulation-related incomes might become a sizeable fraction of the total income of wind generators.

Index Terms- Ancillary services, frequency control, monitoring system, wind power.

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