

Value of perfect information of spot prices in the joint energy and reserve hourly scheduling of pumped storage plants

M. Chazarra, J.I. Pérez-Díaz, J. García-González

Abstract— The value of perfect information of the day-ahead energy prices is studied in the context of the operation of a closed-loop and daily-cycle pumped-storage hydropower plant, participating in the spot market as a price-taker and in the secondary regulation reserve market as a price-maker. The impact of the real-time use of the regulation reserves is also taken into account. Results show that the value of perfect information of the spot prices in the Iberian electricity market decreases if the plant also participates in the secondary regulation service. Several novel indicators to better explain the value of perfect information are presented and evaluated. Finally, several regression models to roughly estimate the value of perfect information of any price forecasting model are obtained. These might help to evaluate the investment in pumped-storage hydropower plants.

Index Terms— Pumped-storage plant; Secondary regulation service; Price forecasting; Value of perfect information

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