

A novel forecasting framework for electricity forward curves

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ABSTRACT

In deregulated power markets, hedging against the volatilities of the spot price is essential to the financial wellness of the players. Therefore, being able to model and predict the dynamics of the electricity forward curve is crucial. Electricity differs from other commodities due to continuous delivery, limited storability, and transportability. Consequently, modeling the electricity forward contracts is a challenging task, in which traditional models must be adapted to address these energy particularities. In this context, the present report describes the difficulties and the results of an R&D project whose objective is to create a methodology capable of model and forecast electricity forward curves. We develop a forecasting framework whose core resides on a novel proposed semiparametric model. This framework combines optimization techniques, dimensionality reduction, and time series analysis to acknowledge the energy particularities, handle scarce datasets of low-liquidity markets, and make probabilistic forecasts of the electricity forward contracts.

KEYWORDS. Electricity forward curves. Probabilistic forecast. Principal component analysis.