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Forecasting Italian hourly electricity demand with multiple seasonal patterns.

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ABSTRACT

Forecasting energy load demand based on high frequency time series has became of primary importance for energy suppliers in nowadays competitive electricity markets. The main characteristic of this time series is the strong seasonal pattern it displays at different frequencies going from the daily up to the semi-annual or annual cycle, along with some calendar effects. In our work we consider an exponential smoothing approach to model the Italian hourly electricity consumption. The data, collected from 2004 to 2010, show an intraday, intraweek and intrayear seasonal patterns. We model the three seasonal components contemporaneously using a parsimonious approach by clustering together days or part of days with common cycle in the week. We show that the model proposed results in remarkable forecasting performance from few weeks to some months ahead.

Keywords: Electricity demand forecasting, Exponential smoothing, Multiple seasonality.

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