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Editorial

Recent Advances in Energy Time Series Forecasting

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Abstract: This editorial summarizes the performance of the special issue entitled Energy Time Series Forecasting, which was published in MDPI's *Energies* journal. The special issue took place in 2016 and accepted a total of 21 papers from twelve different countries. Electrical, solar, or wind energy forecasting were the most analyzed topics, introducing brand new methods with very sound results.

Keywords: energy; time series; forecasting

This special issue has focused on the forecasting of time series, with particular emphasis on energy-related data. By energy, it was understood to mean any kind of energy, such as electrical, solar, or wind.

Authors were invited to submit their original research and review articles exploring the issues and applications of energy time series and forecasting.

Topics of primary interest included, but were not limited to:

(1) Energy-related time series analysis.
(2) Energy-related time series model.
(3) Energy-related time series forecasting.
(4) Non-parametric time series approaches.

From all the submissions received, only those with very high quality scientific content and innovativeness were accepted, after rigorous peer review. A total of twenty-one papers were accepted, with the following author's geographical distribution:

(1) China (9).
(2) Spain (4).
(3) Sweden (1).
(4) Australia (1).
(5) Italy (1).
(6) Austria (1).
(7) Belgium (1).
(8) UK (1).
(9) Korea (1).
(10) United Arab Emirates (1).
(11) Saudi Arabia (1).
(12) Turkey (1).

The submissions received can be broadly divided into the following topics. First, electricity demand forecasting has been addressed by using deep neural networks [1], cointegration techniques [2], random forests [3], imbalanced classification for outlying data [4], or non-linear autoregressive neural networks [5]. Another hot topic—that is, electricity price forecasting—has also been analyzed in this special issue by means of an empirical mode decomposition-based multiscale methodology [6] or by

averaging dynamic factor models [7]. Finally, a comparative study of hybrid models based on a series of optimization algorithms in the electricity context can be found in [8].

Two key aspects in wind energy have been studied in this special issue: wind speed and wind power generation. On the one hand, an ensemble system with weather-adapted correction [9] and a method combining metaheuristics, spectrum analysis, and neural networks [10] have been proposed for wind speed forecasting. On the other hand, wind power generation forecasting has been analyzed by applying hybrid approaches [11,12], and with a method exhibiting physical coupling to the weather [13].

Two interesting manuscripts have been published in the field of solar energy generation. Thus, an ensemble learning approach for probabilistic forecasting can be found in [14] and a neural network ensemble for solar photovoltaic power 2-D interval forecasting in [15].

City natural gas and coal price have also been forecasted. In particular, the authors in [16] discussed and wondered if the steam coal price will rebound under the new economy normalcy in China. By contrast, one-year-ahead demand forecast of city natural gas using seasonal time series methods was introduced in [17].

Finally, other relevant topics, such as forecasting the state of health of electric vehicle batteries [18], a time series clustering based battery grouping method [19], financing innovations for the renewable energy transition in Europe [20], or clustering energy markets [21] have been analyzed and discussed within this special issue.

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