Energy

REQUEST FOR PROPOSAL
RFP #: TS – F1.H2

TITLE: PJM Electric Load Forecasting
CLOSING DATE AND TIME: SEPTEMBER 11, 2023 @ 5:00 PM

Energy Forecast: TS – F1.H2

Background and Purpose

By responding to this Request for Proposal (RFP), the Proposer agrees that s/he has read and understood all documents within this RFP package.

Submission Details

Responders to this RFP should supply:

- A business report up to 5 pages (not including cover page or table of contents), including any supporting plots and tables.
- The commented code (in a separate file) used to produce the results.
- Both files should be uploaded to Moodle by September 11, 2023 @ 5:00 PM.

The report should address **all points described in the "Objective" section** below.

Objective

PJM is a regional transmission organization (RTO) that provides resources for the market of wholesale electricity in all or parts of 13 states and the District of Columbia (source: PJM.com). PJM, henceforth referred to as the client, would like to contract your services in understanding metered load Megawatts for the AEP Appalachian Power transmission zone. For this analysis, the client would like the data to be rolled up to monthly ***average*** transmission and would like the data from 2016-2022 to be used as the training data set; the months of January-April 2023 to be used as the validation data set and the months of May-July of 2023 to be used as the test data set.

- Creation of easy to read and interpret visualizations of the following (ALL graphs MUST be of report ready quality):
    - Decompose the data and provide a graph of the actual electric load values overlaid with the trend/cycle component for the ***training*** data set (be sure to indicate what type of decomposition was used).
    - Time Plot of the predicted values and actual values for the ***validation*** data set.
- Creation of the best ESM model.
- If the best ESM is a seasonal model, the client's analysts are open to either additive or multiplicative ESM's (be sure to specify this information IF a seasonal model is selected).
- The client uses Mean Absolute Percentage Error (MAPE) in calculating the accuracy of its forecasts. Report this measure for the forecasted electric load in the test data. The client is open to other measurements in addition to the MAPE as long as they are clearly stated and supported.

Data Provided

The data is downloaded from Data Miner, which is PJM's enhanced data management tool. The data set provides the hourly energy load in Megawatts (MW) in the AEPAPT Region from January 1, 2016 to July 31, 2023. Columns in this data set are:

Datetime_beginning_utc – do not use this time information (Universal time)

Datetime_beginning_ept – this is the date and the hour for which the energy load occurred
Nerc_region – This is the NERC (North American Electric Reliability Corporation) region (which for this analysis is in the RFC region)
Mkt_region – The market region for this report is West
Zone – The transmission zone for this report is AEP
Load_area – This load area is AEPAPT
Mw – Megawatts per hour of energy (metered)
Is_verified – Boolean (True/False) indicating if results were verified