



HOURLY ENERGY CONSUMPTION

SPRINGBOARD DATA SCIENCE
CAPSTONE PROJECT 2

PJM Interconnection LLC (PJM) is a regional transmission organization (RTO) in the United States.



DATA SET

- The hourly power consumption data comes from PJM's website and are in megawatts (MW)
- The regions have changed over the years so data may only appear for certain dates per region.

THE PROBLEM

What is the trend in the energy consumption between 2002 and 2018?

Predict the energy consumption in coming future by analyzing the previous trends

Factors



Summer/winter consumption

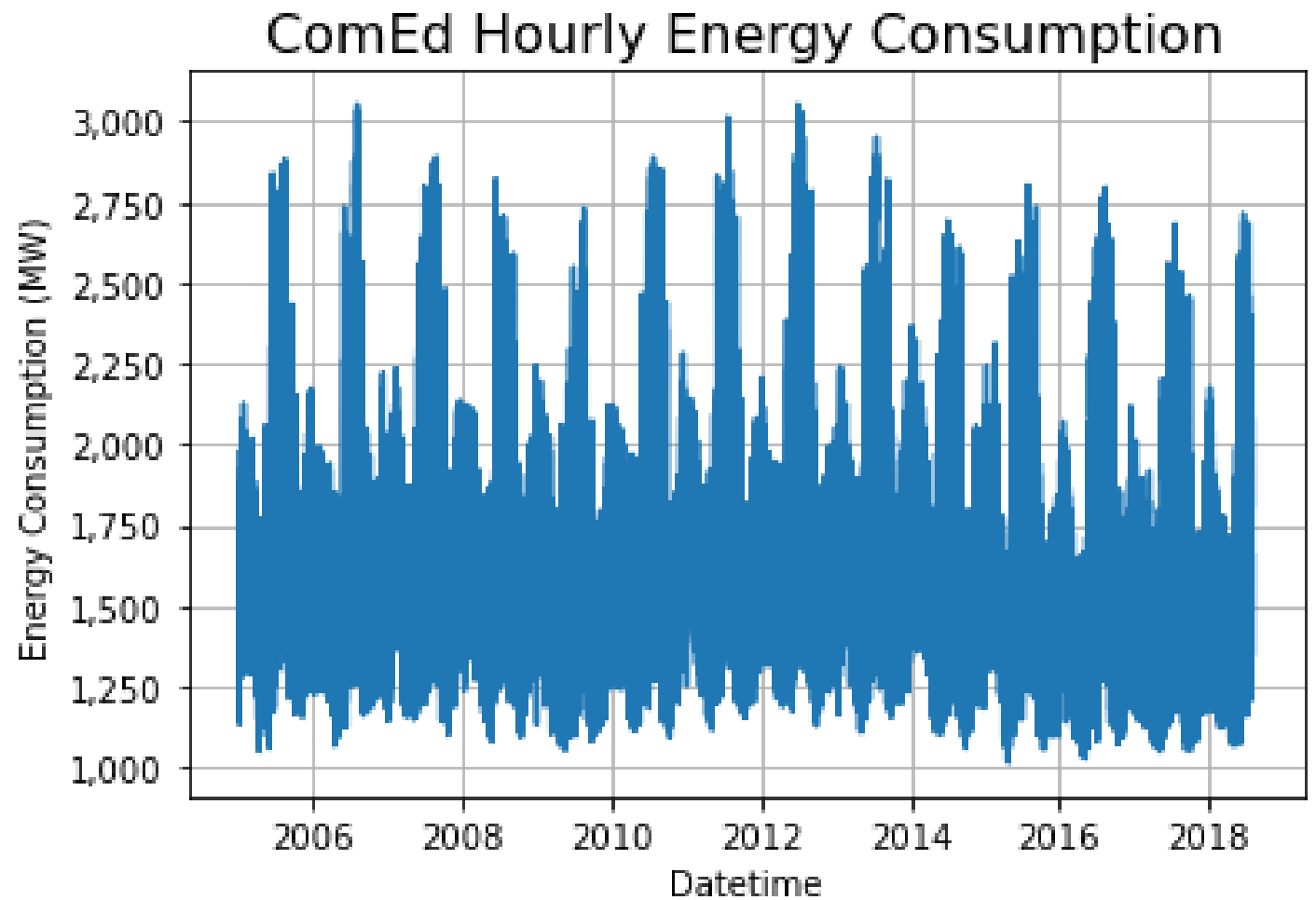


Holidays

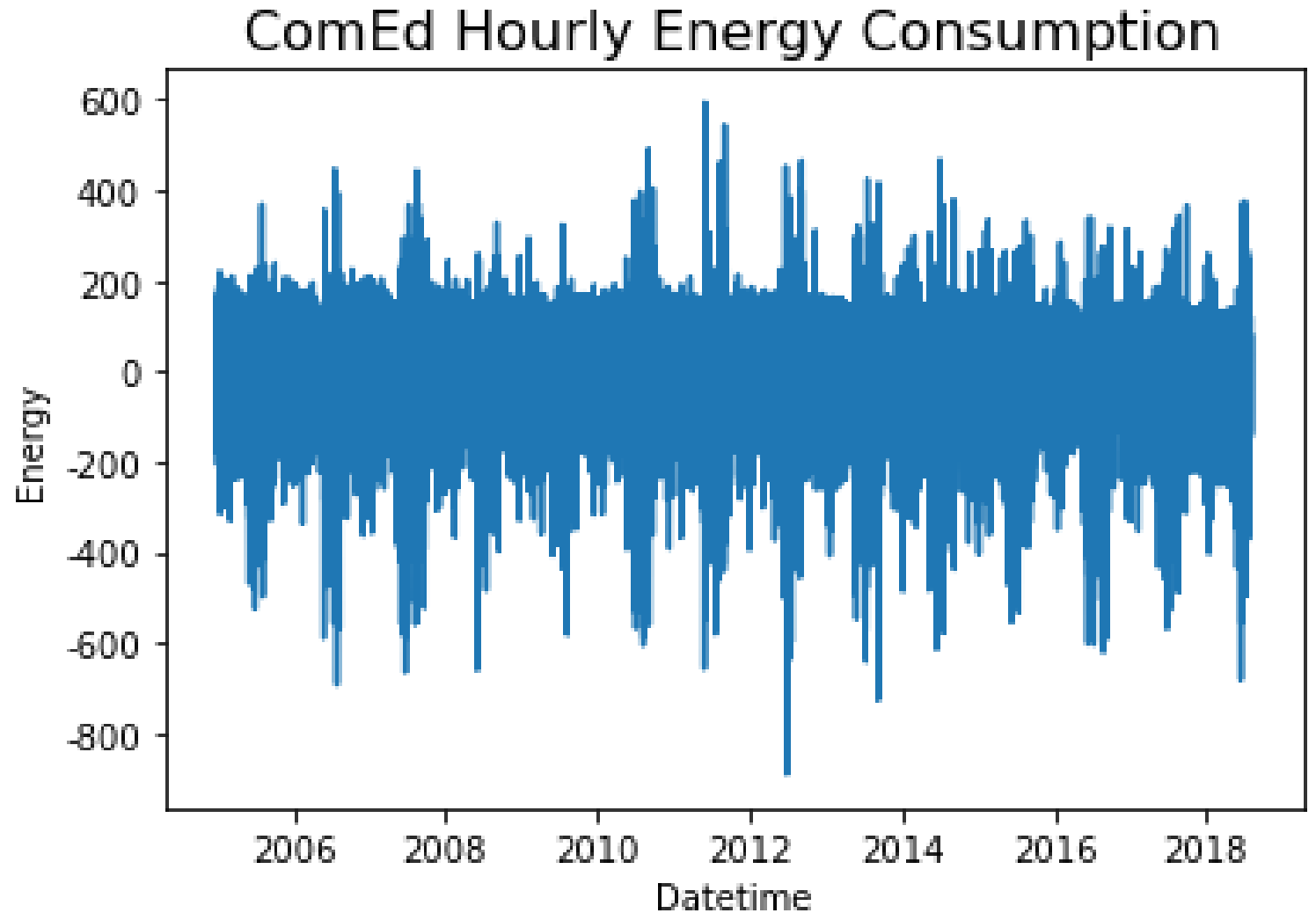


long-term trends

DATA EXPLORATION



Converted
the data into
stationary
dataset



The Approach

ARIMA MODEL

An **autoregressive integrated moving average (ARIMA)** model is a generalization of an autoregressive moving average (ARMA) model. Both of these models are fitted to time series data either to better understand the data or to predict future points in the series forecasting





SARIMAX MODEL

SARIMAX(Seasonal Auto-Regressive Integrated Moving Average with exogenous factors) is an updated version of the ARIMA model. we can say SARIMAX is a seasonal equivalent model like SARIMA and Auto ARIMA. it can also deal with external effects. This feature of the model differs from other models



Prediction Results

- 67.48176385315581 Percent accuracy for Arima model
- 68.515717572227 Percent accuracy for SRIMAX model



Future Improvements

- In the future, I would love to spend more time create a future prediction model.
- This could be improve better in terms of accuracy by applying LSTM model



References

- <https://github.com/gamzebilsen/day-ahead-electricity-prices>
 - <https://www.kaggle.com/datasets/robikscube/hourly-energy-consumption/code>
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