Predicting demand for electricity from hourly weather and Energy Information Administration data

The Energy Information Administration (EIA) has a plethora of hourly electricity demand data for different regions in the lower 48 states. Energy companies rely on accurate forecasts to predict upcoming demand. The goal of this project is to use a machine learning model to generate a more nuanced energy-demand forecast. The client for this type of project would be any energy company looking to better understand how the demand for their electricity varies hour to hour. An improved forecast helps energy companies take next steps to fully capitalize on and perhaps better brace for large spikes in electricity demand. Additionally an improved predictive model will shed insight on the features that most heavily affect electricity demand.

I will retrieve demand, generation, and interchange data from a variety of energy companies in different cities using EIA's API ([data located here](#)). I will then retrieve summarized hourly historical weather data from NOAA. I will try to solve this problem by first combining weather and electricity data and then splitting this hourly data into a training and testing set. The electricity data contain hourly data from July 2015 to present, resulting in ~25,000 data points for each US city. After training the model on different energy companies in different cities in the US, I can easily test this model by utilizing either a separate testing set, or simply waiting for more demand data, since it's updated hourly. Additionally, after building a predictive model, I may even compare my model to [EIA's day-ahead demand forecast](#) and compare performance. The deliverables will be a robust predictive model for electricity demand, the code used to train/test that model and visualize/gather the data, as well as a report fully documenting the methodology and results.