Electric power consumption in buildings vary on a daily, weekly and seasonal basis. Matching peak power consumption with peak power generation is often expensive due to cost involved with running expensive low capacity power plants. Increasing fluctuations in power generation from the penetration from renewables also contribute to the complexity of matching power demand and supply. Accurate forecasts of the building energy consumption can help with better planning and more efficient use of energy. Such forecasts will benefit the end user to lower their electricity bills by better manage their consumption through energy storage and demand response. It will also help the power generators in producing low cost electricity and better planning for generation. Finally, it will help the grid operators in scheduling and providing uninterrupted, reliable power supply for various communities.

The goal of this project is to accurately forecast the power consumption for the hour ahead, day ahead, and for the quarter ahead. These forecasts for different time scales serve different purposes that compliment each other while scheduling and planning the electricity consumption of the buildings. The dataset to be used in the analysis comprises of historical energy consumption data from 49 different sites over the last several years, historical weather data from some of the sites, and additional building related data at each site. This dataset was originally published by Schneider Electric and was retrieved from Kaggle.

Preliminary analysis of the data showing correlations between the weather data and the energy consumption data are shown below.