Impact of Localized Weather Forecasts on Building Electricity Usage Predictions

Tomer Burg[1], Albert Boulanger[2], Roger Anderson[2]

[1]State University of New York at Albany, Albany, NY
[2]Center for Computational Learning Systems, Columbia University, 475 Riverside Drive, New York, NY 10115, USA.

Columbia University's Center for Computational Learning Systems (CCLS), in collaboration with Selex ES and Rudin Management Company Inc., developed the energy saving product, Digital Building Operating System Solution (Di-BOSS), which incorporates CCLS's Total Property Optimizer (TPO) for predicting building energy usage, specifically electricity, steam and space temperature, to optimize energy demand and usage in commercial buildings in Manhattan. TPO currently runs with several covariates, including weather observations from Central Park, and weather forecasts for Central Park from Weather Underground's BestForecast. Previous research concluded that Manhattan has a microclimate effect, with temperature differences of up to several degrees Fahrenheit between Central Park, Midtown, and the Financial District, and this study attempts to determine whether incorporating localized weather forecasts extracted from the National Digital Forecast Database (NDFD) and weather observations from rooftop temperature and dew point sensors for the locations of two Manhattan buildings, 345 Park Avenue in Midtown and 1 South Battery Park in the Financial District, decreases the error in forecasting building electricity consumption by comparing the error in energy usage predictions between the current Central Park forecast and observation vs. the buildings' rooftop observations and their localized forecasts.