

CUNY MSDS Capstone Project

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**COMMERCIAL BUILDING ENERGY  
CONSUMPTION**

**ANALYSIS AND PREDICTION**

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## Abstract

Commercial Building Energy Consumption accounts for approximately 25%<sup>1</sup> of the United States energy production profile. Many economical and sociological factors are pushing owners of these buildings to reduce energy consumption and optimize performance. However, it is difficult to say whether a building is operating efficiently or not. Using publicly available data, models can be constructed to predict major fuel consumption. Keywords: building energy consumption, predicted energy consumption, baseline energy model.

## Introduction

what is the problem

Comparing summary statistics between buildings, such as energy use per square foot, is not as simple as it seems because there are a multitude of factors that affect a building's energy consumption profile. The complexity of making similar comparisons creates a situation where it is difficult to determine whether a building is performing consistent with, or better than, other standard practice buildings. However, every few years, the U.S. Energy Information Administration (EIA) conducts a survey attempting to record pertinent features of these buildings, known officially as the Commercial Buildings Energy Consumption Survey (CBECS)<sup>2</sup>. While the survey is expansive (i.e. more than 600 tracked features), it is best to create a model using the least amount of predictors possible, without losing significant predictive power, in order to make the final product usable when trying to apply it in practice.

why is it interesting and important

why is it hard (why naive approaches failed)

why hasnt it been solved before or whats wrong with the previous solution, why does it differ?

what are the key components of my approach and results, include limitations

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<sup>1</sup>EIA - [https://www.eia.gov/energyexplained/index.php?page=us\\_energy\\_commercial](https://www.eia.gov/energyexplained/index.php?page=us_energy_commercial)

<sup>2</sup>microdata - <https://www.eia.gov/consumption/commercial/data/2012/index.php?view=microdata>