

## **Abstract**

Energy data management is imperative to the understanding of complex building systems and is necessary to make operational decisions and changes that reduce energy spending and carbon emissions. This thesis details the implementation of a data management software (OSI PI) at 41 Cooper Square, an urban academic building. Data management using OSI PI creates opportunities for energy conservation by allowing users to create energy performance dashboards and more easily analyze building operation. Energy performance dashboards display energy consumption and performance metrics for different building components. This thesis work contributed a resource for building operators and researchers to monitor building efficiency and identify energy saving opportunities. Additionally, this thesis project analyzed and validated actual energy savings from a chiller plant optimization strategy that resets the condenser water setpoint based on chiller load and outside air conditions. An analysis of historical building data revealed an average of 36 kW of energy savings when operating the chiller plant with a condenser water reset strategy compared with operating with a constant condenser water setpoint. This thesis concludes that implementing the proposed condenser water reset strategy saves as much as 126,000 kWh of energy and 37 metric tons of equivalent carbon per year, which equates to around \$22,300 of energy savings per year, and an annual penalty avoidance of \$9,800 once NYC's Local Law 97 Climate Mobilization penalties for exceeding specified carbon emissions limits are established in 2024.