

[« Return to FMDAA entries](#)

FacilityMaintenanceDecisions™

ACHIEVEMENT AWARDS

The Wharton School, University of Pennsylvania, Philadelphia

Overview

The Wharton Operations Green Campus sustainability initiative implements programs that align with Penn's long-term goal of carbon neutrality by 2042. This includes focusing on our built environment by promoting and adopting best practices in energy management, design, operations and maintenance to improve efficiency. Jon M. Huntsman Hall (JMHH), in its position as a state of the art classroom and event building, serves as a great example of how complex buildings can achieve these goals over time.

JMHH serves as the main facility for the Wharton School at the University of Pennsylvania. The building, designed by Kohn Pederson Fox, opened in 2002 and features state of the art technology tailored to Wharton's innovative curriculum and interactive learning methods. This 324,000 square foot, nine-story multi-use building houses a 300-seat auditorium, tiered and flat classrooms, group study rooms, study lounges, faculty offices, an event floor, social lounges, radio station and 2 cafes. The building also features the stunning Koo Plaza, a 17,000 square foot accessible green roof garden that also manages stormwater runoff and reduces cooling loads.

In 2009, JMHH pursued a pilot to study the effectiveness LEED-EBOM certification at the University. After two years of preliminary work, commissioning and repair efforts, the EBOM certification process was discontinued as it uncovered issues with preventive maintenance and systems performance that kept the building from functioning to design specifications. In particular, the building's 554 VAV boxes had a 40% failure rate and the building automation system could not adjust airflow rates based on actual building CO2 levels. As a result, the building experienced poor pressurization, increased utility costs and a teaching environment not conducive to learning.

Wharton Operations, the building management team, established a progressive approach towards addressing these issues by initiating a series of system upgrades and recommissioning to ensure the building performs at and above design specifications. The team researched technology that would address existing performance, minimize maintenance and provide energy savings, deciding to replace existing VAVs with Phoenix Controls (PSV) and new Aircuity CO2 sensors. This solution offers a pressure-independent flow-metering valve, providing a high degree of accuracy

requiring no routine maintenance while ensuring the minimum amount of airflow required by occupancy.

By minimizing air change rates, AHU fan speeds decrease, thus offering energy savings along with maximizing comfort for all our spaces. Furthermore, a major challenge in JMHH is limited above-ceiling space. Any solution had to allow for less costly ductwork design and installation without altering proper airflow parameters. PSVs meet these criteria.

Starting in February 2017 with JMHH's 17,000-square-foot premier event space (which often experienced severe temperature and pressurization issues in all seasons), Wharton replaced 25 VAVs to PSVs and installed sensors to test performance and create a solid baseline for future building installs. The project's success initiated a building-wide VAV and CO2 sensor conversion in all the classrooms and public areas, which includes installing new airflow-monitoring stations in the existing AHUs and rebalancing. Energy data benchmarking is occurring during these projects with the goal of submitting the building for LEED-EBOM certification.

Initial reporting from the AHU modifications alone indicate a savings of over \$340,000 per year, or a payback of just 1.8 years. Concurrently, Wharton performed a series of LED lighting upgrades to the event space and auditorium, which has enhanced the overall aesthetic and significantly improved the energy efficiency while reducing maintenance. A project is underway to replace high-wattage traditional sources that operate 24/7 with new LED luminaires in the 11,000-square-foot Forum multi-purpose space. The goal is to minimize relamping and maintenance while increasing overall illumination levels. The renovation's projected payback is less than one year, saving over 600 tons in carbon emissions annually.

All lighting in JMHH has central integration via a Lutron QS system, providing centralized lighting control via Lutron's facility management software. To monitor the effectiveness of these improvement projects, Wharton operations partnered with Penn's central facilities to conduct regular energy usage assessments — a first at Penn. To assist with this ongoing task, the operations group helped develop and pilot an energy dashboard to show real-time energy consumption for JMHH. This tool enables the in-house facilities team to quickly spot anomalies for quick correction, saving energy, operating costs and preventing system failures.

The path towards increased energy efficiency and sustainable practices in JMHH continues. Tracking of annual energy data and other metrics indicate the building is trending in the right direction. JMHH serves as an example of how strong leadership, long-range planning and innovative approaches will yield tangible results. Wharton, the University of Pennsylvania and the community at large are better for it.

In-House Participants

Maria O'Callaghan-Cassidy, Senior Director Wharton Operations; Joseph Birster, Senior Associate Director, Wharton Facilities; David Mazzocco, Associate Director of Wharton

Projects and Sustainability; Ryan Rose, Senior Associate Director of Wharton Projects and Engineering; Kristina Leonard, Associate Director, Wharton Scheduling Services; Aileen Spratt, Senior Associate Director, Wharton Projects; Dave Pancoe, Project Manager University of Pennsylvania Facilities and Real Estate Services; Jennifer Wetzel, Director of Projects, University of Pennsylvania Facilities and Real Estate Services; Michael Dausch, Executive Director Design and Construction, University of Pennsylvania Facilities and Real Estate Services; Andrew Zarynow, Energy Engineer, University of Pennsylvania Facilities and Real Estate Services