

SHOWCASE PROJECT: MICHIGAN STATE UNIVERSITY: ANTHONY HALL

SOLUTION OVERVIEW

Michigan State University (MSU) has long been committed to energy conservation, environmental stewardship and sustainability. With 5,200 acres of contiguous campus, 2,100 acres developed for the main campus and more than 550 buildings, the challenge to maintain and operate the mechanical systems is enormous, and MSU has been consistently innovative in responding to the challenge.

As an example of its commitment, MSU has selected Anthony Hall as its showcase project, a comprehensive energy efficiency building project with expected annual cost savings of approximately \$536,000.

Built in 1957, Anthony Hall is a 317,200 square foot multi-purpose building that houses the Department of Animal Science and the Department of Food Science and Human Nutrition, as well as the University's Meats Lab and Dairy Store. This showcase project has an estimated construction cost of \$5.1 million. Expected annual energy savings once implementation is complete is 34% with a payback period of approximately seven to ten years.

SECTOR TYPE

Education

LOCATION

East Lansing, Michigan

PROJECT SIZE

317,200 Square Feet

FINANCIAL OVERVIEW

Project Cost \$5.1 Million

SOLUTIONS

MSU uses a unique building profiling system to assess campus buildings and determine which provide the best opportunity for energy savings. The profiling system uses historical data about the building, including type and age of systems, energy use per square foot, and more, to determine an opportunity rank. The ranking system helps engineering experts identify target areas for funding.

Building profiling is Step 1 in a comprehensive, five-step "existing-building commissioning" process that MSU will use across its aging building portfolio to reduce energy use and increase occupant

comfort.

In Step 2, the documentation and analysis phase, MSU performs an energy audit in the building to identify significant mechanical and related systems that may need to be replaced or added. In Step 3, all building systems are evaluated, or assessed and adjusted to ensure they are operating at the optimal level, and energy-conservation measures are identified that will result in further efficiencies. Step 4 is the actual implementation of the selected energy-conservation measures.

As the Better Buildings Challenge showcase project, the following energy-conservation measures are planned for implementation at Anthony Hall:

- Installing variable-speed drives on cooling tower fans: savings of \$5,000 annually for building and another \$ 2,000 annually for process towers
- Installing air-flow monitoring and repairing economizer damper controls: savings of \$73,000 annually
- Implementing demand-ventilation control strategies in auditoriums: savings of \$2,600 annually
- Installing air-quality sensors in laboratories: savings of \$128,000 annually
- Installing heat-recovery unit in the exhaust air stream: savings of \$4,000 annually
- Connecting heat recovery to refrigeration units: savings for this measure are under review
- Converting multiple building reheat systems to variable-speed systems: savings for all reheat work including insulation and VAV conversion of \$23,000 annually
- Upgrading lighting and installing lighting controls: savings of \$10,000 annually
- Add occupancy sensors to fume hoods to set back flow when hood is not in use: savings of \$14,000 annually
- Correction actions of typical maintenance and repair items, such as replacing leaking valves and dampers, cleaning heating coils, adjusting controls and programming, etc.: savings of \$130,000 annually
- Other category includes insulating steam and chilled water valves with removable covers; add controls in elevators to turn off lights and fans when not in use; adjust controls on face and bypass dampers and steam control valve; replace existing pneumatic terminal unit controls with DDC control; install control valves on steam humidifiers: savings of \$110,000 annually

To complete the cycle, in Step 5, MSU will “continuously commission” the building, or aggressively monitor the new or newly adjusted systems to ensure efficiency is sustained.

OTHER BENEFITS

Anthony Hall will be the first building at MSU to undergo this complete upgrade process, setting the blueprint for future energy efficiency improvements in MSU's aging building portfolio. The process is supported by the University's senior leadership, including the President and the Vice President for Finance and Operations. This level of support and priority status for energy efficiency projects make them possible at Michigan State University.

Annual Energy Use

(Source EUI)

Baseline(2010)



Expected(2014)



Actual()



Energy Savings

34%

Annual Energy Cost

Baseline(2010)



Expected(2014)



Actual()



Cost Savings

\$536,000



Anthony Hall north view



Anthony Hall east view