

SHOWCASE PROJECT: UNIVERSITY OF UTAH: DUMKE HEALTH PROFESSIONS EDUCATION BUILDING

SOLUTION OVERVIEW

The Dumke Health Professions Education Building (HPEB) is a 52,000 square foot mixed use building built in 1972 that includes classroom, office and clinic space for the Department of Physical Therapy and Division of Occupational Therapy. It also includes laboratory and office space for the Department of Neurobiology and Anatomy. Nearly half of the building is occupied by laboratories and walk in refrigerators for the university's human anatomy and body donor programs.

In 2011, maintenance staff from the university's Facility Operations department established a list of buildings with the worst performing HVAC systems in terms of energy efficiency, energy cost, reliability, maintenance cost and occupant dissatisfaction. The HPEB ranked number one. It was well understood that the building's antiquated controls system and aging inefficient boilers were a big part of the problem and needed to be replaced. The project moved forward with a combination of state appropriated capital improvement funding and an American Recovery and Reinvestment Act (ARRA) grant. In addition, the university's Energy Management group contributed funding toward the new boilers. A portion of the actual energy savings are captured by Energy Management to replenish and increase its energy management fund. The University of Utah views the significant investment and longer payback period for energy efficiency upgrades at the HPEB as a far less costly alternative to construction of a new building.

SECTOR TYPE

Education

LOCATION

Salt Lake City, Utah

PROJECT SIZE

52,000 square feet

FINANCIAL OVERVIEW

Project Cost \$1.27 million

SOLUTIONS

The HPEB underwent comprehensive improvements to its HVAC system. New high efficiency boilers and a DDC controls system were installed. All variable air volume (VAV) terminal units and many other components, including motors for air handlers, relief fans and pumps, were replaced.

The project began in October 2011 and was completed in June 2012. The project's realized savings are projected to come from the following HVAC system improvement measures, implemented during the nine month project:

- DDC controls system: 44% of total savings achieved through improved scheduling and control
- High efficiency boilers: 38% of total savings achieved through better efficiency and control
- Premium efficiency motors and variable frequency drives for relief fans, air handlers and pumps: 18% of total savings achieved through increased efficiency and better control

The project has produced annual cost savings of \$57,000 and annual energy savings of 41% over a 2010-2011 baseline. Electric usage has decreased by 443,000 kWh and gas use by 5,100 Dth. The energy use intensity of the building has been reduced by 192 kBtu per square foot annually.

OTHER BENEFITS

In addition to energy and cost savings, the main objectives of the project were to improve environmental control, increase occupant satisfaction and decrease maintenance cost. Total corrective maintenance work orders have been reduced in the building by 48%. HVAC-specific corrective maintenance work orders have dropped from an average of 6.9 per month to 2.6 per month, a reduction of 63%.

Annual Energy Use

(Source EUI)

Baseline(2011)

479 kBtu/sq. ft.

Actual(2013)

284 kBtu/sq. ft.

Energy Savings

41%

Annual Energy Cost

Baseline(2011)

\$162,000

Actual(2013)

\$105,000

Cost Savings

\$57,000



Side view of Dumke Health Building



Variable frequency drives



High efficiency boilers



Entrance to Dumke Health Building