

SHOWCASE PROJECT: STATE OF DELAWARE: CARVEL STATE OFFICE BUILDING

SOLUTION OVERVIEW

The Carvel State Office Building presents a unique opportunity to implement both larger scale energy conservation measures (ECMs) such as heavy mechanical systems alongside standard water saving and lighting measures.

By using an energy services company (ESCO), the State is confident that Carvel will be able to generate guaranteed savings, serving as an ideal showcase facility. The project achieved a savings of 4,563,975 site kBtu per year (equivalent to 16,049,475 source kBtu) and 20% of the building's baseline energy consumption. In addition, the annual cost savings was \$244,000.

SECTOR TYPE

State Government

LOCATION

Wilmington, Delaware

PROJECT SIZE

302,250 Square Feet

FINANCIAL OVERVIEW

Project Cost \$5,960,000

SOLUTIONS

The construction phase of the performance contract began in July 2008 and lasted through March 2014. The project focused first on implementing low-/no-cost energy ECMs before introducing more comprehensive measures. The State introduced 12 ECMs ranging from water and lighting improvements to heavy mechanical equipment such as HVAC improvements.

The following is a list of energy efficiency initiatives implemented at the Carvel State Office Building:

- Energy efficient lighting for 3,000 bulbs by retrofitting fixtures, downsizing from T12 to T8 lamps and upgrading to LED exit signs: Savings \$84,384
- Lighting controls such as the installation of 400 occupancy sensors in bathrooms, mechanical rooms and perimeter offices most impacted by direct sunlight and intermittent use: Savings \$8,774

- Building automation system upgrades establishing control sequences of: demand ventilation, night setback for unoccupied spaces, morning warm-up/cool-down and chilled/hot water temperature optimization. Also consists of testing and balancing HVAC equipment: Savings \$39,368
- Cooling tower optimization including the installation of three variable frequency drives on cooling tower fans and three pulse power conditioning systems: Savings \$5,470
- Premium efficiency motor installation for eight motors: Savings \$1,116
- Insulated hot water piping for 11th floor mechanical room: Savings \$1,066
- Variable volume piping featuring variable frequency drives on the condensing water system and automatic isolation valves on 10 air handlers and 153 core heat pumps: Savings \$45,279
- ENERGY STAR transformers to replace seven standard models: Savings \$4,846
- Heat pump replacement of 613 original perimeter pumps with high efficiency equivalents. Audit of the facility found 40% of the heat pumps were not fully operational at project baseline: Savings \$30,652
- Roof-mounted 10kW photovoltaic system, expanding existing system for a total of 20kW: Savings \$1,517
- Water Conservation to include the installation of 55 bathroom aerators: Savings \$2,279

OTHER BENEFITS

The State of Delaware achieved an ENERGY STAR[®] rating of 75 at the conclusion of the project.

Annual Energy Use

(Source EUI)

Baseline(2008)



Actual(2014)



Energy Savings

20%

Annual Energy Cost

Baseline(2008)



Actual(2014)



Cost Savings

\$244,000



Carvel State Office Building