



29% HVAC Savings Results in 10% Reduction in Annual Utility Costs

Third-Party Verification by the University of Maryland

Facility

The Holmatro Building is in Glen Burnie, Maryland and was constructed in 1997. The facility is in a small industrial park adjacent to BWI Airport. The building totals 80,000 square feet. The building has a high bay ceiling height of ~24 feet. There is one regular work shift for the production floor: 5:00 am – 5:00 pm Monday thru Friday and 5 hours on Saturday. Therefore ~65 hours/week of active HVAC operation.

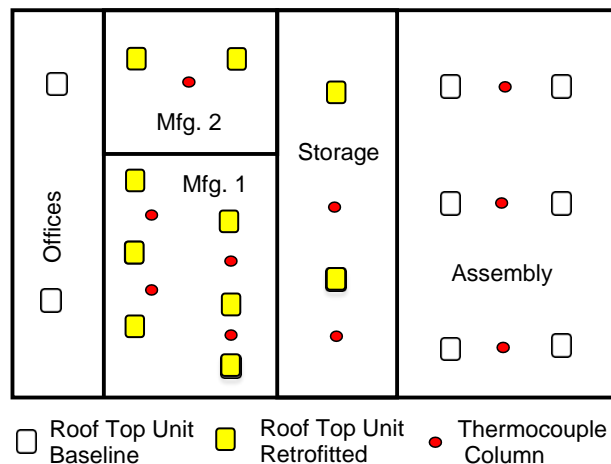


Detailed Investigation by The University of Maryland

The Center for Environmental Energy Engineering (CEEE) investigated the performance of the XChanger system improvements as part of the Maryland Industrial Partnership (MIPS) program. CEEE is a leader in the research of energy conversion technology with extensive modeling, and verification and validation experience. CEEE built a very detailed system performance model and investigated utility bills pre- and post-XChanger installation and operation.

For the demonstration 10 of 18 existing rooftop units (RTUs) were retrofitted in the central part of the building. This represented approximately 50% of the square footage, the assembly area remained unchanged and supported baseline performance measurements.

The graphic below shows a high-level facility layout and the location of the 10 retrofitted RTUs. The colored circles depict 10 thermocouple columns that were used during the study.





U of M Pre-Installation Modeling Predictions		
Center for Environmental Energy Engineering		
	Low	High
Facility HVAC Electric Improvements	19.30%	37.40%
Facility HVAC Gas Improvements	7.70%	25.20%

Vertical temperature profiles (floor-to-ceiling) were measured across the 10 locations over the course of 15 months, with the XChanger installation occurring in month 6. That resulted in 9 months of post-installation, actual operational impact that was recorded and studied.

Post the 9-months of operation the impact of the XChangers was within the predictions above:

Utility Bill Impact after XChanger Installation	
Cooling Season	29% RTU Electric Savings
Heating Season	21% RTU Gas Savings

For this site, the low and midline supply and return locations were located at a 7-foot height due to facility requirements. For maximum savings and thermal management, the low line should be located ~2 feet above the floor – this would have increased savings even further.

The utility bill review showed that the HVAC building loads were 33% of the full facility demand and that the XChangers improved the HVAC efficiency by 29%. The annual total utility costs for the building (gas and electric) were \$184,285 in the year prior to the XChanger installation. Taking 33% of the total electric bill and reducing it by 29% and saving 21% of the natural gas bill results in **annual savings of \$18,781 or a 10.1% reduction in total facility utility costs**. This reduction in energy consumption approximates a reduction of 100 tons of CO2 annually.

Financial Analysis

The economics for this project are **exceptional**. With Section 179 “bonus depreciation” being 100% in year one through 2022 and current utility rebates for custom efficiency HVAC projects at 50% from Maryland utilities, a project like this would be **cash flow positive in year one** and bring consistent savings for decades to come. For further financial details please visit our website.

Additional XChanger Benefits

- Potential for Rebates from Utility Efficiency Programs
- Qualifies for “Bonus” Depreciation or a 179D Tax Deduction
- Savings + Depreciation + Potential Rebate + Low Interest Financing = No Brainer ROIs
- Supports GHG Reduction and Sustainability Goals
- RTU Runtime Reductions
- Increased Employee/Customer Comfort with enhanced Air Circulation and CO2 Management
- In Greenfield Designs or Retrofits, Reduced RTU Count and Lower Capital Expenditures Due to Higher Efficiencies and Peak Load Reductions
- Simple, Reliable and Long-Life Installation
- 100% Sales and Technical Support Supplied by XCo