

Global Financial Organization Headquarters

Work Scope

EMAT completed an ASHRAE Level 2 energy audit of the headquarters for a major global financial organization in Washington, DC.

Facility Description

The facility was constructed in 2005 and consists of one building and a parking garage. The building totals over 700,000 square feet, while the parking garage totals over 180,000 square feet. The building consisted of mainly office space, with large portions of the building devoted to a data center and a kitchen.

Lighting was observed to be mainly compact and linear fluorescent. Most restroom faucets had low-flow faucet aerators installed to reduce water consumption. The building was conditioned by two separate air delivery systems. The first system contained air handlers supplying 100% outdoor air to various VAV terminal boxes throughout the building. This system utilized a glycol heat pipe energy recovery system. The second system was a combination of outdoor air and return air to supply the remaining VAV boxes.

The building was cooled by three water cooled chillers. The chillers' condenser water loop was connected to two induced draft cooling towers located on the roof of the building. These cooling towers also supplied a separate condenser water loop to the Computer Room Air Conditioners (CRAC units) to cool the data center, as well as perimeter water source heat pumps.

The building was heated mainly through electric coils in the perimeter VAV boxes. Several of the air handlers were also equipped with electric duct heaters. Stairwells and elevator lobbies utilized cabinet unit heaters for additional space heating. The facility was controlled locally by a Trane building automation system (BAS). The BAS was programmed for the following control strategies to optimize efficiency: chilled water reset, condenser water reset, optimal start to determine the appropriate time each day to begin building warm up, and waterside economizing.

Summary of Recommendations

The staff should be commended for the current energy efficiency measures in place. The overall Energy Usage Intensity (EUI) of the facility was not very high at the start of the audit. The first measure to implement was lighting retrofits. Most of the facility was still illuminated by fluorescent lighting, so LED upgrades were a straightforward recommendation. The facility was conservative with their nighttime setback temperatures, even with an optimal start strategy that would ensure the building would be up to temperature before occupants arrive. Whenever there is an optimal start strategy in place it is important to be aggressive with setting back temperatures to maximize the potential savings, so EMAT recommended lowering their nighttime heating set point to 50 °F and shutting down cooling equipment during unoccupied hours (data center cooling not included).

EMAT observed large areas of open roof, with no surrounding obstructions. It was recommended that a rooftop photovoltaic system be installed in order to reduce electric consumption and grid dependency. EMAT also observed central, electric duct heaters on many of the air handlers. It was recommended to replace these units with gas-fired duct heaters. While the gas heaters will consume more energy on-site, the overall source energy intensity (factoring in energy to generate and supply electricity vs. natural gas) would be reduced. Also, the price of natural gas was cheaper than the price of electricity for the customer



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so there would be significant cost savings. The final recommended measure was to implement a static pressure reset strategy to optimize the savings potential of the variable air volume supply system.

Potential Savings Identified

- Nine (9) Energy Conservation Measures (ECMs)
- Total annual savings of over 3 million kWh, 18,000 therms, and \$343,000 in cost savings
- Overall payback of less than 4 years