



SHOWCASE PROJECT: CUMMINS: JAMESTOWN ENGINE PLANT

SOLUTION OVERVIEW

Cummins is undertaking a deep energy retrofit project at its Jamestown Engine Plant (JEP) in Lakewood, NY, as part of its corporate-wide commitment to reduce energy intensity. The project combines a suite of energy efficiency measures and necessary infrastructure upgrades to achieve significant energy savings alongside optimal systems performance for the entire facility.

Cummins acquired JEP in 1974, though the facility dates back to 1968 and much of the original base infrastructure within the building remains. This includes three large gas fired steam boilers, related distribution piping, 26 large heating and ventilating units, 29 dock heaters and 5 snow melt systems. This equipment has become unreliable, incurring significant repair costs and operational interruptions. Through this project, steam is almost entirely being eliminated by replacing the major equipment (air handlers, dock heaters, etc.) with direct fired gas units. A few localized manufacturing processes, however, utilize steam; as a result, the plant plans to install three small steam generators to meet that limited local variable demand. This eliminates the need for a plant wide distribution.

SECTOR TYPE

Industrial

LOCATION

Lakewood, New York

PROJECT SIZE

995,000 Square Feet

FINANCIAL OVERVIEW

Project Cost \$29.7 Million

SOLUTIONS

Beginning in January 2012 through 2015, Cummins is implementing a phased, whole building energy and infrastructure improvement project, including \$5.1 million in energy efficiency improvements. In 2014, the plant installed a new, 2 megawatt solar installation, capable of generating about a third of the plant's power on the sunniest days. The plant has also installed three regenerative dynamometers that recover energy from engine testing and provide power to the facility.

The energy efficiency components of the project include heating and cooling upgrades, compressed air optimization and controls upgrades. The compressed air improvements include reduced line pressure, implementation of improved metering, implementation of a sequencing system to automatically stage the compressors to match variable demand and a preventive maintenance system to ultrasonically detect and fix air leaks. The two major energy impacts of the plant-wide improvements are natural gas and electricity, with approximate savings of 41% and 23% from current usages, respectively.

Prior to the project, JEP partnered with Duke Energy One and Mazza, to complete a thorough site assessment. The significant uses on energy were identified, equipment condition assessed and replacement and improvement alternatives individually analyzed. Significant uses of energy were primarily facility based and included all air handlers, air conditioning systems, ventilation systems, exhaust fans, dock heaters, steam users and other pieces of equipment were also evaluated. The energy savings of the alternatives were calculated and the needed funding for the entire project is planned within the corporation's capital process. The plant's investment has been planned within Cummins' multi-year budget and has been included in the business' simulation to ensure profitability. Cummins uses a 20% internal rate of return as its criteria for priority projects. In particular, the plant very carefully evaluated the added cost to become more efficient versus simply replacing the older models with like steam equipment. In a related improvement, the plant replaced its old roof (a project it was going to do anyway) with a new light colored roof with more insulation to reduce cooling and heating load. The plant has installed four large air handling units installed on the outside of the plant, replacing six less efficient ones.

Cummins anticipates that the energy savings from just the energy efficiency-specific measures will be 250 billion BTUs and result in \$1.4 million a year in cost savings, which includes gas, electricity and solar photovoltaic savings. The ongoing sub-metering project will help JEP quantify the performance of the improvements.

OTHER BENEFITS

The JEP project approach contributes to Cummins' corporate environmental responsibility initiatives. The project is expected to reduce plant wide greenhouse gas emissions by 30%, or about 9,000 metric tons. Additionally, Cummins builds to the standards of green building certification; therefore, the JEP site may consider obtaining certification in the future. The plant is currently participating in DOE's Superior Energy Performance program, with certification planned for June 2015, and is working towards ISO50001 energy management certification.

Once the equipment and energy efficiency upgrades have been completed, the plant anticipates installing a building management system to maximize efficiency and data collection and reporting.

Annual Energy Use

(Source EUI)

Baseline(2011)



Expected(2016)



Actual()



Energy Savings

33%

Annual Energy Cost

Baseline(2011)



Expected(2016)



Actual()



Cost Savings

30%

Aerial view of Jamestown Engine Plant



Workers installing air handlers outside plant



New duct work installed at the engine plant



New roof features more insulation than the old roof

Infrastructure upgrade: efficient air handling