

PROJECT SUMMARY

CHESTER UPLAND SCHOOL DISTRICT COMPREHENSIVE INVESTMENT GRADE ENERGY AUDIT

PROJECT SUMMARY

Bridgestone Associates Ltd. performed a comprehensive, investment grade energy study and audit of this large school district with 10 schools and three support facilities including a large maintenance facility. Work was performed for Cinergy Solutions, an Energy Services Company interested in investing in a shared savings program with the School District. Work included detailed auditing of all buildings and facilities, modeling of existing utility bills, analysis of



time-of-day and 15-minute interval electric data, review and evaluation of lighting systems, review and evaluation of HVAC and domestic hot water systems, review and evaluation of water, sewer and other utilities, and review and evaluation of building envelope and structures.

PROJECT STATISTICS

Client:	Chester Upland School District/Cinergy Energy Solutions
Project Type:	Comprehensive Investment Grade Energy Audit
Facility Types:	10 schools (six elementary, two middle, one high, one vocational) and 3 support facilities (maintenance, administration and transportation)
Facility Size:	1.1 million sq ft (17,000 – 385,000 sq ft range)
Facility Location:	Chester, Pennsylvania, USA
Plant Elevation:	< 50 feet above sea level
Electricity Utility:	PECO
Gas Utility:	PECO
Annual Energy Costs:	US\$921,000 electric; US\$436,000 natural gas; US\$161,750 oil; Total US\$1.63 million/year
Annual Utilities Use:	8,747 MWh/year; 2.7 MW peak; 39,200 MCF/year natural gas; 140,750 gallons/year oil; 20.6 million gallons/year fresh water; 13.27 million gallons/year wastewater
Projected Savings:	US\$375,000 base case; US\$475,000 base case plus upgrades
Projected Capital Investment:	US\$2.7 million base case; US\$4.5 million base case plus upgrades

PROJECT DESCRIPTION

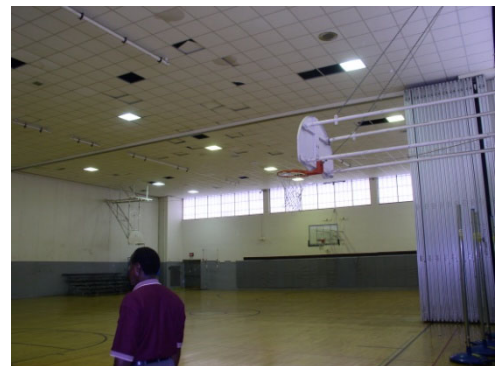
Bridgestone Associates performed this comprehensive investment grade energy audit for Cinergy Solutions, an Energy Services Company interested in investing in a shared savings program with the School District.



The Chester Upland School District is located in a run down, low income area southwest of Philadelphia where there are high unemployment rates and high rates of crime and vandalism. Most industry has moved out of the City and as result, there is a low tax base. Because of the very poor finances of the School District for many years and corruption that occurred in past years, the School District has been overseen by a Pennsylvania State run Board for a number of years. As a result there has been very little investment made in capital projects and for operations and maintenance over many years.

Bridgestone Associates conducted a comprehensive audit of all the School District facilities. Bridgestone was supported by personnel from School District Maintenance Management and by the individual building maintenance personnel. During these audits and building equipment evaluations, Bridgestone Associates found many pieces of equipment not in operation. This included lighting systems, controls and HVAC systems. It was reported that this was directly due to the unavailability of funds for maintenance and repairs.

Because of the poor maintenance of the facilities, it was difficult to develop an accurate baseline from which to measure energy savings. For example, in one gymnasium over half of the existing metal halide light bulbs had failed and not been replaced. Replacement of all the light fixtures and bulbs with more efficient fixtures and bulbs would lower energy use and energy costs if all existing bulbs were working. But with over half not working, the apparent cost savings were actually cost increases.



The facility audits were conducted by a team of three specialists from Bridgestone Associates over a 6 week period with the whole project being completed in a 12 week period. Audits included all buildings and facilities including building envelope, windows, HVAC systems, control systems, lighting, water and waste water, vending machines, outside lighting and security systems, and kitchen and cafeteria equipment and systems. The audits included complete modeling and analysis of past utilities bills. The energy efficiency of each building was calculated and compared against the other buildings within the School District and with industrial standards.

As a result of the building audits, Bridgestone Associates developed a list of 76 Energy Conservation Measures (ECM's). These included a wide range of measures including replacement of HVAC equipment, lighting upgrades, kitchen hood and ventilation systems changes, low flow water use appliances, power factor correction, energy management system upgrades, demand control, vending machine controls, etc.



Each ECM was evaluated for potential savings in both energy and future operations and maintenance costs. Savings were estimated and then tariff models of the utility tariffs were used to estimate actual utility savings. The capital cost of each ECM was estimated and the simple payback calculated. Because implementation of one ECM may affect the savings from another ECM, the cross coupling effects of the ECM's were estimated in order to give a total estimate of savings and costs. A matrix of opportunities was developed for Cinergy Solutions to share with the School District.



It was estimated that over \$375,000/year in utilities costs could be saved in a base case where basic ECM's and repairs were implemented costing \$2.7 million in capital investment. With additional upgrades and ECMs, a total of \$475,000/year in utilities costs could be saved for a total investment of \$4.5 million.

The project was completed by Bridgestone Associates, Ltd. on time and on budget.