

PROJECT SUMMARY

ELWYN INSTITUTE COMPREHENSIVE INVESTMENT GRADE ENERGY AUDIT

PROJECT SUMMARY

Bridgestone Associates performed a comprehensive, investment grade energy study and audit of approximately 50 buildings on this large campus style residential and training facility for mentally and physically challenged persons in Media, Pennsylvania. Work was performed for Cinergy Solutions, an Energy Services Company interested in investing in a shared savings program with the Institute. 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 of the existing steam system (100+ years old) and boilers, review and evaluation of water, sewer and other utilities, review of the cafeteria and the laundry, and review and evaluation of all building envelopes and structures.



PROJECT STATISTICS

Client:	Elwyn Institute and Cinergy Solutions
Project Type:	Comprehensive Investment Grade Energy Audit
Size:	47 buildings totaling 582,276 sq ft on main campus. Two satellite campuses with approx 165,000 sq ft.
Facility Type:	Residential and training institute for mentally and physically challenged persons
Facility Location:	Elwyn, Media, Pennsylvania, USA
Plant Elevation:	300 feet above sea level
Electricity Utility:	PECO
Annual Energy Costs:	US\$1.75 million approx
Annual Energy Use:	12,265,000 kWh/year + 45,000 MMBtu/year
Projected Savings:	1,183,000 kWh/year + 12,787 MMBtu/year
Projected Capital Investment:	US\$4.3 million

PROJECT DESCRIPTION

The comprehensive investment grade energy audit was conducted for Cinergy Solutions, an energy services company considering investing in an energy savings project at the Elwyn Institute.

The main Elwyn campus is made up of 47 different buildings, aging from 1859 to relatively new. These buildings include multi-storey residential buildings, long-term care facilities, secure Alzheimer care facilities, schools, a gymnasium, a large boiler house, single family houses, a large administration building, a laundry, a large cafeteria, and maintenance facilities.



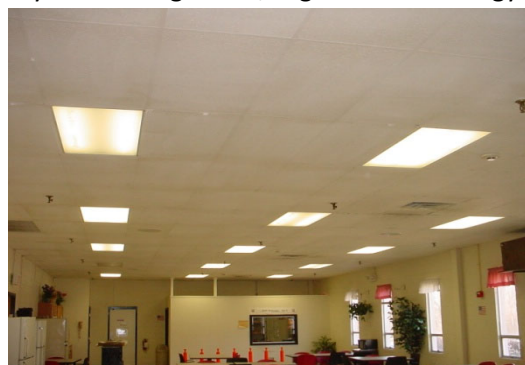
The building types on the main campus vary from a Main Administration building of 3 stories and 77,000 square feet, to a 1,100 sq ft Sears & Roebuck factory catalog house shipped in pieces and constructed in 1917. As a result, the heating and cooling systems were quite varied, differing almost completely with each building. The only exception was seven cottages built in the mid 1980's that all had the same floor plan and HVAC systems.

A comprehensive audit of all building heat and cooling systems was conducted. A central steam plant provided space heating and domestic hot water service to approximately half of the campus. The steam distribution system was installed in 1909, had had little maintenance, and was in poor condition. The existing central steam plant had main boilers that were 36 years old and, like the remainder of the steam supply and distribution equipment, at the end of their useful life.



The other half of the campus was all electric, with predominantly air source heat pumps with electric heat resistance heat backup resulting in very high electric costs in both winter and summer. Each building on the campus had almost a unique terminal heating and cooling system, with combinations of hot water, live steam, electric heat, a variety of equipment, systems, sizes, and manufacturers. As a result, there was no standardization of any type on any HVAC systems. In general, regardless of energy cost savings from replacing HVAC equipment, a major upgrade of portions of the equipment and systems was necessary, regardless of cost or energy impact, simply due to aging failure.

The existing EMS system was evaluated. This was installed in 1992 and expanded in 1997, but it served only a small number of buildings. There was fiber optic cable pulled to every building on campus, so the EMS could easily be expanded using this communication backbone.



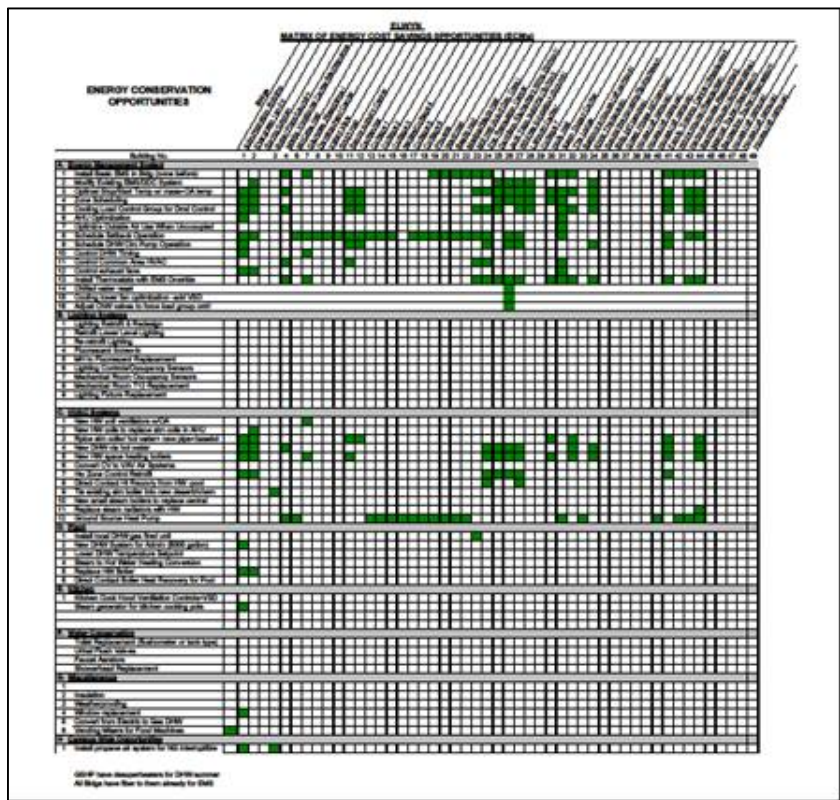
The lighting systems audit showed that the lighting systems throughout the campus were predominately T-12 fluorescent with older fixtures. It was recommended that all of these could be replaced and upgraded to provide substantial savings.

Water savings measures were evaluated and identified. A long term contract with the local Sewer Authority meant that the total water costs had been substantially reduced but still there were opportunities to replace fixtures and lower water use substantially.

Bridgestone Associates also conducted similar comprehensive audits at two other smaller satellite facilities owned and operated by the Elwyn Institute. These facilities were in Aston, Pennsylvania (approx 100,000 sq ft former warehouse building) and Wilmington, Delaware (approx 65,000 sq ft total with single and four story sections). Results and recommendations for these two satellite facilities were included in the final set of recommendations provided to the client.



Bridgestone Associates developed a matrix of opportunities which included a list of over 160 recommended Energy Conservation Measures (ECM's) for the main campus buildings and 10 ECM's for the satellite facilities. The total cost for the recommended ECM's was \$4.3 million with a composite payback of less than 6.5 years. If the recommended ECM's were all implemented, the total annual energy savings was estimated to be 1,183 MWh/year (9.6%) and 12,800 MMBtu (28.4%). Peak demand was estimated to be reduced by 1.2 MW (37%) in winter months and 0.6 MW (27%) in summer months. Because of high utility demand charges, the demand savings represented significant savings in total utility costs.



The comprehensive investment grade energy audit was completed by Bridgestone Associates on time and on budget.