

Energy Services Case Study

Customer: Pellston Public Schools, Pellston, MI

The Challenge

The Pellston Public School System faced several significant challenges. The aging buildings (the high/middle school building and the elementary school building) were in dire need of mechanical improvements. Not only were the buildings' inefficient systems not conducive to a comfortable learning environment, but they were also costly both in terms of operation and maintenance. Furthermore, the school system faced rising energy costs and constrained budgets.

The Objectives

- Lower overall energy consumption
- Lower utility expenses
- Lower cost of operation and maintenance
- Enhance the learning environment

The Solution

Sheren conducted an in-depth energy analysis and audit to understand where and how the school system was using energy. Based on the customer's objectives and our findings from the analysis and audit, Sheren tailored a step-by-step action plan with specific recommendations. Following is a high-level overview of five Facility Improvement Measures recommended and implemented by Sheren:

1. Upgraded lighting throughout

- a. Retrofitted existing fluorescent lighting to higher efficiency T8 fluorescent lamps with electronic ballasts.
- b. Converted the existing 400-watt metal halide lighting to T5 fluorescent lamps with electronic ballasts in the gymnasiums.

2. Upgraded the existing Energy Management System (EMS)

- a. Controlled boiler water discharge temperature per returning water temperature and outside air temperature
- b. Controlled air handling units in gymnasiums with variable frequency drives and CO₂ sensors
- c. Replaced standard V-belts with cog-style belts
- d. Added components to EMS to control operation of heating and cooling equipment only during periods of occupancy

3. Controlled operation of concession machines.

- a. Installed controls on all beverage and snack machines to limit their operation during unoccupied periods

3801 Rennie School Road, Traverse City, MI 49684

4. Upgraded baseboard heating

- a.** Removed existing electric baseboard heating in hallways, entrances, etc.
- b.** Installed hydronic heating baseboard system and connected to hot water boiler system

5. Upgraded heating systems

- a.** Removed existing Cleaver Brooks boilers in high/middle school
- b.** Removed domestic hot water systems in high/middle school
- c.** Installed four 90+% efficiency Munchkins hot water boilers
- d.** Installed two hot water storage tanks

The Results

Accounting for the decrease in the number of heating degree days by 8.3%, the net result of the five Facility Improvement Measures for the high school/middle school and elementary schools follows (tracking from 2003 to 2006):

- Utility provider increased electrical unit costs (\$/kwh) by 29.6%.
- Electrical consumption decreased 35.3%.
- Electrical costs decreased by 16.1%.
- Utility provider increased natural gas unit costs (\$/CCF) by 47.0%.
- Natural gas consumption decreased 52.2%.
- Natural gas costs decreased by 29.7%.

The Pellston School Board is extremely pleased that Sheren Energy Services achieved such dramatic cost savings, while improving operation, efficiency and functionality of the schools' learning environments.