



Belle Vernon Area School District



THE OPPORTUNITY

The Belle Vernon Area School District (BVASD), located approximately 25 miles southeast of Pittsburgh, was in need of many critical repairs and District administrators agreed that implementing energy efficiency and building envelope improvements was an ideal solution to generate the savings needed to fund the work. ENGE Services U.S. (ENGE) had implemented an initial phase of energy improvements in 2013 that exceeded the District's expectations but did not include all of the work that needed to be done at the time due to financial considerations.

THE PARTNERSHIP

Launching the second phase of the program, ENGE conducted an evaluation on District facilities in April of 2016. The evaluation focused on issues that had the potential to force a building closure, resulting in sending students home. The mile-long hot and chilled water distribution piping at the high school was deteriorated and developing leaks that could lead to school closure. It was located in a crawl space that was cramped and dark, making it difficult for the maintenance staff to access. Window systems were leaking, allowing water to penetrate the brick façade and cause structural damage. Additionally, much of the HVAC equipment was beyond its projected life and needed to be replaced.

In addition to identifying problems, the evaluation revealed that the project, with certain efficiency improvements would generate enough savings to fund additional work. This included improvements to the lighting systems and control systems. Although the District had carefully maintained its equipment, it was worn out and the longer District administrators waited to make repairs, the more labor and material costs would rise. If the project was delayed by just one year, labor and material costs combined with raised interest rates would result in increased costs of more than \$1 million over the program life.

Program Highlights

- Will achieve \$10.6MM in operational and maintenance savings over 20 years
- Self-funded through guaranteed savings over 20 years, at no additional cost to the residents and taxpayers of the District
- Saves 438,254 kWh annually, equivalent to the CO₂ emissions from 45 homes' electricity use for one year

Technical Scope

Phase I (2013):

- Installed high efficiency lighting systems
- Recommissioned HVAC systems
- Installed automatic temperature control systems and demand control ventilation
- Implemented energy efficiency measures for vending machines and walk-in freezer optimization

To learn more, call Rick Lewis at 832-657-3868 or visit www.americanenerpower.com

Technical Scope (continued)

Phase II (2016):

- Upgraded interior and exterior lighting across the District
- 76 exterior LED lighting fixtures
- 550 T8 and 1,142 interior LED fixtures
- Replaced cooling tower and three chilled/hot water building pumps and the condenser water pump
- Installed and insulated over one mile of replacement hot/chilled water piping mains and associated sets of risers in crawl space
- Upgraded windows and replaced roofs
- Installed 17 new replacement rooftop heating and cooling units across five sites
- Performed direct digital control (DDC) building automation system upgrades at two sites
- Replaced the existing pool heater with a new condensing boiler and heat exchanger and added an energy-saving automatic pool cover

Acting swiftly after the evaluation, the Board approved the program and ENGE began construction on lighting, HVAC, windows and roofs, and controls in June of 2016. Phase II is self-funded through guaranteed energy, operational, and lifecycle savings with no or minimal increase to existing budgets.

3 DIMENSIONS OF IMPACT

ENGE is committed to building a three dimensions of impact in every customer's future.



Supporting People

- This project exemplifies a collaborative effort between ENGE and Belle Vernon Area School District to achieve a shared vision of energy efficiency.
- The energy efficiency program will benefit students with well-lit, more comfortable facilities, conducive to academic success. By making critical upgrades, BVASD administrators are keeping schools open, while preserving District funds.



Saving Money

- The program is expected to save the District \$10.6 million in operational and maintenance costs over the life of the program.
- This self-funded, innovative energy efficiency program, allows the District to make critical upgrades and repairs to its facilities at no additional cost to District residents and taxpayers.



Protecting the Environment

- As a result of the comprehensive energy upgrades, the District is reducing CO₂ emissions by 326 metric tons annually, the equivalent to removing nearly 70 cars from the road.



Photo representation of HCL technologies.

BVASD'S HUMAN CENTRIC LIGHTING PILOT PROGRAM

District leaders were interested in making improvements in classrooms that could positively impact health, wellness, and productivity. While addressing the critical infrastructure needs of BVASD, ENGE will also install a Human Centric Lighting (HCL) pilot program in one of the high school Math classrooms.

HCL technology provides better quality, dynamic lighting, that is aligned to the circadian rhythms of the human body and the Earth's natural lighting cycle, which spans a range of light levels and correlated color temperatures throughout the day. HCL strategies are linked to increased visual acuity, improved test scores, and productivity gains.¹ In addition to installing more environmentally friendly lighting (sustainable LED lighting has no mercury content and a lower carbon footprint), BVASD is excited to see the gains students will make as a result of the pilot program. ENGE will work with the District to track outcomes and monitor improvements.

To learn more, call Rick Lewis at
832-657-3868 or visit
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