

# LENOIR CITY BOYS & GIRLS CLUB

201 N. B St., Lenoir City, TN 37771

## ENERGY & WATER EFFICIENCY PROGRAM OVERVIEW

September 2015



### Project Overview

The Lenoir City Club of the Boys & Girls Clubs of The Tennessee Valley had several obsolete HVAC systems that were very expensive to maintain. Four of five systems were replaced with high-performance ENERGY STAR rated HVAC systems with CO<sub>2</sub> sensors for demand-controlled ventilation. All facility HVAC systems are now controllable by club staff online or via smartphone using Web-based thermostats that Southface can view as well to assist in fine-tuning HVAC operations.

Other improvements include vending machine controls, and replacing standard plumbing fixtures with low-flow fixtures.

The club loves their new lighting and HVAC, and has realized tremendous maintenance cost savings in addition to the energy and water cost savings.

### Site Details

- Average daily attendance of 131
- 8,500 square feet
- Constructed in 1987

### Energy & Water Benchmarks

- \$13,500 in baseline utilities cost
- 4 million Btu of energy per member per year
- 575 gallons of water per member per year

### Improvements

- Invested \$65,532, or \$7.71 per sq. ft.
- Predicted return on investment (ROI) of 7%
- Actual savings – after only 8 months – of over \$3,542, 29% energy savings, and 1% water savings

Projects Implemented	Predicted Annual Savings					Project Cost	Projected Return on Investment
	Water (kgallon)	Costs	Million Btu (Site)	Million Btu (Source)	CO2 Emissions (tonnes)		
Install high-performance LED lighting throughout with occupancy controls	-	\$1,165	37	117	5.3	\$27,961	4%
Replace four old HVAC systems with ENERGY STAR. Install five Web-based smart thermostats with integral occupancy sensors	-	\$2,915	107	290	13.2	\$34,616	8%
Install vending machine controls on drink machine	-	\$124	4	12	0.6	\$195	63%
Replace plumbing fixtures with low-flow fixtures, including 0.5 GPM restroom faucet aerators, water closets using 1.28 gallons per flush, and pint-flush urinals	37	\$536	-	-	-	\$2,760	19%
<b>Projected Total Savings, Cost, &amp; ROI</b>	<b>40%</b>	<b>28%</b>	<b>21%</b>	<b>27%</b>	<b>27%</b>	<b>\$65,532</b>	<b>7%</b>



**About the Boys & Girls Clubs of America Energy & Water Efficiency Grant Program (BGCA EWEP):** The Southeast Region of BGCA was been selected to participate in an important pilot program to demonstrate the economic and environmental benefits of high-impact energy and water efficiency improvements in club facilities. Funded by The JPB Foundation, the program's ultimate goals were to reduce club utility expenses by 20 percent annually and to improve conditions in existing facilities, so they may be better used in support of BGCA's mission.

## Project Highlights



Figure 1: Old HVAC Example

Obsolete HVAC systems (above) were replaced with high-performance HVAC systems with CO<sub>2</sub> sensors for demand-controlled ventilation (below).



Figure 2: New HVAC Example



Figure 3: New Pint Flush Urinals

Pint-flush urinals use 87% less water than previous fixtures!



Figure 4: New LED Lighting & Controls Throughout

Existing 400W metal halide gymnasium lighting was replaced with new 240W LED fixtures with dimming controls, and fluorescent lighting was also replaced with LED. Occupancy controls were installed throughout the facility in a vacancy mode, where fixtures are turned on manually if needed, and then turn off if inadvertently left on when areas are unoccupied.

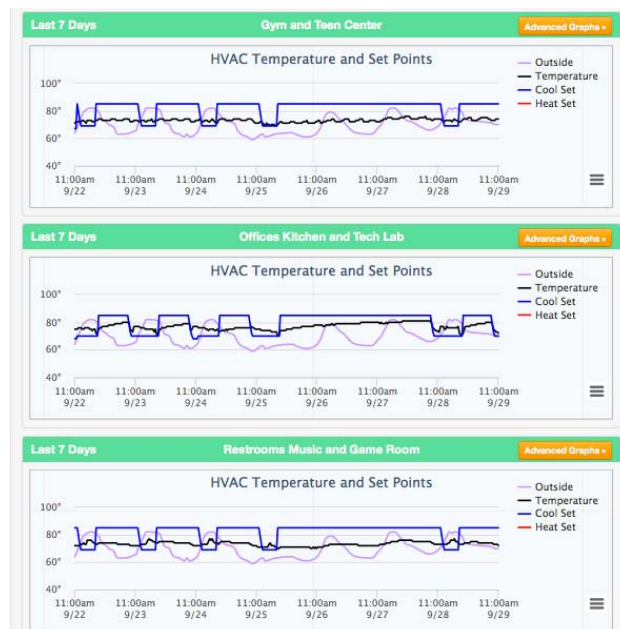


Figure 5: Smart Web-based Thermostats

All thermostats were replaced with smart Web-based thermostats with integral occupancy sensors. The above picture illustrates the online monitoring capabilities, including outside temperature, indoor temperature, indoor setpoint, occupancy status, and operating schedules.