



CASE STUDY
MaST Community Charter School
Philadelphia, Pennsylvania

The Math, Science and Technology (MaST) Community Charter School in Philadelphia is an innovative, award-winning K-12 public charter school, with about 1,100 students in two buildings. The main building was constructed in 2000, on the site of an old wire mill and warehouse, and a newer building was added on the site in 2006.

The school conducted an energy study to determine how best to reduce its gas and electric energy usage while maintaining optimal learning conditions. With GreenTech Energy Services, MaST selected three energy conservation measures that would produce the biggest, quickest return: re-lamping of corridors and classrooms, occupancy sensors for classrooms and office spaces, and PaceControl retrofits for the rooftop gas/electric package units.

GreenTech replaced outdated HID fixtures in the gymnasium and multipurpose room with state-of-the-art T5 HO fluorescent fixtures with lens covers and cages. The new fixtures provided instant on and off, which eliminated warm-up time, and dramatically increased light levels. GreenTech also installed occupancy sensors in the classrooms and offices, resulting in significantly lower energy usage.



PaceControls installed its PACE2 HVAC controller, which established optimal run times for the compressors and burner units. By reducing overall compressor runtime, the controller increased efficiency and reduced energy costs. In addition, GreenTech installed Thermonomics, a refrigerant enhancer that prevented oil buildup on the heat exchanger. This reduced friction in the flow of the refrigerant, increased the heat transfer rate, increased efficiency, and prolonged the life of the HVAC system.

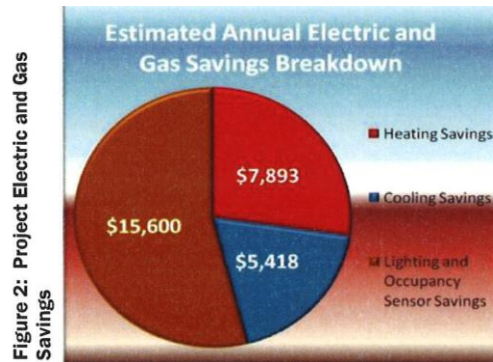
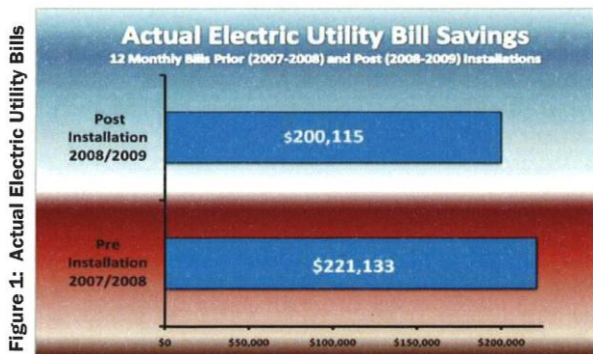
The re-lamping and occupancy sensor ECM installation was completed in 4 weeks during the school's summer vacation. The PACE2 retrofit project was completed during the first two weeks of the school year in order to ensure that HVAC systems were tested with a full student complement in the school. Neither installation affected building operations.

SAVINGS

Building Location	Program Cost	Payback Period	EXISTING LIGHTING USAGE		ENERGY SAVINGS			ENERGY COST SAVINGS				
			KW Usage	KWH Usage	KW Saved	KWH Saved PACE/THERMONOMICS	TOTAL KWH Saved	KWH Savings PACE/THERMONOMICS	KWH Energy Savings	CCF Energy Savings	Operation Savings	Total Savings
K THRU 12 OLD SCHOOL	\$128,582	6.6	103	263,640	30		129,858		\$15,583		\$3,857	\$19,440
PACE CONTROLS	\$30,776	1.3	327	353,100	53	57,090	57,090	\$6,851	\$6,851	\$15,061	\$923	\$22,835
THERMONOMICS	\$13,500	2.9	327	353,100		35,310	35,310	\$4,237	\$4,237		\$405	\$4,642
Totals	\$172,858	3.7	757	969,840	83	92,400	222,258	\$11,088	\$26,671	\$15,061	\$5,186	\$46,917

ENVIRONMENTAL IMPACT

Reduction in Carbon Dioxide (pounds) 194,787
 Reduction in Sulfur Dioxide (grams) 727,203
 Reduction in Nitrogen Oxide (grams) 324,644



Since MaST is a math, science and technology school, we were asked by many students what we as a school were doing to go green. We felt that Greentech would help us meet the needs of our students to address environmental issues. Secondly, our PECO bills were getting out of hand and we thought there were other technological measures we could take to help alleviate these high energy bills. After Greentech and its partner PaceControls implemented their plan for MaST, we started to see our utilities bill drop by \$2500 to \$3000 per month. That's significant!!

Richard Trzaska
 Chief Administrative Officer, MaST Community Charter School



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