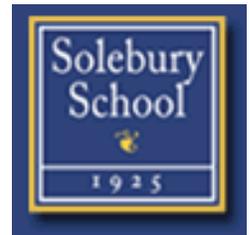


Going Green and Saving Green

Bucks County school looks to reduce energy consumption.

By Gary Keen

“It’s not easy being green,” was Kermit the Frog’s lament. In fact, it is a big leap from that quiet lily pad to the more complicated world of energy efficiency and the systems that support it. Today, building owners not only need to worry about cost, convenience, and comfort, they also must become familiar with environmentally-friendly technology. Americans hesitate to buy hybrid cars because of added costs, inconvenient maintenance, fewer model choices, and a lack of space. We worry that adding solar panels will be expensive, inconvenient, and ugly. But as energy costs skyrocket, going green is becoming unavoidable. As business people, we must save money on energy wherever possible. But where do we begin?



That was the challenge facing Solebury School, a college preparatory day and boarding school in New Hope, Pennsylvania. Over the last two decades, the school has seen significant growth, with construction of several new campus buildings and the renovation of a number of older buildings. With this growth, school leaders quickly realized they had to find new and creative ways to be environmentally friendly and fiscally responsible, while retaining a positive learning environment for its students.

According to school Director of Finance Doug Haigh, “When we began looking to improve efficiency of our buildings, saving money was the primary motivation. However, one of the school’s other objectives is to be a ‘Good Steward’ and a good citizen of our environment, and we realized that improving energy efficiency would both reduce expenses and minimize our impact on the planet.”

Because the school’s newer heating and air conditioning systems are so complex, Haigh decided to hire an outside expert to examine the facilities and offer options. He turned to Vortechs Automation Inc., a Montgomery County company recommended to him by one of his vendors. Vortechs has been providing long-term, customized solutions for buildings with energy-efficiency issues for over 15 years.

According to Haigh, the process was simple. “Walter Horigan, Vortechs’ President, came out and walked through one of our buildings. We sent him copies of our energy bills, and other information about the building. He discovered, right away, a number of things. They are extraordinarily knowledgeable when it comes to HVAC [Heating, Ventilating, and Air Conditioning] systems and controls and how you can make them operate more efficiently.”

Vortechs and Solebury School officials decided that, in order to make the most impact, they would start with the building with the highest energy bill.

For Solebury School that was the Abbe Science Center, a modern 13,000 square foot building housing eight classrooms, faculty and student lounges, and the school’s computer servers. The building is well designed, properly insulated, and maintains a very efficient electric heat pump and cooling system, but it was designed at a time when oil was \$15 a barrel and energy costs, including electric power, generally weren’t as much of a concern.

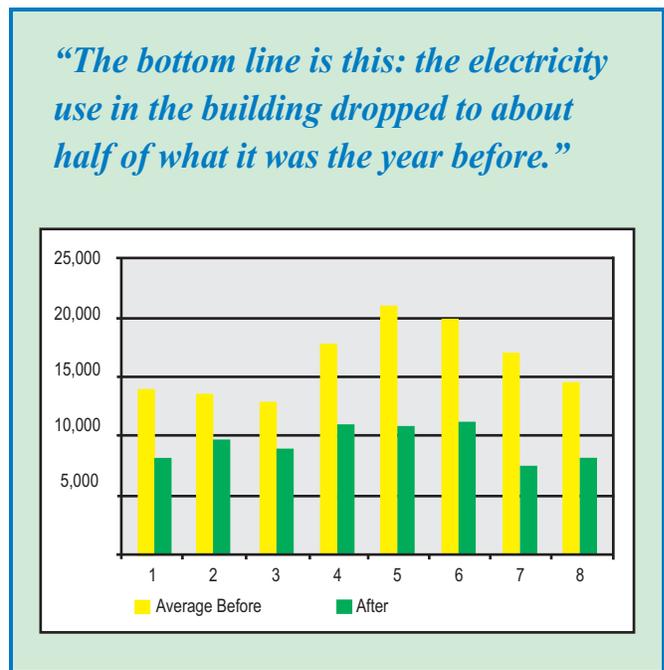
According to Haigh, the electric bill for the building was over \$2,000 per month during the winter and summer, and around \$1,600 in spring and fall. School officials assumed the computer servers used a fair amount of power, but the bills still seemed high.

Vortechs surveyed the equipment in Abbe, tracked the hours each module ran, and calculated where the most power was used. Then they utilized that information to create a comprehensive proposal for a computerized building-management system which would control the entire building’s HVAC system.

But Vortechs had a major challenge on their hands. In order to be effective and worthwhile, any solution they established would have to be cost effective, convenient, easily maintained, and conducive to a comfortable learning environment.

According to Haigh, once Vortechs installed their system, cost benefits came quickly. “The return on investment looked like it would be 12%. Better than our cost of funds—much better. The payback period looked to be less than eight years. But since then the price of power has risen significantly and the payback period is even shorter.”

The bottom line is this: the electricity use in the building dropped to about half of what it was the year before. School officials are convinced that their energy saving investments will only get better.



Haigh adds, “The key thing to grasp about this type of comprehensive energy management system is that the installation of the system is just the beginning. The system Vortechs designed doesn’t just automate and control. It captures the operating data that you need to make continuing improvements. But knowing what adjustments to make is only possible if you have the data showing you where and how energy is being used. That is the most important feature, in my view.”

Haigh also said that the new system is much more convenient than their previous controls. Not only can he access the system on the internet with secure passwords, he can also make instant changes to building temperatures if there is a snow day or an evening concert.

“Now, with the automated controls, a member of the staff tells me that they need heat in Abbe tonight at 7:00 PM, it will take me 30 seconds, from my desk, to make that change. If ten minutes later



the needs change, we can take it off the schedule. If there’s a snow day, I can turn the building to the unoccupied mode at 5:00 AM from my home.”

But even the best cost savings and the most convenience are worthless if the faculty and students aren’t comfortable. Strangely enough, by eliminating thermostats in each classroom, comfort has actually improved.

According to Haigh, “If you have individually controlled thermostats in a room, people come in (and we all do this)

and if it is a little cold, we turn up the thermostat. Nine times out of ten we overshoot. We make it too warm because we want it to come on faster. Of course, the heat doesn’t come on any faster; it just heats up to a higher set point. Then, since it gets too hot, we turn it down. The system goes up and down, cycling more than it needs to. Sometimes, we turn it on too hot, the bell rings for next period and we leave the room. We’re constantly missing the mark. So A, we’re using more energy and B, we’re less comfortable.”

“By integrating all of the heat and air conditioning controls, the Solebury School was able to create an environment that was more comfortable and more energy efficient. Complaints are way down – by 90%, and when we do get them, we can trace the issue down by using the data and then fix it so it won’t recur.”

“Strangely enough, ...comfort has actually improved.”

Most importantly, maintaining the energy benefits has been easy.

“We are constantly monitoring and making improvements,” Haigh says. “And our system gives us the tools and the data that we need to succeed. Now we know where our energy is going, by unit.”

In fact, school officials were so impressed with the results that they are planning future energy-conservation projects. Vortechs is installing new systems in two other school buildings, and the school is looking into other projects involving lighting, water use, and trash disposal.

“One of the items on my list of things to do is to take some time to acquaint the teachers with the system so they can figure out the most interesting way to use this as an educational tool,” Haigh says. “It lends itself easily to science or math courses or, possibly, could be part of an environmental elective course. We can put up monitors in a classroom that shows, minute by minute how we’re using energy around the campus. That makes it visible and accessible in a way that may grab students’ attention. You communicate to them what we’re doing, and what is going right or going wrong. The teachers can have an on-going conversation.”

It is much more environmentally friendly and cost-efficient than tearing down existing structures and rebuilding them. Going green still may not be easy, but for Solebury School and its students it’s becoming much more realistic.

This article appeared in *Building Services Management*, December 2008.