

Polk County Public Schools: Leading the Way in Florida with Low Tech Solutions

Mark A. Lester

ABSTRACT

Conservation isn't sexy, but it is the simplest and best solution out there currently. It works, one can start today, and it makes a big impact. Solar, wind, nuclear and other energy alternatives may play a large role in years to come, but we cannot dream of technology saving us in the future; we need to learn to conserve today. As I once heard it said, "The most efficient energy molecule is the one which never gets created."

It should also be recognized that conservation doesn't have to involve complicated, expensive energy management systems. Polk County Schools has cut its energy consumption by 30% and consistently leads all school districts in Florida, year after year, using some of the simplest and cheapest technology available.

It goes without saying that the nature of one's organization will influence how an energy program should best be run. Certain needs and even deficiencies may be different in a school system than in a hospital or a corporate building. In fact, an organization operating around the clock and with deeper pockets may actually be better served using the most up-to-date control system available.

So with the above in mind, I am not advocating that all organizations should always manage energy with the same approach as Polk County Schools. I am suggesting however, that in some applications, our low-tech approach may be worth looking at, especially if an organization has similar operating hours and struggles to fund and maintain more complicated and expensive energy management systems. I would also promote the idea that any organization can get started saving significant energy, no matter how simple their engineering or controls may be.

If one is interested in our program, I believe eight practices and/or philosophies are worth examining. As somewhat of a disclaimer, I cannot state for sure that all eight are equal in importance, or even that they

all work to the degree I suspect. But after conferring with other energy managers, both in other school districts and in other industries, I feel these philosophies stand out as practices that may differ from the norm.

INTRODUCTION

When speaking at a conference recently, I had some of my beliefs and philosophies validated while listening to other speakers. Although to be completely honest, it was the conversations with the speakers away from the podium that truly made me realize I was not alone in my belief, and that belief being that expensive and modern solutions are not always the best answer and that we manage people as much as we manage energy.

One of the speakers shared with me how he had consulted with a high profile company known for being on the cutting edge of technology, and therefore they wanted everything high tech for their energy management as well. While their quest for modern energy solutions was not necessarily a bad thing in his opinion, he went on to suggest that the company's preoccupation with cutting edge energy tools almost seemed to outweigh their desire for actual results.

Case in point, he mentioned to them something very new and progressive that might save the company a few dollars each month on their natural gas bills, but since the technology was in its infancy, he couldn't make any guarantees on the savings and warned that the device was very expensive. Instead of hesitating, they jumped right in feet first. However, when he suggested that raising the cooling set point by one degree would yield millions of dollars in automatic savings with no additional outlay, they had little interest.

I then listened to another speaker share how when he was consulting with a company looking to save energy, they requested to have a windmill installed in their front parking lot. He informed them that due to their geographic location, the payback on the windmill would probably be over sixty years, and in his estimation would be a poor solution. They ignored his advice and installed it anyway, proudly asserting that it made the company look "green" as people drove by.

So with that in mind, I suggest that we resist the urge to automatically gravitate toward what appears green or high tech on the surface and instead strive to institute what clearly works best in the given work

environment that we consult with or manage. In the case of my organization, that usually means installing control systems that are simple and inexpensive, and instituting practices that appear feasible and reasonable to our employees. I stress the last idea more than most in the energy management field because, as I will share below, we are managing personalities and mindsets as much as we are managing energy and, in my experience, that reality should not be overlooked.

STRATEGIES AGAINST THE NORM

Behavior Modification Over Engineering

Some amount of engineering will be involved no matter what an entity institutes, but it has been our philosophy to spend more time educating staff on how to use energy wisely, as opposed to designing ways to achieve savings with complicated automation, and in my mind this has two main advantages. First, if an employee develops a mind set of conservation, that philosophy often tends to carry over to items that are not automated. Second, employees tend to take ownership and even pride in being efficient stewards of energy and often began to think of energy management as something that they can accomplish rather than something they merely endure.

Physical Walkthroughs of Building Sites

The inefficiency of driving to individual sites and physically walking campuses, as opposed to having all sites at one's fingertips on a centralized computer, is not lost on us. I clearly acknowledge the advantage of more high tech energy management systems. My counterargument however, besides the expense of installing such systems, would be the advantage of thoroughly knowing a building inside and out. Issues such as rusting air handlers, excessive water on mechanical room floors, and odd odors cannot be noticed by simply sitting at a computer. I would make the argument that when people do not have the advantage of monitoring remotely, they are much more likely to check sites in person.

Hand Input of All Bills

We are continually offered the opportunity to have bills electronically entered into our database and we always turn it down. It may seem antiquated and a waste of time to input paper bills into a software

program one bill a time, but we are convinced it forces us to pay more attention to specifics than we would by simply perusing our data from time to time or depending on warnings from a software program. However, keep in mind this goes back to the nature of our organization. We often have numerous electric bills per site, and each bill can give us a window into utility use at each building of a given campus. It should also be noted that we have paid for at least one energy manager's salary every year for the past five years simply by catching mistakes we have found from utility companies on their billing. It is our belief that we catch these anomalies more easily by manually entering the bills.

Individual Control of HVAC

Individual control of an HVAC is a controversial practice that many will disagree with. We understand the efficiencies of chilled water systems or large DX systems cooling large areas for many applications. However, we operate schools for only around 3500 hours a year, with additional off hours for parent meetings, sporting events, and other special functions that may involve only one room or building of a school. Also there are times when a lone principal or teacher worked on a weekend when the school is shut down. For our purposes, the schools with individual units always have a drastically lower cost per square foot than schools with large units cooling numerous buildings. We have also found that we have far fewer complaints about comfort with individual units.

Complete Shutdown of Buildings When Unoccupied

This would clearly be our most controversial practice. Most organizations have set back temperatures for their buildings when no one is present. We completely turn our HVAC off during all nights, weekends, and holidays. Many critics will point out the damage that can be caused by such a practice, especially with the high humidity of the Florida climate, but we have had few major issues. We have over 100 Energy Star Award schools qualifying with a thorough examination of indoor air quality and the overall health of a building by a trained engineer. All of our buildings passed inspection.

The complete shutdown also extends to exterior building lights. Most school districts run their exterior lights all night every night. Our policy is that if no one is on campus, we have a complete blackout. As crazy as this may sound, we have not had higher instances of break-ins or vandalism that I am aware of, but we do have lower energy bills.

Weekend, Night, and Holiday Audits Stressed

A typical workweek is 40 hours, which leaves another 128 hours during the week. It is our practice to monitor the 128 hours where we feel things should be off, more than the 40 when workers are present and busy. Two philosophies are involved in this. First, the 128 hours is, of course, a greater length of time, but second, there is a psychological component involved as employees never seem to argue about why something should be running when no one is around. In other words, the same teacher who will argue vehemently that she should be allowed to run A/C and have her windows open at the same time, will apologize when a TV is found on during the weekend. We have found that if we keep somewhat of a loose hand on what goes on when teachers are present, they buy into the idea that everything should be off when no one is present. Their agreement that our policy is fair has a lot to do with the success of the program.

Human Interaction over Technology

At the risk of sounding like a Dale Carnegie book, I would suggest that getting to know both the key individuals at a specific site and the culture of the company or organization will assist in the success of one's energy program to the same degree as understanding the mechanical engineering involved. A good example of this philosophy is that our county only hires former teachers to be energy managers. Many would argue that limiting the candidate pool to only teachers as opposed to engineers is an unwise practice, but it is our belief that one who understands the culture of a school can be taught the nuts and bolts of HVAC far more easily than a technical person can learn to empathize with the psychology of a teacher. While most organizations will never want to be that drastic, I do strongly suggest that energy managers learn to recognize the psychological aspects and ramifications of what we do on the people we manage. Never lose sight of the cost and value of human productivity.

Support from the Top

I am preaching to the choir on this one, but the value of top end support can never be underestimated. When I speak with other energy managers, whether from other school districts or private industry, their biggest complaint usually is that they don't get the support from the top that they need. Therefore, energy policies really become energy sugges-

tions, and to some degree this is probably why many begin to lean towards complicated automation. Support from the top has allowed us to sit in architectural meetings to contribute our influence before buildings are even constructed, for instance. This is no great insight, but I would make the assertion that the number one variable needed for a successful energy program is support from the top. As antiquated as our energy tools may be in Polk County, I wouldn't trade in our support from upper management for any technological advances that may exist. If one were to come away with only one major principle from this abstract, it should be the importance of those in high positions making energy management a goal for the entire organization rather than the job of a few.

CONCLUSION

Our methods may seem naïve, antiquated, and lacking in creative or technological initiative, but the bottom line is energy management in Polk County schools consistently saves 30% and \$8 million a year in energy costs, while operating on a department budget of only \$250,000. If every school district in Florida operated at our cost per square foot, the state would have saved around \$1 billion over the last 5 years. We are not against technological progress, but before an organization worries too much about paying for a complex EMS system and learning it, they should try simple conservation practices first. Many measures simply involve giving employees control and responsibility of their own environment and keeping automation controls as simple and user friendly as possible.

ABOUT THE AUTHOR

Mark Lester, CEM, taught American History with Polk County Schools for 17 years until 2007, when he was hired as an energy manager for the school system. Under his leadership, Polk has led all school districts in Florida in energy efficiency for the past 5 years and avoids an estimated 30% in energy costs, translating to around \$8 million annual savings. In 2012 he spoke at the World Energy Conference in Atlanta and shared the virtues of simplicity and individual responsibility when it comes to energy management. Mark Lester can be reached at mark.lester@polk-fl.net.