

A Penny Saved is a Penny Earned

How an energy audit may save you big bucks in the years to come.

BY CHRIS HARTWIGER

The name of the game for golf courses in these recessionary times is to keep the current standards and find ways to do so by spending less money. Although turfgrass managers have expertise in many areas, it is unlikely that their turfgrass management degrees provided them with training in how to reduce the consumption of energy at their golf facilities. Actually, this is good news, as it opens the door to a large, unexplored territory for reduced costs and the potential savings that can come from this exploration.

Managing energy costs is a complex subject, but getting started is easy. The remainder of this article will demonstrate why an energy audit is worthwhile and how someone can begin the process. Potential items to evaluate will be reviewed. Most important of all, this article will serve to help you begin the process.

WHY CONDUCT AN ENERGY AUDIT?

The reasons why it is beneficial to conduct an energy audit at your facility are largely self-evident. Most industries, including golf, have sought ways to reduce any and all costs during the recent recession. Difficult times often lead to more careful scrutiny of budgets,



Although modern clubhouses have been constructed with energy efficiency in mind, there are still opportunities to reduce energy costs on these buildings.



Conducting an energy audit is just as important in the maintenance facility. Don't overlook this critical opportunity to improve efficiency.

and inefficiencies are uncovered. The beauty of energy audits is that, in most cases, any changes made to reduce energy demand in the first month will not only save money in that month, but these savings will recur over time. Therefore, there can be a big payoff for the time spent on energy audits. A second reason to conduct an energy audit is the fact that it is easy to begin. A final reason is that, over time, there will be more government regulation of power consumption, not less, and any steps taken now will be helpful should regulations increase in the future.

GETTING STARTED

The first homework assignment is to understand how you are billed for energy, particularly electricity. Generally, there are three sections to a commercial electricity bill: Customer Charge, Killowatt Hour Charge, and a Kilowatt Hour Demand Charge. The Customer Charge is a fixed charge per meter. The Kilowatt Hour Charge is based upon the monthly consumption of kilowatt hours. The Kilowatt Hour Demand Charge reflects the utilities' fixed costs of providing a given level of power availability to the customer. It is determined by the peak 15- or

30-minute period per month. The customer is charged per kilowatt hour (kwh), sometimes above a given threshold.

Figure 1 provides a simple graphic illustration of why demand charges are necessary for commercial entities. The local power company must have the capacity to meet the demand of its consumers. Homeowners have a predictable pattern of consumption, but commercial entities such as factories, machine shops, and even golf courses (think pump station and cart charging) have large fluctuations in power demand. In Figure 1, the customer in the top half of the diagram, who will be referred to as Customer A, “demands” one kwh per day from the local power company over a 10-hour period. The customer in the lower half of the diagram, who will be referred to as Customer B, also “demands” one kwh per day, but it makes its request over a one-hour period. Therefore, the

power company must have the capacity to send 10 times more power per hour to Customer B than Customer A. Thus, the power plant must be much larger for Customer B than for Customer A.

For facilities embarking upon an energy audit for the first time, the process should be research, analyze, implement. There is a tremendous amount of information available on energy audits online and from your local utility. Many power companies offer free commercial energy audits for their customers. Although it may seem counterintuitive that a utility in the business of providing power is helping reduce power demand, keep in mind that the power company wants you to stay in business so you will continue to buy their power. By all means, take advantage of any free energy audit from your local power company. Additionally, in doing your research, you may find a consultant who provides energy audits, too. As you move

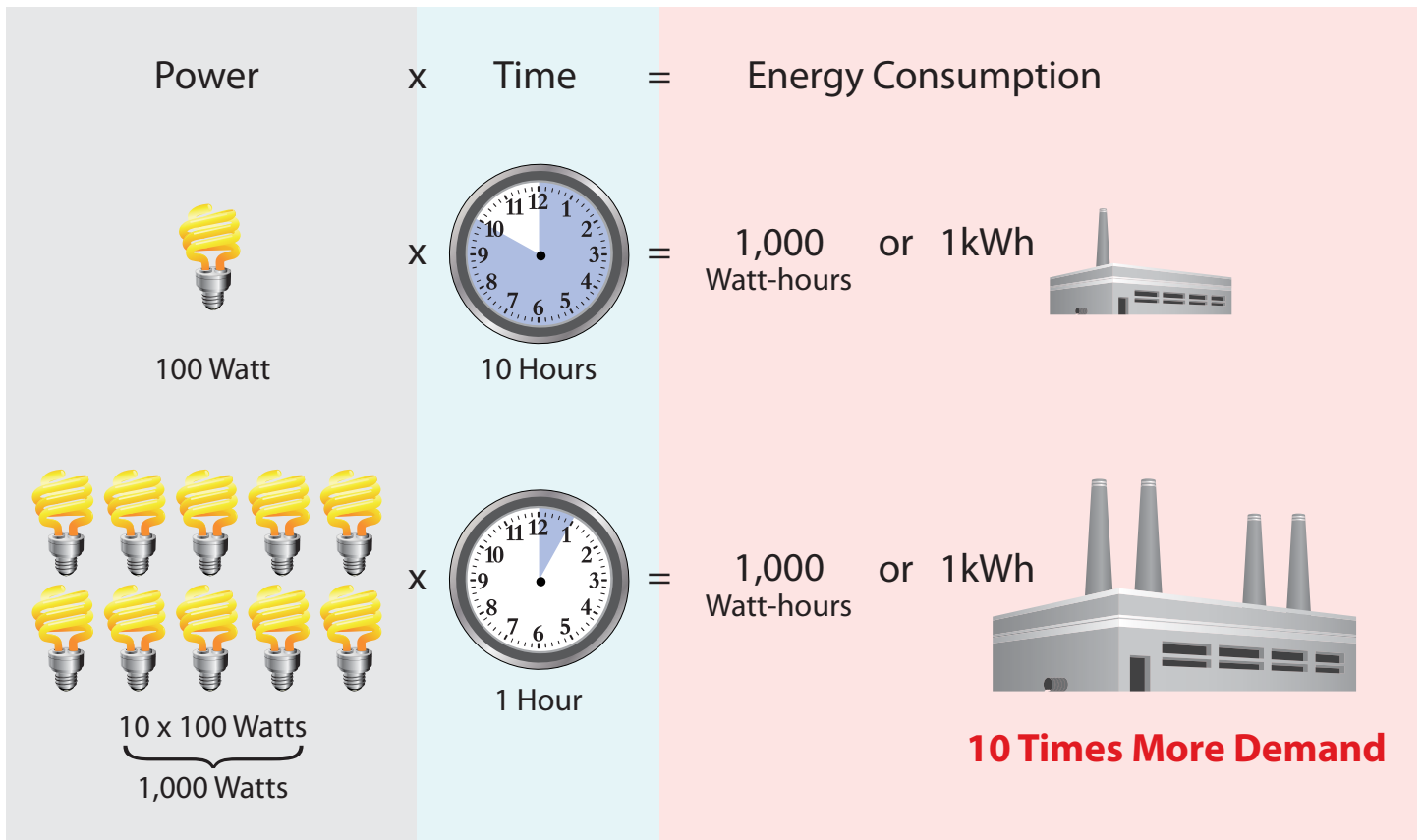
through the process of evaluating your facility, this is something to consider strongly.

Analysis is a key component of an energy audit. Contact people from your facility and encourage them to become involved. Determine what the cost of making the change is and when the projected payoff is expected. Not everything has to happen at one time. As small changes are made and more funds are available, changes that require more funds can be implemented.

Implementation should be gradual. Start small and build from there. Be sure to document the changes and their impact on subsequent bills.

ITEMS TO EVALUATE

Lighting. This is a quick and easy place to start. Take a look at your facility and record the type of light-bulbs that are being used. If incandescent bulbs are still used, replace them with more energy-efficient



Analyzing the demand charge component of an electric bill requires an understanding of both the quantity of electricity requested from the electric company and the length of time over which the quantity is requested.



Solar panels can help reduce energy consumption by 50-75% and extend the life of cart batteries significantly. Sebonack Golf Club in Southampton, N.Y., has taken a leadership role and embraced the technology for their golf cart fleet.

compact fluorescent bulbs. If long fluorescent bulbs are used, replace them with more energy-efficient Super T-8 lighting.

Take a tour of the facility at night. Observe what lights are on and ask a few questions. How long are these lights on? Do they all need to be on?

When are they turned on and off? Are they turned on and off at exactly the right time, or are they on too early and turned off too late? The installation of a timer with a photocell is common for outdoor lighting and may be an answer for your facility. The photocell governs when the lights are turned on and off.

Best of all, they do not require human intervention to adjust when they turn on or off as day lengths change.

Occupancy sensors that detect motion and turn on lights are appropriate for many rooms in the maintenance facility and clubhouse. They ought to be standard operating procedure in break rooms and restrooms. These features are inexpensive and easy to install, and the payback often is less than a year.

Heating and Cooling Systems.

Exploring measures to reduce heating and cooling systems for enclosed spaces and water can become complex fairly quickly. However, there are a few basics that anyone can master. First, be aware that, in the winter, a two-degree increase in temperature in an enclosed space can require five to eight percent more power. Lowering the temperature by two degrees in the summer increases the electricity requirement by a similar amount, too.

Making a commitment to keep enclosed spaces cooler in winter or warmer in summer by a degree or two will make a real difference in consumption and expense each and every month. Programmable thermostats are a great way to reduce electricity demand, too. They save money by altering the indoor climate when the building is in low use or not in use. The payback for programmable thermostats is not long, either. Other simple-to-implement energy-saving techniques in this area include using shades to block direct sunlight into a room in the summer and beefing up insulation where appropriate.

GOLF CART CHARGING

Electric golf carts are a popular fixture at many golf courses. Although a given golf cart requires a certain amount of electricity to recharge, how and when the cart is charged can affect the cost to charge the cart. Below are a few questions to get started:

- How does the current charging protocol affect the demand charge?

- Is the cart storage facility on a separate meter?
- When all the carts are in use during an outing, are they all charged at the same time later that day? Is there a way to stagger the charging of the carts to minimize demand charge?
- Does your electric company offer off-peak rates?

Solar panels on the roof of golf carts are an emerging trend that is receiving attention in the golf media. In an online article, Dave Shefter of the USGA reports that Sebonack Golf Club on Long Island has a fleet of golf carts with solar panels. The club estimates that it will reduce electricity consumption for cart charging by 50% to 75% and extend the life of the batteries in the carts (Shefter, 2009).

Solar panels are well worth investigating. It would not be surprising to see prices come down over time as more courses use this technology. Also, there may be federal and state tax breaks available for courses that pursue the use of this technology.

PUMPING STATIONS

In the article entitled “Energy Use on Golf Courses, Part 1: Energy Generation and Delivery,” Andrew Staples points out that a typical pumping system will account for 25% to 50% of a golf course’s energy use (Staples, 2009). This is eye-opening information. Most turf managers in charge of irrigation scheduling have focused on the least amount of time to apply needed water to golf course turf. However, it is likely that, as a result of this recession, the question will be reframed to, “What is the most energy-efficient way to manage the delivery of water to the golf course and still meet the expectations for the facility?” If your facility has not thought about irrigation in this way, there is ample opportunity to reduce electricity costs. Be forewarned: This is a complex topic and one that will likely require the use of an irrigation consultant, but in the long term, the investment in time and



It is estimated that pump stations use 25-50% of the total electricity for a golf facility.

expense is going to pay off. Begin by reading these three articles, which are available in the *Golf Course Management* archive at <http://www.gcsaa.org/GCM/Archive.aspx>.

- Staples, A. 2009. Golf Course Energy Use, Part 1: Energy Generation and Delivery. *Golf Course Management*. June, 77(6):96-102.
- Staples, A. 2009. Golf Course Energy Use, Part 2: Pump Stations. *Golf Course Management*. July, 77(7):94-102.
- Staples, A. 2009. Golf Course Energy Use, Part 3: Energy Planning, Upgrades, and the Future. *Golf Course Management*. September, 77(9):94-100.

CONCLUSION

Indeed, a penny saved is a penny earned in today’s golf market. Although

facilities all over the country appear to be settling into a new reality as far as projected revenues are concerned, there are steps that can be taken today to reduce expenses. This article should be a starting point for anyone interested in the journey toward improved energy efficiency.

REFERENCES

- Shefter, Dave. <http://www.usga.org/news/2009/October/At-Sebonack-Solar-Powered-Golf-Carts-Get-Day-In-Sun/>.
- Staples, A. 2009. Golf Course Energy Use, Part 1: Energy Generation and Delivery. *Golf Course Management*. June, 77(6):96-102.

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