

Conducting an Energy Audit

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Not many of us can pass through a day without hearing phrases such as “climate change, energy independence, alternative fuels, carbon footprint, and sustainability.” It is easy to become deaf to these concepts and even more detrimental, to become blind to the environments that we live in each day.

The term energy audit is nothing new; it arose from the energy crisis of 1973 and subsequent years. Energy audits have gained new interest since our increase in our understanding of climate change and global warming – and as the price of energy keeps going up.

An energy audit is an inspection, survey and analysis of energy flows for energy conservation a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s).



Motion activated light switches are an easy way to conserve electricity. Plus they come in handy when your hands are full.

There are many great resources available through the U.S. Department of Energy, especially for homes and it is not too large of a stretch to adapt that information to commercial structures. The largest motivating factor the DoE uses to urge people to create an energy efficient home making it comfortable while saving money. Pushes to increase insulation, repair or replace leaky windows, recycle old and outdated appliances

and use high efficiency heating and cooling systems are the mantra of the of programs described by the DoE. Of course, they urge us to look at each system and make sure each component is operating at the highest level of efficiency (i.e. a high efficiency furnace will not have the impact if air ducts in your attic are leaking and or not well insulated).

Like any audit, a professional company can be hired to come in and inspect where energy is being lost throughout an operation. However, there a few simple tools that you most likely already have that can get you on your way to conducting an in house audit.

As we begin to enter our “indoor months” it is a good time to prepare or plan to conduct an audit of your maintenance building or structure. The first place to start could be your office. For \$29 at any major retailer you can pick up a “Kill A Watt EZ” electricity usage monitor. It is an inexpensive power meter that allows you to accurately measure power consumption of appliances (< 15 Amps) and determine the actual cost of the power consumed. It has an option to set the price that you pay per Kilowatt-Hour (found on your bill) and it will tell you how much each appliance costs per day of use. It will even project costs on items that cycle, such as refrigerators, freezers,



Most consider conserving energy because of the cost of it, however some superintendents are taking the lead at their facilities because it is the right thing to do.

compressors, etc. Even when you think an item is completely off – it will show an energy draw if there is any present (many TVs and other electronics will use power even when they are powered off).

Take a measure through your office and shop and see what things are using power throughout the day (and night) and see what items can be switched off or unplugged altogether. Does your irrigation computer need to be on all winter long? How about handheld radios - do all of them need to be charging throughout the off-season? How about power tools with rechargeable batteries – how often do we leave the spare battery plugged in? Does the air compressor in your shop cycle at night? Why?

Are you still using a Cathode Ray Tube monitor (CRT)? Consider switching to an LED or LCD monitor. Set your monitor to sleep or turn off when not in use. If able, turn off your computer and monitor at the end of the work-day. Next time you go to replace your desktop computer, consider switching to a notebook computer with a docking station.



Chances are your equipment technician already has an infrared thermometer.

Lighting usually accounts for 10% of our energy bills. Most have switched to energy efficient bulbs of some type, either LEDs or CFLs. Consider installing motion activated light switches with timers or occupancy sensors in areas where the lights tend to stay on when not needed (interior rooms such as rest rooms, storage areas, break rooms and locker areas). At the very least make sure your night-lights are energy efficient and don't forget to look at exit lights that stay lit all the time. How about your work area, can you install or use task lighting instead of lighting up

a whole room to illuminate your work area.

Do you have a vending machine in your shop. Are the advertising lights always on? Do they need to be? Most likely not.

Most energy loss occurs through heating and cooling systems. Similar to an irrigation leak, either warmed or cooled air is lost to leaks in the system. A tool that most shops already own is an infrared thermometer that uses a laser to measure the temperature of any surface. Using one to detect leaks in your heating or cooling system is an easy way to determine energy loss. It is as simple as shooting surfaces with the thermometer to see if temperatures where a suspected leak may occur are close to the same temperature. (i.e. On a cold day in winter use the thermometer to scan the walls adjacent to windows on the interior of your building – if there isn't a large temperature

difference next to the window when compared to an interior wall, the window is leaking energy.)

Areas to check for energy loss through your heating and cooling system with this method include:

- Ductwork
- Window and door surrounds (especially overhead garage type doors)
- Roof edges and vents
- Around outlets and electrical boxes
- Any structure that penetrates an exterior wall (conduit, pipes, hose bibs, etc.)

One of the best methods to conserve energy is to use programmable thermostats. Once these are installed monitor setback temperatures to make sure they are as far from occupied



A lot of energy is lost where pipes run through exterior walls. Cans of expanding foam are a simple, inexpensive fix.

temperatures as possible. This can be done by seeing how long it takes to heat your shop in the morning from an overnight temperature of say, 50 degrees. If it takes 10 minutes to heat the shop up to a comfortable temperature, set the thermostat to turn the heat on 10 minutes before staff arrival. Simple stuff to take a look at, but often forgot about.

Other ways to combat energy loss through your heating and cooling system include:

- Insulate roofs
- Weatherstripping on doors and windows
- Insulation of HVAC ductwork.
- Water heater insulation and pipe insulation
- Periodic Maintenance – cleaning and inspections

Don't be afraid to ask for copies of your utility bills and track energy usage. Most are motivated by cost savings when conserving energy, let's set an example in industry and lead.

Note: There are many more aspects to energy conservation that can take place within the golf facility and operations. This article was one of a multi-part series to help you take a leading role at your facility in conserving energy. 