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Bottom line thinking on energy.

TOP FIVE ACTIONS TO TAKE CONTROL OF ENERGY COSTS

FOR ENERGY COORDINATORS AND FACILITY MANAGERS

In any grocery store there are certain operational details that have a big impact on the store's energy use. Outlined here are five of the most cost-effective actions you can take as the "go-to" person for energy management to get those details right.

Three of these actions make a big difference to energy; two are smaller contributors. All are inexpensive, with little-to-no cash investment. All are easy to do. Specialized technical expertise isn't required, and the input of staff time is minimal. What's often missing, though… the reason why these areas often persist as low-hanging-fruit… is a structure within the organization that turns these actions into regular practice. For details on how to address this issue, see *Top Four Actions to Take Control of Energy Costs - for Senior Management.*

To put your energy management program on a firm footing, start with these basics. Then move on to the more involved ways to take control of energy cost in your stores.

1. CHECK UP ON THE THERMOSTAT SETTINGS.

Thermostats sense air temperature and send control signals to the heating and cooling units on the roof or in the back of the store, directing them to heat, cool, and run the fans that circulate air in the store. Typically they are mounted on the walls or on columns scattered around the sales floor. Some stores have one or two centralized heating & cooling units with one or two thermostats. Others have many. Each unit may have its own individual thermostat or there may be one master controller in the back room that takes temperature inputs from sensors around the store and sends control signals to each of the heating & cooling units.

Whichever type of system you have, you can save a lot on energy cost by checking the thermostats periodically to make sure that they are still programmed to operate the store as intended. This sounds like a bothersome formality…

why should the thermostats suddenly quit doing what they're supposed to? Unfortunately, experience shows that two particular problems pop up over and over, defeating the best of intentions, causing comfort problems, and driving up energy bills:

- Users – sometimes authorized, sometimes not – change settings on the spur of the moment in well-meaning attempts to deal with local cold spots or warm areas. Although this may help the immediate problem, it often aggravates a problem somewhere else, causing another person to adjust another thermostat, which triggers yet another adjustment somewhere else… and so on. Before long, you have entirely lost control of a coordinated approach to heating and cooling the building.
- Power outages, maintenance work, or a low battery causes a thermostat to "forget" its programming or to get the date and time wrong, so the program loses its reference.

Both of these problems cause the thermostats' programs to get out of sync, so that they no longer work together to heat or cool the space. In some cases, they actually work *against* each other – with some units calling for heating while adjacent units try to cool the same open area. This is expensive in terms of energy, wear on equipment, and environmental impact.

The best solution to this problem is to decide upon an "official" thermostat setpoint policy, write it down, and follow it. If you know what the settings and schedules should be and you know why these particular setpoints and schedules were chosen, it will be easy to verify the programming every month or two and maintain a coordinated approach to heating and cooling. This may not produce ideal comfort conditions absolutely everywhere in the store – 100% satisfaction with heating and cooling delivery everywhere in a building is rare – but it can give the best possible practical outcome in terms of both comfort and energy use. If a particular problem persists, then change the written policy and reprogram the thermostats accordingly. The key, from an energy and comfort point of view, is to stay in control of the situation by making sure that the actual programming conforms to a well-understood, coordinated intent.

2. CHECK UP ON THE LIGHTING SCHEDULES.

Lighting operation is another area where a regular checkup pays off. It's common to find areas of a store where the lights operate even though they aren't actually meeting a need for a customer or employee at the time. Examples include back rooms, walk-in coolers and freezers, and departments that are inactive during part of the day. During non-business hours additional opportunities are common: refrigerated display lighting, gondola lighting, cove lighting, wall washers, a portion of the main sales floor lighting, and parking lot lighting.

During these times, the store is paying for lighting, and the utility is running a power plant to supply electricity to operate the lighting – emitting CO_2 in the process – but no one is getting value from the light.

That's why it makes sense to aggressively go after lighting schedules, either manually or with automatic controls, and to match the quantity of light supplied to the needs of the task at hand. Where lighting is needed for visual

effect, to do a job, or to sell product, pull out all the stops and let it shine. But where light isn't needed, or where there is more than enough for the task at hand, make sure staff recognize that it's okay and expected to turn off some or all of the lights. Check periodically that timeclocks, photocells, and programmable controllers are set up as intended. Verify operation and ask for feedback to get the timing and the amounts right.

Because lighting controls commonly have the same troubles as heating and cooling controls described above, it's a good idea to write out the lighting schedules and use them for reference when checking actual operation. Make this a living document. If the written schedule no longer meets the need, don't just let it go. Update it. The result will be more predictable operation and sustained savings, because everyone will be working from the same reference, not modifying schedules to the need of the moment.

3. IN OPEN REFRIGERATED CASES, KEEP AIR CURTAIN FLOWPATHS CLEAR.

Open refrigerated display cases commonly used for dairy, produce, meat, and beverages function by gently blowing a continuous sheet of cold air down across the open front of the case – a sort of invisible Niagara Falls. Because this air is cold and dense, it wants to drop straight down in a smooth layer to the return grill across the lower front, where it is drawn into the bottom of the case by circulation fans, cooled once more, and sent back up to the top via a channel inside the back of the case. If this flow of air is undisturbed and not blocked, it will keep most of the cold air inside the case and most of the warm store air outside – a good thing from an energy standpoint.

Often, however, two things interfere with this circulation, causing warm air to enter the case and cold air to spill out onto the floor, driving up the energy bills for both electricity (for refrigeration) and gas (for store heat):

- The honeycomb grille across the inside top of the case clogs with dust. When this happens the supply of air is impeded over the affected portion of the case, and the product will warm up in that area.
- The return grille inside the front rail is blocked by product, labels, price tags, etc., preventing the cold air curtain from returning into the grille and causing it to spill out the front of the case.

The solution is straightforward:

- Clean the honeycombs. You should be able to feel the difference between a blocked area and a clear area with the back of your hand. The honeycombs are easily removed for cleaning.
- Keep the return grille open and unblocked. Remove the various objects that tend to fall onto the grille and stock product on the shelves so it doesn't block the grille or protrude into the air curtain.

These steps will enable the case to perform as designed, reducing both electric and gas bills for the store.

4. INSTALL VENDING MACHINE CONTROLLERS ON COLD DRINK VENDING MACHINES.

A beverage vending machine costs more to run than meets the eye – upwards of $225 per year to keep the product cold and to illuminate the machine's signage day and night. A vending machine controller can cut this cost by 30% to 50% by sensing the presence of shoppers and cycling the refrigeration and lighting off during non-business or slow hours when no one is around. Installation is straightforward. The procedure is similar to using a surge protector with a home computer. Just plug the computer (vending machine) into the surge-strip (vending-miser), then plug the surge strip (vending miser) into the wall. There is one additional step with a vending miser – attach its occupancy sensor to the top of the machine. This controller is more than just an occupancy sensing switch, though. A microprocessor takes input from an ambient temperature sensor together with occupancy and repowers the cooling system at one- to three- hour intervals to keep the product cold. It also protects the machine from too-frequent cycling by sensing the flow of current and allowing the compressor to finish its cycle before powering down.

Your electric utility may offer funding to cover much of the purchase cost – in some cases, 100%. For further details and a list of utility rebates, see www.usatech.com/energy_management/index.php.

5. CHANGE INCANDESCENT BULBS TO COMPACT FLUORESCENTS WHERE APPROPRIATE.

The incandescent bulb was invented before the automobile and its efficiency hasn't improved much since. Over 90% of the energy that goes into a bulb comes out as heat, rather than light. But since billions of bulbs are sold every year and they are so inexpensive to make, we still see them everywhere.

There is an alternative that has become increasingly familiar over the past 15 years – the compact fluorescent lamp. Compact fluorescents, or CF's, use about 1/3 the energy of incandescents to produce the same amount of light, and they can last 10 times as long. The savings in energy are impressive, but the savings in maintenance to replace burned-out lamps are even more valuable, particularly in hard-to-get-to locations. You may have heard that early versions had trouble with color rendition and flicker. These issues are long-gone now. There are many models to choose from for general lighting and downlight applications. Note that if cold temperatures or dimming are involved, it is important to select models compatible with these uses.

For an effective demonstration of the use of CF's for area lighting, one need only to look as far as the nearest Starbucks or Baja Fresh.