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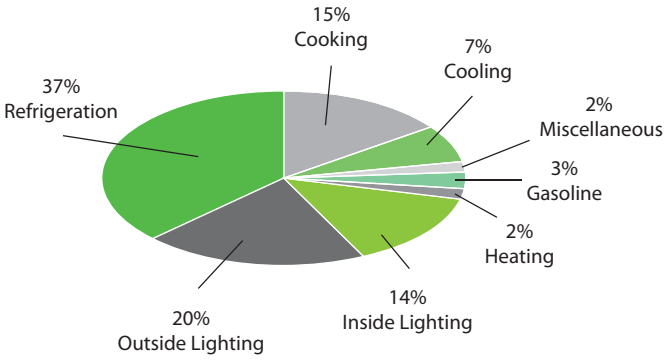
Commercial & Industrial

Convenience Stores

With the cost of doing business going up for nearly everything, it's wise for a convenience store owner to take a few simple steps to increase the energy efficiency of their operations to improve their bottom line.

Refrigeration and lighting typically represent the largest components of energy usage at convenience stores, followed by cooking. That's why it is so important to manage these portions of your energy bill wisely. The chart at right shows that refrigeration comprises more than one-third of energy use at one group of stores. Energy consumption will vary primarily due to the amount of cooking being done and the intensity of the store's outside lighting. Here are the key steps to take.



Energy usage at convenience stores

Refrigeration

- Check that all the doors on the glass door merchandisers close tightly on their own. A partially open door in the store is no different than a partially open refrigerator door at home. It increases your energy costs.
- Make sure that glass merchandiser door seals are not worn and seal completely.
- Turn off the anti-sweat heat on glass door merchandiser coolers during the winter and when humidity is low. At those times, there is not enough moisture to condense on a merchandiser door frame. Never turn the anti-sweat heat off on a freezer door, though, because the door may freeze shut. A high-tech solution is to install a controller that automatically shuts the anti-sweat heat off. A good example can be seen at: http://www.set-s4i.com/antisweat.html.
- Schedule your electric defrost when outdoor lights are not on. Most stores have their highest electric load at night when outdoor lights are on.
- Make sure the lights in the storage area of the cooler/freezer are kept off when no one is in there. Not only is the store paying for the energy to run the lights, it is also paying for the refrigeration to remove that heat from the cooler.
- See that there are no open cases where a anearby heating/air conditioning register can blow air directly into the case. This will increase operating cost and as well as spoilage.
- Arrange all cases to avoid having direct sunlight shine on them.
- Consider switching to LED lighting. Manufacturers are producing LED lights that replace mullion lights that are in glass door cases. LED lights are not more efficient than fluorescent lights, but because the manufacturers are better able to aim the light, LED's use fewer watts and achieve the same illumination of products. Currently, the lights are quite expensive. A four-foot light can have a payback of up to 89 months, but the payback is only 15 months for a six-foot replacement.

OVER

Kentucky's Touchstone Energy Cooperatives

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Lighting

Because there is usually enough internal heat generated by the lighting and equipment, a store's heating system typically only comes on when outside temperatures fall very low, or at night, if the store is not a 24-hour operation.

Store owners should consider switching to energy efficient lighting. The table below shows the most common retrofits and the number of months it takes to recoup an investment. Payback calculations are based on 10¢ per kilowatt-hour.

Old	New	Payback
4-foot, 4-lamp, F34T12 lamps, Magnetic ballast	Electronic ballast, F32T8 lamps	10 months
8-foot, 2 lamp, F96T12 lamps, Magnetic ballast	Electronic ballast, F96T8 lamps	25 months
Incandescent exit light illumination	LED exit light illumination	17 months
400 watt Metal Halide canopy lights	320 watt pulse start Metal Halide lamp and ballast	41 months

Based on canopy lights being on 4,000 hours a year, and other lights being on 24 hours per day.

- If there is a row of lights near front windows and sufficient light comes in the windows, turn off that row during the daytime.
- Replace incandescent light bulbs with compact fluorescent lights.
- Install a time switch on outdoor lights to adjust the on/off times based on changing times of sunrise and sunset. These switches are sometimes called astronomic time switches. The clock should also have a back-up for when the power is out. This can be a battery backup or a clock-spring backup.

Cooking

- If you have commercial sized cooking equipment, use a commercial grade exhaust hood to properly exhaust cooking heat and moisture.
- Pre-heat cooking equipment only about 15 minutes before it is needed.
- If there is cooking equipment that heats up instantly, shut it down during slow times.
- If you have heated product that is seasonal or sells very little, consider whether those sales justify the cost of running the needed equipment. A hot chocolate machine or a cappuccino machine cost as much as $613 per year to operate.

Other considerations

- Make sure all heating and air conditioning ducts are securely connected together. Even if all ducts are in conditioned space, loose or disconnected ducts waste energy and reduce comfort.
- If the ducts have not been sealed with mastic, consider doing so. This will eliminate small leaks and save money.
- If the store is not open around the clock, turn off the computers, games and all displays at night.
- There should be no holes in the ceiling, no matter how small, that would let heated air escape. Even small holes can have a large impact.
- If the roof is flat and not white, consider painting it white with a white paint that has high reflectivity. This reduces cooling costs up to 15 percent.
- If you do not cook, then set the hot water heater to a relatively low temperature, such as 90^{o}F, or turn it off completely.
- Insulate the first three feet of hot and cold water piping going into the water heater. This is where most of the heat loss occurs in the piping.

Taking these steps will go a long way to reducing costs for heating and cooling.