



ENERGY EFFICIENCY



ENERGY EFFICIENCY: Saving Dollars While Clearing the Air

After labor and food, energy is the largest controllable cost in a restaurant's operation. And energy is a great place to start in becoming a green restaurant because you'll be bringing dollars right to the bottom line as you reduce energy use. What's most important here is to think of energy as a controllable rather than a fixed cost.

Cooking equipment consumes the largest share of energy in most restaurants (35%). This is followed by heating and cooling systems (28%), dishwashing (18%), lighting (13%), and refrigeration (6%).





Food Preparation Equipment

You don't need to replace your existing equipment to save energy. If you're opening a new restaurant or you need to replace an aging piece of equipment, buying more energy efficient equipment will save you money over the life of that equipment. But in most cases, there are energy savings to be realized just through the ways in which you operate and maintain equipment.

Operations and Maintenance:

The basic principles of kitchen energy conservation are "shut it off, turn it down and keep it clean." In food preparation, this means taking measures such as

- Reduce broiler, fryer and range pre-heating and idle time.
- Turn on electric cooking appliances sequentially rather than all at the same time. This may not lower your actual energy use. But since these appliances draw a lot of power, you can reduce your demand charge from your electric utility. Since each piece of commercial cooking equipment draws a lot of power even in idle mode, these savings can be substantial.
- Run exhaust systems at lower fan speeds.
- Keep everything clean. The more debris that collects in and on fryers and grill surfaces, the harder they have to work.

Buying New Equipment:

- Compare Energy Use: The US EPA has established Energy Star™ ratings for four categories of commercial cooking equipment: fryers, hot food holding cabinets, refrigerators/freezers and steam cookers. These units can save over 40% in energy costs over comparable non-Energy Star models. For other equipment, you can still compare the rated energy use across different brands and models. Calculate the difference in energy use over the life of the equipment based on the number of hours of daily operation. Multiply this energy savings by the electricity rate you pay. Factor in this lifetime energy savings when making a purchase decisions. Many times the more efficient units also have additional features or greater reliability which help to further justify any price premium.



- **Buy the Right Size:** Evaluate the capacity of the equipment you are buying. By buying the unit that's just big enough for your anticipated volume, you'll save both in up-front and ongoing energy costs.
- **Try New Technologies:** As an example, convection ovens use far less energy than conventional gas ovens.

Dishwashers

Dishwashing uses large amounts of both hot water and electricity. Energy and water use can be reduced through both operating practices and new, more efficient equipment:

Operations:

- **Install low-flow valves on pre-rinse sprayers.** These valves, available for just a few dollars, reduce water use on pre-rinse sprayers by 50% and could save hundreds per year in both water heating and water costs.
- **Run full loads.** The same amount of energy is required whether a load contains one plate or 100.
- **Turn down the temperature.** Make sure that you're not heating water beyond the point required by sanitation codes. New sanitizer products may allow you to reduce water temperature.

Buying New Equipment:

- **Compare Water and Energy Use:** There are huge differences in the amount of water used in commercial dishwashing equipment. Some new models use a fraction of the water as existing models by incorporating advanced spray patterns. The amount of hot water used is the biggest factor in the energy a dishwasher consumes. Water and electricity consumption are listed on equipment specification sheets.
- **Tankless Water Heaters:** Consider installing wall-mounted tankless water heaters. These heat water on demand with no energy spent storing hot water. A conventional tank-type heater might be 40% efficient while a tankless water heater is more than 80% efficient because there is less wasted heat and no stand-by heat loss. With 50% energy savings, paybacks can be as short as 3-5 years. Commercial tankless water heaters have remarkable capacity and are adequate for restaurant use when configured as multiple units. In addition, they eliminate the need for bulky hot water tanks.



Refrigeration and Ice Making

Refrigerators and ice machines run 24/7, so small improvements in efficiency make big differences in energy use.

Operations:

- Maintain clean coils. If evaporator and condenser coils are clean, the equipment doesn't have to work as hard.
- Maintain door seals. Don't let warm air leak into the units.
- Load and unload items as quickly as possible.
- Install high-efficiency evaporator and condenser fans.
- Turn off door heaters if not needed.
- Check thermostat and temperature settings for accuracy.

Buying New Equipment:

- Buy Energy Star™-rated refrigeration and freezer equipment. For a list of rated equipment, go to the commercial refrigeration section of the Energy Star website, www.EnergyStar.gov. Follow the guidelines listed for determining the lifetime energy costs of different models. While it probably does not make financial sense to replace a unit with many years of life left on it, when you are ready to replace this equipment, any additional cost for a more efficient unit will quickly be recovered through energy savings.
- There are no Energy Star™ standards for commercial ice makers. However, the Consortium for Energy Efficiency (www.cee1.org) has established voluntary standards. In general, water-cooled units are far more energy efficient than air-cooled ones. The extra costs for a more efficient machine are negligible.

The Food Service Technology Center is an independent testing facility supported by the food service industry. Their website (www.fishnick.com) contains an extensive set of publications and diagnostic tools to help identify energy savings opportunities in commercial kitchens.



Heating, Ventilating and Air Conditioning

You may be leasing a space where the HVAC system is not your responsibility. Or you've never given much thought to the system except during one of those mid-August days when it breaks. Yet, HVAC costs can be managed down. Here are some tips for reducing them:

- Turn thermostats up (summer) or down (winter) when you're not open. Each one-degree adjustment to your thermostat saves up to 5% on your heating and cooling bill. Use programmable thermostats to bring temperatures back to operating levels.
- Have your furnace tuned and filters replaced regularly.
- Don't overcool or overheat: If your customers are wearing sweaters in the summer and taking them off in the winter, the thermostat is set too low or too high.
- Try to zone heat and cool the kitchen area separately.
- Install sunlight-reflecting coatings on windows to reduce heat build-up.
- Ceiling fans are an efficient way of circulating air, particularly if you have high ceilings.
- Install a seasonal storm door to prevent cold air from pouring in each time a customer enters.
- If you own the building and need to replace an aging or broken furnace or air conditioning system, tell your contractor that you want to buy a furnace with a rated AFUE efficiency above 80% (the federal minimum standard) or an air conditioning system with a minimum EER rating above 11-13 (depending on unit size).





Lighting

Lighting is an important design element of any restaurant. But there are still opportunities to reduce lighting energy use without leaving your customers in the dark.

- Install light-sensitive dimmers. During daylight hours, lights will automatically dim when outside natural light is strong enough.
- Install occupancy sensors in restrooms and storage areas. Lights will turn off automatically whenever the rooms aren't occupied.
- Install high-efficiency fluorescents in kitchen and storage areas. T-8 fluorescent fixtures with electronic ballasts use 20% less energy than standard fluorescents. Replacing these fixtures should pay for itself within three years through the energy savings.
- Install lower-wattage bulbs. Substitute compact fluorescents (CFL's) for incandescent bulbs wherever possible. These use less than 25% of the energy for equivalent brightness, last four times longer and are particularly valuable for light fixtures which operate 24 hours per day. The light quality of these bulbs has improved dramatically over the past years. Try them out in your dining and bar areas, not just in hallways and storage rooms. They can also be used for outdoor lighting.
- Consider turning lights down or off in dining areas during non-customer hours.
- Install LED (light-emitting diode) Exit Signs. The LED exit signs use as little as 3 watts of power (vs. 40 watts or more for incandescent bulb signs).

Renewable Energy

Electricity from renewable sources such as wind and solar is the fastest-growing form of electricity generation in this country. While you can't buy renewable energy directly, you can buy so-called "green tags" which help to bring more renewable energy to the marketplace. The cost of these tags is roughly 2.5¢ per kilowatt hour. If your restaurant uses 10,000 kilowatt hours of electricity per month, you might pay \$25.00 per month for every ten percent of your electricity that you want to come from renewables. US EPA runs a Green Power Partnership program which provides comprehensive information on buying green power (www.epa.gov/greenpower)