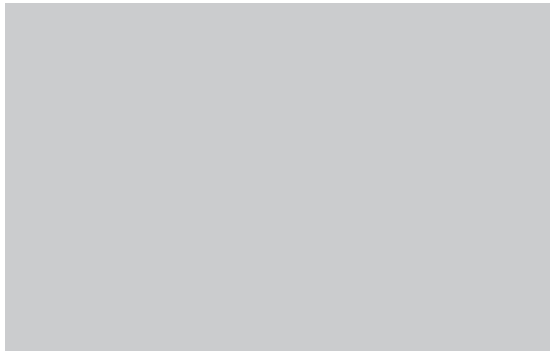
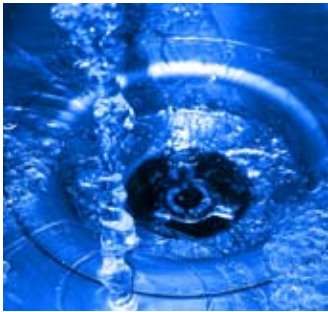




ENERGY STAR® Guide for Restaurants

Putting Energy into Profit





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energystar.gov

ENERGY STAR®, a U.S. Environmental Protection Agency program, helps us all save money and protect our environment through energy efficient products and practices. For more information, visit www.energystar.gov.

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IN PARTNERSHIP WITH

PG&E Food Service Technology Center is the industry leader in commercial kitchen energy efficiency and appliance-performance testing as well as a leading source of expertise in commercial kitchen ventilation and sustainable building design.

National Restaurant Association's Conserve initiative explores conservation efforts in restaurants around the nation and offers suggestions and resources to help operators reduce their costs and improve their environmental performance.

ACKNOWLEDGEMENTS

This best-practices guide was created with the assistance of California's four investor-owned utilities (Southern California Gas Company, Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Edison). These energy suppliers are working together to provide comprehensive energy efficiency resources for California's food service industry, including, but not limited to, the following resources: rebates for cooking and refrigeration equipment, food service specific seminars and workshops, Web tools, energy audits, appliance testing, and energy education centers. The California energy-efficiency research and educational programs are funded by California ratepayers under the auspices of the California Public Utilities Commission and are administered by the four investor-owned utilities.



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Disclaimer: all energy, water, and monetary savings listed in this document are based upon average savings for end users and are provided for educational purposes only. Actual energy savings might vary based on use and other factors.

FIVE EASY STEPS TO SAVE ENERGY AND WATER

1

Install compact fluorescent lamps (CFLs) in your walk-in refrigerators and kitchen ventilation hoods (and throughout your restaurant where appropriate).

2

Install a high-efficiency pre-rinse spray valve in your dishroom and save hundreds of dollars a year!

3

Fix water leaks immediately—especially hot water leaks: wasted water, sewer, and water heating costs can add up to hundreds of dollars a year.

4

Perform walk-in refrigerator maintenance: check and replace door gaskets; clean evaporator and condenser coils; check refrigerant charge.

5

Replace worn-out cooking and refrigeration equipment with ENERGY STAR qualified models!

Get additional easy to implement tips at:
<http://conserve.restaurant.org>

Energy efficiency is a sound business practice that improves profitability, reduces greenhouse gas emissions, and conserves resources. This guide is designed to help your restaurant save energy and water, protect our Earth, and boost your bottom line.

ENERGY EFFICIENCY AND YOUR RESTAURANT

Restaurants use about 2.5 times more energy per square foot than other commercial buildings.

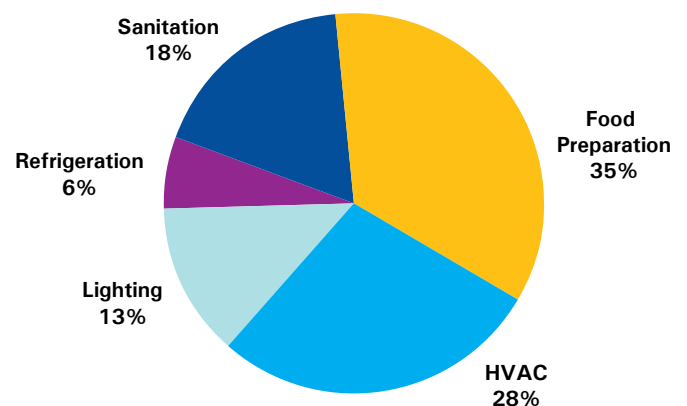
Energy costs have been increasing at a rate of 6 to 8 percent per year. Investing in energy efficiency is the best way to protect your business against rising energy prices.

Most commercial kitchen appliances are energy intensive. For instance, a typical electric deep fat fryer uses more than 11,000 kilowatt-hours (kWh) of energy per year which could cost you more than \$1,100 in electricity.

You can reduce your restaurant's energy consumption by following the **Cost Saving Tips** outlined below and throughout this guide:

- **Buy ENERGY STAR qualified appliances.** If you're in the market for new equipment, think in terms of life-cycle costs, which include purchase price, annual energy costs, and other long-term costs associated with the equipment. High-efficiency appliances could cost more upfront, but significantly lower utility bills can make up for the price difference. Be sure to ask your dealer or kitchen designer to supply you with ENERGY STAR qualified equipment.
- **Cut idle time.** If you leave your equipment ON when it is not performing useful work, it costs you money. Implement a startup/shutdown plan to make sure you are using only the equipment that you need, when you need it.
- **Maintain and repair.** Leaky walk-in refrigerator gaskets, freezer doors that do not shut, cooking appliances that have lost their knobs—all these "energy leaks" add up to money wasted each month. Don't let everyday wear and tear drive up your energy bills.

Example of the Average Energy Consumption in a Full-service Restaurant (British Thermal Units [Btu])



- **Cook wisely.** Ovens tend to be more efficient than rotisseries; griddles tend to be more efficient than broilers. Examine your cooking methods and menu; find ways to rely on your more energy-efficient appliances to cook for your customers.
- **Recalibrate to stay efficient.** The performance of your kitchen equipment changes over time. Thermostats and control systems can fail, fall out of calibration, or simply become readjusted. Take the time to do a regular thermostat check on your appliances, refrigeration, dish machines, and hot water heaters and reset them to the correct operating temperature.

COOKING APPLIANCES

When replacing old appliances or buying new ones, look beyond the sticker price. Buying and installing equipment that has earned the ENERGY STAR could trim hundreds of dollars from your annual utility bills. In order to realize the most savings from your ENERGY STAR qualified equipment you must train your staff to use energy wisely by following good operating practices such as those in the **Cost-Saving Tips** that follow.

Steamers

Steam cookers provide an effective way to batch-cook food but generating steam is an energy-intensive process. ENERGY STAR qualified steamers have a sealed cooking cavity that consumes a fraction of the energy and water required by traditional open systems. In many cases the dollar savings are so great that it makes sense to replace an existing steamer with an ENERGY STAR qualified one.



Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Close the door
- ▶ Use the timer
- ▶ Cut idle time
- ▶ Maintain & repair

Good practices can save:

\$250 to \$350 in annual energy costs for a traditional, electric, open-system steamer by eliminating an hour of idle time per day.

Buy an ENERGY STAR qualified connectionless steamer and save:

- \$680 for water and sewer costs annually
- \$510 for electricity annually (electric steamer), or
- \$390 for gas annually (gas steamer)

Equating to an average \$1,190 total savings for an electric steamer or \$1,070 total savings for a gas steamer (some restaurants with high commercial sewer costs can save hundreds of dollars more annually)



Fryers

Energy-efficient fryers that have earned the ENERGY STAR offer shorter cook times, faster temperature recovery times, and ultimately higher pound-per-hour production rates through advanced burner and heat exchanger designs. Some models also offer an insulated fry pot, which reduces standby losses, giving the fryer a lower idle energy rate.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Cut idle time & turn off back-up fryers when possible
- ▶ Recalibrate



Good practices can save:

\$250 annually for a gas fryer by cutting four hours of idle time per day.

Buy an ENERGY STAR qualified fryer and save:

- \$120 for electricity annually (electric fryer), or
- \$590 for gas annually (gas fryer)

Convection Ovens

Convection ovens are the industry standard due to faster cook-times produced by increased hot air movement inside the oven cavity. In addition, convection ovens are now eligible for ENERGY STAR qualification.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Cut idle time & turn off back-up ovens when possible
- ▶ Fully load the oven when cooking
- ▶ Replace seals & tighten hinges



Buy an ENERGY STAR qualified convection oven and save:

- \$190 for electricity annually (electric oven), or
- \$360 for gas annually (gas oven)

Griddles

Griddles are a versatile piece of equipment and a workhorse appliance found on most kitchen lines. Variations in efficiency, production capacity, and temperature uniformity make it important to choose wisely when shopping for a griddle. Many energy-efficient griddles can deliver both high production capacity and excellent temperature uniformity.



Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Cut idle time
- ▶ Recalibrate

Good practices can save:

\$250 annually from a gas griddle by cutting three hours of idle time per day.

Buy an ENERGY STAR qualified griddle and save:

- \$190 for electricity annually (electric griddle), or
- \$175 for gas annually (gas griddle)

Holding Cabinets

ENERGY STAR hot food holding cabinets typically feature improved insulation, so heat stays in the cabinet and out of the kitchen. An insulated ENERGY STAR holding cabinet uses about half the energy consumed by an uninsulated cabinet. Other available features that could potentially save energy include magnetic door gaskets, auto-door closers, and dutch doors.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Shut off overnight
- ▶ Use the timer
- ▶ Replace missing or worn out control knobs



Good practices can save:

\$500 annually by turning off an uninsulated holding cabinet when the kitchen is closed.

Buy an ENERGY STAR qualified holding cabinet and save:

- \$340 to \$960 annually for electricity



Combination Ovens

The combination oven is an extremely versatile cooking platform with the added bonus of a self-cleaning feature. Operating a combination oven in “steam” or “combination” mode typically uses more energy and water than operating in traditional convection mode. Use the oven’s programming capabilities to properly control different cooking modes to maximize energy efficiency and cost savings. Do your homework when buying a combination oven: the most efficient models will use about half as much energy and water as the inefficient models.



Good practices can save:

\$400 to \$800 annually off an electric combination oven by cutting out two hours of idle time per day.

If ENERGY STAR qualified models don’t exist for the type of equipment you’re looking for don’t worry: you still have options. Ask distributors and manufacturers for energy use information, and check online for equipment reviews. The California commercial food service incentive program is also a third party resource because, like ENERGY STAR, appliances that qualify must meet designated efficiency standards. The list of qualifying appliances can be found at: www.fishnick.com/saveenergy/rebates.

Broilers

Broilers are true kitchen workhorses but their dependability and simplicity come at a price: searing heat requires a great deal of energy and broilers have simple, non-thermostatic controls. This combination can make the broiler the most energy intensive appliance in the kitchen. For example, one gas broiler can use more energy than six gas fryers. A new generation of broilers incorporates better radiant designs, allowing the broiler to get the job done while consuming about 25 percent less energy.

Cost-Saving Tips

- ▶ Cut preheat time
- ▶ Turn off unneeded sections
- ▶ Reduce idle time
- ▶ Replace missing knobs



Good practices can save:

\$600 annually by cutting out three hours of idle time per day.

Ranges

The range top is one of the most widely used pieces of equipment in restaurant kitchens. Ranges are manually controlled and can be energy guzzlers depending on how you operate them. A potential alternative to traditional range tops are induction ranges; they are more expensive but offer very high efficiency, rapid heat up, precise controls, and low maintenance.



Cost-Saving Tips

- ▶ Maintain and adjust burners
- ▶ Use a lid
- ▶ Cut idle time



REFRIGERATION SYSTEMS AND ICE MACHINES

Reach-In Refrigerators and Freezers

Compared to standard models, ENERGY STAR qualified commercial refrigerators and freezers can lead to energy savings of as much as 35 percent with a 1.3 year payback. Glass door refrigerators and freezers can now earn the ENERGY STAR too! Features that could potentially save energy include improved insulation and components such as high-efficiency compressors and motors.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Turn off door heaters when possible
- ▶ Clean coils
- ▶ Set defrost timers
- ▶ Replace worn gaskets



Buy ENERGY STAR qualified equipment and save:

- \$200 for electricity annually (per solid door refrigerator)
- \$140 for electricity annually (per solid door freezer)

Walk-In Refrigerators

Walk-in refrigerators are extremely important to any successful restaurant. Improve this equipment's energy performance with a few inexpensive upgrades and good practices, such as:

- Swapping out incandescent light bulbs for low-temperature ENERGY STAR qualified compact fluorescent lamps (CFLs) can reduce the lamps' heat output by 75 percent! (Look for the lowest possible "minimum start temperature" on the CFL box, e.g., zero degrees Fahrenheit.)
- Adding strip curtains and automatic door closers to your walk-in refrigerator: *they are inexpensive and easy-to-install*. Strip curtains can cut outside air infiltration by about 75 percent!
- Installing electronically commutated motors (ECM) on the evaporator and condenser fans reduces fan energy consumption by approximately two-thirds.

Cost-Saving Tips

- ▶ Allow air circulation
- ▶ Insulate suction lines
- ▶ Check refrigerant charge
- ▶ Repair and realign doors
- ▶ Clean coils





LAMPS AND LIGHTING FIXTURES

In a typical restaurant, lights are usually on for 16 to 20 hours a day. For many areas in your restaurant, high-efficiency ENERGY STAR CFLs and lighting fixtures are your ticket to savings.



- Install ENERGY STAR qualified fixtures and CFLs in your dining area and reduce energy consumption and heat output by 75 percent.
- Install occupancy sensors in closets, storage rooms, break rooms, restrooms, and even walk-in refrigerators. Look for sealed, low-temperature-specific sensors for refrigerated environments.
- If your restaurant features linear fluorescent lighting with T12 lamps and magnetic ballasts it is time to upgrade. Switch to more efficient T8 or T5 lamps with electronic ballasts. Electronic ballasts typically have faster on-times and do not hum or flicker. Look for utility incentives for lighting upgrades in your area.
- Swap your old Open/Closed and EXIT signs with LED technology for electricity savings up to 80 percent.
- Visit www.energystar.gov/lighting for more cost-saving information.

Ice Machines

Commercial ice machines that earn the ENERGY STAR are on average 15 percent more energy efficient and 10 percent more water efficient than standard models.

- Cut down on your daytime electricity demand by installing a timer and shifting ice production to nighttime off-peak hours.
- Bigger ice machines are typically more efficient than smaller ones, yet the price difference is usually not very large. Choose wisely and you could get twice the ice capacity at half the energy cost per pound of ice.
- Avoid water-cooled ice machines because of their high water cost, which make them significantly more expensive to operate. *Note: water-cooled ice machines do not currently qualify for ENERGY STAR.*

Cost-Saving Tips

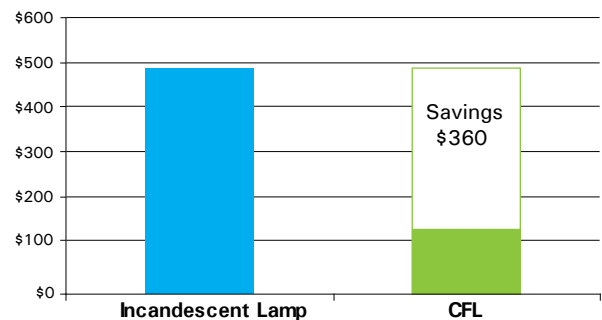
- ▶ Look for the ENERGY STAR
- ▶ Clean the coils
- ▶ Keep the lid closed
- ▶ Adjust the purge water timer



Buy an ENERGY STAR qualified ice machine and save:

- \$120 for electricity annually

Annual Savings After Replacing Eight Incandescent Lamps with Eight CFLs



CFL vs. Incandescent Light Bulbs

If each of the 945,000 restaurants in the United States replaced only one incandescent light bulb with a CFL, more than 630 million pounds of CO₂ emissions could be avoided each year (the annual greenhouse gas emissions from more than 52,000 passenger vehicles*), and the restaurant industry could save about \$42.5 million annually.

*Source: EPA Greenhouse Gas Equivalencies Calculator: www.epa.gov/cleanenergy/energy-resources/calculator.html

Mercury and CFLs

CFLs contain a very small amount of mercury sealed within the glass tubing (approximately 4 milligrams). By comparison, older thermometers contain about 500 milligrams of mercury – an amount equal to the mercury in 125 CFLs. No mercury is released when the bulbs are intact (not broken) or in use. For more information about recycling and disposing of CFLs visit: www.energystar.gov/mercury.

HEATING, COOLING AND VENTILATION

Making smart decisions about your restaurant's heating, ventilating, and air conditioning (HVAC) system can have a big effect on your utility bills—and your customers' comfort.

Heating and Cooling Systems

Heating and cooling systems account for a large portion of your restaurant's annual energy use. For many restaurants, heating and cooling is second only to food preparation in terms of annual energy consumption.

Energy use falls by 4 to 5 percent for every degree that you raise your cooling thermostat setpoint. Easing back on central cooling by only 3°F could trim air conditioning costs by 12 to 15 percent.

Improve customer comfort by using an efficient ENERGY STAR qualified ceiling fan to compensate for the difference in air temperature. Ensure that your heating and cooling equipment is included in the start-up and shut down schedule to save even more.

Don't forget about the restroom! ENERGY STAR qualified ventilating fans use 70 percent less energy than standard models.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Clean heat-transfer coils
- ▶ Replace air filters
- ▶ Consider an Energy Management System
- ▶ Repair broken duct work
- ▶ Recommission economizers

Buy ENERGY STAR qualified equipment and save:

- \$1.70 per square foot over the life of the HVAC equipment (\$4,250 for a 2,500 square foot restaurant; the same as \$430 annually)
- \$17 annually for electricity costs per ceiling fan
- \$75 annually for electricity costs for ventilating fans that are run continuously



According to the Consortium for Energy Efficiency (CEE), at least 25 percent of all rooftop HVAC units are oversized, resulting in increased energy costs and equipment wear. Properly sized equipment dramatically cuts energy costs, increases the life of the equipment, and reduces greenhouse gas emissions.

Kitchen Ventilation

An unbalanced or poorly designed kitchen exhaust system can allow heat and smoke to spill into your kitchen, spelling trouble both for your restaurant's air quality and for your utility bills. Spillage leads to a hot, uncomfortable working environment and higher energy bills for air-conditioned kitchens.

- Cut down on spillage by adding inexpensive side panels to hoods.
- Push each cooking appliance as far back against the wall as possible to maximize hood overhang and close the air gap between the appliance and the wall.
- Install a demand-based exhaust control. It uses sensors to monitor your cooking and varies the exhaust fan speed to match your ventilation needs. Demand ventilation controls could reduce your exhaust system costs by anywhere from 30 to 50 percent and can be installed on either new equipment or retrofitted to existing hoods.

Learning More About Kitchen Ventilation

If you're getting ready to design a new kitchen or renovate an old one, check out "Improving Commercial Kitchen Ventilation System Performance," a two-part kitchen ventilation design guide written by the experts at PG&E FSTC and available at: www.fishnick.com/equipment/ckv/designguides.

Windows

Applying a clear, heat rejecting window film will help cut your cooling costs while making your dining room more comfortable. Use only high quality window film installed by a qualified professional.

Patio Heaters

The best approach to saving money with patio heaters is to cut back their use—both for hours of operation and for the number of patio heaters running at any given time. Patio heaters are radiant devices that heat up quickly so there is no reason to leave them running if a seating area is temporarily empty.

Good practices can save:

\$530 per heater annually by cutting three hours of use per day

WATER AND WASTE MANAGEMENT

Water Use

Using water more efficiently preserves water supplies, saves money, and protects the environment. By conserving hot water you trim not one but two bills: one for the water and sewer and another for the electricity or natural gas used to heat the water used in bathroom faucets, kitchen sinks, and dishwashers.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR and WaterSense label
- ▶ Add aerators
- ▶ Install WaterSense labeled toilets
- ▶ Repair leaks
- ▶ Reduce sink and tap usage

Similar to the ENERGY STAR, the WaterSense® label identifies water-efficient products and programs. WaterSense is a partnership program sponsored by EPA and additional information is available at: www.epa.gov/watersense.



Good practices can save:

\$1,000 annually by turning down dipper wells and making sure they are OFF when the kitchen is closed

\$1,000 annually by fixing leaks in sinks, mop-stations, and dishmachines

Look for WaterSense labeled equipment and use WaterSense irrigation partners to landscape your restaurant:

Bathroom faucets are 30 percent more water efficient

Landscaping with WaterSense irrigation partner could save you 15 percent compared to average watering bills



High-Efficiency Pre-Rinse Spray Valves

A high-efficiency, or low-flow, pre-rinse spray valve is one of the most cost-effective energy saving devices available to the foodservice operator. And it is easy to install! Just unscrew your old spray valve and screw in your new, water-efficient one.



In addition to minimizing hot water consumption, you can reduce both your water-heating and sewer expenditures per month. How? Typical spray valves can release hot water at a rate of three to four gallons of water per minute (gpm), while common high-efficiency units spray only 1.6 gpm or less without sacrificing cleaning power!

Buy a 1.6 gpm spray valve and save:

\$300 to \$350 annually for water, sewer, and natural gas costs annually (used one hour a day and compared to 3 gpm sprayer).

Additional information is available at: www.fishnick.com/equipment/sprayvalves.



Dishwashers

From an operational standpoint, dishwashers are one of the most expensive pieces of equipment in your kitchen. Commercial dishwashers that have earned the ENERGY STAR are on average 25 percent more energy and water efficient than standard models.

- Run fully loaded dish racks through the dish machine. Cutting wash cycles could save you hundreds of dollars annually.
- Pay attention to your dishwasher's pressure gauge—if it's showing pressure above 25 psi, there is a good chance you are using much more water than is necessary. Most dishwashers require only around 20 psi.
- If you have a conveyor-style dishwasher, make sure you are using it in auto mode, which saves electricity by running the conveyor motor only when needed.

Cost-Saving Tips

- ▶ Look for the ENERGY STAR
- ▶ Turn off at night
- ▶ Replace torn wash curtains
- ▶ Repair leaks
- ▶ Replace worn spray heads



Buy an ENERGY STAR qualified dishwasher and save:

- \$975 for electricity annually
- \$200 for water annually

Waste Reduction Is Good Business

Waste reduction leads to increased operating efficiency and cost savings. Decreased solid waste generation reduces collection and disposal costs just as reducing electricity and water consumption reduces utility bills. Waste minimization also may reduce your purchasing costs for restaurant supplies.

Using recycling and composting bins, sustainable take-out containers, and “green” signage are all excellent ways to announce and to demonstrate to your customers your efforts to be more environmentally sustainable and aware.

For help identifying waste reduction opportunities please visit www.epa.gov/wastewise.



BEGIN THE PROCESS, LEARN MORE AND SAVE!

The best first step is to perform an energy audit on your facility. Energy service providers (utilities), state energy offices, and private sector product and service providers can assist you in identifying a trained professional to conduct your audit. However, comprehensive, affordable energy audits are not available everywhere in the country for commercial food service businesses.

To help address the lack of energy audits in many communities, ENERGY STAR provides free online tools and information to achieve energy savings. ENERGY STAR's basic guidance for self-assessments is part of the Guidelines for Energy Management, “Step 2: Assess Performance,” at: www.energystar.gov/guidelines.

In addition, ENERGY STAR's Portfolio Manager software is designed to help businesses “benchmark” and track energy use, costs, and greenhouse gas emissions. Portfolio Manager also offers the option to track water use and renewable energy credits—all in a password protected online file. Portfolio Manager users can track multiple facilities independently or aggregate all the business locations into one file. Your restaurant can generate a Statement of Energy Performance which includes a “weather-normalized” kBtu/ft² energy use intensity calculation, associated greenhouse gas emissions and a national average for similar building types. Access to the software and free online training in use of Portfolio Manager is available at: www.energystar.gov/benchmark.

Once you have identified the areas of potential energy savings, decide which energy efficiency upgrades you want to install and what practices to initiate. If your finances and operating schedule make it impractical to perform all the upgrades at once, you can take a staged approach and install them as time and money allow.

Remember, having your **restaurant manager** 100 percent on board is absolutely key to saving your restaurant money and protecting the environment! Your best-laid energy-saving plans are only as good as the staff that is implementing them!



For more information, please consult the following online resources:

- ENERGY STAR Commercial Food Service: www.energystar.gov/cfs
- ENERGY STAR Restaurants: www.energystar.gov/restaurants
- ENERGY STAR Portfolio Manager: www.energystar.gov/benchmark
- PG&E Food Service Technology Center: www.fishnick.com
- National Restaurant Association Conserve: <http://conserve.restaurant.org>
- EPA WaterSense: www.epa.gov/watersense
- EPA WasteWise: www.epa.gov/wastewise

Find Monetary Incentives

ENERGY STAR CFS Incentive Finder:
go to www.energystar.gov/cfs and click
on "Special Offers" or go to
www.energystar.gov/cfsrebate_locator



For more information visit www.energystar.gov.



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