

Green Restaurant Guide: Energy Conservation

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1. Purpose of This Guide

The purpose of this Energy Guide is to assist new and existing food establishment owners and managers with establishing and maintaining an energy conservation program. The guide provides resources and ideas on free services available and measures to take to start greening your operations and your bottom line.

If you have enrolled in the **San Francisco Green Business Program** for environmental assistance and award recognition, follow all sections of the Green Restaurant Guide to fulfill the measures on the checklist. For information about the San Francisco Green Business Program, please visit www.sfgreenbiz.org or contact 415-355-3700.

2. Why Conserve Energy?

Square-foot for square-foot, restaurants rank among the most energy-intensive commercial spaces in California. Business operations such as cooking equipment, heating, cooling, lighting and sanitation make up the average restaurant's electricity and natural gas consumption.

Typically restaurants operate on a thin profit margin, and reducing the amount of energy used means more dollars can go towards your bottom line. For example, cutting out only one hour each day of broiler "on" time can translate to a savings of around \$450 annually. This could be significant when you think in terms of your profit margin. Consider this: If your restaurant operates with a profit margin of around 5 percent, you'll need about \$9,000 worth of sales to earn \$450.^{i, ii}

The increased use of energy adversely affects California, putting everyone on alert since the Western Energy Crisis of 2000-2001. Ninety percent of California's electricity is derived from unsustainable sources such as: coal, natural gas, nuclear power, and large hydroelectric dams. These are limited, rapidly depleting natural resources. Oil (45%) and natural gas (45%) are the two primary resources that fuel California's transportation and heating needs. Burning fossil fuels (coal, oil, and natural gas) also emits carbon dioxide, the key greenhouse gas responsible for global warmingⁱⁱⁱ.

Figure 1: Energy Use in Food Service (statistics from 2007)

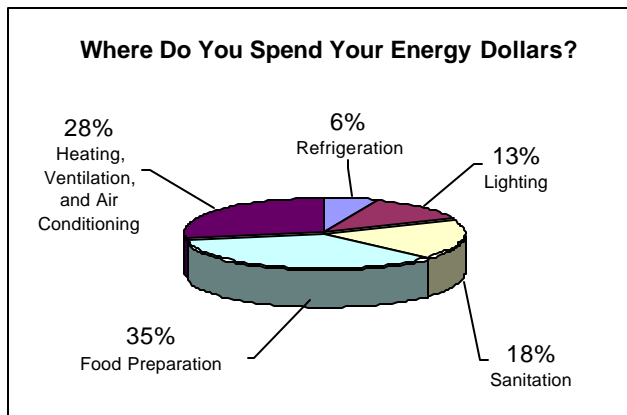


Figure 1 depicts the breakdown of typical energy usage in a restaurant.

Heating, ventilation, and air conditioning (HVAC) alone accounts for 28% of the energy dollar. Choosing Energy Star® qualified appliances and using more efficient practices lowers the amount of energy needed for operation. **By decreasing your energy usage, you alleviate your share of the environmental burden upon California.**

For more information:

US EPA Global Warming Website
<http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsEnergyEfficiency.html>

Environment California – Energy Fact Sheet
<http://www.environmentcalifornia.org/energy/fact-sheet>

US Department of Energy
<http://www.energy.gov/energysources/fossilfuels.htm>

3. Four Steps to Starting Your Energy Conservation Program

Step 1: Have your energy provider or any of the below listed providers conduct a free audit of your facility's energy use and provide you with specific suggestions for conservation.

Pacific Gas & Electric (PG&E)

FREE for PG&E (electricity) customers only: basic energy audit (lighting and cooling). PG&E offers energy audits to all sizes of nonresidential customer facilities. Audit can be targeted to specific areas of your restaurant, and can be completed on-site, on-line, by phone, or using a CD-ROM.

Phone: 1-800-468-4743

Analyze your energy use: <http://www.pge.com/mybusiness/energysavingsrebates/analyzer/>

Food Service Technology Center (FSTC)

FREE on-site surveys. FSTC will survey your Bay Area food service facility to show you where and how you can save money on your energy bill. The thorough free evaluation is followed up with a report to summarize the areas where you can save energy. FSTC specializes in commercial kitchen energy efficiency and kitchen appliances and will help you select the most energy efficient appliances, plus inform you regarding rebates.

Phone: 1-800-398-3782 or for more information: <http://fishnick.com>

San Francisco Energy Watch: Small Business Energy Efficiency Program

FREE on-site assessments to identify energy savings and install energy-saving equipment at greatly reduced cost.

Phone: 415-503-1260 or sign up online: <http://sfenergywatch.org/Business/index.html>

Step 2: Support from your employees is critical to the success of your energy conservation program. Ask your staff for their input on and assistance with what can be done to reduce energy. Involving staff in this developmental stage will encourage participation. If you have more than 10 employees, find out who of your employees would like to champion the energy conservation program. Progressive restaurants have learned that successful conservation programs need a champion – someone to inspire employees and lead the charge.

Step 3: Review the recommended measures in this guide. Work with your staff and the energy auditor to implement measures and train employees to reduce energy use.

Step 4: Integrate the program into your company procedures, job training and incentive programs. For example: include energy conservation measures in employee job duties and evaluations; develop “green” reward system.

If you own or manage a large restaurant **institute and maintain a written policy or maintenance program** that incorporates measures such as these:

- HVAC system: inspect permanent filters every 3 months and set up cleaning and replacement schedule for permanent filters (clean every 2 months, change replaceable filters every three months)
- HVAC: inspect entire system for coolant and air leaks, clogs, and obstructions of air intake and vents
- HVAC: keep evaporator coils free of excessive frost
- adjust hot water heaters to 120-130F

- check pilot lights for proper adjustment (e.g. gas for kitchen and hot water)
- turn off all lighting in unoccupied rooms (consider motion sensors)
- clean lighting fixtures, diffusers and lamps so that they are lighting as effectively as possible (dirt can reduce lighting efficiency by up to 50%) and replace aging fluorescent tubes
- routinely inspect and appropriately adjust lighting control devices such as time clocks and photocells

Maintenance: Monitor restaurant energy use with your energy bills. Make repairs or replace equipment when usage rate changes indicate problems. Review program every 12 months and identify additional opportunities to improve energy savings.

4. Top 5 Actions Restaurants Can Take to Conserve Energy

1. **Invest in energy-efficient lighting^{iv,v}** including fixtures, lamps and ballasts. When an incandescent lamp needs to be replaced, switch to energy efficient compact fluorescent lamps (CFLs). Using efficient lighting such as Energy Star® qualified products may reduce energy use by 75% in comparison with standard models. Further, Energy Star® qualified lighting also emits up to 75% less heat, reducing facility cooling costs.

Eight 100W incandescent lamps	Eight 27W CFLs
Used 16 hours daily	Used 16 hours daily
At \$0.13 per kWh	At \$0.13 per kWh
Cost per year: \$607	Cost per year: \$164
Annual Savings with CFLs: \$443	

2. **Buy efficient equipment and implement good maintenance practices⁴**. Buy energy efficient or Energy Star® cooking appliances, dishwashers and refrigerators. Here are some examples of potential savings:

Equipment	Restaurant 1: Standard Equipment	Restaurant 2: Efficient Equipment	Savings/Year Restaurant 2
Steamer	Electric, standard-efficiency	Energy Star® qualified	\$2,700
Broiler	Gas, standard-efficiency	Gas, high-efficiency	\$660
Holding Cabinet	Electric, Standard-efficiency	Electric, Energy Star® qualified*	\$430
Spray Valve	Standard spray valve, 3 GPM	Low-flow spray valve*, 1.6 GPM	\$1,400
Ice Machine	Standard-efficiency ice machine	High-efficiency ice machine	\$320
Reach-In Refrigerator	Standard-efficiency solid door	Energy Star® qualified solid door*	\$60

**Now required in California*

3. **Switch off lights or install occupancy sensors** in spaces with variable occupancy such as restrooms, walk-in refrigerators, etc.

- 4. Calibrate thermostats and set them at appropriate temperatures to ensure effective use .** This will maximize efficiency of temperature-sensitive appliances such as dishwashers and refrigerators.
- 5. Incorporate a preventive maintenance routine into employee procedures.** Routine maintenance will maximize equipment's and appliances' productive lifespans. For example: regularly cleaning dust from the refrigerator coils will allow the refrigerator to work more effectively and use less energy compared to those with dusty coils. This also translates to cost savings for the restaurant.

As you know, a penny saved is a penny earned. When it comes to energy conservation, these changes in equipment and habits can easily save restaurants hundreds to thousands of dollars.

5. More Tips and Tools for Energy Conservation

Energy Gauging Tools:

Life Cycle Cost Calculator <http://fishnick.com/saveenergy/tools/calculators/>

This calculator by FSTC helps you compare the cost of operating appliances and equipment over their productive service life spans. This tool can help you evaluate the benefits of using certain appliances and equipment as alternatives to others.

Analyze your Energy Use - PG&E Calculator

<http://www.pge.com/mybusiness/energysavingsrebates/analyzer/>

One of the first ways to conserve energy and increase your savings is to find out where the highest daily energy expenditure is spent. Use PG&E's energy calculator or energy audit services to find out where you can cut back on energy usage.

Energy Conservation Tips:

Follow these seven easy, important energy tips: <http://www.fishnick.com/saveenergy/energytips/>

See below for more energy and cost conserving tips. These suggestions are grouped by equipment and operational areas, listed alphabetically.

No Cost/ Behavior Change = ☺

Low Cost = \$

Investment = \$\$

Green Business checklist measure = GB

Braising Pans

- ☺ Close the lid. FSTC has found that you can use 50 percent less energy simply by closing your braising pan's lid during periods of extended use.
- \$\$ When you're buying a new braising pan, look for one with insulated walls.
- ☺ Cut preheat-time. Starting the heat before it's needed wastes energy and heats your kitchen, forcing your air conditioner to work harder. Most appliances heat in less than 30 minutes.
- ☺ Reduce the cooking area. Because broilers use so much energy, turning off a section of your broiler can yield noticeable savings.
- ☺ Eliminate standby time. Turn your broiler down or off during lulls in activity, when possible. Cutting three hours of standby time each day may save upwards of \$1,350 annually.
- ☺ Rely on your griddle. For some restaurants, griddles may be good alternatives to broilers. Thermostatically controlled griddles tend to use far less energy than broilers, and grooved griddles can be used to sear "grill marks" onto foods so they look broiled.

- ☺ Align broilers with exhaust hoods. Appliances may get pulled out for cleaning and not make it all the way back under the hood, thus sending heat and smoke into the kitchen. Make sure that your broiler is fully under the hood and pushed as far back to the rear wall as possible.

Building Systems

- \$\$ Install an energy management system to control electricity usage including lighting, kitchen exhaust, refrigeration, and HVAC.
- ☺ Specify energy efficient fan motors and compressors.
- \$\$ Install a refrigerant heat recovery system and use the waste heat from the walk in refrigerator and freezer to preheat hot water.
http://www.pge.com/rebates/123_reduction_plans/restaurants/index.html
- \$ GB Close air gaps by weather stripping (weatherizing and caulking) windows and doors.
- \$\$ GB Use electrical equipment with energy saving features (e.g. Energy Star®) and ensure that energy reduction settings are enabled (manual set-up often required).

Cooking Equipment

- ☺ Implement a start-up and shut-down schedule for *cooking appliances*. Pay the most attention to big energy users: broiler, griddle, range, pasta cooker, rotisserie, conveyor oven and fryer. Turn off “back-up” appliances when not needed.
- ☺ Implement a start-up and shut-down schedule for *kitchen “plug loads”* like: holding cabinets, coffee machines, conveyor toasters, steam tables, plate and food warmers and heat lamps.
- \$\$ Purchase energy efficient appliances such as insulated hot food holding cabinets, airpot-style coffee makers, insulated electric fryers, induction cooktops, connectionless steamers, and water conserving (1 gallon or less per rack) door-type dishwashers.

Cooking Methods

- ☺ Examine your cooking methods and menu and find ways to rely on these more efficient appliances, e.g. use more efficient ovens rather than rotisseries; griddles rather than broilers.

Dishwashers

- \$ Add extra insulation to reduce standing heat loss in water heaters and storage tanks.
- ☺ Adjust power dryers to deliver heated air just long enough to dry dishes, to avoid over drying.
- \$ Schedule regular rinsewater checks to ensure that boosters generate the minimum required temperature.
- ☺ Reduce dishwasher temperature to the lowest temperature allowed by health regulations and consistent with the type of sanitizing system used. A door-type dishwasher should use 1.2 gallon per rack or less.
- ☺ Turn it off. High-temp dishwashers typically feature internal tank heaters. If these are left on at night, they waste energy by heating water unnecessarily. The same holds true for booster heaters and dishwasher exhaust hoods: turn them off at night to save energy
- ☺ Operate conveyors in auto mode. For a conveyor-style dishwasher, make sure to use auto mode to save electricity by running the conveyor motor only when needed.
- \$\$ Consider heat recovery. (See under “Building Systems” above.)

Fryers

- ☺ Cut idle time. FSTC observed that most fryers spend at least 75% of the day idling. Cutting out four hrs/day of idle time could save \$250/yr for a gas fryer and \$350 for an electric one.
- ☺ Check and adjust thermostats. It’s not uncommon for fryer (or other appliances) thermostats to lose accuracy over time. Invest in periodic temperature checks and recalibrate as needed.

Griddles

- ☺ Cut standby time. Chances are that you don’t need your griddle ready and waiting all day,

every day. Save up to \$250 annually by cutting three hours of griddle standby time per day. Invest in a double-duty griddle. Consider a model that features both grooved and flat cooking surfaces—especially if you do a lot of broiling. (See detail under “Braising Pans” above.)

\$\$

Heating, Ventilation and Air Conditioning (HVAC)

- ☺ Turn off exhaust hoods and hood lights when the appliances below them are turned off.
- \$ GB Install timers on hood fans, exhaust systems and hood lights. *Use off mode only when all cooking has ceased and all cooking equipment is turned off* (per CA health code).
- ☺ GB Set thermostat to 68 degrees for heating, 76 degrees for cooling, and 55 degrees for night setback. Turn off all fans when the building is unoccupied.
- ☺ Maintain evaporate coolers: check fan, pumps, and pads.
- ☺ Maintain outside air economizers and set them to maximize “free cooling.”
- ☺ Set makeup air duct stat to 55 degrees.
- \$ Install an Energy Star® qualified programmable thermostat.
- \$ Schedule preventive maintenance of rooftop equipment: replace HVAC filters at least once a quarter, clean condenser coils and shade them from the sun, and insulate refrigerant lines.
- \$\$ Install advanced glazing systems (low-e, spectrally selective glass) to block heat from entering the windows. Well placed trees, awnings and other shading devices are also effective at blocking heat.
- \$\$ When replacing an old HVAC unit, upgrade to a high efficiency HVAC unit.
- \$\$ GB Use ceiling fans to promote air circulation and reduce the need for air conditioning.
- \$\$ GB Replace or supplement an A/C system with an evaporative cooler.
- \$ GB Apply window film to reduce solar heat gain. Shade sun-exposed windows and walls to mitigate the effect of direct sunlight during the summer. Use awnings, sunscreens, shade trees or shrubbery. Only applicable for air-conditioned spaces.
- ☺ Ensure blinds and curtains are closed during the peak summer period or use ceiling fans to reduce A/C load.
- \$\$ GB Replace inefficient or broken windows with double pane energy-efficient windows.

Ice Machines

- \$\$ Find water and energy-use numbers for ice machines with the Air Conditioning and Refrigeration Institute (ARI)’s website: www.ari.org. Use this list to shop for the most efficient ice machine and save hundreds of dollars a year in water and electricity. Many utilities offer rebates for purchasing efficient ice machines, so check with your energy provider or ice machine dealer to see if you qualify.
- \$\$ Purchase with capacity in mind. Bigger ice machines are up to two times more efficient than smaller ones, yet a 520-pound machine costs less than twice as much as the 200-pound units. The larger machine also makes it easier to shift your ice making to nighttime hours.

Lighting

- ☺ Turn off lights in unoccupied areas like walk-in refrigerators, storage and empty break rooms.
- ☺ Take advantage of “daylight harvesting” and turn lights off in naturally lit areas.
- ☺ Clean fixtures and lamps so they are more effective and replace aging fluorescent tubes. Then delamp (remove lamps) where possible.
- Install lighting controls such as:
 - Occupancy sensors in variable occupancy space (common area restrooms, private offices, linen closets, storage),
 - Turn on lights only when natural light is insufficient. Use photocells for exterior lighting and/or areas with significant natural daylight OR
 - Time clocks for large banks of lights on circuit breaker that operate during off hours.

\$\$ GB

- ☺ Make sure lighting controllers (time clocks and photocells) are working and properly set. Make sure exterior lighting is off in the daytime.
- \$ Install timed switches or low-temperature occupancy sensors in walk-in refrigerators and freezers.
- \$\$ Replace T12 lamps and magnetic ballasts with T8 or T5 lamps and electronic ballasts.
- \$\$ GB Reduce fixtures and the number of lamps by installing optical reflectors or diffusers.
- \$\$ GB Install electronic dimmable ballasts and lighting controls to dim lights when natural lighting is sufficient. Replace low wattage dimming incandescent bulbs with cold cathodes.

Maintenance & Repair

- \$ Everyday wear and tear can drive up your energy bills. While a leaky gasket, clogged burner or loose over-door hinge may not waste much energy, combine all three and suddenly the waste is significant. Stop waste by keeping your equipment and facility well maintained.
- \$ Occasionally check your thermostat and recalibrate as necessary to ensure that you're cooking at the right temperature. Repair or replace broken control panels on ovens, steamers, and other appliances that feature control systems and replace missing knobs on manually controlled appliances like ranges, griddles and broilers.
- ☺ Check pilot flames occasionally to make sure you're using only as much gas as you need. A tall yellow flame is the sign of an over-fired pilot light. Adjust flames so they are bullet shaped and mostly blue.

Office Equipment

- \$ GB Use computer hardware programs that save energy by automatically turning off idle monitors and printers.

Ovens

- ☺ Use "comb" mode sparingly; it is typically not necessary. Combination ovens are attractive because of their versatility as a cooking platform and their space-saving ability to mix the duties of ovens and steamers. Unfortunately comb mode can use double the energy of convection mode, and over 40 gallons of water per hour.
- ☺ Cut idle time. The bigger the oven, the more energy is wasted by leaving it idling. Conveyor ovens allow heat to escape at both ends. Turn ovens down or off during slow periods, shut down backup ovens during lulls and close oven doors completely when empty but still on.
- \$ Replace seals and tighten hinges. When seals and gaskets tear, replace them. When oven door hinges loosen, tighten them and re-align the door
- ☺ Keep it full. It is more efficient to cook in a fully loaded oven than a partially loaded one. If your workload permits it, cook in large batches and then turn off the oven in between loads.

Pasta Cookers

- ☺ Dial in minimum settings. If you boil water at maximum temperatures, you might be throwing away more than \$1,000 per year. Find the minimum settings required to maintain a boil—your food will cook just as fast, and you'll slash your energy bills.
- ☺ Cut idle time. With pasta cookers, you could save \$600 per year by cutting two hours of idle time each day. If you can't shut it down, consider at least turning it down—if kept standing by at less than boiling temperature it will use less energy than one running a constant boil.

Patio Heaters

- ☺ The best approach to saving money with patio heaters is to cut back—on the hours of operation and on the number of heaters running. Consider that three 50,000-Btu heaters operating an average of three hours daily could cost you upwards of \$1,600 per year.
- ☺ Design with efficiency in mind. Keep in mind that moving air can disperse the heat that radiates from patio heaters. Be smart with your patio layout; block cross drafts and consider how to use the fewest heaters so you can get the most bang for your energy buck.

Ranges

- ☺ Maintain and adjust burners. Wavy, uneven or yellow flames are signs that it's time for a burner cleaning and adjustment of the air shutter. Loosen the adjustment screw and move the shutter until the flame is bullet shaped and mostly blue, then tighten the screw. Never drill out the burners or the gas orifice to get a bigger flame—this lowers the burners' efficiency.
- 💰 Consider induction technology as an alternative to traditional range tops. Induction ranges offer high efficiency, rapid heat up, precise controls, and easy maintenance. Induction hobs can be purchased as single units or grouped together and can be set on top-off or built-into counter tops. Induction cook tops require magnetic cookware in order to work properly.
- ☺ Put a lid on it. Use a lid on stockpots to hold in heat, boost efficiency and shorten cook times.

Refrigerators & Freezers

- \$ Maintain refrigerator doors: replace worn gaskets, align doors, enable auto door closers and replace damaged strip curtains. Turn off reach-in refrigerator door heaters when possible.
- ☺ Check and set defrost cycles. Defrosting is an energy-intensive process that varies by model, so figure out which defrost settings are right for you. Only defrost for as long as you need, which in most cases is less than 15 minutes, four times daily. Minimize defrosting during peak energy use periods (12 to 6 pm).
Set your defrost time clock: Use the pins on the outside ring to set the number of defrost cycles, and use the center dial to set how long each defrost cycle lasts. One restaurant saved more than \$800 annually by shortening the defrost cycle length from 70 minutes to 15 minutes.
- \$ Install open-door buzzers on walk-in refrigerators. Install strip curtains and door auto-closers, evaporator fan controllers, and efficient evaporator fan motors on walk-in boxes.
- 💰 GB Replace inefficient refrigerators (usually older than ten years) with new efficient models, such as those labeled Energy Star®. Only use solid door refrigerators for storage of products that are not sold to the public.
- ☺ GB Locate ice machines in a cool area away from internal heat gains.
- ☺ GB Set refrigerator temperature between 38°F and 41°F and freezer temperature to 10°F - 20°F.
- ☺ Allow for air circulation. Refrigerators remove heat from inside the box and reject that heat out through the coils on the top or bottom of the unit. Don't push your reach-ins into tight spaces where that heat will build up, or the unit will end up working harder than necessary.
- ☺ Shade remote condensers. Direct sunlight can put a dent in the efficiency of a remote condenser. (These are usually associated with walk-ins and can often be found on rooftops.)
Use a few strategically placed panels to shade the condenser from direct sun during the hottest part of the day, while still allowing for airflow into and around the condenser unit.
- \$ Insulate suction lines. On refrigeration systems with remote condensers, suction lines transport refrigerant from the evaporator to the compressor. Adding inexpensive insulation to suction lines can help keep them from absorbing heat during the transfer process, ultimately making the entire refrigeration process more efficient. Check with your utility—rebates may be available to offset the cost of the insulation.
- ☺ Check and clean evaporator fins; locate behind the evaporative fans in your walk-in.
- ☺ Close the lid on your food wells. Leaving the lid up on your prep table could increase electricity consumption by up to 50 percent.
- \$ Recharge low refrigerant. Operating a walk-in with too little refrigerant puts strain on the compressor, increasing energy costs and the risk of equipment failure. To keep track of your refrigerant level, look for the sight glass—the small window into the refrigerant line—on the condenser. If you see bubbles while the system is running, it's probably time for a recharge.
- 💰 Switch to efficient fan motors. The electronically commutated (ECM) variety on a small, two-fan walk-in freezer can save \$200 a year per fan. The bigger the refrigerator and the greater the number of motors replaced, the greater the savings. California law requires efficient fan motors on new walk-ins. If you have an existing walk-in, consider swapping out the old motors

for newer ECM models. Don't wait until your old fan motors fail: it's cheaper to plan ahead and upgrade early rather than waiting for an emergency service call. Check with your utility to see if you are eligible for a rebate.

Sanitation

- ☺ Reduce dishwasher usage –fully load the dishwasher and turn off tank heaters and hot water recirculation pumps when the facility is closed.

Steamers

- ☺ Close the door! Your profits are literally evaporating away if you're operating your steamer with its door open.
- ☺ Use only as many compartments as you need. With steamers, two, three or four compartments are not better than one when it comes to saving energy and money. Shut down unnecessary compartments during slow periods.
- ☺ Cut standby time. Eliminating an hour of standby time daily on a boiler-based steamer can save from \$50 to \$300 in a year.
- ☺ Use the timer. If you're not using your steamer's timer, you're probably paying the price for it. Timers save energy by ensuring that the steamer runs at full heat only when needed.
- ☺ Keep it clean. Flushing out the boilers and removing mineral deposits will help ensure that you're operating at maximum efficiency.
- 💰 Invest in connectionless technology. Connectionless steamers require less maintenance than boiler-based steamers and consume far less energy and water. According to field testing by FSTC, a three-pan connectionless steamer can save \$2000 on annual water bills and \$3000 on annual electricity bills compared to a traditional boiler-based steamer.

Water Heating

- 💰 GB Insulate all hot water pipes, hot water heaters and storage tanks.
- 💰 GB Use a solar water heater or pre-heater.

6. Purchasing Guidelines for Energy Conservation

- View lists of rebates, incentives and free services for food service equipment and renewable energy installation at www.fypower.org (see under Commercial– Rebates, Incentives & Services) or www.fishnick.com/saveenergy/rebates
- Ask equipment manufacturers and dealers for energy use information or look online for efficiency information on specific models. The website of PG&E's Food Service Technology Center is a great place to start. Find it at www.fishnick.com.
- Ask dealers about maintenance. In some cases, energy efficient equipment may require less upkeep than standard efficiency equipment.
- Buy Energy Star® qualified appliances whenever possible. Look for the label or visit www.energystar.gov.
- Look beyond the sticker price. Make an energy-smart purchase by thinking in terms of lifecycle cost, which includes purchase price (commercial rebates or other incentives may be available for energy efficient appliances), annual energy costs, maintenance and other long-term costs associated with the equipment. Thinking in the long term can really pay off.
- To find a store near you: <http://www.flexyourpower.com/com/tools/vendors.html>

7. They Did It – So Can You! Case Studies^{vi}

Porto's Bakery, Glendale, California

Porto's Bakery is a great example of how energy-efficient natural gas appliances can help a business expand while keeping energy bills to a minimum. Working with the Southern California Gas Company as part of a major expansion project, the bakery was outfitted with energy-efficient griddles, ovens, fryers, and other pieces of cooking equipment. The investment in energy efficiency paid off: "Even though our sales went up by 40 percent, our gas costs stayed the same," reports Raul Porto, the bakery's owner.

Montebello Unified School District, California

With an assortment of energy-efficient steam kettles, braising pans and other equipment, cafeterias throughout the Montebello Unified School District (MUSD) are saving natural gas and cooking smart. Southern California Gas Company helped make the upgrades happen, providing more than \$12,000 in rebates for new gas equipment, which is saving the district as much as \$18,000 a year in energy costs. "With the money saved through energy efficiency, the school district budget can be spent in direct support of our students," said Derrick Williams, MUSD's energy manager.

Milton Stirm, Subway franchise owner, Lodi, California

Lodi business owner Milton Stirm reenergized his three Subway franchises with a handful of energy efficiency upgrades. Thanks in part to assistance from Lodi Electric Utility, which supplied both financial incentives and expertise throughout the upgrade process, Stirm made the jump from inefficient four-lamp T12 fixtures to energy efficient two-lamp T8 fixtures. "It's just as bright as before, with half as many lights," reported Stirm. Utility rebates for the lighting and other upgrades ranged from \$250 to \$750.

8. Glossary

Compact Fluorescent Lamps (CFLs): There are three common types of compact fluorescent lamps. One looks similar to the standard incandescent, with the exception of a larger base that holds the ballast of the CFL. The most common type is the CFL spiral bulb, which is usually hidden in the first style behind frosted glass. The third type is the two-pin based lamp. These are commonly used in industrial applications and are often used in recessed reflective cans. When choosing a CFL, be skeptical of the cheap ones sold in corner stores and dollar stores. Choose bulbs that have a high color rendering index (CRI) and a color temperature of about 2700 K for a warm light like an incandescent. Note that CFLs are also made in PAR and R type shapes to replace halogens.

Energy Star® is a federal government program to help Americans save money and protect the environment through energy efficient products and practices. <http://www.energystar.gov>

Halogen: Examples of common halogen bulbs are large flood lamps with a screw-in bases and bi-pin bulbs that go into track or recessed light fixtures. Replace the screw-in bulbs with compact fluorescents, and the bi-pin based bulbs with a lower wattage (IR/infrared) version of the same type halogen. Remove any non-spotlighting halogen fixtures with ones that will accept screw-in CFLs.

Incandescent light bulbs provide a relatively poor luminous efficacy, losing energy through heat, and therefore are gradually being replaced in many applications by CFLs, high-intensity discharge lamps, LEDs and other efficient devices. CFLs are easy to use, because they screw into regular incandescent bulb sockets, and consume far less electricity, produce less heat, last much longer, produce light spectra that are acceptable for consumer purposes and produce a many-fold cost savings over their lifetime. http://en.wikipedia.org/wiki/Halogen_light

Exit Signs: The SF Green Business Program requires that energy efficient exit signs be used in businesses seeking recognition. It can be difficult to tell which kind you have without opening the

sign. Look for a strip of tiny red or green lights to indicate that you have an LED sign, or one or two two-pin bulbs that indicate you have an incandescent sign, or two bulbs that look like compact fluorescents to indicate fluorescent. The incandescent bulbs are usually 15-25W each.

Linear/tubular Fluorescent Lamps: These are the most common fluorescents in business applications. There are two main types: the T12 and the T8 lamps. The "T" designation stands for tubular — the shape of the lamp. The number after the T gives the diameter of the lamp in eighths of an inch, e.g. the T12 has a diameter of 1.5 inches, and the T8, 1 inch. The older, T12 lamps require magnetic ballasts that use more energy than the electronic ballasts used with T8s. The most efficient lamp is a T5. The SF Green Business program allows no T12 lamps, and the City and County of San Francisco will soon outlaw the installation of T12 lamps, given their energy usage and mercury content. Get rid of these systems before it's too late!

http://www.flexyourpower.com/com/tools/products_results.html?id=100195

Mercury in Fluorescent Lights: While fluorescent lights are great energy savers, they contain mercury, a hazardous chemical. They are not dangerous during use; however, if fluorescent lights are improperly disposed of by being put in the trash, they can break, exposing sanitation workers, janitors and the public to mercury vapors. Additionally, if these lights end up in landfills, the mercury from them can contaminate the air and groundwater. It is estimated that nearly 75 million waste fluorescent lamps are generated annually in California, collectively containing more than a half a ton of mercury. Because of the mercury content, discarded fluorescent lamps are considered Universal Waste and are banned from the landfill. They must be properly disposed of as Universal Waste, a form of hazardous waste.

<http://www.sfenvironment.com/directories/lighting.htm>

http://www.flexyourpower.com/com/tools/products_results.html?id=100195

Occupancy Sensors: For spaces like restrooms, conference rooms, storage rooms and lockers, consider using occupancy sensors. If these spaces are empty for long periods and experience short bursts of use, they could be a good fit for occupancy sensors. There are many options for the sensors: most used in commercial settings have a sensor integrated into the switch, so one can override the off setting.

Credits

Thank you to Heike Bridgwater and Ivy Wong for your dedication and extensive contributions to this guide.

Much of the information in this guide was compiled from the following sources:

- Boosting Restaurant Profits With Energy Efficiency: A Flex Your Power publication
- San Francisco Green Business Program DIY documents

ⁱ Flex Your Power, Boosting Restaurant Profits With Energy Efficiency:

http://fypower.org/pdf/BPG_RestaurantEnergyEfficiency.pdf

ⁱⁱ PG&E

www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/inforesource/food_service_equipment_and_applications.pdf

ⁱⁱⁱ <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsEnergyEfficiency.html>

^{iv} Flex Your Power, Boosting Restaurant Profits With Energy Efficiency

^v Energy Star © http://www.energystar.gov/index.cfm?c=fixtures.alp_consumers

^{vi} Flex Your Power, Boosting Restaurant Profits With Energy Efficiency