



ENERGY STAR Commercial Food Service (CFS) Program

CFS Industry Training (For dealers, operators, consultants & designers)

Last updated: September 2011



Learn more at energystar.gov



ENERGY STAR Overview



This presentation section provides an overview of the U.S. Environmental Protection Agency's (EPA's) voluntary partnership and the programs and products covered. It also summarizes the energy intensity and energy breakdown in restaurants and commercial kitchens.

What Is ENERGY STAR?



- Voluntary climate protection partnership with the U.S. Environmental Protection Agency (EPA)
- Strategic approach to energy management, promoting energy efficient products and practices
- Tools and resources to help save money and protect the environment
- Influential brand recognized by over 80 percent of Americans



ENERGY STAR is a voluntary partnership between EPA and industry organizations. EPA started ENERGY STAR in 1992 to reduce greenhouse gas emissions through greater energy efficiency.

Today, EPA works with over 17,000 organizations and the ENERGY STAR label can be found on over 60 different types of products, as well as new homes and commercial and industrial buildings.

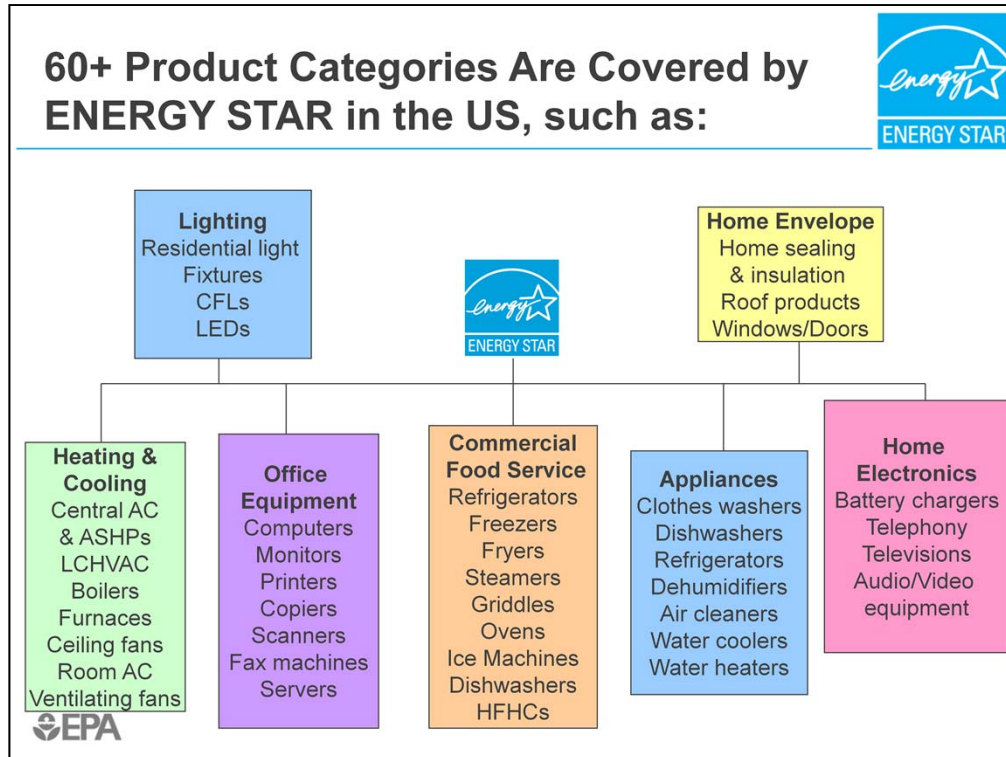
The ENERGY STAR Product Label



- The ENERGY STAR label was established to:
 - Reduce greenhouse gas emissions and other pollutants caused by the inefficient use of energy
- AND
- Make it easy to identify energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.



ENERGY STAR helps your organization improve the energy performance of its portfolio and demonstrate its environmental leadership by providing guidance, tools, and other resources.



The ENERGY STAR label now appears across more than 60 product areas and is recognized by more than 80 percent of American consumers. This includes 8 commercial food service (CFS) product categories and the program continues to expand.

The ENERGY STAR also identifies superior energy performance for America's commercial and industrial buildings.

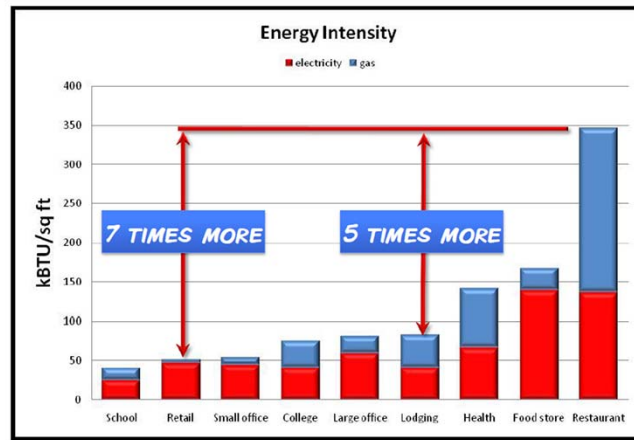
Restaurants are Energy Intensive!



Shaping Restaurants to Be Models of Efficiency

By LAURA NOVAK
May 17, 2006

“If restaurants were automobiles, they would be Hummers.”



Source of graph: PG&E Food Service Technology Center

Restaurants are extremely energy intensive. Restaurants use about 5-7 times more energy per square foot than other commercial buildings, such as office buildings and retail stores. High volume quick-service restaurants (QSRs) may even use up to 10 times more energy per square foot than other commercial buildings.

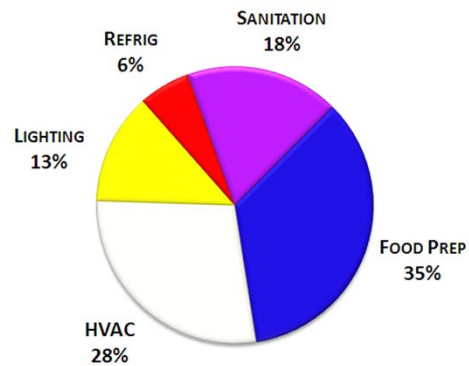
Much of the energy use in the commercial food service industry can be reduced through employing more efficient equipment and practices.

(Source of chart: www.energy.ca.gov/2006publications/CEC-400-2006-005/CEC-400-2006-005.PDF and PG&E's FSTC.)

Restaurant Energy Consumption



Energy use in restaurants is dominated by food preparation



An example of how energy (BTU) is consumed in a typical full service restaurant



Source: PG&E Food Service Technology Center

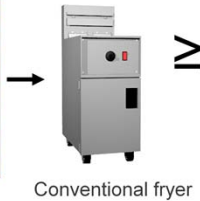
Where should operators look for energy savings? Energy consumption in commercial kitchens is dominated by food preparation.

French Fries Have a Huge Energy Cost



- A single appliance can consume more than a home!

A typical electric deep fat fryer uses more than **18,000 kWh** annually



Conventional fryer

The average U.S. household electricity use is approximately **13,000 kWh** annually



Source: PG&E Food Service Technology Center

A typical electric deep fat fryer uses more energy annually than an average home uses!

Energy efficiency is the percentage of energy consumed by an appliance that actually goes into the food product, and ENERGY STAR products ensure that more of the energy consumed is used wisely.



Making the Case for ENERGY STAR



This portion of the presentation describes how ENERGY STAR helps you – whether selling or purchasing equipment. ENERGY STAR’s advantages range from energy and dollar savings to recognition opportunities.

The corresponding presentation – “Overview of ENERGY STAR Qualified Products & Savings Opportunities” provides an overview of the eligible products for the front and back of the house, along with estimated average annual and lifetime savings.

Why Should You and Your Customers Care About ENERGY STAR?



- ENERGY STAR equipment saves end-users energy, water, and money
- Energy efficiency is becoming more important in foodservice environments
- Designing to include ENERGY STAR:
 - Boosts end-users long-term bottom line
 - Demonstrates commitment to environment
 - Guards against rising energy rates
- ENERGY STAR qualified equipment has a lower total cost of ownership over time



EPA's ENERGY STAR program supports restaurant operators by helping quickly and easily identify more efficient equipment that maintains or improves performance. ENERGY STAR qualified equipment uses less energy and less water than standard equipment, helping operators save money and increase their bottom line.

Making the Case for ENERGY STAR



- ENERGY STAR qualified CFS equipment can save significant amounts of money
 - See annual and lifetime savings figures
- Performance is maintained with higher efficiency
- High utility costs cut into restaurants' bottom line
 - Utility costs: 3 to 5% of sales*
 - Average profit ~5%*
 - Restaurateurs are taking notice of high energy costs
- Benchmarking restaurant energy use helps keep track of savings



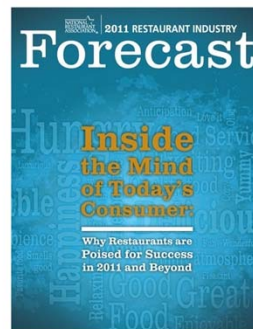
**Source: National Restaurant Association
2009 Restaurant Industry Forecast*

ENERGY STAR Qualified CFS equipment helps protect the environment while lowering costs. For annual and lifetime savings figures, see the presentation section on product-specific benefits with ENERGY STAR.

Restaurant Industry Trends



- Restaurant operators across all segments plan to devote more resources to green initiatives in 2011
- Roughly 40% of operators (from quick-service to fine dining) plan to purchase energy-saving kitchen equipment in 2011

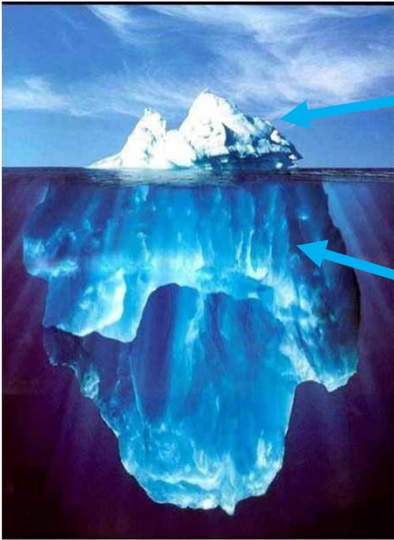


Source: National Restaurant Association
2011 Restaurant Industry Forecast

The trend towards improving sustainability cuts across all restaurant segments – fine dining, casual dining, quick service restaurants are all planning to devote more resources to green initiatives.

A number of reports demonstrate increased consumer awareness and demand for sustainable business practices. In particular, NRA's 2011 Restaurant Industry Forecast shows that the demand for efficient equipment is increasing.


Total Cost of Ownership




The diagram shows an iceberg floating in the ocean. The small tip of the iceberg is above the water line, and the much larger, submerged part is below the water line. Two blue arrows point from text labels to the iceberg. One arrow points to the tip, and the other points to the submerged part.

Acquisition costs of equipment

Maintenance and other ongoing costs of equipment (can be 2 to 20 times greater)

 *Source: PG&E Food Service Technology Center*



When comparing equipment, make sure to take into account installation, shipping, maintenance, labor, energy and water, repair costs, and disposal fees. The ENERGY STAR program works to achieve energy efficiency without sacrificing quality in performance.

Remember the acquisition cost of CFS equipment is only the tip of the iceberg in terms of total costs. Restaurateurs often look for the least expensive equipment option on the showroom floor and rarely consider the total cost of ownership of the equipment (which includes the purchase price and lifecycle costs like energy and maintenance). Better made equipment that saves energy and water and lasts longer compensates for initial differences in purchase price.

Range of CFS Incentives Offered by Utilities



Product	Incentive Range
Dishwashers	\$50 – \$2,000
Fryers	\$66 – \$2,500
Griddles	\$125 – \$2,100
Hot food holding cabinets	\$110– \$650
Ice machines	\$18 – \$700
Ovens	\$115 – \$3,000
Refrigerators and freezers	\$25 – \$1,000
Steam cookers	\$40– \$2,000



Please note that utility programs can change. Please contact your utility to ensure the program is still in effect before purchasing your equipment.

Source: 2011 ENERGY STAR Commercial Food Service Incentive Guide

To help offset the initial cost of investing in energy-efficient equipment, many energy utilities across the country offer prescriptive incentives.

More than fifty utilities are featured in the 2011 edition of the ENERGY STAR CFS Incentive Guide (See: www.energystar.gov/cfs/incentives), offering prescriptive incentives up to \$3,000 (utility and equipment dependent).

Utility incentive programs can change so please check with your local utilities to ensure a particular incentive is still available.

Utility Incentives



- Contact your utility program administrator to:
 - Ensure that they continue to offer CFS incentives to customers
 - Ask whether they offer marketing and outreach materials, point of purchase materials, or trainings
 - See if they will develop custom incentives
 - Determine whether they have an education center with CFS testing facilities



Utilities in your state may also offer custom incentives, so contact your utility program administrator for more information. Dealers can provide more information about utility incentives and manufacturer's financing.

Be sure to contact your utility program administrator to ensure that the incentives are still in place. Programs and funding can change to any time so before making a recommendation or decision, be sure that the incentive you are factoring into your decision is still available.

ENERGY STAR Recognition Opportunities



- ENERGY STAR Partner of the Year Awards
- ENERGY STAR Small Business Awards
- Special recognition



Go to: www.energystar.gov/awards



ENERGY STAR Partner of the Year: Organizations that join as an ENERGY STAR partner will be eligible to apply for the ENERGY STAR Partner of the Year award (see: www.energystar.gov/awards).

ENERGY STAR Small Business Awards: Members of the Small Business Network are eligible to apply for an award focused solely on small business network members (separate from Partner of the Year). See www.energystar.gov/smallbiz (under "What You Can Do").

Special Recognition Opportunities: The Small Business Network recognizes organizations that support small businesses in their efforts to reduce energy in their operations. Larger restaurant organizations and commercial kitchens can earn special recognition by helping franchisees and other small businesses to become members of the network and reduce their energy intensity.

Other: The ENERGY STAR CFS team is looking into methods for developing a restaurant recognition program based on the use of ENERGY STAR qualified CFS equipment products in commercial kitchens. Send your suggestions to the ENERGY STAR Marketing team by e-mailing commercialfoodservice@energystar.gov.

Additional Recognition Opportunities



- Commercial kitchen & restaurant sustainability recognition programs are growing in popularity:
 - National Restaurant Association's Conserve Initiative
 - Food Service Warehouse *Certified Green Commercial Kitchen Program*
 - Green Seal GS-46
 - U.S. Green Building Council (USBGC) LEED programs
- Threshold for CFS equipment: ENERGY STAR



These recognition programs include the purchase and installation of ENERGY STAR qualified CFS equipment as part of their recognition criteria.

Additional benefits beyond energy, water, and dollar savings include recognition opportunities and other benefits (e.g., LEED certification, Green Seal, consumer and employee satisfaction).

LEED Points with ENERGY STAR



- The U.S. Green Buildings Council (USGBC) LEED for Retail leverage ENERGY STAR
- ENERGY STAR can help earn credit
 - Water efficiency, energy and atmosphere, innovation and design
- Some prerequisite requirements include ENERGY STAR



Restaurants can earn LEED credits by installing ENERGY STAR equipment. In addition to LEED for Retail, other LEED ratings that leverage the ENERGY STAR program include New Construction, Existing Buildings: Operations & Maintenance, Commercial Interiors, Core & Shell and Schools.



Overview of ENERGY STAR Qualified Products & Savings



This presentation section provides an overview of the eligible products for the front and back of the house, along with estimated average annual and lifetime savings.

ENERGY STAR Guiding Principles



- ENERGY STAR label effectively differentiates products by labeling the most efficient products
- Other guiding principles:
 - Cost effective for the end user
 - Significant unit/national energy savings
 - Performance is maintained or enhanced
 - Efficiency performance is measured and verified with industry accepted test method
- Third-party certification procedures bolster the integrity of the program and ensure energy-efficient performance



ENERGY STAR differentiates the most efficient products in the market. In developing product specifications, EPA follows several guiding principles. These principles ensure that performance is maintained or enhanced with ENERGY STAR qualified products and that the products are cost-effective, offer significant energy savings nationwide, and that energy performance can be measured and verified by testing.

EPA protects the ENERGY STAR brand integrity via a multitude of efforts and safeguarding mechanisms such as third-party certification and verification processes.

How Does ENERGY STAR Maintain Relevancy?



Specifications are updated in response to market changes:

- High market share
- Change in Federal minimum efficiency standards
- Availability, performance, or quality concerns
- Advancements in technology
- Changes in test procedures



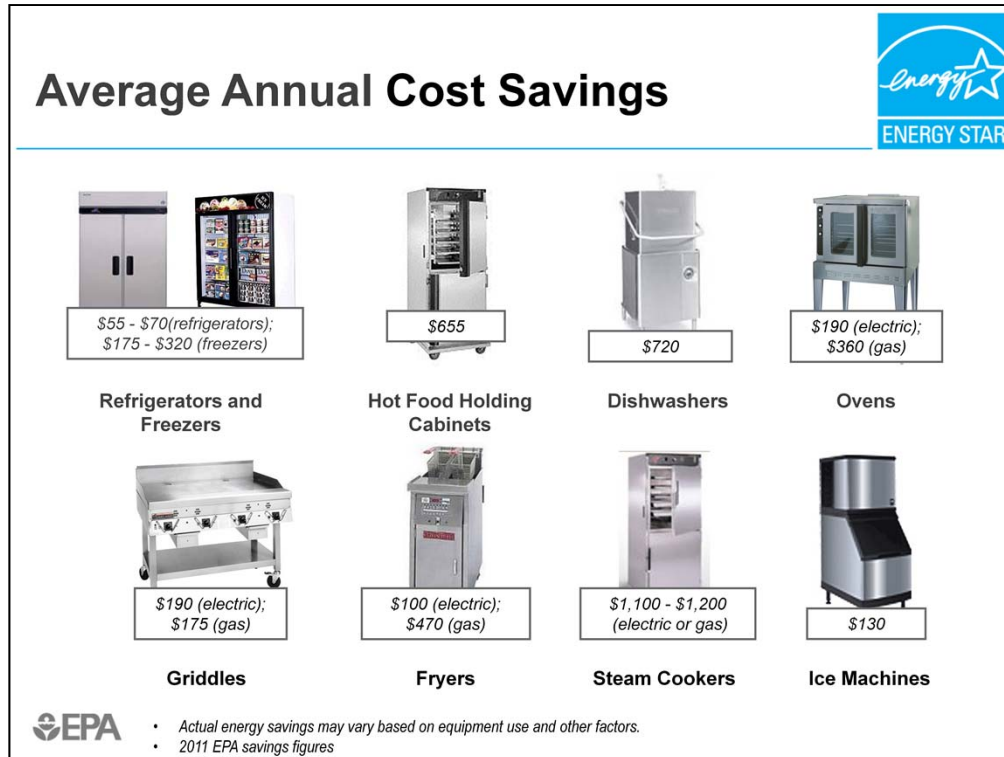
EPA revisits ENERGY STAR product specifications to ensure continued relevance in the marketplace and to identify potential new savings opportunities. This review happens at least every 3 years but may happen sooner based on market conditions. The specification development process is transparent and offers manufacturers and other interested stakeholders several opportunities to engage throughout as is seen in the cycle diagram.

All documentation and comments are posted to the ENERGY STAR website as well. EPA also looks for new labeling opportunities and follows the same process when development new ENERGY STAR specifications. For complete product details and specifications, see www.energystar.gov/cfs. For details on the current specifications under revision, see www.energystar.gov/revisedspecs.



The ENERGY STAR program covers 8 commercial food service (CFS) product categories and continues to expand to cover wider scope of eligible products as EPA works to make energy efficiency in commercial kitchens a priority.

The ENERGY STAR program works to achieve energy efficiency without sacrificing quality in performance. In many cases, improvements in energy and water efficiency actually enhance performance and extend product lifetime while lowering operating costs. Whether you are planning a renovation, replacing equipment that has reached the end of its useful life or need an emergency replacement, save energy and water by selecting an ENERGY STAR qualified model.



Restaurants that invest strategically can cut utility costs 10 to 30 percent without sacrificing service, quality, style or comfort – while making significant contributions to a cleaner environment.

Outfitting an entire kitchen with a suite of ENERGY STAR qualified CFS equipment can save operators about 370 Million British thermal units per year (MBtu/yr), or the equivalent of more than \$3,300 per year.

Average Lifetime Cost Savings



12 year life
\$500 – 650 (refrigerators);
\$1,650 – \$3,000 (freezers)

**Refrigerators and
Freezers**



12 year life
\$ 6,150

**Hot Food Holding
Cabinets**



20 year life
\$5,850 – \$9,750

Dishwashers



12 year life
\$1,800 (electric);
\$3,400 (gas)

Ovens



12 year life
\$1,800 (electric);
\$1,650 (gas)

Griddles



12 year life
\$950 (electric);
\$4,400 (gas)

Fryers



12 year life
\$10,350 (electric);
\$11,500 (gas)

Steam Cookers



8 year life
\$900

Ice Machines



- Actual energy savings may vary based on equipment use and other factors.
- Lifecycle cost savings based on a 4% discount rate

The average lifetime figures are typically based on a 12-year lifetime (however dishwashers and ice machines vary as stated). Lifecycle savings are based on a 4% discount rate.

Additional Benefits of ENERGY STAR Qualified Equipment



- ENERGY STAR qualified products are constructed using innovative and energy-efficient technologies that offer other benefits such as:
 - Shorter cook times
 - Improved production rates
 - Reduced load on the HVAC system (from heat loss)
 - Improved recovery times
 - Lower maintenance costs
 - Reduced noise levels



In addition to reductions in energy and water consumption, end users also experience other performance benefits due to ENERGY STAR qualified equipment, from shorter cook times and improved recovery times to higher production rates. Efforts to reduce energy at the equipment level often lead to greater savings and comfort in the kitchen. For example, improved equipment insulation helps to retain heat needed to cook and warm the food but also reduces the burden on the overall HVAC system to keep the kitchen cool and also makes for a more comfortable work environment.

Beyond the Kitchen: Opportunities for Additional Savings



HVAC Equipment



Televisions



Printers



CFLs and Fixtures



Ceiling Fans



Computers and Displays



The ENERGY STAR label now appears across more than 60 product areas. ENERGY STAR qualified products are great options to save energy outside of the kitchen as well, from lighting and electronics (e.g., televisions and computers) to HVAC equipment.



Learn more about how ENERGY STAR qualified CFS equipment improves kitchen performance by reviewing the product-specific benefits in the following slides.

This segment details the improved performance and efficiency of the eligible CFS products, providing details on the scope of products covered by ENERGY STAR specifications, performance criteria, and also a sampling of equipment features and benefits.

The technical approaches and equipment benefits listed represent a sampling; not all of these features and benefits are represented across all ENERGY STAR qualified models.

Overview of Improved Efficiency with ENERGY STAR



Product Type	% Improved Efficiency*
Dishwashers	25% (+ 25% more water efficient)
Fryers	30%
Griddles	10-25%
Hot Food Holding Cabinets	65%
Ice Machines	15% (+10% more water efficient)
Ovens	10-25%
Refrigerators and Freezers	30%
Steamers	60%



**Approximated values*

ENERGY STAR qualified models offer significant improvements in energy and water efficiency when compared to standard models, as shown in the snapshot above.

Commercial Dishwashers



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> ▪ High temp (hot water sanitizing) and low temp (chemical sanitizing) machines ▪ Undercounter, single tank door type, single tank conveyor, and multiple tank conveyor machines ▪ Includes glass and pot, pan, utensil machines 	<ul style="list-style-type: none"> ▪ Flight type* dishwashers ▪ Dishwashers that include an optional manual rinse after the final sanitizing rinse 	<p>Specification Version 1.1 Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> ▪ Idle Energy Rate (kW) ▪ Water Consumption (gallons per rack)

*The Version 2.0 specification under development is revising performance levels for covered products and may include requirements for flight type conveyors.

The revision effort also revisits performance levels for existing product types. See www.energystar.gov/revisedspecs.



Note: Pot, pan, utensil machines are already eligible, but EPA is setting specific and separate levels for this type with the Version 2.0 specification.

Commercial Dishwashers



- **Approximately 25% more energy efficient & 25% more water efficient than standard models**
- **Examples of technical approaches to reduce energy & water consumption:**
 - Improved tank insulation
 - Improved nozzles and rinse arm designs
 - Auxiliary pre-rinse section
- **Additional equipment benefits:**
 - Quiet operation
 - Auto mode capabilities
 - Water heater/building energy savings
 - Heat recovery



Auxiliary pre-rinse section: This is essentially a multi-staging system that reuses rinse water. This technology allows for a reduction in final rinse water, which is supplied from the electric or gas booster heater. The auxiliary pre-rinse water partially rinses the dishes with the previous cycle's final rinse water, after which the current cycle's final rinse water completes the final rinse.

Auto mode capabilities: Some manufacturers equip their dish machine units with smart controls or timers that will set the machine in an energy saving or sleep mode after an extended period of time of inactivity. This can be pre-set by the operator. Additionally, sensors may be installed to automatically shut off the pumps and conveyor when no racks are running through.

Commercial Fryers



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> ▪ Gas and electric open-deep fat fryers ▪ Standard frypot sizes (not greater than 15 inches) ▪ Large vat fryers (18-24 inches) 	<ul style="list-style-type: none"> ▪ Models < 12 inches wide or > 24 inches wide ▪ Closed vat fryers 	<p>Specification Version 2.0* Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> ▪ Cooking energy efficiency (%) ▪ Idle Energy Rate (Btu/h or watts)

Specification expanded in 2011.



Commercial Fryers



- **Approximately 30% more energy efficient than standard models**
- **Examples of technical approaches to reduce energy consumption:**
 - Advanced gas heat exchanger designs
 - Advanced electrical heat transfer technologies
 - Thermostats with improved accuracy
 - Frypot insulation (electric only)
- **Additional equipment benefits:**
 - Continuous production capacity & higher pound-per-hour production rates
 - Quicker comparable recovery process
 - Improved oil conservation and management, improved ease of cleaning



Advanced gas heat exchanger designs

Recirculation Tubes: Routes the flue gasses through or around the sides of the frypot to provide a greater effective heat-transfer surface to the hot gasses.

Powered Burners: Burners with a blower to force the fuel/air mixture into the burner at the optimum rate.

Infrared Burners: Transfers heat to the frypot through metal plates that radiates heat more evenly than an open flame.

Advanced electrical heat transfer technologies

Low Watt-Density Elements: Provide an even distribution of heat to the frying oil by spreading the power across a greater surface area.

Thermostats: Solid-state thermostats can be more sensitive, empowering fryers to recover quicker and maintain temperature. It has been shown that smaller fluctuations in oil temperature can increase efficiency and productivity.

Manufacturers do not insulate the gas models due to safety limitations.

Commercial Griddles




Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> ▪ Thermostatically controlled gas and electric models ▪ Single- and double-sided models 	<ul style="list-style-type: none"> ▪ Manually controlled griddles ▪ Fry-top ranges 	<p>Specification Version 1.1 Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> ▪ Cooking energy efficiency (%) ▪ Idle Energy Rate (Btu/h per ft² or watts per ft²)

Specification took effect in 2009.



Commercial Griddles



- **Approximately 10-25% more energy efficient than standard models**
 - **Examples of technical approaches to reduce energy consumption:**
 - Strategic placement of thermocouples
 - Double sided griddles
 - Use of highly conductive or reflective plate materials
 - Improved thermostatic controls
 - Sub-griddle insulation (electric only)
 - **Additional equipment benefits:**
 - Improved cooking performance
 - High production capacity
 - Improved/more even heat distribution
-  EPA Easier to clean



Double sided griddles: These griddles are more energy efficient because the operator does not need to flip the food product during cooking. Instead the top and the bottom of the product can be cooked simultaneously.

Reflective plate material: Some manufacturers offer griddles with a chrome-finished cooking surface which is easier to clean and radiates less heat into the kitchen and exhibits lower heat loss during idle and cooking.

Thermostatic Controls: Heating elements or gas burners that are controlled by a solid-state thermostat which is usually embedded in the plate itself.

Manufacturers do not insulate the gas models due to safety limitations.

Commercial Hot Food Holding Cabinets



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> ▪ Glass or solid door cabinets (fully enclosed) 	<ul style="list-style-type: none"> ▪ Dual function equipment, such as cook-and-hold models ▪ Transparent merchandising cabinets and drawer warmers 	<p>Specification Version 2.0* Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> ▪ Idle Energy Rate (watts per ft³)

Revised specification - Version 2.0 is effective October 1, 2011.



Commercial Hot Food Holding Cabinets



- **Approximately 65% more energy efficient than standard models**
- **Examples of technical approaches to reduce energy consumption:**
 - Improved insulation
 - Temperature and humidity controls
 - Magnetic door gaskets
 - Dutch doors
- **Additional equipment benefits:**
 - Better temperature uniformity from top to bottom



Commercial Ice Machines



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> Air-cooled, cube-type machines Includes ice-making head (IMH), self-contained (SCU) and remote condensing (RCU) units 	<ul style="list-style-type: none"> Ice machines that use water-cooled technology Continuous type ice machines 	<p>Specification Version 1.1 Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> Harvest Rate, H (lbs ice/day) Energy Use Limit (kWh/100 lbs ice) Potable Water Use Limit (gal/100 lbs ice)

The Version 2.0 specification under development will expand coverage to include continuous type (i.e., flake and nugget) designs. The revision effort will also revise performance levels for existing product types. See www.energystar.gov/revisedspecs.



Commercial Ice Machines



- **Approximately 15% more energy efficient & 10% more water efficient than standard models**
- **Examples of technical approaches to reduce energy & water consumption:**
 - Improved cold-compartment insulation
 - Higher efficiency compressors, fan motors and fan blades
 - Reduced harvest meltage and evaporator thermal cycling
- **Additional Equipment Benefits**
 - Quicker ice harvesting
 - Less frequent compressor start up and shutdown cycles → less maintenance



High-efficiency fan motors, for example electronically commutating motors (ECMs), have variable speed capabilities which is more efficient than a single speed motor that runs continuously on its maximum speed.

Commercial Ovens



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> Convection ovens (full - size gas and full- or half - size electric) 	<ul style="list-style-type: none"> Combination Conveyor Slow cook-and-hold Deck Mini-rack/rack Range Rapid cook Rotisserie Laboratory grade 	<p>Specification Version 1.1 Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> Cooking energy efficiency (%) Idle Energy Rate (Btu/h or kW)

Specification took effect in 2009. EPA anticipates revising the specification during 2011- early 2012 to expand the scope to include other product types.



Commercial Ovens



- **Approximately 10-25% more energy efficient than standard models**
- **Examples of technical approaches to reduce energy consumption:**
 - Direct-fired gas burners
 - Infrared burners
 - Improved insulation
 - Quality control features
 - Improved gaskets
- **Additional Equipment Benefits:**
 - Faster & more uniform cooking process
 - High production capacity



Direct-fired gas burners: These ovens typically position the burners below the cooking cavity and allow the hot combustion products to route through the cooking cavity rather than around it. Heat is transferred directly from the hot gasses to the food, rather than through an intermediate device, thus improving the cooking-energy efficiency.

Infrared burners: Combustion takes place close to the burners surface, causing it to become red-hot and emit infrared radiation to the surrounding heat transfer tube walls.

Quality control features: Upgraded controls include more accurate electronic sensors and thermostats, electronic ignition controls (on gas models), and programmable cooking computers which recall several cooking sequences.

Commercial Refrigeration



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> ▪ Solid and glass door refrigerators ▪ Solid and glass door freezers <p><i>Examples include: Reach-in, roll-in, or pass-through units; merchandisers; undercounter units; milk coolers; back bar coolers; bottle coolers; beer-dispensing or direct draw units</i></p>	<ul style="list-style-type: none"> ▪ Drawer cabinets, prep tables, deli cases ▪ Open air units ▪ Laboratory-grade equipment 	<p>Specification Version 2.1 Key Eligibility Criteria</p> <p>Performance based on:</p> <ul style="list-style-type: none"> ▪ Maximum daily energy consumption (MDEC) (kWh/day) ▪ MDEC is dependent upon volume, door type, and product type



Specification was revised in 2010. EPA anticipates revising the specification during 2011 to address testing and high market penetration.

Commercial Refrigeration



- **Approximately 30% more energy efficient than standard models**
- **Examples of technical approaches to reduce energy consumption:**
 - High-efficiency compressors and improved coil design
 - ECM (Electronically Commutated Motor) evaporator and condenser fan motors
 - Improved fan blade designs
 - Hot gas anti-sweat heaters for defrost
 - Improved insulation and gaskets
 - Efficient interior lighting
- **Additional Equipment Benefits:**
 - Uniform cabinet temperatures



Commercial Steam Cookers



Eligible Products	Ineligible Products	Key Product Criteria
<ul style="list-style-type: none"> ▪ Electric and gas steamers ▪ ≥ 3 pan sizes ▪ May include countertop, wall-mounted, and floor-models 	<ul style="list-style-type: none"> ▪ Hybrid/combination products 	<p>Specification Version 1.2 Key Eligibility Criteria</p> <p>Performance requirements based on:</p> <ul style="list-style-type: none"> ▪ Cooking energy efficiency (%) ▪ Idle Energy Rate (Btu/h or watts)

Specification took effect in 2003. EPA anticipates revising the specification during 2012.



Commercial Steam Cookers



- **Approximately 60% more energy efficient than standard models**
- **Examples of technical approaches to reduce energy consumption:**
 - “Connectionless” steamers
 - Closed-system design
 - Improved insulation
 - Low-temp standby/idle modes
 - Improved gaskets
- **Additional Equipment Benefits:**
 - 90% reduction in water consumption (connectionless models)
 - Shorter cook times
 - Higher production rates



“Connectionless” steamer: A closed-system design that produces steam by boiling water which is manually poured directly into the cooking compartment prior to operation. Though many connectionless steamers are better for batch cooking, newer technologies are enabling “a la carte” performance with more rapid recovery times.

Closed-System Design: Steam is generated inside the cavity, it condenses into water, then returns back into the water reservoir to become steam. An open-system design has an external boiler or steam generator that produces steam that enters the cooking cavity, circulates, then condenses and goes down the drain.



Tips for Restaurant & Commercial Kitchen Operators

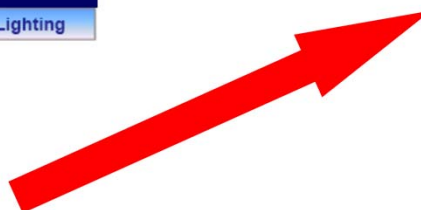
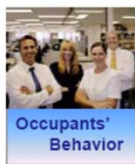


This presentation section outlines strategic ways for commercial kitchen managers and operators to identify low and no-cost savings opportunities and curtail overall energy consumption.

Strategically Save Energy



- Benchmark and then work to improve your energy performance using a staged approach



Go to: www.energystar.gov/benchmark

To strategically save energy, EPA recommends restaurants first benchmark energy to determine the impacts of their efficiency projects. Restaurants can use EPA's free online tool, Portfolio Manager, to benchmark energy and water use and greenhouse gas emissions. Visit www.energystar.gov/benchmark.

Operations & Maintenance



- O&M = “low-hanging fruit” for energy savings
- Perform regular maintenance on:
 - Walk-in refrigerators: clean coils, add refrigerant, fix gaskets
 - Heating, cooling, and ventilation (HVAC): regular tune ups by professionals and schedule filter changes
 - Cooking and sanitation equipment: have a professional tune up and recalibrate the equipment
 - Fix water leaks immediately
- Consider an energy audit
 - Often available for free from utilities



Source: PG&E Food Service Technology Center

After benchmarking energy use, EPA recommends restaurants prioritize efficiency efforts and start with the easiest measures to implement. One of the easiest ways for a restaurant to save energy is to implement a routine operations and maintenance schedule.

Employee Behavior



- Create a “start-up/shut-down schedule”
 - Most equipment only needs 15 min. to preheat
 - Turn off lights and burners when not in use!
 - Cut idle time for support equipment
 - Toasters
 - Coffee Warmers
 - Warming drawers
 - Plate warmers
 - Holding cabinets
 - Steam tables
- Walk-in refrigeration: do not prop open doors, use strip curtains



Source: PG&E Food Service Technology Center

Changing employee behavior is a low-cost way to save energy in a commercial kitchen, but does require time, patience and consistent reinforcement. Using smart controls on appliances, including products that have not earned the ENERGY STAR, can drastically reduce energy consumption.

Lighting



- Installing ENERGY STAR qualified lighting can save operators money
 - LED and CFL lighting use about 75% less energy than incandescent lighting and produces less heat → saving money on HVAC expenses
 - ENERGY STAR qualified lighting lasts longer and can also improve the visual experience



The ENERGY STAR program covers light fixtures and light bulbs, and includes LED and fluorescent options for both. While energy use in full-service restaurants is dominated by food preparation and HVAC, lighting is a significant energy user — averaging 13 percent of the total energy breakdown.

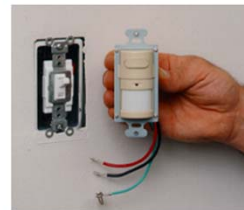
Traditional lighting consumes 75% more energy and also wastes that extra energy as heat. Upgrading to ENERGY STAR qualified lighting systems, improves the visual environment and may reduce the sizing needs of HVAC systems too.

Replacing lighting both in the front of the house and back of the house with ENERGY STAR qualified lighting is a great way to kick-off upgrades which lead to a more energy-efficient restaurant or commercial kitchen.

Vacancy Sensors & Lighting Controls



- Use occupancy sensors to turn off lights when they are not needed
- Cost: \$25 to \$80 (ultrasonic or infrared)
- Place in restaurant bathrooms, storerooms, and walk-in refrigerators
 - Restrooms: save 30 to 75%
 - Storage areas: 45 to 65%
 - Offices (private): 25 to 50%



Source: ENERGY STAR Small Business Guide:
Putting Energy Into Profits

Install switch plate occupancy sensors in proper locations to automatically turn lighting off when no one is present, and back on when people return.

Installing bi-level switching so you can control lighting in a large room will help save energy because you can turn off a set of lights if you do not need lighting in the entire room. Installing dimmers also allows users to control the amount of light in a room and save energy. If your kitchen or dining area has large windows, dim or turn off the lights when sunny. Also, dim the lights in the dining area in the evening to create ambience.

Engage with ENERGY STAR



- Review ENERGY STAR tools & resources to:
 - Locate utility incentives and rebates
 - Download or order a copy of the ENERGY STAR Guide for Restaurants
 - Sign up for the ENERGY STAR CFS newsletter
 - Read success stories via insightful case studies
 - Join ENERGY STAR as a partner
 - Measure and track energy performance with Portfolio Manager
 - Much more...
- Questions? Contact us!
 - Reach out with any questions by contacting the ENERGY STAR Marketing Team at commercialfoodservice@energystar.gov



The ENERGY STAR CFS team continues to welcome engagement by restaurateur stakeholders across the CFS program. Restaurant operators that currently make energy efficiency a priority (or wish to do so) are encouraged to speak with ENERGY STAR program representatives about opportunities to leverage ENERGY STAR tools and resources. EPA is open to additional opportunities to collaborate.

While all ENERGY STAR resources are free and most are available to all stakeholders, consider joining the program as a partner to publicly show commitment to energy efficiency and to get additional support from ENERGY STAR representatives.

Restaurant operators can join the ENERGY STAR Small Business Network or as an ENERGY STAR Buildings Partner. Operators should also encourage their dealer representatives to join ENERGY STAR as a retail partner.

Additional Tips



- Benchmark your restaurant
- Install ENERGY STAR qualified light bulbs and fixtures
- Install a high-efficiency pre-rinse spray valve
- Fix water leaks immediately
- Perform walk-in refrigerator maintenance
- Replace worn-out equipment with ENERGY STAR or other efficient equipment
- Ask your dealer/designer/manufacture rep about ENERGY STAR and other energy efficient models



Remember, to begin making your kitchen more energy efficient, start with a few easy steps to implement measures like the ones listed on this slide. Also, remember to ask your dealer for equipment demonstrations and request that they stock ENERGY STAR equipment.



ENERGY STAR Tools & Resources

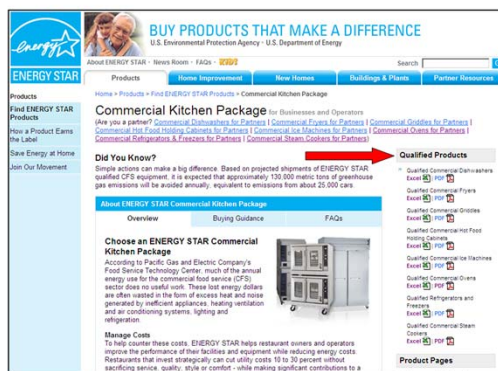


This portion of the presentation provides an overview of the tools and resources available for partners and stakeholders, from printed publications and e-newsletters to tools for searching incentives and product data.

Qualified Product Lists



- ENERGY STAR offers easy-to-access qualified product lists
 - Available on www.energystar.gov/cfs



ENERGY STAR qualified product lists are available in searchable Excel files and also PDF for each product category.

Review ENERGY STAR qualified product lists when creating purchasing lists or specifying equipment for projects to ensure products are qualified or to see where ENERGY STAR can be incorporated.

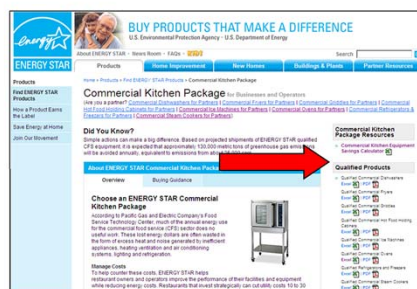
Energy Cost Savings Calculator



- ENERGY STAR calculator features all eight CFS equipment types
 - Calculate average energy, water, and dollar savings over lifetime of equipment
 - Easy to use
 - Allows users to enter in product specific values
 - Provides estimated savings benefits

Go to: www.energystar.gov/cfs

Click on "Commercial Kitchen Equipment Savings Calculator"

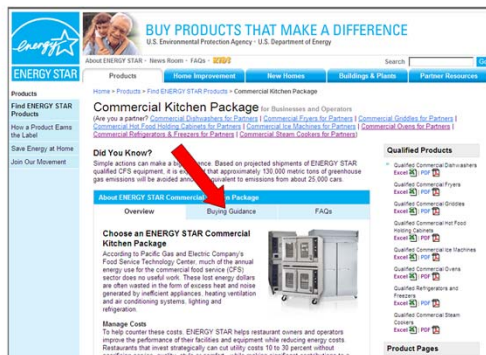


Utilize the ENERGY STAR savings calculator to estimate equipment paybacks, lifetime savings based on the performance details of an average or specific piece of equipment, and greenhouse gas savings.

“Where to Buy” List



- Highlights ENERGY STAR retailer/dealer partners that sell qualified CFS equipment
 - Available on www.energystar.gov/cfs (Under “Buying Guidance” tab)



The ENERGY STAR Where to Buy List features the dealers that have partnered with ENERGY STAR. As an ENERGY STAR retail partner and commercial kitchen equipment dealer, ENERGY STAR dealer partners commit to stocking a wide range of ENERGY STAR qualified equipment and helping to raise customer awareness of energy-efficient products and practices for commercial kitchens.

To find out more about joining as a retail partner/CFS equipment dealer, contact your buying group or e-mail join@energystar.gov. To join now, fill out the retailer partnership agreement available at www.energystar.gov/join.

Find Money: Utility Incentives for CFS



- ENERGY STAR CFS Incentive Finder & Incentive Guide Spreadsheet
 - Available from more than 50 utilities across the U.S.
 - Prescriptive incentives up to \$3,000+ (utility and equipment dependant)



Go to: www.energystar.gov/cfs

Click on "Buying Guidance"





Utilities in your state may also offer custom incentives



Download the Excel file of the ENERGY STAR Incentive Guide which highlights offerings for efficient equipment from more than 50 different utilities across the country.

ENERGY STAR Incentive Finder





BUY PRODUCTS THAT MAKE A DIFFERENCE
U.S. Environmental Protection Agency • U.S. Department of Energy

About ENERGY STAR • News Room • FAQs • **ENERGY**

Search

Products Home Improvement New Homes Buildings & Plants Partner Resources

Products

- Appliances
- Heating & Cooling
- Home Electronics
- Lighting
- Commercial Food Service
- Office Equipment

[Purchasing & Procurement](#)
[Interested in Partnership?](#)

Join ENERGY STAR

Home > Products > Locate CFS Incentives

Commercial Food Service Equipment Incentive Finder

This tool provides commercial food service (CFS) equipment manufacturers, dealers, distributors, and purchasers with information about rebates for ENERGY STAR qualified CFS equipment available from utilities and other energy-efficiency program sponsors.

Search by equipment type to find all available rebates. Add a zip code to narrow your search to those rebates for which you may be eligible. In general, incentive eligibility is determined by zip code. Contact the incentive sponsor for details.

Required: select at least one equipment type to see all available rebates.

<input type="checkbox"/> Commercial Dishwashers	<input type="checkbox"/> Commercial Ice Machines
<input type="checkbox"/> Commercial Fryers	<input checked="" type="checkbox"/> Commercial Refrigerators & Freezers
<input type="checkbox"/> Commercial Hot Food Holding Cabinets	<input type="checkbox"/> Commercial Steam Cookers

[Check All](#) [Check None](#)

Optional: add your zip code to narrow your search

Disclaimer: EPA and DOE do not provide financial incentives for ENERGY STAR qualified products. This tool is provided as a courtesy to share information with consumers and partners on the financial incentives available from utilities and other energy-efficiency program sponsors. Please direct your questions and comments about these incentives to the sponsor.

To locate incentives in a particular zip code, enter it here

To locate all available incentives in the United States, leave zip code blank

Next, click on "Locate Incentives"

Another way to search for incentives is to use the CFS Incentive Finder tool. The CFS Incentive Finder tool, also available at www.energystar.gov/cfs/incentives, allows users to search by product type and zip code.

Portfolio Manager



STATEMENT OF ENERGY PERFORMANCE
Restaurant
 Building ID: 2544614
 For 12-month Period Ending: September 30, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: May 06, 2011

Facility Restaurant 123 Main Street Washington, DC 20016 Year Built: 2002 Gross Floor Area (ft²): 2,000 Energy Performance Rating² (1-100): N/A	Facility Owner N/A	Facility Restaurant 123 Main Street Washington, DC 20016 Facility Owner N/A Primary Contact for this Facility N/A
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General Information

Restaurant	
Gross Floor Area Excluding Parking (ft ²)	2,000
Year Built	2002
For 12-month Evaluation Period Ending Date	September 30, 2010

Facility Space Use Summary

Restaurant	
Space Type	Other - Fast Food
Gross Floor Area(ft ²)	2,000
Number of PCs ³	N/A
Weekly operating hours ⁴	N/A
Workers on Main Shift ⁵	N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	458,500
Natural Gas (kBtu) ⁶	588,500
Total Energy (kBtu)	1,047,000

Energy Intensity⁴

Site (kBtu/ft ² /yr)	524
Source (kBtu/ft ² /yr)	1074

Emissions (based on site energy use)
 Greenhouse Gas Emissions (MTCO₂e/year) 96

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 09/30/2010)	Baseline (Ending Date 09/30/2010)	Rating of PS	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	524	520	0	N/A	534
Source (kBtu/ft ²)	1074	1053	0	N/A	1306




Go to: www.energystar.gov/benchmark

This slide shows an example of the Statement of Energy Performance report generated using ENERGY STAR's Portfolio Manager.

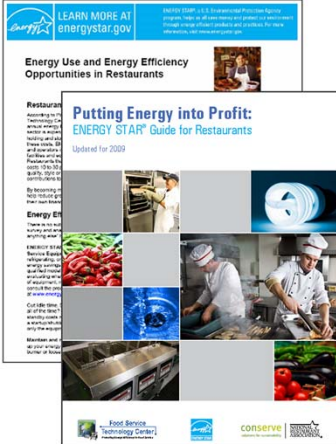
Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption, and verify improvements, across an entire portfolio of buildings in a secure online environment whether the user owns or manages properties.

See step-by-step guidance to benchmarking a restaurant with the document, [Benchmark Your Restaurant Using EPA's Portfolio Manager](http://www.energystar.gov/benchmark). See www.energystar.gov/benchmark.




Additional ENERGY STAR Resources


Restaurant Guide and Fact Sheets




Case Studies



Quarterly Newsletter





Go to: www.energystar.gov/cfs

Leverage additional ENERGY STAR resources like the ENERGY STAR Guide for Restaurants (which may be customized for franchisees and corporate restaurant operators), case studies, and the quarterly e-newsletter.

The Guide for Restaurants was co-authored with PG&E Food Service Technology Center and the National Restaurant Association's Conserve Initiative and outlines simple steps to save energy and water along with money-saving strategies. The guide is brief and easy to read text (12 picture-filled pages) and may be co-branded with EPA approval to help educate franchisees or other employees. An electronic version is on the ENERGY STAR CFS Web site and free, printed versions are available at: www.energystar.gov/publications.

Sign up for the ENERGY STAR CFS newsletter. The newsletter is distributed once a quarter to industry stakeholders from utilities and manufacturers to dealers and restaurant operators. It covers relevant events, specifications under development, ENERGY STAR partner activities, and more.

Useful Web Links



- ENERGY STAR Qualified Products & Resources
 - www.energystar.gov/cfs
- ENERGY STAR Rebate Locator
 - www.energystar.gov/cfs/incentives
- ENERGY STAR Training Center
 - www.energystar.gov/training
(look under “Products” for Commercial Food Service)
- ENERGY STAR Small Business partnership program
 - www.energystar.gov/restaurants



Additional Useful Web Links



- ENERGY STAR Commercial Buildings partnership program & Portfolio Manager
 - www.energystar.gov/benchmark
- PG&E Food Service Technology Center
 - www.fishnick.com
- National Restaurant Association's Conserve Initiative
 - <http://conserve.restaurant.org/>





Program Questions?

E-mail: commercialfoodservice@energystar.gov



Learn more at energystar.gov



Technical Questions?

Product-specific e-mail accounts:

- Commercialdishwashers@energystar.gov
- Commercialfryers@energystar.gov
- Commercialgriddles@energystar.gov
- Commercialhotfoodholdingcabinets@energystar.gov
- Commercialovens@energystar.gov
- Commercialrefrigeration@energystar.gov
- Commercialsteamcookers@energystar.gov
- Icemachines@energystar.gov



Learn more at energystar.gov