

Managing Energy Costs in Restaurants

Key Points



- Restaurant operating hours are long so any efficiency measures can pay for themselves quickly.
- Lighting and air conditioning efficiency measures also enhance the ambience, appearance, and comfort of your establishment.
- Typical restaurant > cooking, water heating, refrigeration, and lighting represent about 70% of total energy use - best targets for energy savings.
- Restaurants tend to operate with narrow profit margins and have pretax income that is 4 to 7% of total revenue. **What this means** > achieving just a **20% reduction** in energy costs translates directly into an additional **1% in profit**.

How electric billing works

- Electricity can be charged based on two measures — **consumption** and **demand**:
 - **Consumption** based on the amount of electricity, in kilowatt-hours
 - **Demand** is the peak demand - in kilowatts - occurring within the month or, for some utilities, during the previous 12 months. If you have a demand meter, demand charges can range about 10% to 20% of your bill.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserda.org/Commercial_Industrial/CommercialKitchens.

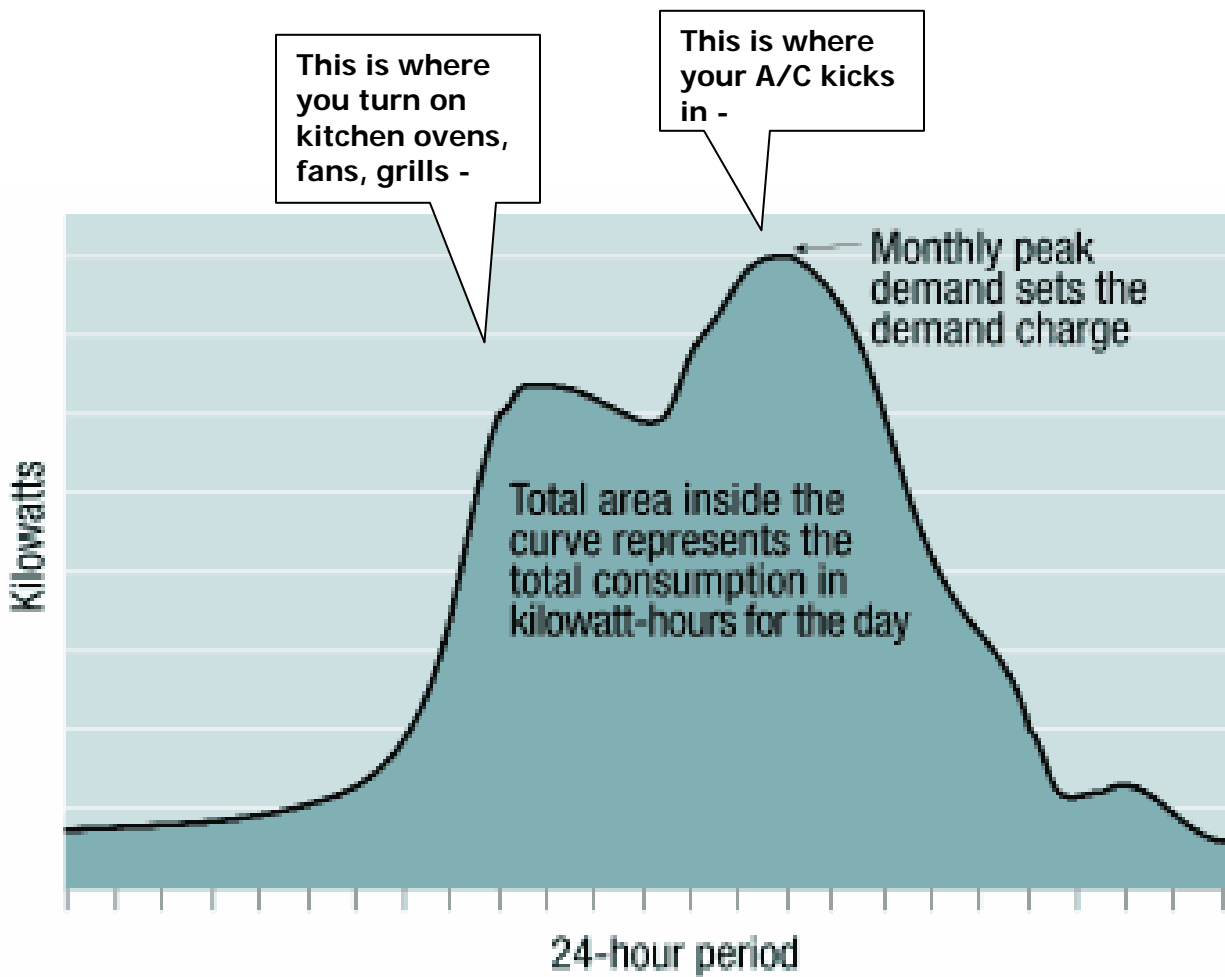


Figure 1: Diagram of a typical daily load shape

Source: Platts

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserdera.org/Commercial_Industrial/CommercialKitchens.

Quick Fixes



Every 1,000 kilowatt-hours (kWh) that you save by turning things off equals **\$120** off your utility bill (assuming 12 cents per kWh).

Turn Things *Off* _____

What > Lights, ventilation fans, and other equipment left on when not in use

Action Step - Cheap

- Simply inform your staff about being conscious of energy use.
- Develop simple energy management procedures — with checklists — and assign responsibility between shifts and at the end of the day for turning off cooking equipment, exhaust fans, lights, computers, and other office equipment.

Action Step - Investment

Install an energy management system or series of occupancy sensors — especially in walk-in coolers and other storage areas — to turn off or turn down equipment automatically.

Turn Things *Down* _____

What > Equipment that you do not to turn off entirely: A/C, heating, lighting

Action Step - Cheap

- **Set controls** to minimum levels during operating hours
- **Turn down** temperature settings on HVAC equipment and water heaters just before closing each night. (Programmable thermostats can do this automatically.)
- **Dim lights** where you have natural sunlight. Don't have a dimmer? Just install one.
- **Keep refrigeration set** at the appropriate temperature — but no cooler than necessary.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserdera.org/Commercial_Industrial/CommercialKitchens.

C. Repair and Maintenance

Why? > Dirty or stuck equipment eats up electricity

Action Steps - Cheap

INSPECT REFRIGERATOR AND FREEZER DOORS

WHAT: Poorly maintained refrigerator doors can leak cool air.

WHICH MEANS: the cooler runs longer or harder to maintain proper temperature

ACTION STEP: Replace worn gaskets and make sure doors are aligned properly. Check that automatic door closers are functioning and strip curtains are not damaged.

CHECK ECONOMIZER

WHAT: Many air conditioning systems use a damper vent (called an "economizer") to draw in cool outside air when it is available to reduce the need for mechanically cooled air. If not regularly checked, the linkage on the damper can seize up or break.

WHICH MEANS: An economizer stuck in the fully opened position can add as much as 50% to a building's annual energy bill by allowing hot air in during the air conditioning season and cold air in during the heating season.

ACTION STEP: Have a licensed technician check, clean, and lubricate your economizer's linkage about once a year and make repairs if necessary.

CHECK AIR CONDITIONING TEMPERATURE

WHAT: Declining operation, or, temperature settings that have drifted off.

WHICH MEANS: Air conditioning system is working too hard or cycling too much. This eats up electricity and raises demand charges.

ACTION STEP: Check (or have your mechanical contractor check) the temperature of the return air going to your air conditioner; then, check the temperature of the air coming out of the register nearest the air conditioning unit. If the temperature difference is less than 14° Fahrenheit (F) or more than 22°F, have a licensed technician inspect your air-conditioning for the source of the problem.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserda.org/Commercial_Industrial/CommercialKitchens.

CHANGE AIR CONDITIONER FILTERS; CLEAN CONDENSOR COILS

WHAT: Dirty air filters; filters and coils clogged with leaves and debris

WHICH MEANS: The air conditioning system has to work harder to achieve temperature settings. This eats electricity and raises demand charges.

ACTION STEP: Filters should be changed monthly. They should be changed more often if you are located next to a highway where dust and debris gets blown around.

CHECK COVER PANELS ON THE AIR CONDITIONING UNIT

WHAT: Panels on rooftop air conditioning units become loose in time

WHICH MEANS: Chilled air leaks out; it can cost \$100 per rooftop unit per year in wasted energy.

ACTION STEP: Once every three months, make sure the panels to your rooftop air-conditioning unit are fully attached with all screws in place; check that gaskets are intact so no air leaks out of the cabinet.

Investment Steps

These are some strategies and measures that NYSERDA finds under the Small Commercial Energy Audit Program.

IMPORTANT: Like any product, quality may vary among manufacturers. Choose Energy Star[®] labeled products for assurance of high quality.



Lighting

INCANDESCENT BULBS WITH COMPACT FLUORESCENT LAMPS ("CFLs")

T12 FLUORESCENT LAMPS/MAGNETIC BALLASTS WITH T8 SYSTEMS

WHAT:

- Incandescent bulbs last a fraction of time as CFLs; about 40% of the electric is used as light – the rest is waste heat the air conditioning system has to remove.
- T12 lamps/magnetic ballasts are inefficient and also make more heat

WHICH MEANS: Electricity gets eaten away as lighting; you pay an extra penalty in air conditioning costs

ACTION STEPS: Replace all incandescent bulbs with CFLs

CFL Facts

Fraction of energy use.

Example: Light from a 17W CFL = 75W incandescent

Longer life.

Regular light bulbs at 750 hours (about 3 months). CFLs rated at **10,000 hours** (about 7 years)

Same color.

CFLs are available in same color range (2,700 Kelvin) that produce a warm color tone similar to incandescent lamps.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserdera.org/Commercial_Industrial/CommercialKitchens.

USE LED LIGHTING IN EXIT SIGNS AND DISPLAYS

WHAT: Light-emitting diodes (LEDs) use a fraction of electric for same amount of light as old incandescents.

WHICH MEANS: Fraction of electricity cost for same use; less liability for fire and safety

ACTION STEPS:

- Replace old exit signs and window signs with LED signs
- Typical LED signs use 5 watts to illuminate a sign, where an incandescent bulb typically uses 40 watts to produce the same effect.
- LEDs never burn out, and last 10 years or longer

USE SMART LIGHTING DESIGN IN PARKING LOTS

WHAT: Larger restaurants have security and parking lot lighting which represent a large part of their lighting. Some have more lighting than lighting experts recommend.

WHICH MEANS: Some restaurants set their peak demand when they turn on lights in parking lots. Cheaper flood lights and security lights create “glare bombs”, which actually make it more difficult to approach the building at night.

ACTION STEPS:

- Remove and replace ALL halogen floodlights that are 300W and higher.
- Replace with low-wattage “pulse start metal halide” fixtures that direct the light *downward*, instead of using cheap halogen floodlights. Metal halide and pulse start metal halide fixtures also give a natural white color. High pressure sodium fixtures are also efficient – these have the slight yellow color.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserda.org/Commercial_Industrial/CommercialKitchens.

Kitchen

BOOSTER HEATERS FIRED BY NATURAL GAS, PROPANE, OR FUEL OIL

WHAT: Electric booster heaters for dishwashers are a major source for electricity demand.

WHICH MEANS:

- Switching to another fuel source permanently lowers demand charge costs.
- Chemical sanitizing costs are eliminated
- Quick recovery time keeps water temperature constant
- Lower maintenance costs (no elements to burn out)

ACTION STEPS:

- Replace electric booster heaters with boosters fueled by gas, propane, or oil

See a successful case study of gas booster heaters for a KFC regional franchise:

<http://www.nashvillegas.com/commercial/caseStudiesSection/kfc>

or

www.nashvillegas.com, > "Commercial" > "Case Studies and Technologies"

Walk In Cooler

EVAPORATOR FAN CONTROLLERS

WHAT: Nearly all walk-in coolers have forced-circulation evaporators that contain motorized propeller fans, which consistently run although full airflow is only necessary 50% of the time.

WHICH MEANS:

Electric use and demand is wasted on running the fans.

ACTION STEPS:

Install inexpensive controller devices to slow these fans when full cooling capabilities are not necessary.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserda.org/Commercial_Industrial/CommercialKitchens.

To find a list of commercial food service equipment qualifying for incentives available from NYSERDA, visit www.nyserda.org/Commercial_Industrial/CommercialKitchens.