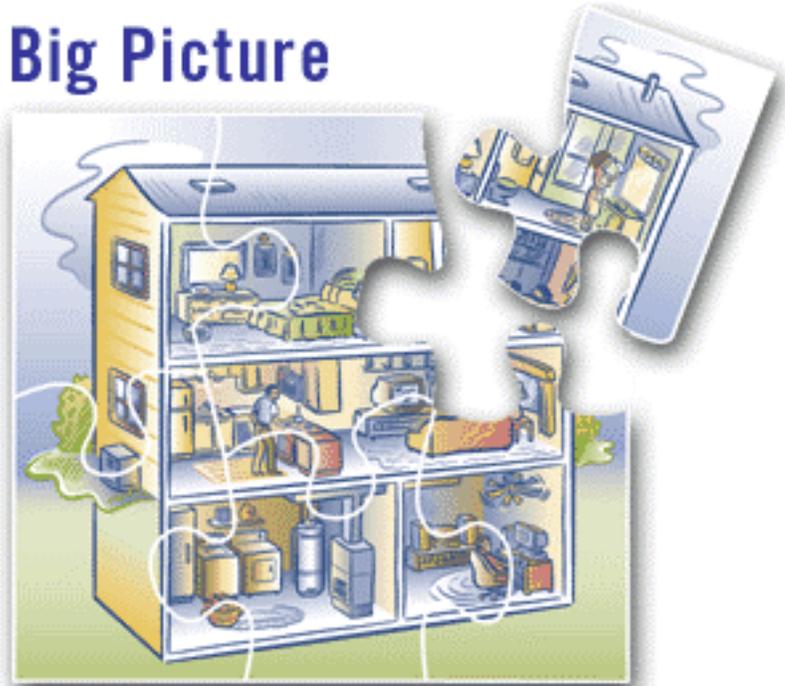


# The Big Picture



## **A Step-by-step California Guide to Smarter Home Energy Use**

Like most Californians, you want your home to use energy wisely — to save money and help the environment. But you may not know where to begin, or how to put the pieces together to make your home more energy efficient.

This step-by-step guide offers a series of energy saving tips that will help you solve the puzzle.

Follow the puzzle pieces to the left to put together your picture of home energy savings. Start with our five easy pieces, then work your way through the guide to the advanced options that can reduce your energy costs and improve your comfort. We'll also tell you where to go to find other resources.

Throughout this guide, you'll find links to additional resources provided on the Pacific Gas and Electric Company website. [www.pge.com](http://www.pge.com)

# Five Easy Pieces

*Start with the easy things. You can begin saving money — at little effort and cost.*

## **Insulate water pipes**

Insulate the first 5 feet of your water heater piping. Also, wrap the tank in an insulating blanket if the water heater's energy factor is less than 0.59. Remember to follow the blanket's installation instructions.

## **Stop drafts with weather stripping**

Weather stripping and caulking around windows and doors will help get rid of unwanted drafts.

## **Clean your refrigerator coils**

Dirty coils on the back or bottom front of your refrigerator can make it work harder than necessary, driving up your energy bill. Check and vacuum them at least twice a year. See your appliance owner's manual for maintenance instructions.



## **Replace old bulbs with compact fluorescents**

New compact fluorescent lamps come in various shapes and sizes that fit regular light fixtures, can last up to ten times as long as old-fashioned bulbs, and can use a quarter of the electricity.

## **Wash full loads**

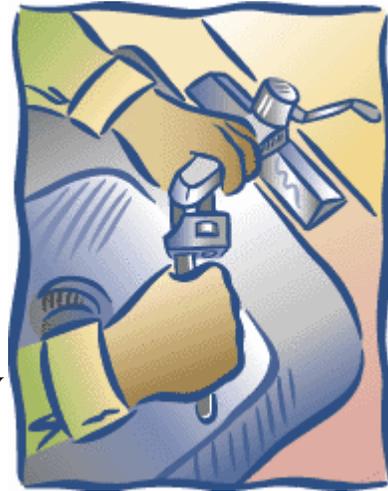
Washing a full load of dishes in the dishwasher actually uses less water and energy than washing them in the sink.

## More Simple Measures

*You may have to go to the hardware store for some of these low cost recommendations. But others require nothing more than flipping a switch, turning a tap, or changing a habit.*

### **Make sure it's an ENERGY STAR® torchiere**

Operating at temperatures up to 1000°F, popular halogen torchiere lamps burn a lot of electricity and can pose a serious safety threat. A better choice to consider is a torchiere that features the ENERGY STAR symbol. ENERGY STAR torchieres run cooler — at around 100°F — and reduce energy use by over 80% compared to halogen fixtures.



### **Repair leaky faucets**

Leaky faucets can make your hot water heater work overtime. Also, putting aerators in your faucets and installing low-flow showerheads can reduce both your water use and water heating bills.

### **Seal heating and cooling ducts**

Leaky ducts can account for over 50% of heating and cooling losses. Have a contractor check behind registers, in your crawlspace, or in the attic for crushed, disconnected, or leaky ducts. Ducts should be repaired with mastic-type sealant — not duct tape.

### **Clean or replace your furnace filters**

Filters keep your heating and cooling equipment running clean and efficiently. Many types of filters are available for your unit. A pleated-media filter will remove finer



particles than a standard disposable filter. In addition, electrostatic filters can remove pollens and other allergy-causing organisms. Replace disposable filters at manufacturer-recommended intervals and clean others regularly with a vacuum or garden hose.

### **Install a programmable thermostat**

Clock thermostats turn your heating and cooling system on and off at pre-programmed intervals for maximum comfort control. Wake up to a warmer house in the winter and come home to a cooler house in the summer.

## The Next Steps

*A picture of a more comfortable home and lower energy bills is coming together. You're now ready for the next steps.*

If you're thinking about replacing an old refrigerator or washer/dryer — think energy efficiency. In addition to purchasing new appliances, there are lots of other things you can do that may require an initial investment, but help pay for themselves with energy savings as well as improve the comfort and convenience of your home. See how far an investment in energy efficiency will take you.



### **Replace old refrigerators**

Refrigerators can eat up more electricity than any other appliance in your home. New, efficient models use as little as half the electricity of older units. If you have two refrigerators, or an additional freezer, consider whether you really need to operate more than one.

### **Consider an energy-efficient washer/dryer**

Save money with new energy-efficient models and take better care of your clothes at the same time. Check with your local energy company on the availability of rebate programs for replacing old appliances.



### **Install ceiling fans**

Creating air movement in a room can improve the comfort of the space. Ceiling fans are often all you need to make your home comfortable. They also can cut energy use and cost compared to central air conditioning. And if you have a high ceiling, use your ceiling fan during the winter months to push warm air down to where you need it.

### **Leave your exterior lights on...**

and let photocells turn them off. Photocells and motion sensors on outdoor lights are an easy way to increase home security. In addition, they save energy because you no longer have to remember to turn these lights off in the morning.

## Plant a tree

Use trees, awnings, and overhangs to provide shade around the outside of your home, especially on the south and west sides where the summer heat gain is greatest. Well-placed deciduous trees and shrubs increase the value of your home, improve its appearance, and cut your energy bills. Make sure you get the right tree for the right place — one that will provide adequate shade while not interfering with overhead wires or underground pipes.

## Advanced Options

*You're now looking at lower energy bills and you like what you see. It's time to go after the big-ticket items and really put your house to work for you!*

Maybe you're thinking about remodeling or are considering replacing your old water heater. Get prepared ahead of time and make sure you know your options.

Although the following efficiency measures cost more than previous options, they offer higher potential savings as well.

### High-performance windows

New, high-performance windows add an insulated section to your walls — eliminating cold spots in the rooms and reducing drafts. In addition to double panes, good windows have coatings that act like sunscreen, efficient frame material, and high-security locks. Check the National Fenestration Rating Council's (NFRC) rating on new windows and get the right one for your home (see the What Does it Mean? page in the Other Resources section).



### Efficient heating and cooling equipment

When shopping for new heating and cooling equipment, look for the Energy Star® label. And remember, bigger is not always better — have a contractor conduct a complete heating and cooling load calculation to size your system properly (see the Consumer Tips page in the Other Resources section). Among other considerations, this calculation includes the size of your home, number and type of windows, and insulation levels.

### **Efficient water heaters**

Efficient water heaters cost a bit more up front, but help pay for themselves down the road. A water heater's efficiency is listed as the Energy Factor (EF); the higher the number the more efficient the appliance. Consider a high EF model when buying a new water heater.

### **Wall, ceiling, and floor insulation**

Insulation is key to keeping your home comfortable any time of the year. Installing ceiling insulation should be your first priority. The best time to insulate walls is when you are remodeling or before painting interior or exterior walls. It's easiest to install a layer of insulation on walls that are already opened up or being worked on. Floor insulation is also important for rooms over garages or open crawl spaces.



### **Evaporative coolers**

Ideal for hot, dry climates, such as exist in California's Central Valley and desert areas, this low-cost cooling method works by drawing air through a wet pad. This air is then cooled by evaporation and blown into the living space. The price tag for an evaporative cooler is about one-fourth that of a central air conditioner, and operating costs are only about one-fifth as much. In addition, indirect evaporative coolers are now available that do not increase a home's relative humidity.

# Incentives and Rebates

*Want to improve your home's energy efficiency but don't have the money right now? Don't worry, financial assistance is available from a variety of sources.*

## **Energy Efficient Mortgages (EEMs)**

EEMs are easy to use, federally recognized, and can be applied to most home mortgages. EEMs work under the premise that homeowners with lower utility bills have more money in their pocket each month so they can afford higher housing expenses.

## **U.S. Department of Housing and Urban Development (HUD) Energy Efficient Mortgages Program**

In addition to mortgages, HUD also offers financial assistance for energy efficiency upgrades through its section 203(k) program for rehabilitation and repair of single-family homes, including condominiums. For more information visit their web site. For more information see [www.hud.gov/progdsc/energy\\_r.html](http://www.hud.gov/progdsc/energy_r.html).



## Other Resources

*Follow these links for more energy-saving information, tips, strategies and resources for your home.*

### [Learn Where Your Energy Dollars Go](#)

An important part of keeping your energy bills down is knowing what it costs to run your appliances. This page lists the most-used appliances, the average cost to run each, and links to interactive tools elsewhere on the Pacific Gas and Electric Company web site which can help you calculate your energy costs and potential savings.

### [Consumer Tips](#)

Just by following the easy suggestions in this guide you can make your home a lot more comfortable and save money.

### [What Does It Mean?](#)

A guide to the California Home Energy Efficiency Rating System (CHEERS), the EnergyGuide label, the ENERGY STAR® label, and the National Fenestration Rating Council (NFRC).

### **How Much Does It Cost?**

An important part of keeping your energy bills down is knowing what it costs to run your appliances. Here are the most-used appliances, and the average cost to run each. Costs are based on average California rates and average energy use in a single-family home. Future costs will vary and the cost to operate your appliances will change accordingly.



Some typical energy usage costs for household appliances are listed below.

### **Typical Home Appliance Energy Costs**

- Hair Dryer  
\$.01 per 5-min use

- Portable Heater  
\$.09 - \$.18 per hour

- Incandescent Light Bulb  
100 watts: \$.01 per hour

- Equivalent Compact Fluorescent Bulb  
27 watts: \$.01 per 4 hours

- Window A/C  
\$.09 - \$.28 per hour

- Central A/C (3-ton)  
\$.48 - \$.66 per hour

- Fan  
\$.01 - \$.07 per hour

- Color Television  
\$.01 - \$.05 per hour

- Stereo System  
\$.01 - \$.03 per hour

- Personal Computer  
\$.01 - \$.02 per hour

- Vacuum Cleaner  
\$.05 - \$.09 per hour

- Microwave Oven  
\$.01 - \$.03 per 10 minutes

- Electric Oven  
\$.30 - \$.60 per hour

- Electric Rangetop Burner  
\$.07 - \$.30 per hour

- Gas Oven  
\$.05 - \$.11 per hour

- Gas Rangetop Burner  
\$.04 - \$.08 per hour

- Dishwasher  
\$.08 - \$.09 per load

- Electricity for wash water: \$.37 per load, or

- Gas for wash water: \$.10 per load

- Refrigerator (Frost-free)  
16 cu ft: \$10.00 - \$18.00 per month  
20 cu ft: \$12.00 - \$22.00 per month

- Freezer  
\$15.00 - \$30.00 or more per month

- Gas Furnace  
Smaller Homes: \$16.00 - \$40.00 or more per month  
Larger Homes (2000 sq ft or over): \$41.00 - \$200.00 or more per month
- Electric Baseboard or Electric Central Heater  
Smaller Homes: \$35.00 - \$110.00 or more per month  
Larger Homes (2000 sq ft or over): \$114.00 - \$400.00 or more per month
- Water Heater  
Electric: \$20.00 - \$70.00 per month  
Gas: \$7.00 - \$19.00 per month
- Clothes Washer  
\$.03 - \$.23 per load  
(cold wash - cold rinse / hot wash - warm rinse)
- Clothes Dryer  
Electric: \$.30 - \$.60 per load  
Gas: \$.10 - \$.16 per load

*Just by following the easy suggestions in this guide, you can make your home a lot more comfortable and save money. But if you want to take a step toward additional savings by replacing your windows or heating and cooling system, you'll need the help of a licensed contractor.*

When looking for a quality contractor to help you fix an old system or install a new one, the California State Licensing Board (CSLB) recommends the following tips:

- Ask neighbors and friends if they can recommend a contractor
- Focus on local companies
- Look for licensed, insured contractors
- Get three bids with details in writing
- Ask about previous experience
- Check references
- Inquire with the Better Business Bureau, 1-703-276-0100



*And here are some special considerations...*

### **Heating and cooling**

If you're remodeling or if your current heating and cooling system is getting old, consider buying a more efficient model. But don't just replace your old system with one the same size.

Chances are your house has changed considerably since the original equipment was installed — maybe you've added a room or put in efficient windows. This means your heating and cooling needs have changed as well.

A complete sizing calculation will help you get the unit that's best for you and your home. Ask your contractor for a complete sizing calculation that takes into account the following factors:

- The size of your home
- Its location (i.e., desert or coastal)
- The number, size, and orientation of windows
- Size of doors exposed to the outside
- Average ceiling height
- Insulation levels
- Number of occupants
- Roof color

Another important consideration when evaluating heating and cooling equipment is the unit's Seasonal Energy Efficiency Rating (SEER). Check with your local energy company for the rating that's best for your area.



### **Replacement windows**

Energy efficient windows reduce the amount of heated or cooled air needed, admit natural light, and help keep noise and dust outside where it belongs.

Purchasing new windows can be a substantial investment. However, if you are remodeling or replacing windows anyway, it is the most cost-effective time to consider energy efficient upgrades. Remember that prices vary widely, so be sure to get more than one bid before buying windows. For more information, visit: [www.efficientwindows.org](http://www.efficientwindows.org)

## CHEERS

The California Home Energy Efficiency Rating System (CHEERS) is a California program for rating your home's energy efficiency. It's an accepted, standard method for measuring a home's energy efficiency.



CHEERS examines your home for important energy saving features. Your home is then given a rating on a scale of 1 to 100. Similar to fuel efficiency (miles per gallon) standards for cars, this rating lets you know how efficiently your home uses energy. CHEERS also provides specific recommendations on how you can increase the efficiency of your home and reduce your energy bills. The cost of a CHEERS rating varies.

For your CHEERS rating or more information contact, 1-800-424-3377 or visit [www.cheers.org](http://www.cheers.org).

## The yellow EnergyGuide labels

The bright yellow EnergyGuide label on new appliances can be a very valuable resource in helping you select a new appliance. It shows the annual energy use and the estimated annual operating cost. The actual operating cost can vary depending on use and your utility rate.



## ENERGY STAR® labels

ENERGY STAR is the symbol for energy efficiency.



ENERGY STAR labeled products use less energy than other products, may save you money on utility bills, and help protect the environment. Look for the ENERGY STAR label on household appliances, home electronics, office equipment, heating and cooling equipment, windows, residential light fixtures, and other products.

ENERGY STAR products are made by many major manufacturers and are widely available.

For more information on ENERGY STAR products contact 1-888-782-7937 or visit [www.cheers.org](http://www.cheers.org) or [www.energystar.com](http://www.energystar.com).

## NFRC window label

The National Fenestration Rating Council (NFRC) has developed a rating system that takes into account a window's energy-related characteristics.



The NFRC label rates:

- U-factor, or how well a window keeps heat inside a home
- Solar heat gain, or a window's ability to block warming caused by sunlight.
- Visible light transmittance, or how much light gets through a product

## All Together Now

*Which piece of the home energy puzzle plays the biggest role in ensuring comfort? Your heating and cooling system? The building "envelope" (walls, floors, and roof)? Your appliances?*

The answer, of course, is all of the above.

Every part of your home — its heating and cooling system, ductwork, building envelope, appliances, insulation, and even the occupants — all work together as a system to keep you comfortable. Even the most powerful furnace won't keep you warm if you have leaky windows and doors.

That's why it's important to take a whole-house approach to energy efficiency, and ensure that your equipment is the correct size and operating properly, and that your building envelope is sealed tightly.

A home energy profile can show you just where to put your time and money for maximum savings and comfort. Free home energy profiles are available from your local energy company or online from the Department of Energy.

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Or, for a fee, you can have a licensed professional assess your home (see the section on CHEERS, on the What Does It Mean? page in the Other Resources section).

*In addition to your energy company, here are some more home energy efficiency information resources:*

**California Energy Commission 1-800-555-7794**



[www.energy.ca.gov/efficiency/index.html](http://www.energy.ca.gov/efficiency/index.html)

**Energy Efficiency and Renewable Energy Network (EREN) 1-800-363-3732**



[www.eren.doe.gov](http://www.eren.doe.gov)

**Environmental Protection Agency (EPA)**



[www.epa.gov](http://www.epa.gov)

**Lawrence Berkeley National Laboratory Energy Crossroads**



[eetd.lbl.gov/links.html](http://eetd.lbl.gov/links.html)