Energy-Efficient Home

What is an Energy-Efficient Home?

The exterior of your home is often called the envelope or shell. The insulation, outer walls, ceiling, doors, windows, and floors all work together to control airflow in and out of the structure, repel moisture, and prevent heat from being lost or gained inside your home. A high-performance envelope helps maintain a consistent temperature even under extremely hot or cold conditions. The goal of sealing air leaks and adding insulation is to improve the home's envelope to make it more comfortable and energy-efficient.

ENERGY STAR

- ENERGY STAR is a government-backed program helping businesses and individuals protect the environment through superior energy efficiency. Energy-efficient choices can save families about a third on their energy bill without sacrificing features, style, or comfort.
- Household products that have earned the ENERGY STAR approval meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE).
- ENERGY STAR offers information resources that will help you plan and undertake small improvements or even large-scale projects to reduce energy bills and improve home comfort. Check the websites on page 3 for more information.

Locate and Block Air Leaks

How Leaks Steal Energy

Air leaks raise a home's energy bill and make your house drafty in cold weather. Attic air leaks act like a chimney, pulling expensive heated air up into the attic and sucking in cold air through windows, doors, and especially the basement. Leaks may be difficult to locate because they are often hiding under insulation. The biggest leaks are usually hidden in the attic or the basement. To find leaks in the attic, take the following steps:

- You can usually feel a draft or temperature difference with your hands; however, smoke from a lighted incense stick will also help.
- Check for insulation that is dirty around the edges. This indicates that air has been passing through.

Most common air leaks

Be aware of the places in your home that are most likely to have air leaks. Here are some likely spots to search:

Interior

- Behind knee walls
- Attic hatch
- Wiring holes
- Plumbing vents
- Open soffits and duct chase-ways
- Recessed can lights
- Furnace flue and chimneys
- Basement rim joists

Exterior

- Bath, kitchen, and dryer vents
- Outdoor electrical wires
- Pipes and spigots
- Utility openings, including TV cables
- Window and door frames
- Foundation sill plates

1-2-3 Books for Ideas and Inspiration

Ice Dams

- An ice dam is a thick band of ice that forms along the eaves of a house. The results are water-stained ceilings, dislodged roof shingles, sagging gutters, peeling paint, and damaged plaster. Ice dams form along the roof's edge, usually above the overhang.
- The best way to treat symptoms is through proper air sealing, insulation, and attic venting, which keeps the entire roof cold.

Unconditioned Spaces

- A significant source of energy loss in a home is due to ducts running through unconditioned spaces such as, attics, crawlspaces, and garages.
- Sealing and insulating ducts in unconditioned spaces can improve comfort and reduce energy costs.
- See this site for more information: ***http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_ducts***

Attic Safety

Keep the following in mind when working in the attic:

- Wear knee pads to help prevent pain from crawling on attic joists.
- Wear a lightweight, disposable coverall, gloves, and hat to keep irritating insulation off your skin.
- During hot weather, start working early, as attics heat up as the day moves on. Drink plenty of water.
- Use a particulate respirator or double-strap dust mask to prevent inhalation of hazardous substances.
- Walk on ceiling joists or truss chords, not your ceiling drywall. An even better strategy is to bring walkboards into the attic. You can use either solid lumber or plywood.

Ways to Seal Air Leaks

These products when properly installed will help minimize air leaks.

- Caulk and caulk gun
- Expandable foam (2 versions: standard and low-expansion)
- Foam weather stripping
- V-channel weather stripping
- Polyethylene or plastic sheeting
- Door sweeps
- ENERGY STAR qualified windows and doors
- Storm windows and storm doors
- House wrap
- Window A/C covers
- Shrink-to-fit window film

Insulation

According to the Department of Energy, up to 45% of a home's energy loss is through the attic. When adding insulation, first evaluate how much and what type you currently have. The Recommended Levels of Insulation table can help you determine what is most cost-effective for your home. Look at the R-value map on the Department of Energy's online Insulation Guide: ***www1.eere.energy.gov/consumer/tips/insulation.html.***

Installation Tips (Rolls & Batts)

- Start at the outer edges of the attic and work towards the center.
- When adding a second layer of insulation always use unfaced insulation, even if the present layer doesn't have a vapor varrier. Adding a second vapor barrier will create moisture problems.
- Keep insulation in the wrapper until you're ready to use it. Packaged insulation is compressed and expands when opened.
- Cut insulation in a well-ventilated area to keep to a minimum the amount of fiberglass dust raised. Follow the manufacturer's recommendations for the use of protective gear.
- To cut insulation, lay it on a board with the vapor barrier facing down. Lay a metal yardstick (or 2×4) over the area of insulation to be cut. Press your straightedge down hard, and cut with a utility knife, using the straightedge as a guide.

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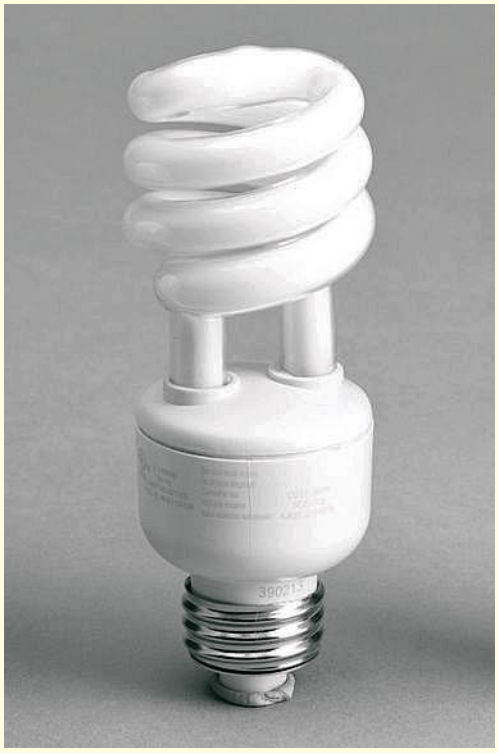
More Ways to Save

Replace the Thermostat

- An ENERGY STAR qualified thermostat can reduce the amount of energy used and lower monthly energy bills.
- Heating and cooling can make up to 45 percent of your total home energy costs.
- An ENERGY STAR qualified programmable thermostat with four temperature settings keeps your home comfortable by automatically adjusting your temperature settings while you are asleep or away.
- When used properly, an ENERGY STAR qualified programmable thermostat can save up to $150 a year in energy costs.



Replace Light Bulbs

- Lighting is one of the easiest places to start saving energy. Simply change your lighting to energy efficient, ENERGY STAR lighting, which includes a variety of light bulbs and light fixtures.
- Changing the five most-used fixtures or bulbs in your home to ENERGY STAR qualified lights can save up to $65 a year in energy costs while helping improve the environment.
- Ninety percent of a standard bulb's energy escapes as heat, creating a hot bulb and heating the surrounding air. ENERGY STAR qualified CFLs produce 75 percent less heat and are cooler to the touch.

ENERGY STAR Lighting

A common misconception is that a bulb's wattage describes the amount of light it gives off. In lighting, watts measure the amount of energy needed to make a bulb operate. Lumens are the standard measurement of light output.

- ENERGY STAR qualified lighting offers more lumens (light output) with fewer watts.
- Most CFL manufacturers provide a wattage equivalency chart on their packages to make it easier to know which CFL to buy.

Helpful Web Sites

http://www.epa.gov

http://www.powerhousetv.com

http://www.energystar.gov

http://www.doe.gov

http://www.eere.energy.gov/

http://www.eere.energy.gov/buildings/info/homes

http://www.eere.energy.gov/consumer

Home Energy Audit

To complete a home energy audit: *http://www6.homedepot.com/ecooptions*

Compare ENERGY STAR and standard incandescent bulbs

Typical Light Output (Min. Lumens)	450	800	1100	1600	2600
Incandescent Bulb (Watts)	40	60	75	100	150
ENERGY STAR® CFLs (Watts)	9	14	19	23	42

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