



Tips on Saving Money and Energy in Your Home



Weatherize Your Home

Weatherizing your home helps you save money by saving energy, and it can also improve the comfort of your home. Home weatherization includes sealing air leaks and adding insulation.

Air Sealing

Air leaks are among the greatest sources of energy loss in a home. One of the quickest energy- and money-saving tasks you can do is caulk, seal, and weatherstrip all seams, cracks, and openings to the outside. By sealing uncontrolled air leaks, you can save 10%–20% on your heating and cooling bills. Following your energy audit, you may have a number of recommended energy-saving projects you are considering. Prioritize weatherization projects to quickly improve the efficiency and comfort of your home.

To identify air leaks, check around your walls, ceilings, windows, doors, lighting and plumbing fixtures, switches, and electrical outlets. Look for gaps, improperly applied caulk and weatherstripping, and doors and windows that don't close tightly.

On a windy day, carefully hold a lit incense stick or a smoke pen next to your windows, doors, electrical boxes, plumbing fixtures, electrical outlets, ceiling fixtures, attic hatches, and

other places where air may leak. If the smoke stream travels horizontally, you have located an air leak.

After you identify all air leaks, do the following:

- Weatherstrip doors and windows.
- Caulk and seal air leaks where plumbing, ducting, or electrical wiring comes through walls, floors, ceilings, and soffits over cabinets.
- Install foam gaskets behind outlet and switch plates on walls.
- Use foam sealant on larger gaps around window trims, baseboards, and other places where air may leak out.
- Check for open fireplace dampers and make sure they properly close.
- Consider an inflatable chimney balloon to seal your fireplace flue when not in use. Fireplace flues are made from metal, and repeated heating and cooling can cause the metal to warp or break over time, creating a channel for air loss. Inflatable chimney balloons are made from durable plastic and can be removed easily and reused hundreds of times. If you forget to remove the balloon before making a fire, the balloon will automatically deflate within seconds of coming into contact with heat.

Where to Air Seal in a Home



- 1 Plumbing and utility access
- 2 All ducts
- 3 Sill plates
- 4 Outlets and switches
- 5 Water and furnace flues
- 6 Recessed lights
- 7 Attic entrance
- 8 Chimney flashing
- 9 Dropped ceilings
- 10 Door frames
- 11 Window frames

- Seal air leaks around fireplace chimneys, furnaces, and gas-fired water heater vents with fire-resistant materials such as sheet metal or sheetrock and furnace cement caulk.
- Install an insulated box to seal leaky attic stairs. Visit [EnergySaver.gov](https://www.energy.gov/energysaver) for DIY instructions.

Insulation

After you complete air sealing, consider whether you need to add insulation. Insulation is essential for reducing heat flow through a home's building envelope (the parts of the home that separate the interior from the outside elements, including the walls, roof, and foundation). The greater the difference between the indoor and the outdoor temperatures, the more energy it will take

to maintain a comfortable temperature in your home.

Adding insulation between the indoors and the outdoors reduces that energy demand, improves the comfort of your home, and saves you money.

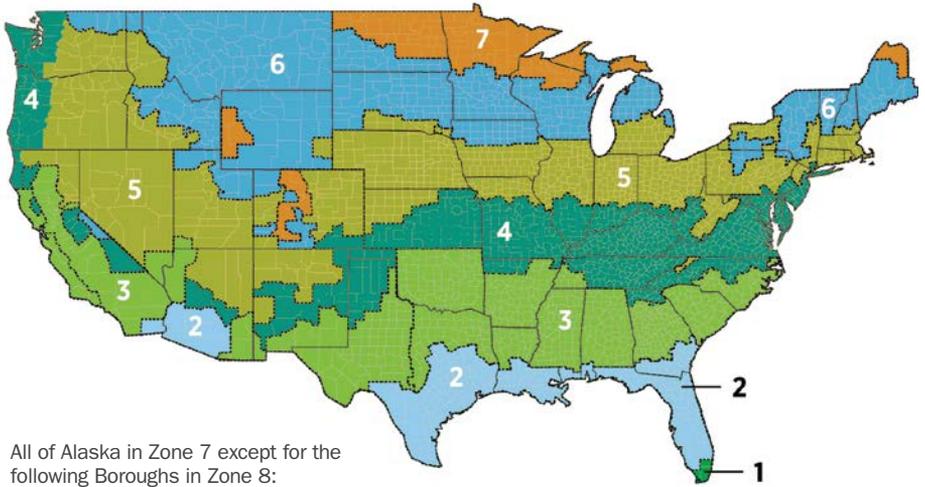
R-Value

An insulation's R-value is a measure of its resistance to heat flow; the higher the R-value, the greater the insulating effectiveness. R-value is dependent on the type of insulation and the thickness. When purchasing insulation, refer to the insulation packaging or the paper backing of rolled insulation to find the R-value.

How Much Insulation?

Consult the ENERGY STAR recommended insulation levels for retrofitting existing wood-framed buildings

U.S. Department of Energy Recommended* Total R-Values for New Wood-Framed Houses



All of Alaska in Zone 7 except for the following Boroughs in Zone 8:

Bethel	Northwest Arctic
Dellingham	Southeast Fairbanks
Fairbanks N. Star	Wade Hampton
Nome	Yukon-Koyukuk
North Slope	

Zone 1 includes Hawaii, Guam, Puerto Rico, and the Virgin Islands

Zone	Add Insulation to Attic		Floor
	Uninsulated Attic	Existing 3–4 Inches of Insulation	
1	R30 to R49	R25 to R30	R13
2	R30 to R60	R25 to R38	R13 to R19
3	R30 to R60	R25 to R38	R19 to R25
4	R38 to R60	R38	R25 to R30
5 to 8	R49 to R60	R38 to R49	R25 to R30

Wall Insulation: *Whenever exterior siding is removed on an*

uninsulated wood-frame wall:

- Drill holes in the sheathing and blow insulation into the empty wall cavity before installing the new siding, and
- Zones 3–4: Add R5 insulative wall sheathing beneath the new siding
- Zones 5–8: Add R5 to R6 insulative wall sheathing beneath the new siding.

insulated wood-frame wall:

- For Zones 4 to 8: Add R5 insulative sheathing before installing the new siding.

* These recommendations are cost-effective levels of insulation based on the best available information on local fuel and materials costs and weather conditions. Consequently, the levels may differ from current local building codes.

Source: ENERGY STAR

to determine how much insulation you should consider adding to your home. For masonry sidewalls (such as concrete block or poured concrete), it is sometimes feasible to install rigid insulation on the outdoor side. However, if that is not an option, you can use rigid insulation boards or batts to insulate the interior of masonry walls. A home energy professional can help you evaluate options for your specific home.

Consider factors such as your climate, home design, and budget when selecting insulation for your home. A home energy professional may be able to help you decide what type of insulation is best for you.

The Home Energy Saver tool can also provide recommendations for your home (hes.lbl.gov/consumer).

Types of Insulation

Insulation is made from a variety of materials, and it usually comes in four types: rolls and batts, loose-fill, rigid foam, and foam-in-place. The type of insulation you should choose depends on how you will use it and on your budget. Also visit [Energy Saver.gov](https://EnergySaver.gov) for more information about types of insulation.

Rolls and batts—or blankets—are flexible products made from mineral fibers, such as fiberglass and rock wool, as well as recycled fibers such as denim. They are available in widths suited to standard spacing of wall studs and attic or floor joists.

Loose-fill insulation is usually made of fiberglass, rock wool, or cellulose in the form of loose fibers or fiber pellets. It should be blown into spaces using special pneumatic equipment. The blown-in material conforms readily to odd-sized building cavities and attics with wires, ducts, and pipes, making it well suited for places where it is difficult to effectively install other types of insulation.

Rigid foam insulation is typically more expensive than rolls and batts or loose-fill insulation, but it is very effective in exterior wall sheathing, interior sheathing for basement walls, and special applications such as attic hatches.

Foam-in-place insulation can be blown into walls, on attic surfaces, or under floors to insulate and reduce air leakage. You can use small pressurized cans of foam-in-place insulation to reduce air leakage in holes and cracks, such as window and door frames and around electrical and plumbing penetrations. There are two types of foam-in-place insulation: closed-cell and open-cell. Both are typically made with polyurethane.

Caution: installing foam insulation requires that you wear personal protective equipment, maintain adequate ventilation, and take other safety measures. Consider hiring a professional to install foam insulation.

Use higher R-value insulation, such as spray foam, on exterior walls and in cathedral ceilings to get more insulation with less thickness.

If your attic has enough insulation and proper air sealing, and your home still feels drafty and cold in the winter or too warm in the summer, your heating or air conditioning system may not function properly, or you may need to add insulation to the exterior walls. Consult with a home energy professional to evaluate whether your HVAC system has design or equipment issues, or if you need additional insulation.

If you replace the exterior siding on your home, consider adding insulation at the same time.

Air Sealing and Insulation Projects

See the References section for links to DIY air sealing and insulation project steps and instructional videos.

Energy Efficient New Construction and Additions

In many jurisdictions (but not all), if you build a new home or an addition to your current home, the contractor must meet the requirements of the local building code related to energy efficiency. Building energy codes are issued by the International Energy Codes Commission (IECC) and updated every 3 years. State and local jurisdictions adopt the IECC codes and may choose to amend them.

Ask your local building code office which version of the IECC your contractor is required to follow. If the local code is older than the latest IECC, consider building an ENERGY

STAR Certified New Home or a Zero Energy Ready Home.

An ENERGY STAR Certified New Home has integrated systems and features such as high efficiency heating and cooling, complete thermal enclosure systems, efficient lighting and appliances, and water protection systems. Independent inspectors ensure that the home meets the program requirements. Homes earning the ENERGY STAR label use 15%–30% less energy than typical new homes and even more when compared to most resale homes on the market today. Learn more at energystar.gov/newhomes.

A Zero Energy Ready Home is so energy efficient that a small renewable energy system can offset all or most of its annual energy consumption. Zero Energy Ready Home requirements include all ENERGY STAR Certified Home requirements, plus additional requirements that bring unparalleled performance. DOE Zero Energy Ready Homes are verified by a qualified third party and are at least 40%–50% more energy efficient than a typical new home. Learn more at energy.gov/eere/buildings/zero-energy-ready-home.