



general, blown-in, loose-fill cellulose insulation should be about 8 inches thick (after settling) and rolled blanket or batt insulation should be 9 to 10 inches thick to obtain a proper insulating effect (a value of R-30). The access hatch to the attic should be insulated and weatherstripped to reduce air leakage. Whoever installs the insulation should ensure that the attic ventilation is adequate and unblocked; otherwise, trapped moisture rising from inside the house will damage the ceiling, insulation, roof deck and framing.

Add wall insulation. Adding wall insulation can be cost-effective, particularly in uninsulated wood frame walls. Loose-fill insulation is blown into the wall through holes cut into the wall cavity. When replacing the building's siding, sheathing or inside finish for other repairs, take advantage of having the framing exposed and add insulation. Due to high installation costs, adding insulation to walls that are intact may not be cost-effective.

Consider storm windows and doors. These measure are commonly added for energy efficiency, but recent research suggests that they are less cost-effective from an energy-savings standpoint than many of the other energy-saving measures listed here. Nevertheless, in cold climates storm windows do have the additional benefits of improving comfort and helping to reduce interior moisture condensation on window panes.

Use energy-efficient replacement windows. If you have broken or dilapidated windows that need to be replaced, low-emittance, double-pane windows are worth the extra cost. New windows should be properly sealed into the rough opening before trim and paint are applied.

Appliances, Fixtures and Lighting

Consider use of fluorescent lighting. Existing incandescent light fixtures in common areas such as bathrooms, hallways, garages and storage areas, or kitchens can be inexpensively replaced with fluorescent tube lighting, increasing lighting efficacy (the amount of light provided per watt consumed and dollar spent) by a factor of about 1.6. Energy-efficient ballasts should be specified



when installing tube fluorescents. New compact fluorescent lights are also available and can fit into existing incandescent light fixtures (though an adapter or new fixture is sometimes needed). These bulbs cost significantly more to buy than incandescent bulbs, but are 3 to 4 times more efficient and last 10 to 20 times as long. Check with your local utility company to see if they offer any relamping programs or cash rebates.

Repair leaky faucets and toilets. Leaking hot water taps can waste a surprising amount of energy. Cold water lost through leaky faucets or toilets may not affect energy bills, but will significantly increase water bills, thus boosting housing costs. These repairs are usually very simple to make.

Reset water heater thermostat. In many cases, the thermostat on the water heater is set too high. A setting of 120-140°F (the "low" setting) should be sufficient for household use. If the home has a dishwasher, use the water heater thermostat setting recommended for the dishwasher. Temperature settings below 120°F are not advised for health reasons.

Add water heater wrap. Insulate the water heater with an insulating jacket or rolled fiberglass insulation, and wrap the first 6 to 8 feet of all pipes exiting the water heater (pipes that are warm to the touch) with pipe insulation. Follow special insulating instructions for gas-fired tanks, such as leaving the top and base of the water heater uncovered.

Replace water heater with an energy-efficient model. If the water heater needs to be replaced, choose one that is energy efficient and properly sized to meet the expected needs of the household; an oversized water heater is an energy waster.

Replace old refrigerator with an energy-efficient model. Old refrigerators are big energy consumers. If you think you may need to replace the refrigerator in your rental property, buy an energy-efficient model. When shopping, compare refrigerator costs and efficiencies (annual energy consumption and energy costs are provided on the "EnergyGuide" labels attached to new refrigerators). You will probably be surprised to find that more efficient refrigerators



do not necessarily cost more to purchase. In any case, the average new refrigerator is twice as efficient as one that is 20 years old.

Install low-flow showerheads. Install good quality fixtures that reduce water flow but maintain water pressure and comfort. Many different models are available that fit standard shower goose neck pipes.

Examine efficiency of other appliances. If the stove/oven, dishwasher, clothes washer or clothes dryer are being replaced, choose energy efficient units. Again, use the "EnergyGuide" labels to compare different models.

Heating System

Maintain existing heating system. Have a professional service your heating system to make sure that it is in good working order and inquire if there are ways to make the system more energy efficient, such as installing a flame retention burner (in an older oil-fired furnace) or reducing the size of the system.

Inspect/repair/insulate ductwork. Check and repair heating and cooling ducts that are easily accessible (you can use the "draft detector" described in the section on caulking for this). A hole in a duct or a disconnection between sections of ductwork can waste large amounts of energy. If ducts located in unheated areas are easily accessible, tape the joints and wrap the ducts with insulation.

Replace old heating system with properly sized, energy-efficient system. If the heating system is in need of major repair or replacement, consider replacing it with a properly sized, higher-efficiency system. Particularly after you make your house more energy efficient, your furnace is likely to be oversized. It is not uncommon for systems to be as much as 160 to 225 percent larger than needed to effectively heat the home; this excess capacity wastes a lot of energy. In very cold climates, an efficiency rating (or AFUE) of 82 to 84 percent may be cost-effective. In milder climates, or if your home is very well insulated, then an AFUE of 72 to 82 percent should be sufficient.



How Do I Get These Measures Installed In My Property?

You may be able to get public assistance to help pay for making energy efficiency improvements as part of the rehabilitation of your property. There are several Federal programs, funded by the U.S. Department of Housing and Urban Development (HUD) and administered by local community development agencies, that may be available to assist you. The Community Development Block Grant Program and the HOME Investment Partnerships Program are the two major sources of funds for rental property owners. Information about assistance that may be available in your area, and how to qualify for it, can be obtained from your local community development agency representative. You can also obtain information about HUD programs from the HUD Field Office that serves your state.

To decide which energy efficiency measures to undertake, first discuss the features described in this brochure with your local agency representative. The current condition of the property, with respect to energy efficiency, needs to be assessed. If you want an energy audit of the house (which is highly recommended) the auditor should tell you which energy-efficiency measures are most appropriate and cost-effective for your house. Pass this information along to the community development agent and/or contractor that is doing the work for incorporation into your rehabilitation plans.

In any case, make sure that the contractor who will do the actual rehabilitation work on the property includes the energy efficiency measures that you have selected in the final work order for the job. For example, if you want to install additional insulation in the attic, the contractor should specify the labor and material costs for this work in the work order. After installation, ask the rehabilitation specialist at the community development agency to check the contractor's work to make sure that quality materials were used and properly installed.



Where Can I Get More Information or Help?

If you want more detailed information on energy efficiency improvements, contact your state and local energy offices to see what resources they have available. These offices should be listed in the government agency section of your phone book. If you have trouble locating them, contact the National Association of State Energy Officials at (202) 639-8749. As mentioned previously, the local utility company may provide certain assistance programs, such as free or low-cost energy audits, free replacement lighting, appliance rebates, leasing programs, or subsidies.

Another information resource is the National Appropriate Technology Assistance Service (NATAS), which is operated by the U.S. Department of Energy to answer a wide variety of energy-related questions. NATAS can be reached at 1-800-428-2525. The Department of Energy also sponsors the Conservation and Renewable Energy Inquiry and Referral Service (CAREIRS), which can be contacted at 1-800-523-2929.

Finally, there are a number of good, easy-to-use reference books on home energy efficiency in print that should be available from your local library or bookstore. They will provide more details on the large number of energy efficient options that are available to you, including typical costs and benefits that may be expected, listings of energy efficient appliances, and directions for comparing "EnergyGuide" labels when shopping for appliances.



Remember . . .

Your investment in energy efficiency will pay dividends for years to come. Don't miss this valuable opportunity to increase the livability and value of your property by including energy efficiency in your rehabilitation plans!

Energy Efficiency: A Good Investment

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