



WEATHERIZATION FOR HOMEOWNERS



MIDWEST
COLLABORATIVE

Who: Homeowners installing a heat pump or other HVAC system

Why: Lower heat pump purchase and installation costs, decrease utility bills, and increase comfort

MAXIMIZE COMFORT AND MINIMIZE COSTS BY WEATHERIZING YOUR HOME

Before installing a heat pump, ensure your home is properly air sealed and insulated. A properly weatherized home requires less energy to heat and cool and maintains temperature much better than an average home; allowing a smaller heat pump to be installed and distribution needs to be simplified. Upgrading your envelope can lower the cost of installing a heat pump while improving comfort and reducing energy bills. Weatherization upgrades often pay for themselves through a lower cost of a new heat pump, lower installation costs, and lower monthly utility bills.

Weatherization is the process of air sealing and insulating to improve airtightness and the ability of a home to retain heat in the winter and resist heat in the summer.

HEAT PUMPS AND WEATHERIZING

Upgrading your home's envelope and HVAC system go hand in hand. Ideally, the home will be weatherized and ready for a new heat pump when the heat pump installer arrives. However, the timelines do not always align. **When installing a heat pump and planning to weatherize, always size the heat pump for the reduced loads after weatherizing upgrades are complete.** This will ensure the heat pump is not oversized after the home's envelope has been upgraded. Install supplementary heating or retain the existing heating system if upgrades will not be completed before heating season. Install controls to ensure the heat pump and supplementary heating work in unison.

ENERGY AUDIT

The first and best way to start is to perform an energy audit of your home to find where your home is leaking air or lacking insulation. An energy audit will help you determine not just the biggest items that may need professional remediation but could also show easier do-it-yourself repairs and upgrades that could result in immediate savings on your energy bills. An energy audit can cost between \$100 and \$1,500 as the price varies due to location, size and complexity of home, audit depth, and energy audit type. In some states, an energy audit could be free for the homeowner. No matter where you live, there are federal tax credits to assist with the cost of performing an energy audit.



What an Energy Audit Will Identify

- Ways to improve the energy efficiency of your home
- Large and small air leaks
- Areas that need insulation
- Appliances that can and/or should be upgraded
- Air pollution sources and methods to increase air quality
- Window and door leakage and potential upgrades
- Ductwork leakage and insulation needs
- Corrective action items to increase comfort and lower energy consumption



Benefits of an Energy Audit

- Reduced energy bills
- Focused list of improvements
- Improved air quality and safety
- Increased comfort
- Stabilized home temperature
- Increased home value
- Reduced carbon footprint

AIR SEALING

Air sealing your home is a quick and easy way to tighten up yourself. You probably already know where most of these leaks are. As you move through your home, you may notice areas that are cold during the winter and hot and muggy during the summer months. Leaks around your windows and exterior doors make your heating and cooling system work harder and use more energy to maintain your comfort. Go to www.energy.gov/energysaver/air-sealing-your-home to learn how you can air seal your home to help lower your energy costs or contact an air sealing contractor in your area for a quote today.



INSULATION AND RADIANT BARRIERS

Attics are the top offenders for energy losses in American homes, especially in older homes. Older home attics are typically uninsulated, have insufficient insulation, or don't have a radiant barrier to reduce the amount of heat gained. Improper attic insulation can force your heating and cooling systems to work harder to make up for the losses. Radiant barriers, typically installed in attics of homes in hot climates, help reduce the amount of heat absorbed, thereby reducing the cooling needs of a home. Attics can also contain ductwork for your heating and cooling system and wiring for ceiling lighting and fans. These penetrations allow for air to leak through into the home if they are not properly sealed. Department of Energy recommends insulation values for different regions in the United States. Go to www.energy.gov/energysaver/insulation to learn what is recommended for your region or contact an insulation contractor in your area for a quote today.



WINDOWS AND DOORS

Windows are responsible for 25-30% of residential heating and cooling energy use. Air leaks through gaps and heat travels easily through inefficient and old windows. A home's exterior doors can contribute significantly to air leakage and energy waste, especially if they are old, uninsulated, improperly installed and/or not air sealed correctly. If your windows and doors are in good condition, you don't have to replace them, but you can update them to improve their efficiency. Updating windows and doors can include the following to help lower your home's energy costs:

- Caulk and weatherstrip windows and doors
- Add storm windows and/or doors
- Install energy efficient window coverings
- Add solar control film

If you are planning on replacing your windows and exterior doors, make sure that you select windows that are designed for your region's climate. Go to www.energy.gov/energysaver/update-or-replace-windows to learn steps you can take or what type of window you should be installing.



Weatherization upgrade costs and benefits vary with each home. The high priority items are relatively easy improvements that quickly result in benefits and energy savings in most homes. The lower priority items are more expensive or labor intensive and can be done when a homeowner is looking to do a complete renovation or an obvious need is presented.

High Priority

- Air seal known cracks or gaps with caulking, gaskets, or weather stripping
- Air seal attic, basement, and wall partitions
- Increase or improve attic insulation
- Insulate and air seal the basement rim joist
- Add storm windows or SHGC film to windows
- Replace damaged windows and doors

Low Priority

- Install new windows and doors
- Increase or improve wall insulation

COSTS AND SAVINGS OF WEATHERIZATION

Weatherization costs are typically cheap compared to the alternative of paying high monthly energy bills. Many weatherization tactics will quickly pay for themselves through cost savings on monthly utility bills. Table 1 shows the typical costs and potential savings of weatherization tactics. There are local, state, and federal incentive and tax credits available to help offset the costs of installing weatherization upgrades. Also, a weatherized home can now be heated and cooled by a smaller heat pump resulting in savings on the cost of a new system. Contact a contractor in your area today to get an estimate of what your home will cost to upgrade.

Table 1: Cost and potential savings of weatherization upgrades

Weatherization Tactic	Cost to Homeowner	Possible Annual Savings	Total Annual Savings
Energy Audit	\$100 - \$1500	-	37% ^{4,5}
Air Sealing	\$600 - \$6000 ¹	11% ²	
Adding Insulation or Radiant Barriers	\$1.50 - \$5.00 per square foot		
Window and Door Upgrades	\$60 -\$200 each	12% -33% ³	
Window Replacement	\$150 - \$1500 each	12%	
Exterior Door Replacement	\$250 - \$4000 each	10%	

¹ Air Sealing costs range greatly depending on home square footage, age, existing insulation, and existing windows and doors
² Air sealing and insulating combined reduces total energy costs by 11% per www.energystar.gov.
³ Range based on type and age of windows. Upgrading single pane windows will have higher annual savings then updating newer double and triple pane windows.
⁴ Average annual cost savings based on U.S. Department of Energy national evaluation of their Weatherization Assistance Program.
⁵ Total annual savings based on U.S. Department of Energy's typical home of 1700 square foot with an annual energy bill of \$1000
⁶ Data from www.energy.gov/energysaver

Table 2: Federal annual tax credits for energy efficiency upgrades available to homeowners through the IRA 25C

Energy Efficiency Upgrade	Annual Tax Credit Limit
Home energy audit	\$150
Insulation and air sealing	\$1200
Exterior doors	\$250 for one door; \$500 for all doors
Exterior windows and skylights	\$600
Central air conditioners	\$600
Electrical panels and related equipment	\$600
Natural gas, propane, oil water heaters and furnaces	\$600
Heat pump water heaters	\$2000
Heat pumps	\$2000
Biomass stoves and boilers	\$2000

Help offset the costs of weatherization upgrades through incentives, rebates, and federal and state tax credits. Check with your local utility and state incentive, rebate, and tax credit programs to see what additional cost savings are available. Table 2 shows annual federal tax credits you can receive for completing energy efficiency upgrades. The IRA 25C tax credit reimburses 30% of the cost for each energy efficiency upgrade up to the annual tax credit limit for that upgrade. There is an aggregate yearly maximum of \$1200 for all building envelope components, home energy audits, and energy property.

HOW TO PROCEED

1. Contact an energy auditor to perform a whole home assessment
2. Determine priorities for your home improvements
3. Contact local contractors to get quotes
4. Hire a contractor that best fits your home's needs
5. Use local, state, and federal programs to assist with funding the upgrades
6. Enjoy the comfort of your weatherized home

