

Vermont Community Energy Mobilization Project



Home Visit Guide



Efficiency Vermont is operated by Vermont Energy Investment Corporation (VEIC)

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Thank you for advocating for energy efficiency in your community to reduce energy use and to help Vermonters save money. Below is a step by step guide to your home energy visit.

1. INTRODUCE YOURSELF

Below is a proposed introductory talk when you arrive at the homeowner's house:

“Hello, I am (your name) from the (your local group), and I am here for a Home Energy Visit. This visit is part of the Vermont Community Mobilization Project which is being implemented by (Name of Community Group) and Efficiency Vermont.

I understand you have requested a visit? Let me explain what we'll be doing today.

I will be installing some efficient products and providing you with information regarding additional energy savings opportunities that might be available to you. This visit is not a professional home energy audit and will not include weatherizing your home. A professional home energy audit includes an evaluation of the amount of air leakage in your home and the effectiveness of your insulation, heating system, lighting, appliances and windows, and results in a comprehensive scope of work for improvement.

Specifically what we will do is: replace inefficient incandescent light bulbs with efficient ENERGY STAR® compact fluorescent bulbs (CFLs) in select locations, install faucet aerators and low-flow showerheads, talk about energy saving opportunities in Vermont homes, and finally - help you get a sense of how energy efficient your home is. If your house is found to have room for improvement, we will provide you with information about next steps you can take to save energy.

Are you still interested in receiving this 2 hour-long visit? Great. Let's begin.

2. ASK HOMEOWNER TO COMPLETE RELEASE AND LIABILITY WAIVER

Ask the homeowner to complete the form on the back page of the “Home Intake Form” before you start to install energy saving products. If individuals are unwilling to sign the waiver form, please do not conduct a home energy visit on this home. This form is essential to releasing the volunteer, the local group and Efficiency Vermont from any possible damages that might occur during the home energy visit. The chances of any serious damages occurring are relatively small given the nature of the visit. Further, we offer participants a 24-hour call-in service in case something does go wrong with the low-flow water devices. Efficiency Vermont will pay for the service if the problem is a result of the volunteer installation. If the problem is NOT a result of the volunteer installation, Efficiency Vermont will pay for the service fee, but not any work completed by the contractor.

Please note: If the property is a rental, the landlord must sign a waiver before the energy visit can take place. Rental buildings eligible for this program must have 4 or fewer units.

3. ASK IF THE HOMEOWNER HAS ASSEMBLED THEIR ANNUAL HOME HEATING ENERGY USAGE INFORMATION AND/OR COMPLETED THE “HOW ENERGY EFFICIENT IS YOUR HOME” WORKSHEET

If not, ask the homeowner to assemble information on electricity and fuel they used over the last year and the square footage of their house while you install the energy saving products. This is not a requirement to receive the bulbs and water efficiency measures but is valuable in helping to determine the relative efficiency of the house. This worksheet may be mailed prior to the visit by the local group.

4. INSTALL ENERGY SAVING PRODUCTS

Document the number and type of products installed on the *Home Energy Visit Form*. Volunteers must install all items; no items may be left with the homeowner to be installed later. If the home participant does not like the product, remove it immediately. Encourage the home participant to be a partner with you during the whole visit. Do not force the home participant to install any measures (i.e., showerhead).

Estimations:

We have estimated the number of products to install per home, as shown in the table below. However, depending on the style and age of the home, and whether it was remodeled, these numbers will vary. Many Vermont homes already have CFLs installed. You may also find that the bulbs you have do not fit in certain fixtures. We are estimating a *maximum* number of 15 bulbs per home.

Materials	Estimated #/house
13W EarthMate Spiral	3
20W EarthMate Spiral	2
14W TCP "A" style bulb	2
33W EarthMate 3-way	1
15W GE Reflector	3
26W Feit Outdoor	1
8W Litetronics Dimmable	1
Bathroom 0.5 gpm aerator	1
Kitchen 1.5 gpm aerator	1
Low flow showerhead	1
Pipe Insulation	9 feet
Tank wrap	0.2 (or 1 in every 5 homes)

Let the homeowner know that you will be giving them a fact sheet about CFLs. Listed below are some of the products you may install:

- **ENERGY STAR Compact fluorescent light bulbs:**

CFLs: CFLs last up to 10 times longer than traditional incandescent light bulbs. CFLs also use up to 66% less electricity.

Where to install: Replace light bulbs that are used more than 1 hour per day. See estimates above for number of bulbs. Number of light bulbs installed should not exceed 15.

Locations where CFLs should NEVER be installed: CFLs will fail if installed in a socket where the current continually leaks. This occurs in (1) motion detectors, (2) photo-sensors, (3) and illuminated switches.

Cold or outdoors: In the cold or outdoors, use CFLs that are rated for low temperatures. CFLs may take anywhere from 3-5 minutes to warm up in extremely cold weather.

What to do with old bulbs: Leave old incandescent bulbs with the homeowner and inform homeowner of the mercury fact sheet in Folder for reference for the CFLs.

Other bulb types: CFLs come in a variety of wattages, shapes, sizes and types. If the homeowner is interested in a bulb type that we are not providing, direct them to the Knowledge Guide (in Folder) or www.encyciencyvermont.com.

- **Tank wrap for electric hot water heater:**

How it works: If the hot water tank is old or inadequately insulated, wrapping insulation around and on top of the tank will help to maintain the tank temperature.

How to install: Only install on electric hot water heaters that are warm to the touch. (*Do not install on gas or oil-fired heaters. This can be a fire hazard*). Cut the wrap to the height of the heater so that it fits all around without compression, leaving a couple more inches for fastening. Locate the temperature and pressure relief valve and discharge pipe and cut the wrap to allow these to be outside of the jacket. Wrap the jacket around the heater and use white tape to fasten it securely. For the top, cut a circle slightly larger than the top of the heater. Place the top on and tape the top to the sides. Install tape along any seams, and then tape further to permanently secure the jacket. Feel for the control panel and cut the jacket on three of the four sides of the cover plate, leaving one side intact as a "hinge". Label the access door you have just created as "Controls". Place a "Caution" label on the outside of the jacket.

Caution: If there is no cover plate on the control panel, do not install. Inform participant that there is exposed power present.

- **Pipe insulation (for domestic hot water purposes):**

How it works: Insulating your hot water pipes reduces heat loss and can raise water temperature 2°F–4°F hotter than uninsulated pipes can deliver, allowing for a lower water temperature setting. You also won't have to wait as long for hot water when you turn on a faucet or shower head, which helps conserve water. Insulating your cold water pipes may reduce the likelihood of pipe freeze.

How/Where to install: Install regardless of heater type (i.e., electric or other). Go to the hot water heater. There will be two water pipes attached to it. One is the cold inlet and one is the hot outlet. Usually they are marked on the heater, or you can tell by feeling their temperature. Install pipe insulation on the first three feet of the cold inlet and the first six feet of the hot outlet. At elbows, cut the insulation at a 45 degree angle and wrap with duct tape to get complete coverage. **CAUTION:** Do not install within two feet of a boiler, heater or flue pipe. Do not install on hot water pipes from the boiler. This insulation is rated for up to 180°F; water from a boiler is hotter than 180°F.

How to enter the amount of pipe insulation on the Home Energy Visit Form: First, measure the number of feet installed. Do not install more than 9 feet total, but inform the home participant it would make sense for them to do so.

- **Faucet aerator:**

How it works: Faucet aerators work by restricting the flow and forcing the water through very small apertures which aerates and increases the velocity of the water, creating a very fine but “wet” feeling spray pattern. The kitchen model you are installing flows at 1.5 gallons per minute (gpm). The bathroom model you are installing flows at 0.5 gpm.

How/When to install: First, measure the flow of the existing faucet. Replace the bathroom faucet with a new aerator, if the flow is greater than 1.5 gpm. Replace the kitchen faucet if the flow is greater than 1.5 gpm (see full description). Most aerators can be removed by hand. Use the pliers if necessary, but then use a soft rag around the faucet to prevent damage. Install Teflon tape (clockwise) on the treads. This will help to prevent leaks.

- **Low-flow shower heads:**

How it works: Low-flow shower aerators work by restricting the flow and forcing the water through very small apertures which aerates and increases the velocity of the water, creating a very fine but “wet” feeling spray pattern. The model you are installing flows at 1.5 gpm.

Energy Savings: Replacing an existing high-use shower head with a low-flow model rated at two gallons per minute can reduce hot water use by one-half from showering, resulting in savings of \$175/year with a standard efficiency electric water heater.

How/When to Install:

- First, measure the flow of the existing showerhead. Replace it if the flow is greater than 2 gpm.
- Second, wrap a rag around the pipe just behind the existing showerhead (to prevent scratches) and grab the pipe firmly with pliers to keep it from twisting when you remove the shower head. Use a wrench to remove it and clean the threads. Install Teflon tape (clockwise) on the treads. This will help to prevent leaks. Screw the new shower head on, again using the pliers and rag to hold the pipe steady.

CAUTION: Do not insist on removal of an existing aerator/showerhead. If showerhead is corroded, see if the participant would like to take it off or leave it alone.

Making and Calibrating your Flow Meter:

Cut off the top of a 1-gallon plastic milk/cider jug. Fill it with 1.5 quarts of water, draw a line along this “1.5” water level, and write “1.5” with a marker on the jug. Add another .5 quarts (or 2 cups) and draw a line at the “2” level, adding “2” with a marker. Then, turn on the water fixture full blast, insert jug underneath the fixture, and using your watch, wait only 15 seconds. Each quart per 15 seconds corresponds to one gallon per minute. For the following fixtures, replace with an efficient fixture if:

- Kitchen sink faucet: if the quantity of water exceeds the “2” level
- Bathroom shower faucet: if the quantity of water exceeds the “2” level
- Bathroom sink faucet: if the quantity of water exceeds the “1.5” level

5. CONDUCT WALK-THROUGH ASSESSMENT

Take a quick walk-through the house and check the following locations. The purpose of the walk-through assessment is to identify indicators of heat loss that point toward energy savings opportunities. Only go into those parts of the house that are easily accessible.

• Attic:

- Is there an attic hatch or pull-down stairs?
- Is the attic hatch insulated or weather stripped?
- Does the homeowner know how much/if any insulation is in the attic? What type is it?
- If it easy to access the attic, can you see how much insulation is in the attic and what types of insulation are there? If so, provide this information in the Home Intake Form.

• Walls:

- Generally: Insulation in walls is difficult to assess without additional tools, training and time.
- *Tip:* Most houses that are less than 50 years old have insulation in the walls, but many older ones do not unless it has been blown in. If it has been blown in, there may be evidence of “plugs” in the walls. For old “farmhouses” (or any house more than 50 years old), try to determine if the original lath and plaster is still there (in other words, have they torn it down and replaced it with drywall). If it’s still lath and plaster, and no insulation has been added to the walls in the last decade, the house may be a good candidate for wall insulation.

• Basement:

Look for the following signs of whether air sealing has been done in the basement:

- If the basement has stone walls and a dirt floor, have the walls or floors been covered with plastic? If so, this indicates that a professional weatherization contractor may have completed work at the house. (Plastic is used to limit moisture).
- Is there a bulkhead door? Does it close tightly? Is it insulated?
- Box sill or band (or rim) joist: This is the first foot or so of wood-framed section immediately above the foundation wall and below the first floor. Has this been insulated with foam and/or rigid board insulation?

6. HOLD KITCHEN TABLE DISCUSSION

Purpose: Provide overview of visit, review findings, explain where energy loss occurs, and review folder with incentives and resources.

“How Energy Efficient is Your Home?” Worksheet:

Walk the homeowner through the steps of this worksheet which compares fuel consumption based on a one year period and the square footage of the home. Homes using over 40,000 BTUs/square foot generally have opportunities for cost-effective savings. Homes using more than 600 kWh/month in electricity may have opportunities for cost-effective savings.

Ask Homeowner Questions on Comfort and Efficiency Levels:

(Note: some of these questions may have been answered as part of the walk-through assessment)

- Is your house drafty or uncomfortable?
- Do you have ice dam problems?
- Do you know if any major energy efficiency improvements have been done in the last ten years?
- Does the house have an extensive home entertainment system?

Share basic information on how homes lose heat:

Homes lose energy through *convection* (air leaks principally in the attic and basement) and through *conduction* (cold surfaces exposed to warm surfaces). Plugging air leaks with foam and caulk addresses *convective* heat loss, while insulation addresses *conductive* heat loss. Compare this concept to that of wearing both a shell and a sweater on a cold, windy day – the shell stops the air from leaking in while the sweater keeps your body temperature in.

Review Findings of Walk-Through Assessment:

Review what information you found in the walk-through assessment. Clarify that these are indicators that there may be energy saving opportunities in the house. Most homes older than 20 years old (and some newer ones) have opportunities for thermal improvements like insulation and air sealing and will greatly benefit from a professional energy audit and a comprehensive retrofit project (see description in next paragraph). This is a fairly recent service. Few homes in Vermont were treated this way before 1990. If this has never been done, and if there are indications of a leaky house (cold drafts, low humidity, uncomfortable rooms, ice dams), the house may be a good candidate for a comprehensive retrofit project through Home Performance with ENERGY STAR.

Explain the difference between a Home Energy Visit and a Professional Energy Audit.

A professional Home Performance with ENERGY STAR or Vermont Weatherization contractor will evaluate the amount of air leakage in your home and the effectiveness of your insulation, heating system, lighting, appliances and windows. They are certified to conduct diagnostic and combustion safety testing, detect carbon monoxide, and protect indoor air quality. They are able to both identify areas for improvement and install the recommended energy efficiency improvements. Vermont Gas also provides this service to natural gas customers.

Review what was installed: The Home Energy Visit volunteer provided free installation of energy-saving materials (review what was installed and write in the 24-hour contractor follow-up number if water efficiency measures were installed). Most importantly, by reviewing several indicators, opportunities for additional energy savings steps were identified. These indicators include the “How Energy Efficient is Your Home” worksheet, in combination with the walk-through assessment and conversation with the participant.

Fill in the appropriate check boxes under “This home would be a good candidate for:” and provide the incentive information.

Review Easy Steps:

Thermostat: For every 5 degrees a thermostat is lowered, it is estimated that 5% or more is saved on your energy bill over the heating season; a programmable thermostat makes setting back the temperature easier.

Phantom Power: Many modern products consume energy even when off (5-8% of your electric bill); major culprits are home entertainment centers. Advanced Power Strips (or Smartstrips) can help save this energy.

Furnaces/Boilers: Seal ducts outside heated space, keep the system maintained, keep registers clear.

Attic hatch/Bulkhead door: Make sure they are weatherstripped.

Review Folder of Resources: Please walk participant through these materials and highlight special offers for VCEM participants.

- Knowledge Guide: general overview
- A DIY Guide to ENERGY STAR Home Sealing
- Home Performance with ENERGY STAR Incentives
- List of local Home Performance with ENERGY STAR contractors
- ★ Advanced Power Strip VCEM coupon
- JACO Refrigerator “pick-up” flier
- CFL Information Sheet
- Insert Worksheet and 1 copy of Intake Form into folder
- The Energy Smart Home booklet
- Home Performance with ENERGY STAR Case Study
- ★ VCEM \$150 coupon off audit after completed work
- Electrical Use Guide (and meter loan option)
- Appliance Rebate Sheet
- Seasonal Energy Saving Tips
- Additional Resources
- ★ Special offers for VCEM participants are starred.

Remind Home Participant they may receive a call from the their local group about their visit and next steps.

BUILDING SCIENCE TERMS

Conduction: Heat flow through solid object. Affected by insulation and installation practices.

Convection: Heat carried by a moving current of air or fluid. How boilers and furnaces get heat to rooms.

Radiation: Heat flows through empty space as infrared light waves. You feel heat through space, even if the air is cold.

U-value: The basic unit of heat flow by conduction; windows and doors are rated in “U.”

R-value: The most common unit of measure for describing insulation performance; “Resistance” to heat flow.

Bypass: A path for air to escape from (or enter) the building, carrying heat with it; Insulation in the absence of effective air sealing doesn’t stop the flow of air.

Thermal Envelope: The part of the home that is purposefully heated.

An efficient home has a:

Thermal barrier: Composed of good insulating materials that resist conductive heat loss — “The Sweater.”

Air barrier: Seals air leaks that stop air under pressure from pushing through insulation, cracks and holes in the building — “The Shell.”

Prioritizing where to improve building heat loss:

Attic: Warm air leaks out — usually a very good return on investment.

Basement: Where cold air is sucked in; relatively easy to work on when unfinished; usually a good return on investment.

Middle of the house: Often most expensive area to address.

What is a Home Energy Audit?

A typical Home Performance with ENERGY STAR audit includes the following services:

- An evaluation of the amount of air leakage in your home and the effectiveness of your insulation, heating system, lighting, appliances, and windows (Note: there is a fee for this service)
- Professional advice on ways to improve the comfort and durability of your home as well as solve building problems and lower your energy bills
- Assistance in prioritizing energy-saving home improvements
- Installation of energy-saving products such as efficient light bulbs and water conservation products

If you decide to move forward your Home Performance with ENERGY STAR contractor will also install the recommended improvements, such as insulation and air sealing.



Gas Water Heater



Electric Water Heater

CHECKLIST OF HELPFUL ITEMS TO BRING WITH YOU:

- Cell phone
- Pen/pencil/Marker (for completing Home Intake forms, writing on Water Heater Jacket)
- Measuring tape
- Calculator (for computing worksheet on “How Energy Efficient is Your Home)
- Flashlight
- Stepladder (for attic, replacing lights)
- Adjustable wrench and pliers (for showerhead)
- One gallon plastic milk jug (to determine flow rate of showerhead)
- Scissors/knife (for water tank wrap)
- Cloth rags
- Trash bags
- Watch
- Inside shoes/sneakers
- Rubber/latex gloves and mask for water tank insulation

Efficiency Vermont will provide the rest of the items you need. Thank you!

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