

PRESERVATION NEWSLETTER

ENERGY EFFICIENCY IN HISTORIC BUILDINGS

Energy efficiency is a common concern with home owners today; but unfortunately there are a lot of misconceptions about energy efficiency as it relates to historic buildings. Many energy efficient “upgrades” can be structurally harmful to historic buildings and are often expensive. Before you spend your hard earned money on expensive changes, take a look at the information below and be sure to contact your district’s preservation planner if you have specific questions about your home.

Your first step in making your historic building energy efficient?
Get an Energy Audit!

ENERGY AUDITS

If you are experiencing high energy bills consider having an energy audit before making any drastic (and often expensive) changes to your historic house. An energy audit is a professional assessment of how much energy your home actually consumes. Using techniques like blower door tests, thermal imaging, duct testing, and visual inspections of insulation, energy auditors can provide homeowners with specific recommendations for changes and fixes that will provide true financial benefit and reasonable return on investment. Getting an energy audit is a great first step toward energy efficiency to determine where the problems areas are and ensure that you spend your money on the most cost effective solutions. Energy audits start around \$300 and the cost of the testing can typically be applied toward any work performed as a result of audit recommendations. Go to www.bpi.org/locator-tool/find-a-contractor to find an Energy Auditor near you.

HOME ENERGY CHECKUP REPORT



Duct Work

Relieve pinched flex ducts. See photo1.

Air seal boot connections.

Flex duct(s) are holding water. Recommend having HVAC professional to inspect. See photo2.

Use mastic and fiberglass mesh tape as needed for duct sealing. Can also use approved tape specifically for HVAC.



HOME ENERGY CHECKUP REPORT



Insulation

Attic insulation R-value (Approximate): R-6

Fill-in low/missing insulation to equal R30 or better for consistent coverage.



Sample pages from a free SCE&G Home Energy Checkup Report

On the fence about investing a few hundred dollars in an energy audit? SCE&G offers **free** energy check-ups! An energy specialist will take a look at your house, note problem areas, and let you know if hiring a professional is suggested. Find out more information at their website.

TOP TEN LIST

Tips for Energy Efficiency from the National Trust for Historic Preservation

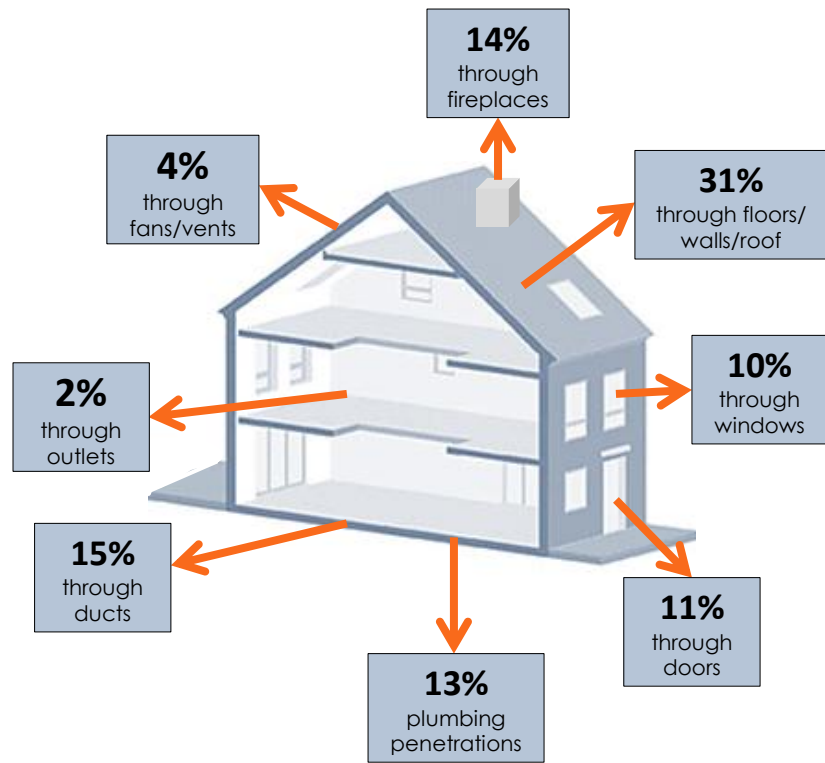
- 1. Air seal.** Use caulk and weather stripping to close cracks near your baseboards, ceilings, window and door openings, and foundation to reduce the amount of air leaking in or out of your home.
- 2. Maintain and weatherize historic windows.** Add storm windows and weather stripping for a cost effective step towards energy efficiency.
- 3. Insulate your attic.**
- 4. Tune up your HVAC.** Maintain your heating and cooling systems so that they run efficiently and make sure the air filters are clean.
- 5. Adjust your thermostat.** Keep the heat at 68°F or lower in the winter and 78°F or higher in the summer. Use a programmable thermostat to change the temperature when no one is home.
- 6. Close the curtains.**
- 7. Seal and insulate heating ducts.**
- 8. Adjust your water heater.** Most water heaters are set to 140°, but setting it to 120° can save on energy costs. Use an insulating jacket on your water heater for extra savings.
- 9. Insulate hot water pipes.**
- 10. Close fireplace damper when fireplace is not in use.**

MINIMIZING AIR LEAKS

After an energy audit, locating and sealing air leaks is often the first step toward energy efficiency. However, sealing a historic building too tightly can lead to bigger issues such as improper ventilation and trapped moisture. For instance, when caulking the exterior of the building it is **not recommended** to caulk the underside of clapboards or under windows as this can often prevent liquid from escaping and cause long term deterioration of the structure.

Recommended ways to reduce air leaks:

- Weather-strip doors and windows
- Caulk cracks and joints at baseboards
- Seal around outlets, switches, and fixtures
- Seal plumbing and electrical penetrations
- Insulate and seal attic hatches
- Seal any cracks or gaps (appropriately) where window and door frames meet the wall
- Use spray foam sealant for basement and attic cracks
- Close the fireplace damper when not in use



Sources of air leaks (U.S. Department of Energy)

WINDOWS

Many myths about historic properties and energy efficiency stem from the idea that historic wood windows are inherently energy inefficient and that replacing historic windows with an “energy efficient” model will save tons of money on energy bills. But a look at facts and studies into window replacement when considering overall energy efficiency and cost benefit analysis proves that this is not true. Studies show that with a few simple changes and regular maintenance historic wood windows will offer a comparable energy efficiency to replacement windows with a better return on investment. In fact, in a recent energy check-up at an older home an SCE&G energy specialist stated that replacement windows typically take 20-30 years for a return on investment in energy savings so replacing windows is **not recommended**. Protect your pocket-book, protect the environment, and protect the character of your home by not adding to the landfill with historic wood windows.

Improving The Energy Efficiency Of Historic Wood Windows:

- Maintain your windows with proper glazing and paint
- Add exterior and/or interior storm windows
- Add weather stripping
- Caulk around the window frame where the frame meets exterior cladding
- Use shades or curtains for extra insulation

From the Whole Building Design Guide, a program of the National Institute of Building Sciences:

“With proper maintenance, windows built from old growth wood can function indefinitely and their performance can be substantially bolstered by using caulk and weather-stripping to eliminate infiltration, or using storm windows to reduce heat gain and loss...Studies have shown that these simple improvements can result in efficiency similar to that of new insulated glass windows...”

From a study on energy efficiency in historic houses by the Sustainability Institute:

“The research in this study found that window replacement was unadvisable from a financial perspective. The high up-front costs of wholesale window replacement rarely realize a positive cash flow over the life of a typical 30-year mortgage. The argument for window replacement may stem more from product advertising than from legitimate building science and cost benefit analyses.”

From a report by the Preservation Green Lab, a project of the National Trust for Historic Preservation:

“There are readily-available retrofit measures that can achieve energy savings within the range of savings expected from new, high performance replacement windows. This challenges the common assumption that replacement windows alone provide the greatest benefit to homeowners...Almost every retrofit option offers a better return on investment than replacement windows”

INSULATION

Adding insulation to your historic home in the right way can make a big difference to your overall comfort level. Before you install insulation, make sure you address areas that require air sealing and be sure to research different types of insulation for the most appropriate applications. Insulating around ducts and pipes can also often improve efficiency. An energy audit will let you know where insulation is recommended for best results.

Attic: Most heat loss and gain is through the top of the house. Making sure your attic is properly insulated is a great way to increase energy efficiency. Most attic insulation will be added between the floor joists; however, if your HVAC equipment is in your attic you may want to consider insulating between roof rafters- this will keep the attic space better insulated and allow HVAC equipment to run more efficiently. Also, be sure to insulate or air seal your attic door or hatch as they can be responsible for a great amount of heat loss/gain.

Basement/crawlspace: If the basement or crawlspace is not part of the conditioned space of the building then it is typically recommended to add insulation between floor joists on the underside of the subfloor. Moisture barriers on exposed dirt floors of crawlspaces are also recommended to prevent moisture from entering the building.

Walls: Adding insulation to the walls of historic buildings may not be a cost effective or safe solution. In many cases, insulation added to historic walls can trap moisture and lead to accelerated deterioration of the structure. Add insulation to walls only as a last resort and be sure to check with a professional who understands historic buildings to make sure moisture issues are handled before hand.

UPGRADES: EQUIPMENT, APPLIANCES, LIGHTING

HVAC: Up to half of the energy used in a home can go towards heating and cooling. Make sure your air filters are clean and have a professional tune up your HVAC annually to ensure that the system is working properly so that there are no surprises when the weather changes.

Appliances: Consider both the initial cost of new appliances and their yearly operating costs. Energy Star appliances can help you save money in the long run with a lower impact to utility bills. Buying a new refrigerator or freezer? Check out SCE&G Appliance Recycling Rebates for up to \$100 back.

Lights: Replace your bulbs with Compact Fluorescents (CFLs) or LEDs. Using dimmer switches can also impact your overall costs. SCE&G residential electric customers can purchase up to 15 LED bulbs at a reduced cost at SCE&G's EnergyWise Savings Store.

FURTHER READING

- Find out more information about SCE&G rebates, discounts, and energy saving tips at their website: <https://www.sceg.com/for-my-home/save-energy-money>
- The Whole Building Design Guide, a program of the National Institute of Building Sciences, offers information on the preservation process, updating building systems appropriately, and sustainable historic preservation. <https://www.wbdg.org/design-objectives/historic-preservation/sustainable-historic-preservation>
- The National Park Service has created fifty Preservation Briefs to provide guidance on preserving historic buildings. Preservation Brief 3 is titled *Improving Energy Efficiency in Historic Buildings*. <https://www.nps.gov/tps/how-to-preserve/briefs/3-improve-energy-efficiency.htm>
- The South Carolina State Historic Preservation Office offers a number of links to studies, articles, and publications related to sustainability and energy efficiency in historic buildings. <http://shpo.sc.gov/tech/Pages/sustain.aspx>



We Are Columbia

This newsletter was created by the Preservation Staff of the City of Columbia's Planning and Development Services Department. If you have any questions about your specific historic property please contact your district's preservation planner. Contact information can be found on our [website](#). If you would like to be added to our newsletter mailing list please send an email to preservation@columbiasc.net.