

Preserving Energy

By John H. Cluver

Old buildings have an unjust reputation for being energy hogs. And unfortunately, this misconception can be misused to justify "improvements" that do little to save energy or money, while doing real damage to an historic building.

Very often, the most cost-effective measures are overlooked because they are so simple and mundane, and do not seem able to make a difference, or because the larger and more expensive projects get all of the attention. But the simple fact is that the easier and cheaper an energy improvement is, the sooner real financial savings can be realized. However, for owners and managers of historic buildings, saving money should not be the only consideration – there is also the need to guard against the loss of historic character and to make sure that interventions do not introduce new elements that could create future problems where none previously existed.

To determine the appropriate steps to take, the best idea is to hire a professional to do an energy audit or energy model of the property. The former shows you where energy is being lost, while the latter can create numerous "what if?" scenarios to determine what will produce the best results. Short of undertaking those studies, here is a list of seven affordable steps that can easily be done to reduce energy loss in an historic building:

- 1. Seal visible gaps in exterior walls.** Very often there are gaps between elements in exterior walls, such as where the wood sill plate meets a stone foundation, where an old gas line was drilled through a wall, or at the sill of a basement door. A couple of unfilled gaps can be equivalent to having a window open an inch or two year-round.
- 2. Seal leaks in ductwork.** A duct is designed to move conditioned air from a furnace or handler to the room that requires heating or cooling. Unsealed gaps in the ductwork can divert a significant portion of that air from its intended destination, requiring the mechanical system to work that much harder.
- 3. Insulate the attic.** Many attics have little or no insulation, which is the building equivalent of not wearing a hat in winter. If a building has an accessible attic and does not have 10 in. or more of insulation between or on top of the attic joists, roll out some batts. This could pay for itself within the first year!
- 4. Insulate the hot water heater and pipes, and check for leaks.** Hot water sitting in under-insulated hot water tanks and running through uninsulated pipes forces the heater to burn more energy and reduces the amount of hot water getting to the showers and sinks.
- 5. Install a programmable thermostat or other automated control.** This allows the temperature to be adjusted automatically for less heating or cooling when the building is unoccupied. A general rule of thumb is that 1% of heating costs can be saved for each degree that the thermostat is lowered over an eight-hour period.
- 6. Install more efficient light bulbs.** Incandescent bulbs consume almost four times the energy to produce the same amount of light as a compact fluorescent, which can fit into the same fixture. Note that their light is not quite the same and they do not work with dimmer switches.
- 7. Maintain equipment.** Equipment that is periodically cleaned and maintained operates more efficiently (not to mention reducing the risk of having it break down at an inconvenient time).

All of these ideas share the traits of being inexpensive, requiring minimal specialized skills, and making no discernible change to an historic property. However, in addition to these seven simple steps, an historic property owner who is willing to make a more intensive capital investment could look into these effective improvements, all of which would have a minimal impact on its character.

Upgrade the mechanical equipment. Older mechanical systems can run at efficiencies of 65% or less, wasting a lot of energy. New standard equipment will be over 80% efficient, and high-efficiency systems will be closer to 90%. This change alone could reduce a heating bill by 25%. If this is coupled with system zoning, variable dampers, and other controls, savings (and comfort) can be improved even further. If conditions and budget allow, a geothermal system can provide even more substantial energy saving benefits.

Upgrade the lighting controls. Occupancy sensors and timers can make sure that lights are turned off when they are not needed, preventing the useless consumption of electricity.

Provide proper attic ventilation. A ventilated attic can reduce the build-up of summertime heat in upper floors, lowering the amount of cooling required from air conditioners.

Hot water alternatives. The storage tanks on standard hot water heaters allow heat to escape when not in use. In contrast, tankless systems heat the water only when needed. Alternatively, a solar collector can also be cost-effective, but only after careful consideration to determine its efficacy and visual impact on the building.

Install weatherstripping. Every building has joints where operable components of doors and windows meet their frames, and these small gaps create those notorious old-window drafts. Bent metal or compressible weatherstripping can greatly reduce this airflow with minimal cost and visual impact.

***** Install storm windows.** Storm windows have a bad reputation as flimsy, awkward and unsightly intrusions. They can, however, be done in an historically sensitive manner and have the ability to reduce energy loss to the same level as a replacement window. Replacement windows will not deliver energy savings that will justify their expense and should be considered only as a last resort for historic buildings.

There are many purported "green" solutions on the market today. Some deliver on their promises, others do not. And of those that do, many would be inappropriate for historic buildings. In contrast, our older, traditional buildings were designed to take maximum advantage of natural opportunities for light, heat, and cooling. By working with these traditional principles and selectively applying modern technological opportunities, there are many great ways to save energy, money, and history all at the same time. **TB**

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