

Energy upgrades threaten older homes

BY SALLY ZIMMERMAN

For much of the past 20 years, the major threat to old houses and historic neighborhoods has been teardowns for McMansions. But rising energy costs and the burst of the housing bubble have dampened the teardown phenomenon. More people are hunkering down in their existing homes, which has slowed

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the wholesale replacement of our historic housing stock. Unfortunately, an even greater threat is suddenly looming.

As gas prices fluctuate and household budgets shrink, as our country struggles for independence from foreign oil, attempts to improve the energy efficiency of older houses could put them on the endangered-species list. To date, the green-building movement has focused largely on new construction, and certainly, the stories of

superinsulated houses and net-zero houses offer great examples for reducing energy consumption. If we apply the lessons of these leading-edge projects to all existing houses without taking historic architecture into account, however, we risk losing something of great value.

Preservationists and environmentalists can agree on the need to reduce energy consumption in our homes. By some counts, there are an estimated 58 million uninsulated, pre-1970s houses in the United States, and these houses must be part of any viable energy strategy. Existing homes also represent a vast storehouse of embodied energy far too valuable to discard. We must fit these houses for a new energy future, but we can't afford a one-size-fits-all approach. We need something more nuanced, particularly for those houses we consider historic.

Older homes weave a historic tapestry

Let's consider older houses first, say, those built after about

Fine Homebuilding

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1870 when central heating became standard. These are often the background buildings in established communities and neighborhoods—the streetcar suburbs, the 1920s speculative subdivisions, the GI Bill-sponsored housing developments. Many were simple houses to begin with, but they have been altered and updated, perhaps not sympathetically. Although they're not "historic" by the standard definition, that doesn't mean we can afford to tear them down because they're outmoded or inefficient.

These houses define whole neighborhoods with their presence, the rhythm of their roof-lines, the regular spacing and setback of porches, side yards,

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and driveways. Less architecturally distinctive individually and often built with stock components, these houses are significant in the aggregate as attractive and often affordable dwellings, and as a reflection of the great historical movements of the 19th and 20th centuries.

More than just cultural artifacts, these houses may also offer some of the best opportunities for “greening.” Many of them start off green because they're in densely settled, urban neighborhoods still relatively well served by public transit. They're built with more or less modern platform framing, and incorporate more or less modern heating, plumbing, and lighting systems. Even

though they're outmoded, these systems were designed to support a lifestyle not all that different from today's. These homes can adapt gracefully, sustaining extensive upgrades for energy conservation. They may be prime candidates for blown-in cellulose wall insulation, for example, or for gut rehabilitation, which would allow for sprayed-in-place foam insulation.

Up-front costs might be prohibitive

More problematic for a modest older house is superinsulation, which is usually the first step in a deep-energy retrofit. Superinsulation often doubles the code-required R-values of walls and roofs, with R-40 walls and R-60 roofs being the goal. *The Boston Globe* recently reported on a pilot case of superinsulating an 80-year-old, two-family house outside Boston. The cost of applying several inches of rigid-foam insulation to the exterior sheathing and the roof, and of installing the ventilation controls needed to maintain proper moisture levels, topped \$100,000 (much of it picked up by an energy-company sponsor). Even if we factor in potential incentives, economies of scale as these projects become more common, and steeply rising energy costs, most people still can't afford a six-figure bill.

Also, superinsulation often requires the complete removal of siding, trim, windows, plaster, and finishes, stressing landfills, wasting embodied energy, and stripping away much of the charm, character, and historical value that attract people to these modest older houses in the first place. Superinsulation and deep-energy retrofits also

involve a full-scale modification of the entire building envelope, conditioning (heating and cooling) the whole interior space from attic to cellar as one seamless and integrated system. This work requires a comprehensive understanding of building science. Done incorrectly, as it is sure to be in many cases, it can lead to mold, rot, and indoor-air pollution. Perhaps the most likely outcome of a large-scale push toward deep-energy retrofits of older, less well-maintained homes is an increase in whole-house teardowns as owners and developers weigh the costs of new construction against these modifications.

Historic houses are a greater responsibility

For truly historic homes, however—those that are older, rarer, more fragile, or more culturally significant—balancing preservation and environmental considerations is even more delicate. When you look at the historic house built 150, 200, or 250 years ago, then the question of energy efficiency must be weighed against the potential for cultural loss.

The great 19th-century English architectural writer John Ruskin said that we are the stewards of certain old buildings and have no right to harm or destroy them. Ruskin admonished that old buildings “are not ours, they belong partly to those who built them and partly to all the generations of mankind who are to follow us... What we ourselves have built we are at liberty to throw down; but what other men gave their strength, and wealth, and life to accomplish, their right over does not pass away.”

For certain houses—the hand-hewn timber-frame 1728

Georgian saltbox; the board-and-batten Gothic-revival cottage with its bargeboards, finials, and crockets; the intact, oak-paneled Sears, Roebuck mail-order bungalow—we need not just a different

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approach to rendering the dwelling more comfortable or energy efficient, but a whole different attitude toward ownership. If an old house has survived with its finishes, structure, and character intact, it is an increasingly precious and irreplaceable artifact.

From an energy standpoint, a house built in the 1840s or 1850s just as furnaces were being developed (and certainly those constructed earlier) operates on entirely different principles than the houses we build today. To expect that old house to adapt to us and to our needs and current-day comforts—without our making any concessions in return—is presumptuous and disrespectful. At the very least, we need to accommodate our needs, and those of the environment we have brought into crisis, in ways that ensure no permanent or irreversible damage is done to the historic structure. We would do well to remember that when all of these houses were originally built and occupied, they supported a far more

sustainable lifestyle than ours is today.

Perhaps the preservation approach to insulating historically valuable houses should be called a “shallow-energy” retrofit, limiting insulation to easily accessible spaces such as attics and using removable materials such as loose-fill cellulose or fiberglass. (Even still, building-science data proving that wall insulation poses no threat to historic houses has yet to be developed.) Through comprehensive but reversible treatments, including careful caulking of interiors and exteriors for air-sealing; wrapping heating ducts and hot-water pipes; repairing (rather than replacing) historic wood windows and adding high-quality storm windows; as well as

upgrading, maintaining, or installing mechanical systems and appliances for peak performance, a reasonable level of comfort, savings, and conservation can be achieved. And perhaps “reasonably green” should

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be good enough for old and historic homes.

Preservationists need to step up

To date, the work of preservationists has not been as practical

as it now needs to be. We can’t complain about invasive energy upgrades if we don’t provide more options for achieving reasonable energy improvements that work within the parameters of an older house. We need to accept that some losses of historic fabric will occur, but trust that appropriate energy interventions can be scaled to a house’s age and architectural merit. We must advocate for better research on the long-term impact of energy interventions, and help to develop detailed, user-friendly sources for owners and contractors working on energy upgrades, similar to the recently developed ReGreen guidelines of the U.S. Green Building Council and the American Society of Interior Designers (www.regreenprogram.org).

Older and historic houses stand on the brink of a new era of scarce energy resources and stringent new conservation demands. But old houses have adapted before—to new mechanical systems, to new architectural styles, and to new ways of living. If they are to adapt yet again for a greener world, old houses need to be respected for their character, for their precious materials, for the historical significance of their construction methods, and for the humanizing contribution they make to our communities. They need to be protected from energy “cures” that are worse than the colds they seek to alleviate.

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