JLC Report

Can Replacement Windows Live Up to Energy Claims?

With window sales in a multiyear downward spiral, manufacturers have understandably embraced the tax-credit component for energy-efficient building products contained in the stimulus package. Companies like Andersen and Simonton are vocal supporters of new proposals like Home Star (sometimes called "Cash for Caulkers"; see *JLC Report,* 01/10). Besides being good for the industry's bottom line, the argument goes, such programs also have the potential to save vast amounts of energy and money.

But how much do replacement windows actually save? According to consultant Marc Rosenbaum — whose New Hampshire–based company, Energysmiths, specializes in energy-efficient houses — the numbers are less compelling than some might have you believe. In a 6,000 heating-degree day climate, he says, replacing a standard clear insulated-glass R-2 (U-value 0.50) window with a triple-glazed R-5 (U-value 0.20 or lower) unit would save between 30,000 and 43,000 Btu per square foot per year. The more conservative 30,000 Btu/sf/yr estimate is probably more accurate, Rosenbaum believes, because the lower SHGC values typical of triple glazing also negate some solar gain.

In short, assuming annual fuel costs of $20 per million Btu, each $750 to $1,200 3x5-foot replacement window will save the homeowner something like $9 per year. If the existing windows were in good condition — even if they were no better than single-glazed windows with fitted storms — their high-tech replacements are unlikely to pay for themselves in energy savings during their lifetime.

A complex equation. As Rosenbaum points out, there are other factors to consider. Old windows may also be from five to 10 times leakier than new ones, which presents another significant opportunity for additional energy savings. He also cautions that simple payback doesn't account for maintenance costs, inflation, the volatility of energy prices, or a window's expected service life. A more detailed life-cycle analysis would be needed to take these factors into account, though this data for new windows is hard to come by.

"The economics of windows have not really changed that much," says Bruce Harley, a technical director at Conservation Services Group, which manages residential energy-efficiency programs. "You can get much more savings from replacing a dog of an hvac system than by replacing windows." The key, Harley believes, is to take advantage of energy-saving opportunities as they arise. "Do the hvac if it's old, inefficient, and is likely to need replacement soon anyway, rather than waiting until it breaks. Insulation, air sealing, and duct sealing are relatively cheap and

■ A last-minute amendment to H.R. 3590 — the Senate version of the health care bill now working its way through Congress — would impose some substantial costs on small construction companies. Under the amendment, construction companies with five or more employees would have to provide workers with health insurance or pay an excise tax of $750 per employee. Small businesses in other industries, however, would not be subject to the tax unless they had 50 employees or more. Labor unions lobbied for the provision, contending that small nonunion employers would otherwise have an unfair competitive advantage over companies that do provide insurance. — *T.H.*

■ South Floridians are beginning to plan their response to rising seas caused by global warming. Miami-Dade County Commissioner Katy Sorenson recently told National Public Radio that while communities in the region have so far mostly focused on ways to stop contributing to global warming, it's time to focus on adapting to a changed environment. "Part of the adaptation is going to mean actually doing building codes requiring people to have a higher foundation," she said. Some climate models are predicting a sea-level rise of just over 2 feet by 2060, with Florida standing to lose almost 10 percent of its land area and the homes of 1.5 million people, mainly in its four southernmost counties. — *T.H.*

Though not intended for calculating actual energy costs, the Efficient Windows Collaborative's window selection tool is useful for comparing different glass configurations and frame materials for windows in both cooling and heating climates.

give you robust savings — they're no-brainers. Do a substantial layer of rigid foam if you're putting up new siding. Do windows if you're doing major renovations, and get the best ones you can possibly afford. Take advantage of the leverage you get if you are spending money anyway, to upgrade to the most efficient possible option, because the incremental cost will always be lower."

Realistic incentives. Energy experts like Rosenbaum use RESFEN (Residential Fenestration) software to calculate the impact of windows on heating and cooling costs, but a simpler way to estimate savings for different glass configurations in various climates is to use the Window Selection tool (see screen capture, left) at the Efficient Windows Collaborative Web site (efficientwindows.org). If energy savings alone don't justify making the switch, tax credits contained in the current stimulus bill — currently 30 percent of the cost of the windows (up to a maximum of $1,500) — or in proposals like Home Star could provide the needed incentive for the homeowner to make the investment.

For remodelers, the lesson in all this may simply be to avoid promising more than you can deliver. New windows offer any number of benefits, many of which can't easily be reduced to dollars and cents. They may be better-looking than the old ones or feature a design that makes them easier to clean. In a room with large expanses of glass, efficient high-tech glazing can bring a big improvement in occupant comfort, even if the dollar value of the energy saved is relatively modest. But your reputation stands to take a serious hit if you sell a job on the basis of cost savings that never materialize. — *A.W.*

■ Iowa home builders are urging the state's legislature to override a provision in the new state building code that would require automatic sprinkler systems in all new one- and two-family homes and townhouses, and to prohibit such requirements by local and county governments. The debate in Iowa — which adopted the 2009 IRC but delayed the sprinkler provision's phase-in date until January 1, 2013 — resembles one playing out in states across the country. According to the *Des Moines Register,* of 21 states where "anti-sprinkler legislation" has been filed, four states have prevented local governments from adopting sprinkler mandates. Several states defeated bills, or ended the session with no action. Building officials in Pennsylvania, New Hampshire, and New Jersey adopted the code, but in these states, as in Iowa, pending legislation at the state level could remove the requirement. — *T.H.*

■ Colorado has become the first U.S. state to reduce its hourly minimum wage since a federal minimum wage was established in 1938. While 10 states tie their minimum-wage levels to inflation, Colorado's law also allows for the possibility of wage declines. When the state's consumer price index (CPI) fell by 0.6 percent last year — mainly as a result of lower fuel prices — the state minimum wage was reduced from $7.28 to the federally mandated floor level of $7.25. From the low-wage worker's point of view, it could have been worse: If not for the federal minimum, the new CPI figure would have lowered the state wage by an additional 4 cents. — *T.H.*

Keeping Basements Dry

Basement remodeling can be a lucrative niche or a good infill for remodelers looking to fill out their dance cards. But given the high percentage of basements with moisture problems — ranging from dampness to mold to outright leaks and standing water — how do you know if it's safe to cover the walls and floor and finish that space?

The answer, of course, is that you don't. Even if a test piece of poly taped to the concrete comes up dry, such a moisture-level snapshot tells you nothing about what the future might bring. That great-looking basement remodel you finished in January could be a full-scale disaster by summer.

The problem with paint-ons. Conventional "waterproofing" coatings applied to the walls or slab from the inside aren't much help. "No coating will stop water outside the wall from forcing its way in," says Scott Anderson, owner of Tri-State Basement Systems in Berlin, Vt. "Using an interior coating is like expecting one side of a sponge to hold a coat of paint when there's a hose held against the other side. The higher the pressure, the worse it gets. Look at a basement wall that's been painted for a while, and you'll always see that the paint flakes off soonest along the bottom."

Attacking the problem from the outside yields much better results. Any number of waterproofing and moisture-control systems — which direct soil moisture to a perimeter drain alongside the footing and from there to a storm drain or remote outlet — will provide a reliably dry basement.

However, they all share one major limitation: Installing them requires access to the exterior of the basement walls. While they add relatively little to the cost of new construction, it's a rare remodeling project that has the budget to excavate, waterproof, and backfill an existing foundation.

Don't dig, drain. But there's another way. Some basement waterproofing contractors specialize in drainage systems designed to effectively manage water from within the finished space, through the use of perimeter drains that collect water at the footing and relieve water pressure under the slab. The water is directed to a sump pit, where it is pumped out to daylight a safe distance from the foundation.

According to Larry Janesky, founder and president of Basement Systems, a Connecticut-based network of waterproofing contractors, the cost to install an interior perimeter drain runs from $25 to $40 per linear foot, and basic pumping systems start at $800.

"We're really big into making sure the pump doesn't fail during flooding, whether from a frozen discharge line, mechanical failure, or a pump just being overwhelmed for a spell," Janesky says. The best sump pits, he adds, are equipped with a triple-redundant pumping system, which accommodates three pumps in one pit — including a battery-powered backup pump and alarm — to ensure against mechanical failure. If the primary pump fails and water rises in the pit, a secondary pump tied to a separate discharge line kicks in. If the main power goes out, the DC motor takes over.

Scott Anderson relies almost exclusively on interior drainage. "The only time we'll dig on the outside is if it's a stone foundation with lots of open pores in it," he says. "Then we'll hang a heavy membrane on the wall and put some drainage underneath with pipe and stone. But we still install the interior drainage system and sump pit." — *D.H.*

Adding an interior perimeter drain to an existing basement is cheaper and easier than exterior waterproofing. Drains like the one shown here cost in the neighborhood of $40 per linear foot.