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INDUSTRY NEWS

Energy Star Tackles Existing Homes

Energy Star's program for existing homes, Home Performance With Energy Star, is now over two years old (see ***EDU***, March 2001). The program seeks to connect interested homeowners with contractors who can assess the performance of an existing home as well as perform improvements to the home's HVAC system and building envelope.

For those who may not follow Energy Star news closely, the Home Performance With Energy Star program is easily confused with another Energy Star program for existing homes called Home Sealing (see ***EDU***, November 2001). While the Energy Star Home Sealing program promotes residential air-sealing and insulation improvements, the Home Performance With Energy Star program takes a broader whole-house approach that encompasses not only a home's shell, but also its HVAC equipment and appliances. According to Doug Anderson, Home Sealing's program manager, "Because we don't want the messages to be confused, we are intentionally not pushing the Home Sealing program in areas where we have a Home Performance With Energy Star program."

For over six years, the Energy Star Homes program has been successful at improving energy efficiency in new homes. But the number of new homes built annually is dwarfed by the number of existing homes. Moreover, most existing homes are very inefficient. According to Mike Rogers, a consultant working with the Home Performance program, "The savings we are getting in new homes are nowhere near the savings that we could get in existing homes."

Improving Homes, Not Just Assessing Them

The developers of the Home Performance program have learned from the mistakes made by many utility-sponsored home audit programs, which typically have a poor record of implementing improvement measures. "In some utility audit programs, only 16% of the measures recommended to homeowners are ever acted on," says Rogers. The key to getting more of the work done, according to Home Performance's developers, is to offer homeowners one-stop shopping, so that the same contractor who performs the initial home assessment is able to contract with the homeowner to make necessary home performance improvements.

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According to Rogers, the traditional insistence on independent assessments is actually a roadblock to effecting home improvements. "There are folks who insist on a third-party independent approach—for example, the HERS raters—but their doors are not being beaten down by existing homeowners for this service," says Rogers. "First of all, people don't want to pay the upfront cost. The HERS rater says, 'I charge $350 or $500 to do an evaluation, but I will not do the work.' So the rater goes in and establishes a good relationship with the homeowner, and the homeowner says, 'Now where do I go to get the work done?' And often the work never gets done. This is a huge challenge, and it's why we have to be willing to look beyond the idea of the independent auditor."

One goal of the Home Performance program is to encourage the emergence of a new type of contractor, able to perform a thorough whole-house assessment, and then to return later to perform air sealing, insulation installation, duct system improvements, and HVAC equipment installation. Alas, in most areas of the country, such fantasy contractors do not yet exist. It is extremely rare to find heating and cooling contractors with the skills to perform air sealing and insulation work. According to Andrew Fisk, a senior project manager at the New York State Energy Research and Development Authority (NYSERDA), which administers the Home Performance program in New York, the scarcity of trained contractors is just one problem facing the program. "There are several market barriers that we need to overcome: limited consumer awareness, a still-developing market of competent service providers, high start-up costs for business, continual raising of standards and training, the need for interaction between trades, and the need for contractors to learn how to better close the deal," says Fisk.

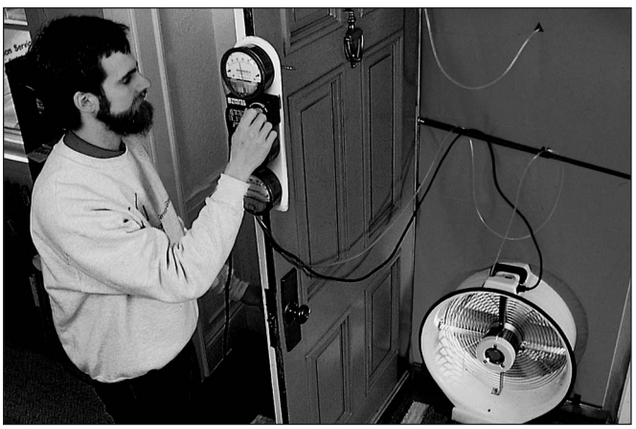

Figure 1. When a homeowner contacts a Home Performance With Energy Star representative, the first step is to schedule a thorough evaluation of the home, including blower door testing. [Photo credit: Conservation Services Group]

Characteristics of Home Performance Programs

Early on, Home Performance program developers settled on a decentralized model. "We rely on state and local folks to implement this," says Rogers. "The EPA does not have the resources to manage a program of this scope from Washington." Home Performance programs have now been established in New York, Wisconsin, California, Massachusetts, Rhode Island, and Missouri. Although the programs differ in their details, they share a few common principles:

- All Home Performance programs take a whole-house approach to energy conservation;
- All programs include diagnostic testing;
- All programs include an emphasis on delivering home performance improvements; and
- All programs have a mechanism for quality assurance.

Typically an initial inspection includes blower-door testing, duct leakage testing, inspection of heating and cooling equipment, and combustion safety testing (see

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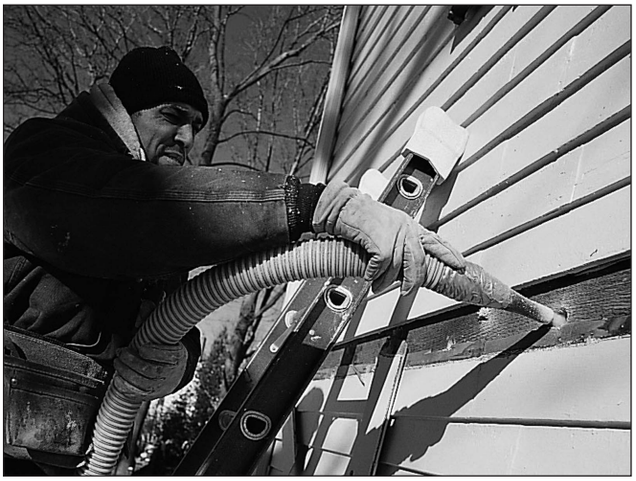

Figure 2. Home Performance contractors present homeowners with recommendations for home improvements, including insulation improvements if necessary. Most homeowners arrange for some improvement work to be performed. [Photo credit: Conservations Services Group]

Figure 1). To provide safeguards against substandard work, Home Performance contractors are either required to be certified and accredited by an independent organization (for example, the Building Performance Institute), or are subject to third-party inspection and performance testing at the completion of the job.

The Home Performance With Energy Star program does not promise to raise the performance of an existing home to the minimum level of an Energy Star home (that is, a HERS score of 86). "For most existing homes it is not really cost-effective, especially in a heating climate, to bring them up to Energy Star standards," notes Rogers.

New York Blazes the Trail

The longest-running and best-funded Home Performance program in the country was launched in New York in early 2001 by NYSERDA, the agency that administers New York's public benefit funds. To participate in the New York program, contracting firms must become accredited by the Building Performance Institute (BPI), and their field technicians must become BPI-certified. To prepare for the BPI certification tests, which include a written test and a hands-on field test, most technicians attend training sessions. "We have a huge demand for our training," says Fisk. "We reimburse 75% of the cost of training, certification, and accreditation."

BPI offers four levels of certification, each of which requires a separate test: auditor, shell specialist, heating specialist, and cooling specialist. BPI tests cover building science principles, diagnostic techniques, calculation of projected energy savings, and methods of installing improvements.

New York homeowners pay Home Performance contractors a $100 testing fee for the first visit to a home. If a homeowner decides to have work performed on the home, the testing fee is deducted from the cost of the work. After the inspection is complete, the Home Performance contractor provides the homeowner with a list of suggested improvements, including the cost and projected energy savings of each improvement. About 70% of Home Performance inspections result in contracts for work (see Figure 2).

Homeowners are more likely to agree to have work done if financing is available. The Home Performance program in New York offers homeowners low-interest (currently 5%) Fannie Mae energy improvement loans for up to 10 years. The maximum loan amount is $20,000. In many cases the home improvements save enough energy to provide homeowners with positive cash flow after loan payments. Homeowners who do not need financing are eligible for a 10% rebate on the cost of the home improvements.

Promoting the Home Performance program is a delicate balancing act; it is counterproductive to encourage homeowner demand before enough contractors are available to provide services. Contractors need to be recruited, trained, and certified. "To start out, the primary trades we drew on were insulation and air-sealing contractors and heating contractors," says Fisk. "But the insulation contractors are not a big trade, and as the program has grown, we found we're tapping the market pretty well. That's one reason why we are now going after the remodelers." Interested contractors need to be committed to the program. "If a contractor says he wants to be part of the program, he will need training and certification, which may take three or four months," says Fisk. "It requires a lot of time away from the job, but it's very beneficial to his or her business in the long run."

The New York Home Performance program markets heavily to homeowners and has been growing rapidly. The program has enrolled 112 BPI-accredited firms and 257 BPI-certified technicians; these contractors have completed 2,201 jobs at an average cost of $7,178. "We are on the climb—the numbers are growing big time," says Fisk. "A year ago we were doing 50 houses a month, and now we're doing 200 houses a month."

Home Performance in Wisconsin

Wisconsin's Home Performance program, a component of the Wisconsin Focus on Energy Partnership, was launched in October 2001. The program, which is administered by the Wisconsin Energy Conservation Corporation (WECC), has a $6.6 million annual budget originating from public benefit funds.

The Wisconsin program now has 93 participating contractors, and has completed over 400 jobs in the past 11 months. In Wisconsin, contractors working with the Home Performance program are assigned to one of two "initiatives": the Building Performance Initiative deals only with a home's shell, while the Heating and Cooling Initiative handles HVAC equipment. These contractors may be either "qualified contractors"—that is, contractors owning specialized equipment (like blower doors) allowing them to certify their own jobs—or less qualified "allies" who focus on air sealing or insulation installation but perform no diagnostic work or testing. Assisting the allies are trained consultants equipped with diagnostic equipment.

The Building Performance Initiative now has ten qualified contractors and 45 allies, all of whom have received training. "We do the training in-house," says Gregg Newman, the program manager for Wisconsin's Home Performance program. "We have developed a building science curriculum, including training in REM/rate software. Qualified contractors get three days of building science training, while the allies get a more basic level of building science training and sales training. The consultants get five days of training." Training continues on the job site. "A consultant goes out to mentor the contractors, and we provide technical assistance when people have problems," says Newman.

The consultants who perform Home Performance evaluations inspect the whole house, including not only the shell but also the HVAC equipment. After the evaluation, the homeowner is provided with recommendations for improvements, which may include shell work, equipment upgrades, or both. In Wisconsin, the average building-shell job costs $1,969, and produces average annual savings of $335 (equivalent to 407 Therms and 1,010 kWh saved per year).

Of Wisconsin's two initiatives, the Heating and Cooling Initiative is larger, encompassing virtually every HVAC contractor in the state (821 contractors at last count). These contractors have completed 9,000 installations of efficient equipment, including minimum SEER 13 air conditioners and two-stage 90+ AFUE furnaces with ECM blowers. "We've organized the initiative through HVAC distributors," says Newman. "We write the curriculum on best practices, and the training is delivered at no cost to us by the HVAC distributors."

Wisconsin offers homeowners a financing package that is virtually identical to the one offered in New York (Fannie Mae energy improvement loans for up to $20,000 at 4.99%). Homeowners who do not need to borrow money are eligible for rebates that subsidize some improvement measures.

Wisconsin has a smaller advertising budget than New York. "We don't market much to homeowners," says Newman. "We focus on the contractors who sign on to the program, and the contractors market to their customers."

Newman is looking for ways to improve the Wisconsin program. "The average customer doesn't want the air-sealing work," says Newman. "It's a sticking point—it's hard to get across to them the importance of it. Our intention next year is to make air-sealing work mandatory for all insulation jobs, so it is no longer an option to the customers." Newman would also like to broaden the base of participating contractors. "We are now talking with more remodeling contractors," he says. "Window and siding contractors are usually dealing with motivated customers whose wallets are open."

A Pilot Program in California

The California Home Performance Program was launched in 2002 by the California Building Performance Contractors Association. Funded by a $1.6 million grant from the California Public Utilities Commission, the pilot program is focusing on two cities, San Jose and Fresno. The first training sessions were held in January 2003. So far, the program has enrolled ten contractors, most of whom started out as HVAC contractors.

Robert Knight, a consultant at the Hayward, California firm of Bevilacqua-Knight, administers the California Home Performance Program. "The HVAC people seem to be most comfortable with this kind of work, and they're willing to subcontract the air-sealing and insulation work when needed," says Knight. "Some of the contractors take to this like a duck to water, while others really struggle."

In California, all home improvement costs are borne by the homeowners. "We aren't spending a nickel on homeowner incentives, because incentives always go away," says Knight. "Incentives make the contractors skeptical."

In California, as in many areas of the country, one of the biggest barriers to the Home Performance With

Energy Star program is homeowner indifference. "We did a focus group, we found out that people aren't very interested in energy efficiency," says Knight, who advocates de-emphasizing the energy-efficiency aspects of the work offered by the program. "Home Performance projects solve a lot of problems in addition to improving energy efficiency—the unpredictability of utility bills, carpet fading, soot in the house, asthma, worries about mold, noise from the ducts, possible carbon monoxide dangers, and the potential of contaminants in the indoor air," says Knight. "People seem to respond most positively when you talk about protecting and enhancing the lives of their families, about health-related issues and comfort issues. When you tell them Home Performance can do those things then they get really interested, but when you tell them it is an energy-efficiency program they are not very interested."

Knight shies away from any focus on payback. "If you do a comprehensive home performance retrofit—if you do everything that a house needs to really work well—the measures don't always pay for themselves in a reasonable amount of time with their energy savings," he says. "But the homeowner doesn't choose to do the work just because of energy savings. The homeowner is also doing those things because of other intangible paybacks—maybe he has a child with asthma, and he wants to do everything he can to alleviate those symptoms. Even if the measures don't pay for themselves in a reasonable amount of time, the improvements save a huge amount of energy. I've always been frustrated that the people that run these energy-efficiency programs—usually state and utility officials—have a much too narrow view of what they are doing. Let's say someone does a $10,000 retrofit, and the resulting energy savings are only $500 a year, for a 20-year simple payback. It might take the rest of his life to make economic sense, and he will probably sell the house and move in five years anyway. But energy savings weren't his only motivation. The homeowner is happy with the economic transaction because he got all these other benefits."

Programs Differ

Depending on the format of each state's program, the recommendations made by Home Performance contractors may be presented to the homeowners as a prioritized list or a whole-house package. Speaking with a national perspective, Mike Rogers says, "The homeowner can take the service as far as they want or stop as early as they want. There should be some prioritization of the recommended measures, but the details are a function of the local program and the participating contractors."

While homeowners in New York are presented with a menu of recommendations, each with a separate cost, homeowners in California get a single price. Knight describes the typical scenario in California: "By the time the diagnosis is done, the homeowners are already sold, because they've been shown all kinds of things in their home that aren't working right," he says. "Then for the second visit the contractor prepares a proposed set of improvements, trying to emphasize that the measures work together on a whole-house basis. It is presented as an integrated package, not as a series of line items. If the homeowner says that the proposed solution is too much money, our general guidance to the contractor is to say, 'Fine—why don't we develop a phased program?' We counsel which measures can be done now, and we say, 'We'll talk to you again in a year.' But in almost all cases the contractors have sold the whole package with no changes."

Do You Do Windows?

Since there are no strict guidelines requiring recommended measures to be cost-effective, Home Performance contractors often recommend window replacement. "One thing that we have found is the people are willing to push their cost-effectiveness number pretty far," says Rogers. "A lot of people are doing everything—they're going for the whole enchilada."

Many homeowners don't care whether replacing windows is a good investment. "People usually want to change their windows, and we have always included window replacement in the program," says Knight. "One of our contractors recently sold a $33,000 home retrofit that included all new windows and new ducts. He sold the work because the homeowner wanted his family to live in a house that was really working right."

According to Mike Rogers, window replacement has a place in the Home Performance program. "The contractors don't tell the homeowners that new windows are going to solve their problems, but if the homeowners do want windows, they can be incorporated as part of the energy solution," he says. "It will never be just a windows program. But because it is a market-based program, if homeowners want to put windows in, we will not tell them not to."

Potential Pitfalls

All of the regional Home Performance programs have had to devise mechanisms to address the inherent conflict of interest arising when inspectors profit from the work they recommend. If unscrupulous Home Performance contractors recommend unnecessary work, the Energy Star brand will be tainted. One qual-

ity assurance mechanism is post-job third-party verification; however, such verification is expensive. "You can't sustain an inspection-based program forever, because you can't pay the cost of it," says Knight. The solution in California is spot-checking. "We require that the contractor do testing on 100 percent of the jobs, in and out, but we test for verification on only 5 percent of the jobs," says Knight.

In Wisconsin, the percentage of jobs that are verified by third-party testing varies with the contractor's experience. While only 10% of the jobs of long-time contractors are verified, up to 50% of the jobs of newer contractors may be checked. "It usually takes about a year until we really trust people to be sure they are doing the work the way we want to see," says Newman.

The Home Performance program in New York also includes some verification. "We have an implementation contractor, Conservation Services Group, that does quality assurance by checking 15 percent of the jobs," says Fisk. But in New York, as in Kansas City, the most important quality-assurance mechanism is BPI certification of contractors. Accredited firms must agree to allow BPI to come in and look at their jobs at any time. "BPI is able to review a contractor's books and review the quality of the assessments, to see not only whether they did everything according to the standards, but also whether they missed any opportunities in the house," says Fisk. In theory, these reviews can be initiated by consumer complaints. "A homeowner can always contact BPI and say, 'This guy wrecked my house,'" says Rogers.

In spite of significant hurdles, the architects of Home Performance With Energy Star have crafted a program that successfully improves the energy performance of existing homes, and the program's potential benefits are substantial. "Existing houses are where all of the energy waste is," says Robert Knight. "I applaud everything being done in new construction, but that is not where the problem is. The Home Performance with Energy Star is by far the best approach we have seen so far."

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