

New Equipment, Same Old Problems

EPA proposes a solution in its ESVI program

BY CHANDLER VON SCHRADER
FOR THE NEWS

Many homeowners who are seeking to replace their existing heating or cooling equipment. As an industry, we've done a good job promoting high-efficiency equipment, but we haven't done enough to ensure these new systems actually perform as advertised. Yeah, it likely blows warm or cool air, and it most likely will perform better than the one it has just replaced.

Homeowners may even have engaged a utility program that offered a rebate for buying an Energy Star-qualified system. Our homeowners will hope that the \$8,000-plus they spent on new HVAC systems will reduce their energy bills. But, to be honest, HVAC technicians are often too busy to check the performance of the system, even if they know how. And the homeowner will be stuck with poor comfort, ongoing maintenance, and high utility bills. It's just not fair, and it's not necessary.

shortcomings are caused by many factors — one of the biggest being homeowners who neither understand nor demand proof that the new system is performing as well as the slick brochures claim. Ignorance is bliss until things such as oversizing, short-cycling, duct leakage, and high static pressures undermine the system's proper operation. I hate to simplify this as, "It's the installation, stupid," though, let me be clear: It's the design, the ducts, the commissioning, and the maintenance. All of these must be verified to ensure the system performs as the manufacturer intends, the contractor hopes, and the homeowners expect.

The situation is often not much better on jobs that are implemented by home-performance contractors, who are focused primarily on the building envelope. Many of these firms do not have the expertise, tools, or licensing that would enable them to effectively address problems with HVAC systems. So, the HVAC work is subbed out and the home-

tion are severe in today's market, whether the HVAC contractor is working as a subcontractor to a general contractor or directly with homeowners.

Homeowners seldom maintain their equipment, and when a minor problem crops up, they often choose to fix and forget until the system fails catastrophically. Then comes panic time and another rush job. Most homeowners consider HVAC equipment to be a simple piece of plug-and-play machinery, and they have no idea how complex it is to design and commission a new system, nor do most HVAC contractors have time to educate them. Adding to this crisis planning is the fact that HVAC systems do not usually fail in good weather, so the working conditions around HVAC replacement jobs are often trying: It's either 95°F in summer or 20° in winter. At times like these, many systems are often failing within the same community, and the good contractors are overbooked. If a homeowner is lucky enough to get a reputable and quality-minded firm to bid on the job, that firm's higher price, which is justified by its better workmanship, will likely push homeowners to get multiple bids.

Given this situation, it seems like an easy choice for most homeowners to find a contractor who can install a new box tomorrow for thousands of dollars less than the competition. But will this low-bid "Chuck-in-a-Truck" follow the manufacturer's installation guidelines or industry specs, such as ACCA's Quality Installation standard, on sizing, equipment selection, duct design, airflow, and charge? Not likely. And, so the cycle repeats itself: little if any design, little oversight of commissioning, little regard for maintenance, and little attention paid to ducts. For the next eight to 10 years, at best, the homeowner is stuck with an underperforming HVAC system.

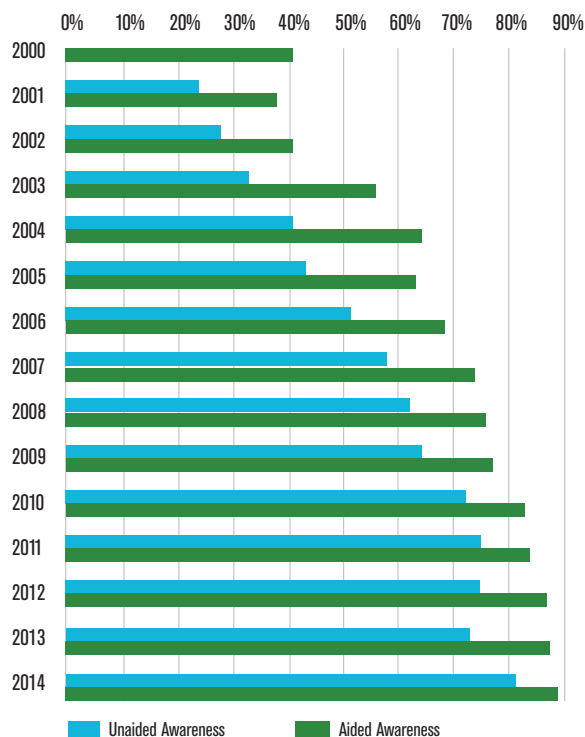
THE ESVI SOLUTIONS

My colleagues and others working with us at the U.S. Environmental Protection Agency (EPA) hope the Energy Star Verified HVAC Installation (ESVI) program will solve this problem. Set for launch in 2016, ESVI will help bridge the gap between the

designed performance and the installed performance of HVAC systems. By verifying the quality of installations, contractors will ensure homeowners receive the value for which they've paid, competent contractors will gain

market advantage for the good work they already perform, and sponsoring utilities will have verification that energy savings are realized.

The ESVI program, with its emphasis on remote reporting



Note: When a consumer recognizes the ENERGY STAR label before it is shown, it is defined as "unaided awareness." When a consumer recognizes the ENERGY STAR label after being shown the label, it is defined as "aided awareness."
Source: National Awareness of ENERGY STAR for 2014: Analysis of CEE Household Survey. U.S. EPA 2015b.

FIGURE 1

Sadly, when we do follow-up evaluations of HVAC systems, we find they seldom perform at their rated capacity, with bad consequences for energy consumption, comfort, safety, and maintenance. These systematic

performance contractor cannot ensure that the homeowner got a high-quality HVAC installation.

Unfortunately, many HVAC installations are implemented as rush jobs. Part of the problem is that price pressure and competi-

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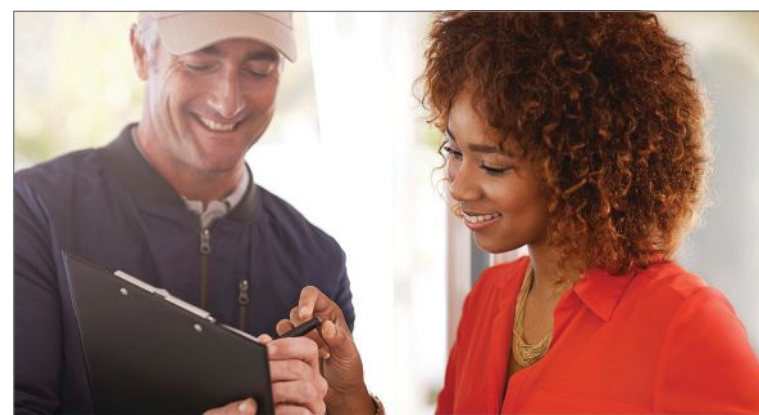
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of system performance, will benefit from the advent of smart systems that offer real-time guidance for system installation, commissioning, and operation. These systems allow all parties to verify that the original equipment manufacturer's (OEM's) key performance metrics are achieved and reduce the need for expensive third-party verification visits.

The ESVI program will allow the EPA to extend the respected name of Energy Star to HVAC systems that have been verified to perform as advertised (see Figure 1 on Page 19). With the help of progressive utilities and HVAC contractors, we'll bring home the message, "It's all in the installation to the consumer market."

Verified HVAC installation is the last substantial low-hanging fruit on the savings-and-comfort tree, and we're bringing it within reach of industry.

The ESVI program will be implemented in cooperation with existing utility-sponsored demand-side management programs in a similar way to the Home Performance with Energy Star program for existing homes, and the Energy Star Certified Homes program for new homes. And while the technical specifications of verified ESVI installations will remain consistent and supportive of ACCA standards, local program implementers will be allowed the leeway to apply the standards in ways that are compatible with their existing programs and policies, and which give them that Energy Star marketplace advantage. Who derives benefits from Energy Star Verified Installation?

1. Homeowners — They gain peace of mind, comfort, and safety when their systems fit their houses and perform properly. Their homes gain value;

2. Utilities — With ESVI in place, utilities will have verification that the performance and savings of HVAC systems are real;

3. Quality-minded Contractors — They can now participate in a program that rewards high-quality installations and provides strong market differentiation for their superior work;

4. Original Equipment Manufacturers (OEMs) — With verified installations, the OEMs can offer premium warranties, which reduces the enormous cost of warranty replacements for good equipment that has failed due to poor installation;

5. Society and the Environment — Any improvement in energy efficiency results in a

whole slew of external benefits. Verifying the quality of your work in a transparent process is a good idea for everyone.

THE FUTURE OF VERIFIED INSTALLATION

Homeowners who have comfort problems often call HVAC contractors. The HVAC industry holds the keys to a large number of households, as HVAC technicians are ringing more than 100,000 doorbells a day across America — far more than home-performance contractors. We see a logical partnership between these industries. Home-performance remediation is the comfort key the HVAC industry struggles to capture, and high-quality HVAC work is often missing from home-performance jobs that focus on the building envelope.

There is a lot of opportunity here, though the road to success is crowded with barriers. But having a way to truly verify the operation of HVAC installations will overcome many of those barriers. Imagine installing an HVAC system that you know will deliver what was promised. Imagine the value added to high-quality jobs performed by contractors who do the best work. Imagine if homeowners could have ongoing confidence that their systems' performance will be monitored and tuned up over the years. It all starts with a verified quality installation, baseline performance measurements that can be used over the lifetime of the equipment, and an agreed-upon set of industry standards to guide the process.

I encourage you to learn more and to reach out a hand to Energy Star Verified Installation at www.energystar.gov/esvi.

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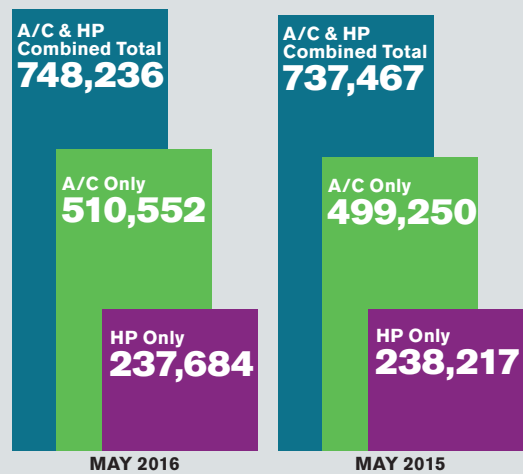
Chandler von Schrader has worked in the energy-efficiency industry since 1981, selling and installing solar domestic hot water systems, performing residential energy audits, delivering demand-side management services, and providing sales and marketing support for the HVAC industry. He has worked for the U.S. Environmental Protection Agency (EPA) since 2001, promoting best practices for energy efficiency in the HVAC, home-performance, and remodeling industries. Von Schrader was the national manager of the Home Performance with Energy Star program and now leads the Energy Star Verified HVAC Installation program. Contact him at vonschrader.chandler@epa.gov.

Furnace Shipments Jump in May

YEAR-TO-DATE: Year-to-date U.S. shipments of residential gas storage water heaters decreased 12.2 percent, residential electric storage water heater shipments decreased 16.3 percent, commercial gas storage water heaters decreased 5.4 percent, commercial electric storage water heaters increased 44.7 percent, gas warm air furnaces increased 5.2 percent, oil warm air furnaces decreased 7.7 percent, central air conditioners decreased 1.2 percent, and heat pumps decreased 4.8 percent.

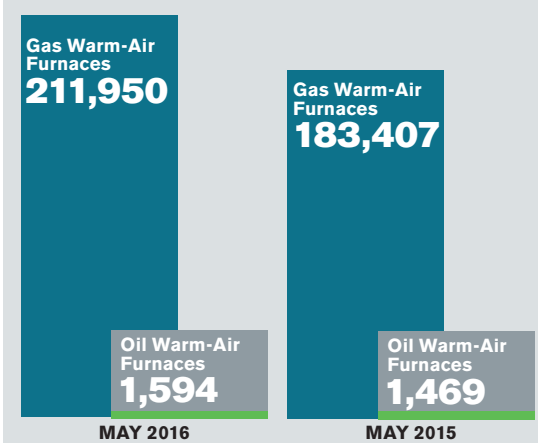
CENTRAL A/C AND AIR-SOURCE HEAT PUMPS

U.S. shipments of central air conditioners and air-source heat pumps totaled 748,236 units in May 2016, up 1.5 percent from 737,467 units shipped in May 2015. U.S. shipments of air conditioners increased 2.3 percent to 510,552 units, up from 499,250 units shipped in May 2015. U.S. shipments of air-source heat pumps decreased 0.2 percent to 237,684 units, down from 238,217 units shipped in May 2015.



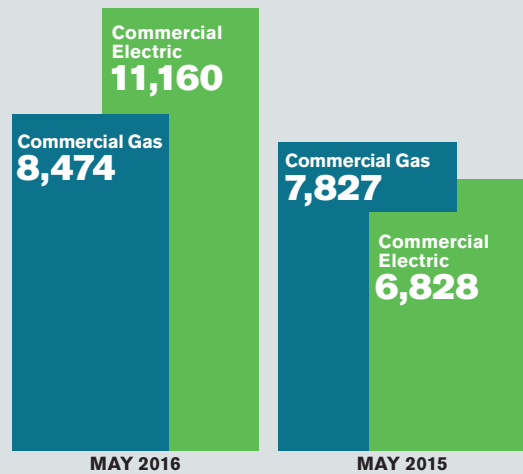
SHIPMENTS STATUS OF WARM-AIR FURNACES

U.S. shipments of gas warm-air furnaces for May 2016 increased 15.6 percent to 211,950 units, up from 183,407 units shipped in May 2015. Oil warm-air furnace shipments increased 8.5 percent to 1,594 units in May 2016, up from 1,469 units shipped in May 2015.



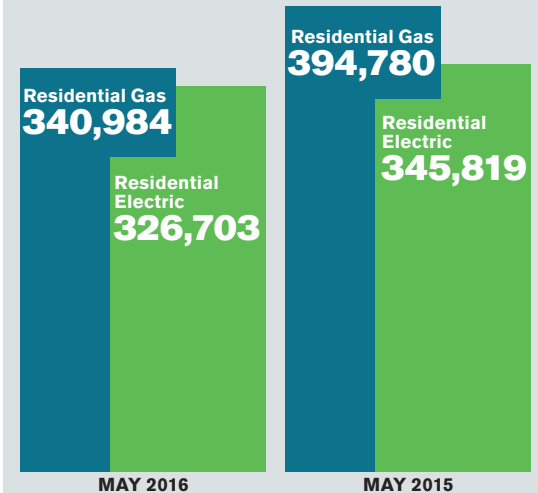
COMMERCIAL STORAGE WATER HEATERS

Commercial gas storage water heater shipments increased 8.3 percent in May 2016 to 8,474 units, up from 7,827 units shipped in May 2015. Commercial electric storage water heater shipments increased 63.4 percent in May 2016 to 11,160 units, up from 6,828 units shipped in May 2015.



RESIDENTIAL STORAGE WATER HEATERS

U.S. shipments of residential gas storage water heaters for May 2016 decreased 13.6 percent to 340,984 units, down from 394,780 units shipped in May 2015. Residential electric storage water heater shipments decreased 5.5 percent in May 2016 to 326,703 units, down from 345,819 units shipped in May 2015.



SOURCE: Information contained in these graphs are courtesy of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). Industry figures are estimates that are derived from the best available figures supplied by a sample of AHRI member companies.

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