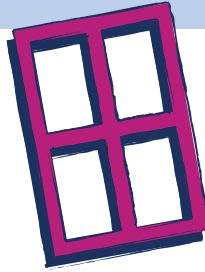
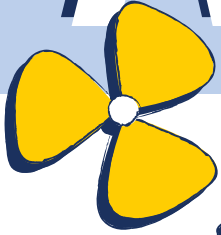


ANSWERS



By Mary Iannotti

After every energy audit delivered by the Center for ReSource Conservation's Residential Energy Audit Program (REAP), homeowners receive a list of recommended energy efficiency upgrades. The good news is that there are more energy efficiency products, contractors, and resources than ever before. The bad news is that decisions are harder to make with so many choices. Finding qualified contractors, choosing the appropriate technology, and prioritizing conservation measures provoke perplexing questions.

Fortunately, the CRC doesn't just deliver an audit. The REAP program also delivers information and resources that educate homeowners so they can make smart energy efficiency improvements. Two homeowners, Sharon Santa and Chris Hansen, asked some difficult questions after their audits. The following insights from energy professionals were just what the homeowners needed to make informed decisions.

Energy-Efficient Windows

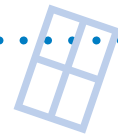
Sharon Santa's audit recommended new windows, because her Boulder home had aging single-pane windows. With metal frames and no storm windows, significant heat was lost. Her window replacement bid specified dual-pane Low Emissivity 2 (Low-E2) glass with a U value of .35 and Solar Heat Gain Coefficient (SHGC) of .33. The bid increased by \$480 for an upgrade to a high-performance glass with a .31 U value and .22 SHGC. Sharon was curious about the Low-E2's level of energy efficiency and wanted to know if the high performance glass would provide a significant enough efficiency increase to warrant the extra investment.

REAP auditor George Scott at Scott Home Inspections supported using the Low-E2 window but felt that the high-performance glass upgrade would not yield a substantial energy gain. In his opinion, Low-E2 is a quality window and has a high energy performance. It is a good generic window that is useful for any application in the home. South-facing windows with no exterior shading are one exception. Sharon could use high-performance glass for the south-facing windows only and use Low-E2 for the other windows.

George added that blinds or cellular shades aid in reducing heat gain in the summer and heat loss in the winter.

Sharon selected Amerimax vinyl windows with a .35 U value and .33 SHGC. She now closes her first-floor window blinds on the east side of the house during the morning and on the west side in the afternoon. Upgrades still to come include energy-saving cellular shades for some of the basement windows and insulation. Sharon is "grateful for the analysis report and referrals, because the information enabled me to make informed decisions."

Window Efficiency Facts



U Value

An overall heat transfer term. Low U values mean lower heat loss in winter and lower heat gain in summer.

Solar Heat Gain Coefficient (SHGC)

This is a new and more accurate way to describe a window's solar heat gain. It is expressed using a scale of 0 for none to 1 for 100%.

- A low SHGC reduces cooling.
- A high SHGC increases passive solar heat gain.

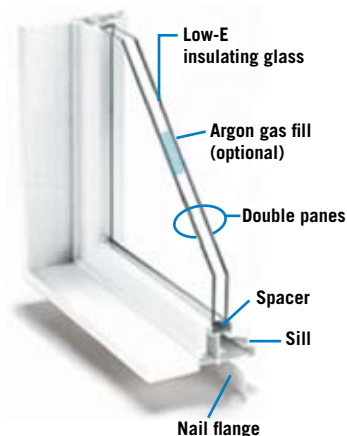
Low Emissivity Glass (Low-E)

Glass with a metal oxide coating that reflects up to 70% of heat energy while still allowing visible light.

- During the summer months Low-E glass reflects heat energy but allows light in, keeping a home cooler.
- In the winter these coatings allow absorption of visible light by furniture, walls, and flooring, which then radiates throughout the home.

For more information, visit www.ConservationCenter.org and read the CRC's Skinny Series fact sheet on energy-efficient windows.

to Common Energy Efficiency Questions



Sharon's new windows have double panes of Low-E glass.

Learn More About Fans

Consult this website for more information about ventilation:

http://www.eere.energy.gov/consumer/your_home/space_heating_cooling/index.cfm?mytopic=12351

improvement will be applying a white reflective roof coating to the black roof. Chris was so impressed with what he learned that he shared the information with his townhome association and plans to spread the knowledge to his community neighbors.

In addition to helping residents understand their energy usage and offering suggestions to lower energy costs, CRC's REAP team gives guidance for efficiency improvement choices. Our knowledgeable staff, contractor referrals, efficiency product fact sheets, and publications empower residents to make the right decisions. For more information contact REAP manager J.C. Martel at REAP@conservationcenter.org or 303.441.3278 x224. •

Cooling Issues

Boulder resident Chris Hansen called the CRC for an energy audit because he needed to use his air conditioner throughout the summer to keep his skylight-lit study comfortable. After inspecting Chris' house, REAP auditor Charlie Richardson from Homeworx suggested the following solutions to reduce heat gain and air stratification in the townhome's third floor.

Since the room is surrounded by attic space, Charlie suggested blocking heat gain that comes directly through the roof. This will reduce heat in the attic, because heat transfers through the insulation into the bedroom. Charlie recommended changing the black roof surface to a lighter color that will reflect heat. Stopping solar gain through the skylights will also cool the third floor. The shades already installed will help, but eliminating solar gain outside the window with an awning or deciduous tree would be even better.

Flushing heat from the house was another recommendation. A whole-house fan, also known as an attic fan, is an effective way to move large amounts of air. It is especially important to move air at night when building materials emit heat captured during the day and transfer it back outside. Ventilating an attic will help, but it's usually not enough. The interior living area also needs to be ventilated to make it as cool as possible at the beginning of the day. Closing the windows and sealing the room tightly to prevent hot air from infiltrating during the day will help tremendously, especially if the house is well insulated. The longer the area is kept cool and comfortable, the longer air conditioning can be forestalled.

Chris is adding insulation to the attic and a reflective barrier to the attic walls. A fixed window will be replaced with an operable window so that it may stay open at night. Fans will be installed soon. Another future



Charlie Richardson uses a blower door during a REAP audit to identify problems such as those found in Chris Hansen's house.