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INSIDE & OUT

# Get that warm feeling

Options abound for efficient home heating

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The Denver Post

POSTED: 02/13/2010 01:00:00 AM MST  
UPDATED: 02/15/2010 10:02:49 AM MST

Want a warmer house for Valentine's Day?

There is one holiday-appropriate option, of course.

But there are others.

You can install a wood or a pellet stove. You can buy a new, energy-efficient furnace. You can switch from electric heat to gas.

An alternative form of heating called geothermal could be the ticket. And you can heat your floors.

Before you start shopping, though, you need to think about your house differently.

Imagine your house as a ship.

Ships that float don't have leaks.

Neither should your house.

"The first dollar you spend should be on constructing the house better," says Harvey Sachs, a senior fellow with the American Council for an Energy-Efficient Economy in Washington, DC. "You shouldn't put money into the system, into a bigger one, until you have run out of cost-effective ways to seal the house better."

The place to start, experts say, is with an energy audit of your home.

"We can measure how much leakage there is in the home," says Paul Kriescher, with Lightly Treading Energy and Design in Denver, a company that performs energy audits for homeowners. "We can then go around with infrared cameras and find the leaks and show the family: 'It's not coming from the windows, it's coming from an interior wall, (or) it's coming from the attic.' That empowers people."

Conserving the heat you pump into your house is an important first step, says J.C. Martel, manager of the energy-efficiency program for the Center for Resource Conservation in Boulder.

"You can have a 95 percent efficient furnace," she says, "but if all of the heat is pouring outside, it won't be operating at 95 percent efficiency."

About 58 million houses in the country are heated by natural gas; another 33.7 million by electricity, according to data from the federal Energy Information Administration. Together, that represents most houses in the nation.

Most houses, too, receive their heat through forced-air systems — hot air blows through vents in walls — instead of radiators, which depend upon hot water, stoves or other devices.

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Forced air can be excellent, says Sachs, as long as the vents and ducts that thread that house are properly sealed and insulated. Otherwise, heat leaks away.

Sachs says the next big thing will be combination systems — boilers or water heaters that heat the house, as well as the stuff coming out of the shower head. For now, he says, combination systems are niche players. He expects them to become more common in the next decade.

"My next water heater will be one capable of doing that," he says. "I'm installing it next to my furnace, so when the furnace wears out, I can turn to the combination system."

In terms of the quality of the heat, there isn't much difference between gas and electricity. For now, gas runs cheaper, but that should change in decades to come.

Gas heat is the most kind to the environment, says Pam Milmoie, air-quality coordinator for Boulder County. Most electricity along the Front Range comes from coal, which sends particulate matter into the atmosphere.

"In our climate, electric heat is just not very effective," says Milmoie. "It's about on-par with an oil furnace."

Switching from electric heat to gas can be reasonable — and cost as little as a few hundred dollars — if gas lines already run into the house, Kriescher says. Otherwise, it likely will cost thousands of dollars.

Electric and gas forced-air systems are, by far, the most common ways to heat homes along the Front Range. But there are other options.

Radiant heat — heat coming from water that is pumped through tubes under floors — is increasingly popular.

The systems cost about twice as much as traditional forced-air systems, but they are more efficient than traditional systems, in part because individual rooms can be controlled. In the morning and afternoon, you might want the heat lowered in the bedrooms and upped in the family room. You can do it.

The quality of the heat, too, is different. Instead of blowing from vents, it radiates from the floor. Advocates such as Derek Strong of Radiant Floors Inc. in Aurora say the systems are between 20 and 40 percent more efficient than traditional forced-air approaches to home heating. The downside? Cost, says Strong.

Geothermal heat is another option.

Here's how it works: Contractors dig holes deep in the ground — as far down as 400 feet — and run tubes filled with a mixture of liquids into the holes and to a heat pump, a furnace-like device, in the house. The liquids flow in a loop through the tubes. As the liquid travels, it picks up heat from the earth and delivers it to the pump, which distributes it through the house.

It costs more than a traditional system, but utility bills can be cut in half, says John Kelly, a Monument resident who runs the Geothermal Heat Pump Consortium, a trade association.

"The heat pump itself costs about the same as a conventional furnace," he says. "The extra cost is drilling outside and installing the piping."

The industry has been growing at about 30 percent a year, but it captures only about 2 percent of the home-heating market, he says.

Finally, there are stoves. Some burn wood, others burn pellets made from wood. Neither, says Milmoie, is especially efficient.

"You've got one heat source in one room trying to heat an entire home, and nobody lives in one room in their house," she says. "And they aren't just plug-and-play. You don't just chuck wood in there. If you put too much wood in there, or not enough, they don't burn efficiently. There is an art and science around it."

Martel, on the other hand, says pellet stoves are "cool," and a decent option for heating a single room.

"They use renewable materials," she says, plus "they are efficient."

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