



Home Economics

If gas and electric costs are leaving you cold, you can move into a futuristic heat-harnessing new home—or buy a \$4 tube of caulk. *By Amanda Schupak*



HOW'S THIS FOR a chilling fact?

The average American family pays about \$1,000 a year to heat and cool their home. And it's not just their wallets that suffer; the gas and electricity that warm the homestead also contribute to global warming. With all that riding on their thermostats, eco-enterprising families are moving into "passive houses" that use roughly one-fifth the energy of a regular home and slash heating costs by as much as 90 percent.

Passive homes are virtually airtight, extraordinarily well-insulated buildings that harvest heat generated inside the house—and keep it there. Materials like concrete and granite act as thermal storage units, soaking up heat from household electronics and even residents' bodies. Specially treated

windows capture extra sunlight. (In warmer climates, reflective windows are installed to keep the home from feeling like an oven.) Constant air exchange between indoors and outdoors keeps things from getting stale, and, yes, you can open the windows.

Passive certification is one of the world's most stringent standards for energy-efficient construction. Passive house principles were actually developed in the United States and Canada in the mid-1970s but didn't catch on because energy prices here were so low at the time, there wasn't enough incentive to invest. Not so in Germany, where, in the '90s, engineers and architects embraced the concept and refined and strengthened the standards. More than 30,000 passive buildings have since been built in Europe. (There

they call it *Passivhaus*.) Now passive design is swinging back Stateside: Dozens of residential and commercial projects are in the works from Oregon to North Carolina, and by the end of the year 200 American families could be living in passive homes.

"If you can be comfortable by passive means, rather than actively burning fossil fuel, that's ideal," says Katrin Klingenberg, executive director of Passive House Institute U.S., which grants certification. "A building that is almost self-sufficient is a beautiful thing." She also points out that the higher up-front costs (up to 15 percent for new buildings) pay off handsomely in the long run.

Not in the market for a new home but still want to save on energy costs? Turn the page for our step-by-step guide. ▶

How to Curb Home Energy Costs

Sealing your space up tight and fixing other energy trouble spots can save as much as 30 percent on your current energy bills. Here's our four-stage approach to get you started. —A.S.

BASIC ←

→ ADVANCED



Know Your Home

You've heard you should do a home energy audit, but what exactly does that mean? Certified home energy raters will conduct a blower door test, putting a powerful fan in your doorway to send air outward through all the tiny holes that let in cold or heat; gauges identify the extent of air leakage. The energy team may also take infrared scans to show energy-loss culprits like spaces between drywall. Visit energystar.gov to find a certified home energy rater in your area.



Fill the Gaps

Homes built before 1970 can have so much seepage that the entire volume of air inside is replaced by air from outside in 40 minutes. Yet air infiltration is one of the easiest problems to correct. After identifying leaky spots, hit the hardware store for a caulking gun and some caulk or insulating foam. Then check out the Green Dream Group's YouTube channel for tutorials on filling spaces around outlets and window frames. Sealing your home can trim your bill by 9 percent.



Switch to Savings

Flipping on the lights accounts for about a tenth of your monthly electricity use, and most of that energy is squandered in the form of heat (think how hot those bulbs can get). Switching to Energy Star-rated CFLs can save you \$6 a year in electric costs per bulb (bulbs are designed to last for years). LEDs are much pricier—think \$25 versus \$2—but last two to five times longer. Replacing all your old bulbs with either CFLs or LEDs can reduce your energy bill by about \$100 a year.



Reinsulate

Especially in older homes, poor wall insulation makes it hard to maintain a comfortable temperature without cranking the heat or A/C. Check your attic, basement, and crawl spaces to see if you have full coverage. Adding insulation can cost anywhere from 15 cents to \$4 per square foot, depending on what type you use, and it may take years to recoup your investment. But if you've completed stage 2, adding insulation can save you more than \$200 a year.



None

Moderate

Light

Heavy; you may consider hiring a contractor.



Up to \$500 (Call your utility company first; some offer free or discounted audits.)

Under \$50

From around \$60 (for CFLs) to \$750 (for LEDs) for an average home (30 bulbs)

From a few hundred dollars to thousands

Tools for Tracking Energy Use

Knowing how much energy you use can inspire smarter habits—slashing energy consumption by as much as 15 percent and lowering bills by an average of \$330 annually. Three monitors we love:



TO BUDGET: The Energy Detective

Rather than being installed on a meter (which requires utility company permission), the Energy Detective hooks directly into your home's breaker panel and immediately starts tracking energy use and dollars spent on up to five appliances. Use the device to set a budget, and see, for example, that running the dishwasher right after dinner, when rates are typically higher, will set you back more than waiting until bedtime. (\$217; lowes.com)



TO AUTOMATE YOUR HOME: Control4

Program closet lights to turn off automatically after five minutes; set all your household lighting to run at 80 percent; create a "vacation" mode to keep energy use as low as possible when you're out of town. In addition to tracking energy consumption, this sleek system allows you to control virtually all your household electronics, lighting, and even security. (Control packages start at \$1,500; control4.com)



TO CONNECT LOCALLY: Tendril

Thirty-five utility companies use Tendril's software program, which collects energy data and can link to in-house displays. Tendril Energize, its new Web portal, offers customized energy-saving recommendations. The Social Media tool lets users share tips with their neighbors. A pilot program yielded average energy savings of 9 percent. (Free; check with your utility company.)

—STEPHANIE SCHOMER