

THE NEW ENERGY CRISIS

A SURVIVAL GUIDE

12 ways to beat the high cost of
home heating | MAX ALEXANDER

WINTER STORMS may be hard to predict, but here's a forecast you can bank on: Home heating bills will go through the roof this season.

According to the federal government's Energy Information Administration (EIA), the price you pay for natural gas (the most common heating fuel in America) is likely to jump 7.5 percent over last

ILLUSTRATED BY VIKTOR KOEN

PLEASANTVILLE, NY
MONTHLY 11,090,349
NOVEMBER 2004

RD | NOVEMBER 2004

winter. The price of home heating oil, commonly used in the Northeast, will rise 17 percent this winter. And don't think you're off the hook if you heat your home with electricity, the choice in much of the South and Southwest. Wired heat is predicted to be up nearly 2 percent from last winter.

Now for the really chilling news.

Those projections are based on average winter temperatures. "A really cold winter could drive prices much higher," says Dave Costello, who monitors short-term energy rates at the EIA. Talk about a squeeze play: For instance, you will pay more for the natural gas itself and burn more of it to boot—perhaps 33 percent higher if the mercury plunges just 10 percent.

What's going on here? When did Jack Frost switch from nipping at your nose to picking your pocket? It sure sounds like price gouging to the average Joe, but Costello blames a more basic economic force: supply and demand. "Cold weather puts huge pressure on the natural gas market," he explains. "U.S. gas production is stagnant, and Canadian supplies have been in decline since 2002." Overseas gas has to arrive by ship, in liquefied form—and

there are only four liquefied natural gas facilities in the country, in part because communities are scared of them. "It's very flammable stuff," says Costello, "but the safety record has been quite good."

The oil situation looks equally shaky. "World oil markets have been tight for a while," notes Costello, who points to burgeoning oil use in China as one reason why supplies are low. Right now the entire world burns through more than 82 million barrels

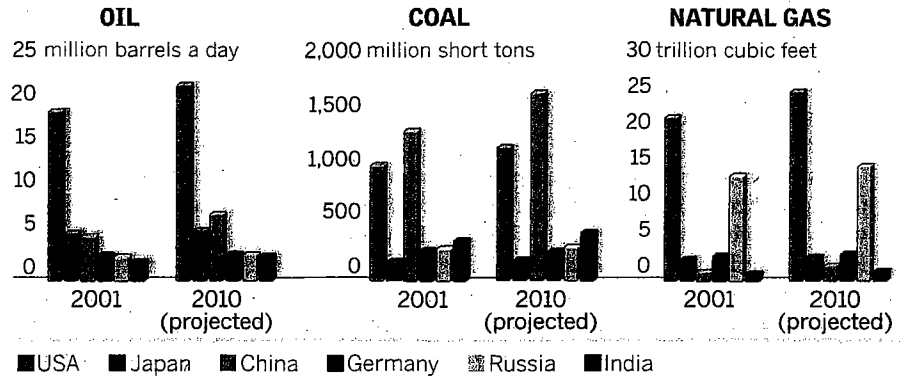
a day—a number expected to reach 84 million next year—straining the ability of suppliers to keep up.

But aren't there still huge proven oil reserves in countries like Saudi Arabia and Iraq? Yes, says Robert Kaufmann, an economist at Boston University's Center for Energy and Environmental Studies.

"But there's a limited ability to pump oil from the ground," he notes. "It costs a lot to drill a well and hook it up to a pipeline. The operable capacity of OPEC—what you can pump today if you wanted to—hasn't changed much in 20 years. So now we have demand for oil that's just about at capacity."

To make matters worse, says Kaufmann, technology has made it easier

Energy Consumption by Country



for refiners to cut down on their stocks—the oil they keep in storage. That saves them money but makes it harder to supply consumers when demand runs high.

Political turmoil in oil-producing countries could drive prices even higher. "It's the fear factor," says Kaufmann. Production in Iraq, a country with the world's second largest proven oil reserves, has slowed considerably since the war began.

Other fear-factor hot spots include Russia, where the huge privatized oil company Yukos is in hot water over charges of financial mismanagement. And in Venezuela, the largest oil producer outside of the Middle East, leftist president Hugo Chávez has rattled markets with his anti-Western sentiments. "I don't want to say it's a perfect storm," says Kaufmann, "but right now we've got a confluence of low inventory and production, as well as instability."

That explains why crude oil prices rose by nearly 25 percent earlier this year, to more than \$45 per barrel. "If something bad happens in Saudi Arabia," says Kaufmann, "we'll think \$45 is a bargain."

Some experts say oil is a bargain—especially in America, where fuel prices are comparatively cheap. (Europeans pay the equivalent of about \$4 per gallon of gasoline.) Low U.S. taxes explain the difference, making it easy for Americans to drive gas-guzzling cars—and ignore some of the energy-saving appliances and habits that are mandated in other countries. As scientist David Goodstein writes in *Out of Gas*, "Cheap gasoline is not the solution; it's a big part of the problem."

Indeed, recent history has shown that Americans tend to "spend" energy efficiency on more luxurious products, not "bank" it on energy savings. In the 1990s when engines and furnaces became more efficient, we bought SUVs and built bigger homes. (According to the National Association of Home Builders, the average American house has grown by more

than 200 square feet—the size of an extra family room—since 1990, to 2,320 square feet.) So instead of using less fuel, we are burning more and more—nearly one-fourth of the entire world's oil production.

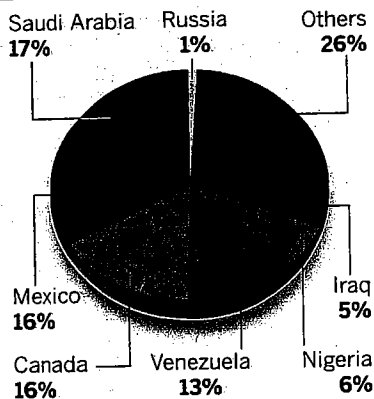
It's a habit that we will soon be forced to break. Experts disagree on when the world will run out of fossil fuels (including gas and coal, used to generate most U.S. electricity), but just about everyone says that the crisis will come sometime in this century. Naturally, as these precious fuels become scarcer, we will pay more.

In anticipation of the looming crisis, both Presidential candidates supported increased federal spending on

research and development of alternative energy, such as wind power, and cutting-edge fuels like hydrogen cells that may someday run cars.

New coal-fired power plants that virtually eliminate greenhouse emissions (using what's known as clean-coal technology) could help improve the environment. And today's appliances are saving more energy than ever. A new Energy Star-qualified clothes washer costs just \$21 a year, on average to run. By contrast, a ten-year-old model costs \$74 a year—over three times as much. Even compact fluorescent light bulbs have tripled in efficiency—costing just \$3 a year, as opposed to \$9 a decade ago. ■

U.S. Oil Imports



Based on 2002 data

QUICK FIXES AND MORE

SOME SAVINGS STRATEGIES COST nothing at all—like turning down your thermostat. Every degree you cut back will save about 3 percent on your bill. (Most people are comfortable in a light sweater when the house is at 68 degrees.) Programmable thermostats that automatically turn down the heat at night (or when you're away) cost about \$50, and are simple to install.

Make sure your fireplace damper is tightly closed (think of it as a window), and use bathroom and kitchen fans only when necessary—they suck heat out of your house. Reverse the direction of ceiling fans (there's a switch near the top) so they circulate warm air down into the room. Put an inexpensive insulating blanket around

your water heater, and wrap hot water pipes in cheap foam tubes.

Call your fuel provider and schedule an annual checkup for your furnace or boiler, which generally costs less than \$100. Change furnace filters at least twice a year, and keep heat registers and radiators clear of dust.

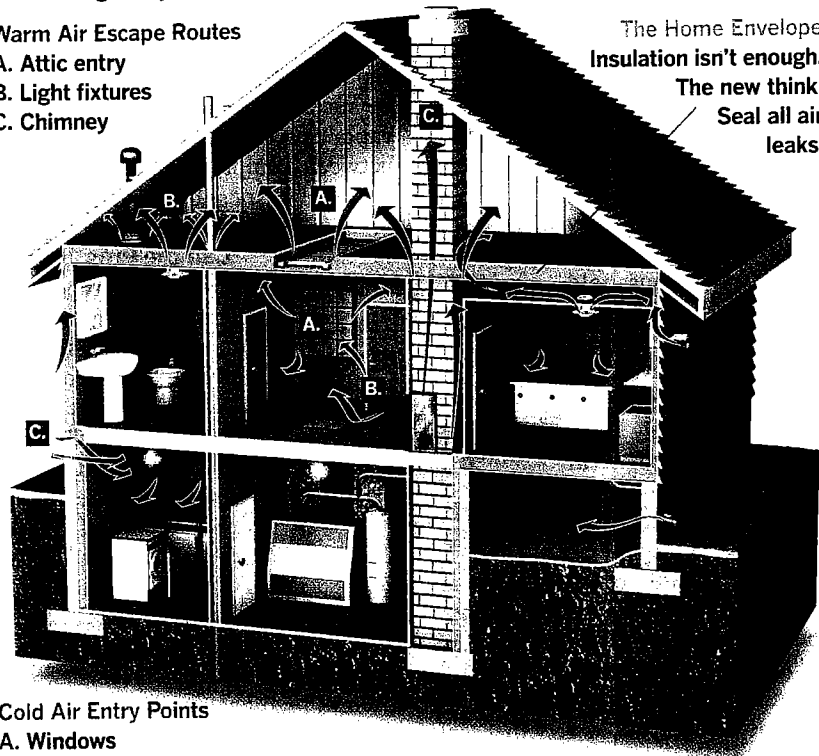
Plug the Leaks ... The latest research into home efficiency goes beyond insulation to what building scientists call the whole-house envelope. "Insulation is important," says Doug Anderson, the home-sealing project manager for the federal government's Energy Star program. "But we've come to realize the importance of sealing air leaks in your home."

Escape Routes

Save up to 20 percent—and that's a conservative estimate—on your home heating and cooling bills just by sealing up the air leaks and insulating the attic.

Warm Air Escape Routes

- A. Attic entry
- B. Light fixtures
- C. Chimney



Cold Air Entry Points

- A. Windows
- B. Exterior doors
- C. Exterior gaps (outdoor light fixtures, vents, cracks, etc.)

Start in the attic, where most leaks are hidden. "Hot air rises," explains Anderson, "so heat will rush out of any leaks at the top of your house. That creates negative pressure, like a vacuum, which makes cold air rush in from door and window cracks, and gaps where pipes and wires come through."

Walk around your attic on a windy

day while holding a lit stick of incense. "The smoke will tell you where the leaks are," he says. Look for dirty insulation, another sign of air leakage. "It acts like a filter as the air passes through, trapping dust," says Anderson.

Cracks in the attic less than 1/4 inch wide can be sealed with a long-lasting outdoor latex caulk. Gaps around chimneys or furnace flues

require special high-temperature caulk. Larger cracks (up to three inches wide) are best closed with a can of expanding urethane foam spray. Be sure to weatherstrip around your attic hatchway.

Because recessed lights give off heat, the metal cans for such lights can't touch any insulation. Unless you have special insulation boxes around the lights, they leave a significant gap where warm household air gets sucked into the attic. Manufacturers have recently developed inexpensive light cans that can be safely insulated. Look for the term ICAT, which stands for Insulation Contact, Air Tight.

Pay close attention to places in the basement where pipes or wires enter the home. Inspect where the wooden sill rests on the concrete foundation—a common source of leaks.

Some homeowners worry that sealing their house will inhibit the flow of fresh air, causing a furnace or water heater to “backdraft” deadly carbon monoxide into the home. While that can be a concern in new, super-tight houses, it's rarely a factor in existing homes. “You're not going to get it sealed up that tight,” says Anderson.

... Then Insulate. Only after thoroughly sealing your house should you worry about insulation. “A good rule of thumb is if you can see the tops of the So in the fall of 2002, CSG went through the whole house. “We had recessed lights that were leaking,” says Dick, “and they insulated those properly. They added 12 inches of insulation in the attic, and they built a box over the pull-down attic door to insulate that too. Then they showed me how the guy who replaced my windows hadn't insulated properly around them, so they did that.”

The result was a 10 percent reduction in Dick and Barbara's heating oil use—averaging out to 1,370 gallons per winter since the work was done. And because those two most recent winters were on average 12 percent colder than the previous two, the work saved even more money.

“The house is a lot more comfortable too,” says Dick. Not a bad return on a \$2,000 investment. (Energy Star estimates conservatively that home sealing and attic insulation cuts heating and cooling bills up to 20 percent. For an average household spending \$750 a year on heating and cooling, that adds up to \$150 in savings annually.)

Install low-e windows and reduce your energy loss by 30% or more.

joists in the attic, you need more insulation,” says Anderson. One quick, easy solution is to unroll new fiberglass batts perpendicularly across the joists. If the existing insulation has a vapor barrier (a paper or foil backing), be sure the new stuff does not; two vapor barriers will trap moisture in between, compromising the effectiveness of the insulation.

Call the Pros. Not the do-it-yourself type? Call a home-sealing contractor, who will use specialized tools to find, evaluate and fix leaks. Such work typically costs from \$400 to \$2,000, depending on the house size and scope of the job. (To review a list of the

companies in your state, check out energystar.gov/homesealing.)

Dick and Barbara Grady of Westwood, Massachusetts, were sick and tired of high heating bills when they called Conservation Services Group (CSG), a home-sealing contractor. Dick, a retired engineer for General Electric, suspected that his 1965 Colonial was not very efficient, despite adding insulation and new windows. “I thought I had really brought it up to speed,” he says—but the 3,000-square-foot house was still burning up an average 1,516 gallons of heating oil each winter. And that really burned up Dick. “I'm a typical thrifty New Englander,” he says with a laugh. “I hate waste.”

Big Bucks, Big Savings. The government estimates that replacing a 15-year-old gas furnace with a super-efficient Energy Star-qualified model can save \$200 per year or more on heating costs, depending on where you live. If your heat comes from a gas-fired boiler, consider one of the new, high-tech condensing boilers. These models use a heat exchanger to wring heat out of the moisture in gas—before it escapes up the chimney as steam.

Dual-pane insulated glass windows—preferably models with a special low-emissivity coating (low-e)—cut down on heat loss through radiation. Low-e windows cost 10-15 percent more than regular windows, but reduce energy loss by 30-50 percent.

If you really want to plan ahead, consider building an energy-efficient Energy Star-certified new home. It will cost you essentially the same as a conventional home—but when Jack Frost gets your number, it won't be a cold call.