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By Degrees

A New Enforcer in Buildings, the Energy Inspector

By [CLIFFORD KRAUSS](#)

AUSTIN, Tex. — Peering behind a bathtub in a newly built house, an inspector, John Umphress, spotted a big gap in the wall insulation. “Somebody took a lunch break!” he complained to the builder, who sheepishly agreed to patch the hole.

With the fix, the house, already a model of energy efficiency, will use even less energy and save its residents money — for decades.

But that small catch would not have been made in many American towns. Mr. Umphress is a particular kind of inspector, an energy auditor, and Austin, with one of the toughest building codes in the country, requires an energy inspection before a building can be occupied.

Climate scientists and architects say that no single policy change could do more to save energy over the long run — and reduce the nation’s contribution to [global warming](#) — than building codes that make saving energy the law.

Since the energy crises of the 1970s, the United States has known it has an energy problem. Yet today, the energy requirements in building codes remain weak across half the country, and at least seven states have virtually no rules. That means that in many places, particularly the nation’s heartland, almost every new home, store and factory that goes up locks the country into unnecessary energy use for years to come.

The problem is not just construction defects like the one Mr. Umphress caught, though those are plentiful. In many places, builders are still using too little insulation. Citing cost, they have not adopted the most energy-saving water heaters, roofing materials or window panes.

The Energy Department reports that buildings and the appliances inside them account for almost 40 percent of the carbon dioxide emitted in the country.

Stricter codes have been fought bitterly by politically powerful builders’ lobbies, which contend that they can add \$2,000 or more to the cost of a house. But in a few places, including cities like Austin and entire states like California, tough new rules have been adopted.

The efforts of these localities show that no new technology needs to be invented to make major gains in saving energy. Products already available permit the construction of homes at least 30 percent more efficient than the national average. With enough political will, a new law can be

put in place anywhere with the stroke of a pen, and made even more potent if it is coupled with tough oversight, as in Austin.

“If you build a building well, it’s an asset for 100 years; conversely, if you build a shoddy building, it can be a 100-year liability,” said Hal Harvey, chief executive of ClimateWorks, a group seeking to tackle global warming. “Energy building codes are the single biggest opportunity to save the environment while saving the consumer money.”

Mr. Harvey estimated that if today’s best building practices were applied in new buildings across the United States, the country could cut its total emissions of carbon dioxide, a principal global warming gas, by about 11 percent by 2030, compared to what it would otherwise be.

As global warming has become a pressing issue, sentiment has developed in Washington to push the country toward more stringent building codes. The Obama administration’s [stimulus package](#), enacted in February, required states to pledge to adopt stronger energy building codes as a condition of receiving more than \$3 billion in funding for various energy programs.

Energy legislation moving through Congress would go further, setting binding federal targets for efficiency that would require most states to adjust their codes. The proposed legislation aims to achieve an efficiency improvement in the next few years of at least 30 percent in states that already have up-to-date codes, and even more in states without them. That requirement would gradually tighten through 2030.

“A national building code is the key for getting our greenhouse gas emissions and energy consumption under control,” said Ed Mazria, executive director of Architecture 2030, an organization that researches building efficiency. “As you begin to level off emissions from buildings, you can begin to phase out [coal](#) plants as they age.”

Studies suggest that updated codes produce substantial gains, including savings for homeowners over the long run. In Austin, for instance, the municipal utility estimates that it takes about five years for the typical homeowner to save enough money on utilities to pay for the initial upgrades, and hundreds of dollars a year in savings continue after that. In places where energy costs are higher or codes are weaker, the savings could be even greater.

Strong codes are helping states reduce the growth in their electricity use — sometimes to the point that per capita consumption has leveled off, as in California.

California reports that it has reduced energy consumption in new houses and commercial buildings by 75 percent over the three decades that codes have been in effect there. Likewise, a new home built today in Florida, a state that also has a strong energy code, is nearly 70 percent more energy-efficient than a home of the same size built when codes were first enacted in 1979, according to the Florida [Solar Energy](#) Center, a state-supported research institute.

But builders warn that tough energy building codes would further harm the housing market and encourage people, particularly those with modest incomes, to live in older homes that are less

efficient. “It’s extremely difficult to market and sell efficiency in a new house as an incentive,” said Harry Savio, executive vice president of the Austin Home Builders Association.

Despite the opposition, political sentiment in many places has shifted toward making more efficient use of energy. Even in the absence of binding national standards, stronger building codes are making headway in most states of the Far West and the Eastern Seaboard, as well as in some cities.

But even so, a majority of the states follow codes that are out of date or leave it up to local communities to decide how efficient they want their buildings to be. The states that have no statewide mandatory codes, or perfunctory ones, include Alabama, Arizona, Mississippi, Missouri, North Dakota, South Dakota and Wyoming, according to the Building Codes Assistance Project, a research group that supports codes.

Amory Lovins, founder of the Rocky Mountain Institute and one of the country’s leading voices on energy efficiency, estimated that if every state had a building code as tough as California’s, energy consumption in a typical new home could be cut as much as 75 percent.

Here in Austin, which has had progressively stronger building energy codes since 1985, the typical home has decreased its annual energy use per square foot to 6.5 kilowatt hours, from 8.95 kilowatt hours, an efficiency gain of 27 percent, even though residents now own more computers and larger television sets. As a result, the municipal utility was able to avoid building a coal-fired power plant that had been in the planning stage.

Last year, Austin sought to leapfrog California with a code that aimed to increase the efficiency in new buildings by 65 percent, with requirements gradually tightening from now to 2015. It requires reflective heat barriers below roofs, installation of [efficient lighting](#) and windows, and better wall insulation, and also requires that new homes constructed in 2015 or later be built in a way that makes it easy to install solar panels or other types of renewable energy. (Builders estimate that in a typical 2,100-square-foot house, the roof heat barriers cost them around \$400 while each of the 20 efficient windows will cost an extra \$20.)

The code couples strict requirements with tough enforcement. For instance, it obliges builders to hire private inspectors to do energy audits before they can get a certificate of occupancy that allows them to sell new homes. “The buyer gets a better house,” said Mr. Umphress, the Austin auditor.

The day after he spotted the missing insulation behind the bathtub at 2105 Antone Street, he oversaw an energy audit at a pretty yellow house across town at 3013 Sea Jay Drive, just before it was to go on the market. The house had all the markings of an ecologically friendly structure. The insulation surpassed code requirements, the water heater was the highly efficient tankless type, and kitchen counter tops were made from recycled glass.

But when the inspectors ran a test of the duct system, they found leakage more than twice that allowed in the energy code. The crew and Mr. Umphress climbed into the attic and found leaks from duct connectors and around the wires on the air blower.

“This is why we test,” Mr. Umphress said. “Otherwise we would never catch this and this house would have been leaking dollars and contributing more carbon dioxide into the atmosphere for decades, or until the ductwork fell apart.”