The Power of Efficiency

You may not notice it, yet it's the nation's most abundant energy resource.

BY GLEN ANDERSEN

It lacks the visual appeal of a shiny new array of solar panels, a natural gas plant or wind farm. Yet "energy efficiency" is the country's most reliable, least expensive and cleanest energy resource. And it can be found in abundance in all 50 states.

Energy efficiency describes the technologies, materials and practices that use less energy, providing the same benefits at less than half the cost of generating more energy. It increases energy security, promotes local economic development and lowers energy costs for consumers and business. Efficiency creates no emissions and reduces the number of power plants and power lines that need to be sited and built.

With all these advantages, why is it so seldom fully embraced?

"Energy efficiency is largely invisible, and its benefits can be challenging to convey," says Senator Marc Pacheco (D) of Massachusetts, who promoted legislation making his state a national leader in efficiency.

Senator Marc Pacheco (D) Massachusetts

Pacheco adds that many people confuse efficiency with conservation and "simply don't understand it doesn't require them to change their energy consumption habits at all."

Energy efficiency and conservation both help reduce energy consumption, but in very different ways. Wearing a sweater and turning down the heat, or raising the temperature of an air-conditioned house from 76 to 80 degrees in the summer, is conservation. Installing an efficient furnace or air conditioner and increasing building insulation is energy efficiency. A modern efficient refrigerator, for example, uses one-fourth as much energy as the average mid-'70s refrigerator, while providing more space, better temperature control, cold water and crushed ice.

Energy efficiency cannot be seen, but its results can. Massachusetts saved 610 gigawatt-hours in 2010 after the legislature passed a law in 2008 requiring state utilities to boost energy efficiency. That's equal to the annual energy used by nearly 85,000 households. The economic results are just as dramatic. Efficiency investments made from 2010 through 2012 are projected to save $6 billion in energy costs, according to the Energy Efficiency Advisory Council, which helps administer the effort.

Although energy efficiency has broad support among utilities and policymakers, some think there should be stricter efficiency standards for utilities, while others feel the market is operating effectively and merely needs coaxing. Texas Senator John Carona (R) authored an energy efficiency law that changed the regulatory structure to eliminate regulations that discouraged competition.

"I do think the market was using cost-effective energy efficiency methods under the mechanisms previously available to them," he says. "My bill is meant to broaden market opportunities in areas that were previously not as competitive or consumer friendly."

Senator John Carona (R) Texas

Energizing the Economy

Investments in efficiency can be attractive, particularly in a tough economy. Utilities save money because they don't have to build new plants, for example, and consumers save because they use less energy. By freeing up capital, efficiency programs allow companies, and consumers, to find more productive uses for that money. Decreased energy use increases economic security. Less fluctuation in energy prices protects consumers—and the econ-

5 Things States Can Do To Improve Energy Efficiency

❶ Create a regulatory structure that rewards utilities for meeting energy demands in the most cost-effective manner, rather than for selling more energy.
❷ Provide incentives for utilities to use and sell less energy, as well as rewards for meeting efficiency goals.
❸ Allow utilities to collect surcharges to recoup investments in efficiency programs.
❹ Adopt energy-efficient building codes.
❺ Require energy-efficient improvements in state buildings.

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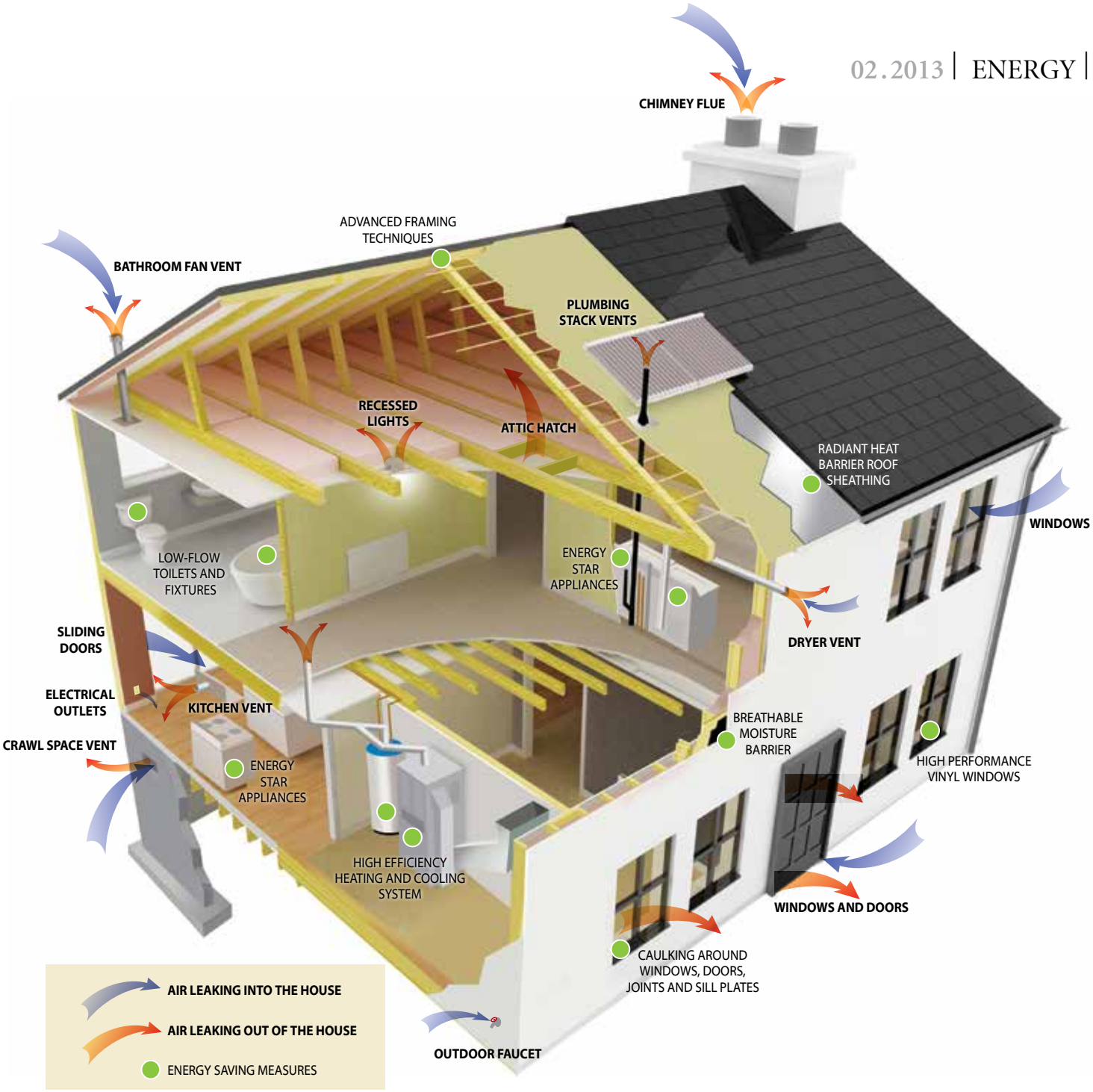

omy—from hardships caused by high energy prices.

"When consumers and utilities are able to reduce energy consumption through efficiencies and behavior, the entire electric grid benefits," says Carona.

Saving a kilowatt-hour through energy efficiency is less than half the cost of producing an additional kilowatt-hour of electricity from a new coal plant, wind farm or natural gas power station. Efficiency efforts reduce demand for energy and natural gas, driving down prices and decreasing the need for utilities to build power plants, which keeps rates down for consumers.

"Any time there are savings because you don't need to generate a kilowatt, the savings are passed on to consumers," says Lisa Wood, executive director of the Institute for Electric Efficiency at the Edison Electric Institute. "This makes a lot of sense from a cost-benefit perspective."

Research by the Tennessee Valley Authority found saving a dollar on utility bills and spending it locally more than doubles the effect of that dollar on local employment and wages.

The States Step In

"With no major source of fossil fuels in the area and with a position at the end of the energy pipeline, Massachusetts unfor-

Energy Labeling

Information drives the free market, but when it comes to the largest financial decisions, such as renting or purchasing a home or building, information on operating costs can be hard to come by.

This lack of information distorts the market by hiding costs from consumers—like buying car without knowing the miles-per-gallon rating.

If an average home's yearly energy bill is about $2,200, the bill in a highly efficient home might easily be 40 percent lower, around $1,300 a year. The $75 per month savings gained by purchasing the efficient home would be equivalent to a $15,000 reduction in the home's price if financed at today's 30-year fixed mortgage rates. When it comes to commercial buildings, the energy costs—and potential savings—can have an even greater effect.

Buyers and renters can overlook the added value of energy efficiency. Benchmarking and disclosure policies aim to address the knowledge gap by requiring an assessment of the energy efficient features of a building or home and telling potential renters or buyers. Similar to an mpg rating for homes, the system is just starting to catch on. California, Kansas, Maine and Washington now have some variation of efficiency disclosure and benchmarking laws, and at least five states considered disclosure laws in 2012. A number of cities already require energy ratings for buildings.

tunately has historically had high energy costs," says Pacheco. "In the interest of promoting a strong economy, the burden has fallen on the legislature and the executive to develop ways to bring down costs."

With the Green Communities Act, which became law in 2008, Massachusetts became a leader in innovative energy efficiency policy. It makes energy efficiency the state's "first fuel" with three-year plans that focus on tapping all cost-effective energy efficiency resources before constructing new power plants. The program's goal is to deliver energy savings, reduce state reliance on imported fuel, create local jobs and reduce pollution.

Utilities are working with lighting manufacturers and distributors to offer discounted high-efficiency lighting to commercial and industrial customers, helping to reduce their energy costs. They also provide energy audits to home and business owners to identify cost-saving measures, along with incentives such as rebates, for sealing air leaks and installing efficient lighting and appliances.

The first of the three-year energy plans required utilities to meet 1.4 percent of their electricity demand through energy efficiency in 2010. The requirement ramped up to 2.4 percent for 2012. The 2013-2015 plan is higher yet, at 2.5 percent for all three years.

Utilities pay for their efficiency efforts by collecting surcharges on utility bills. But even with the surcharges, customers saved money. In 2010, the people of Massachusetts not only saved significantly on electricity bills, but pollution was down. The program also reduced greenhouse gasses as much as the yearly emissions from 74,000 cars. In 2011, the average customer received more than $4 in benefits for each dollar spent. Energy-saving projects completed between 2010 and 2012 are expected to provide $6 billion in lifetime benefits.

Texas also has energy efficiency requirements, updated in 2011. The law requires utilities to verify that energy efficiency investments are providing adequate savings.

"Now consumers can feel confident that the energy savings they are promised by using energy efficiency will be evaluated, measured and verified," says Carona. "Utilities can implement energy efficiency in a more consistent manner" because of the verification process.

The law also allows utilities to expand demand-side management programs to residents and businesses, so more customers can participate in the energy market. Customers are offered discounts for reducing electricity consumption during peak times, like on a hot summer day, when prices are high.

"Capturing more energy and associated economic savings for Texas taxpayers and businesses is a priority—especially with the challenges Texas and Texans face with the economy today," says Carona, who wrote the legislation.

Twenty states require utilities to provide energy more efficiently, though few have requirements as strong as those in Massachusetts. Advocates believe efficiency requirements send a clear signal to the market and help drive long-term, productive investments in efficiency technology and services.

Reversing Reverse Incentives

With all its promises, one would expect energy efficiency to be first on the list to meet the nation's growing energy needs. But traditional regulatory structures and a lack of knowledge have prevented utilities, businesses and consumers from fully embracing energy efficiency. Most utilities make money by selling energy, yet aggressive efficiency efforts can lead to a decline in sales—and profits.

Conventional regulatory models allow utilities to make a profit on the energy they sell, and receive a return on their investments building more infrastructure. Providing energy more efficiently does not earn a return on investment. And even though all utilities work to increase efficiency to some extent, large scale efforts are a hard sell.

"Why would utilities want to promote something that reduces cost recovery?" asks Wood. Yet rising energy prices and new technologies make efficiency desirable for a number of economic, energy security and environmental reasons.

"It goes back to how rates were structured historically—it is the legacy of an outdated rate structure that needs to be modified," Wood says. "If we had to create a regulatory structure from scratch, we would design it a little differently today."

And some states are doing just that. Lawmakers are looking at alternatives that decouple profits from the amount of energy sold, so utilities can make money by selling less energy, not more.

Massachusetts and nine other states have changed regulations so utilities can recoup costs no matter how much electricity they sell.

The previous utility rate structure created "a disincentive for utilities to promote the widespread use of efficiency," Pacheco says. "With the decoupling provided by the Green Communities Act, utilities are now working harder than ever to bring these efficiency plans to consumers."

While decoupling opens the door for utilities to pursue efficiency, some states are adding incentives to save energy. They are allowing utilities to earn a return on their investments in energy efficiency. In Massachusetts, for example, utilities earn a 5 percent return on their investments in meeting energy savings and cost-benefit goals. The goal is to reward utilities with financial incentives for providing least-cost, reliable energy.

"Energy efficiency represents one of the most cost-effective methods to lower our commonwealth's electricity bill," Pacheco says. "The least expensive kilowatt-hour is the one you don't use."

Building Smart

The lion's share of electricity in this country, some 65 percent, goes to power buildings. And the price tag for that energy is nothing to sneeze at—about $400 billion per year.

A building erected today will last more than 70 years, so energy efficiency put in place during construction can provide many years of benefits. Energy efficient features are far less costly to integrate during construction than to add later. Buildings can usually be constructed to be 30 percent more efficient than the average new home or building, while adding only 1 percent to 2 percent, or even less, to construction costs. When factored into mortgage payments, the energy savings can far exceed the additional costs.

Features such as improved lighting and ventilation increase worker productivity and comfort, while humidity, drafts, and cold or hot windows are all reduced by improving energy efficiency. Also, energy efficient buildings tend to have higher lease rates, occupancy levels and sale prices.

State incentives to encourage more efficient construction are broad, including enacting efficient energy codes, requiring more efficiency in state-funded buildings, offering tax breaks for green building construction and providing financing that takes into account lower utility bills.

When older buildings are retrofitted with new, energy efficient technologies, payback often ranges between two and 15 years, depending on the range of retrofits. In many cases, however, building and homeowners do not have the money to cover upfront costs and attractive financing may not be available. To promote the retrofits and engage the market, states offer a range of options, including revolving loan funds, grants and utility financing that is incorporated into the customers' bill.