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At Issue: Energy Efficiency

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at issue:

ENERGY EFFICIENCY

Relatively simple measures, such as switching to more efficient lightbulbs and insulating commercial buildings, hold great promise in efforts to combat climate change. So what's the holdup? **BY MICHAEL B. GERRARD, ANDREW SABIN PROFESSOR OF PROFESSIONAL PRACTICE AND DIRECTOR OF THE CENTER FOR CLIMATE CHANGE LAW**

Once again, energy-related disasters and disputes crowd the front pages. The Fukushima nuclear power plant meltdown, the Deepwater Horizon oil spill, the Keystone XL pipeline from Canada, and fights over climate change regulation all concern the world's seemingly insatiable thirst for energy.

No one action will solve all of these problems. However, there is one that stands far ahead of all other methods, with the greatest quantitative potential, the lowest cost, and the fewest negative effects: improving the efficiency of energy use. It is a wonder that it is not more widely embraced, but there are explanations.

Only 42 percent of the energy used in the U.S. actually provides energy services; the rest is lost. The National Academy of Science has concluded that the U.S. could reduce its energy use by 17 to 22 percent by 2020, and by 25 to 31 percent by 2030, mostly using existing technologies that are already in commercial use and delivering the same services as their less-efficient counterparts.

In 2010, the International Energy Agency studied what energy measures could, in combination, allow us to achieve the reductions in greenhouse gases that will be needed by 2050 to stay within an acceptable range of global temperature rise. The two methods that have received by far the most attention—renewable energy (such as wind and solar) and nuclear power—would meet 17 percent and 6 percent of the needs, respectively. But energy

efficiency would accomplish an amazing 38 percent—significantly more than renewables and nuclear combined.

It could do this at very low cost. The McKinsey consulting firm has prepared a series of reports showing a broad array of energy efficiency measures that have a high net negative cost—in other words, over the lifetime of the actions, they save a great deal of money. At the top of the list are changing lightbulbs, improved residential electronics and appliances, insulating commercial buildings, and more efficient motors. According to Lazard, the leveled costs (that is, counting fuel as well as capital costs) of efficiency are far lower than those of every other source

of energy—coal, natural gas, nuclear, wind, solar, or biomass.

Energy efficiency has many other advantages over other energy sources: It does not require siting facilities in places where people do not want them, or where they can have negative environmental impacts; it requires no imports from other countries; it generates neither greenhouse gases nor conventional air pollutants; it is always effective, even when the wind is not blowing and the sun is not shining; and it is not vulnerable to price fluctuations.

So if energy efficiency is so great, why don't we have more of it? Why aren't more businesses flocking to it?

Part of the reason is that no one has figured out how to



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become an energy efficiency billionaire. The actions are widely dispersed, both geographically and by method. Efforts are now being made to bundle them into profitable businesses, and a few companies are jumping in, but so far the scale has been limited.

Energy efficiency faces several other impediments. These include “split incentives” (often the party that would have to pay for energy efficiency improvements is different from the party that would benefit—for example, the builder of a commercial office tower has little incentive to spend extra on window insulation that would lower the utility bills of the building’s future tenants); “capital stock turnover” (some energy-con-

suming devices, such as laptop computers, are replaced every few years, and thus new energy-saving characteristics can quickly be disseminated; many other devices, such as refrigerators and industrial motors, stay in service for many years, even though much more efficient equipment has become available); “utility rate systems” (cost-of-service ratemaking, the traditional means by which utility rates have been set in the U.S., and regional wholesale electricity markets, both reward utilities for making and selling more electricity and natural gas; thus, these companies have had little incentive to encourage their customers to use less energy); and “invisibility of waste” (energy

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conservation is inhibited because people are often not aware that they are using energy unnecessarily; there is no warning sign that an electronic appliance has been left on or is still gobbling energy while in the “standby” mode, though some “smart grid” innovations are beginning to address this).

The law provides several techniques that can be used to increase energy efficiency. Among these are technology standards (such as fuel economy standards for vehicles, and energy standards for appliances and buildings); energy audits that lead to building retrofits; requirements that electric utilities spend a certain amount of money on helping their customers achieve greater efficiency; and government procurement of efficient products. And creative new financing techniques are now being devised, such as New York’s new “on-bill financing” law that allows people to borrow money for energy efficiency improvements, and to pay it back through an added charge on their utility bills.

Ultimately, the most effective method for spurring energy efficiency might be a charge on greenhouse gas emissions, such as through a cap-and-trade system or a carbon tax. But under the current political mood, that seems remote. Indeed, in 2011 Congress banned the enforcement of a 2007 statute (signed by President George W. Bush) that imposed performance standards on lightbulbs that cannot be met by conventional incandescents, even though this law would save the equivalent of the output of 11 nuclear power plants. Fortunately, bulb manufacturers had already converted most of their production lines, so this law had little impact. But so long as energy efficiency and renewables are on the losing side of America’s culture wars, the potential for progress will not be realized.