New York Law Journal
SERVING THE BENCH AND BAR SINCE 1888
WWW.NYLJ.COM

An ALM Publication
VOLUME 245—NO. 9
THURSDAY, JANUARY 13, 2011

ENVIRONMENTAL LAW

Expert Analysis

Increasing Energy Efficiency: Legal Techniques and Impediments

Increasing energy efficiency is the most important action that can be taken to combat climate change. The International Energy Agency declared in 2010 that "[i]ncreasing energy efficiency, much of which can be achieved through low-cost options, offers the greatest potential for reducing CO2 emissions over the period to 2050. It should be the highest priority in the short term… Decarbonising the power sector [is] the second-largest source of emissions reductions."[1] The United Nations Foundation has calculated that if the G8 countries (United States, Canada, France, Germany, Italy, Japan, Russia, and United Kingdom) doubled their historical rate of energy efficiency improvement, that would avoid the need for 2,000 coal-fired power stations and would make it possible to keep CO2 concentrations in the atmosphere below 550 parts per million.[2] One study has shown the potential to meet all of the greenhouse gas (GHG) emission reduction goals for 2020 under the climate legislation that passed the House of Representatives in 2009 through energy efficiency measures.[3]

Much potential remains for further improvements in U.S. energy efficiency. Only 42 percent of the energy used in the U.S. actually provides energy services; the rest is lost.[4] The National Academies of Science have concluded that the U.S. could reduce its energy use by 17-22 percent by 2020 and 25-31 percent by 2030, mostly using existing technologies that are already in commercial use, and delivering the same services as their less efficient counterparts.[5]

Returns on energy efficiency have been calculated at 20-30 percent for many actions, while their relative invulnerability to price fluctuations enhances their reliability as investments.[6] In a series of well-known reports, the McKinsey consulting firm has found that just by using measures with a positive net present value, end-use energy consumption in the U.S. could be reduced by roughly 23 percent of projected demand by 2020.[7]

MICHAEL B. GERRARD *is Andrew Sabin Professor of Professional Practice and director of the Center for Climate Change Law at Columbia Law School, and senior counsel to Arnold & Porter LLP. His latest book is "The Law of Green Buildings: Regulatory and Legal Issues in Design, Construction, Operations, and Financing" (with J. Cullen Howe) (American Bar Association 2010).*

By
Michael B. Gerrard

In view of the recent election, there appear to be no immediate prospects for comprehensive climate and energy legislation in the United States. However, an abundance of legal techniques are available at the federal, state and municipal levels that cumulatively could accomplish a great deal in cutting energy use, lowering U.S. reliance on foreign oil, and reducing GHG emissions and the other adverse environmental impacts of energy production.

An abundance of legal techniques are available at the federal, state and municipal levels that cumulatively could accomplish a great deal.

Legal Techniques

Technology Standards. Since 1975, Congress has required manufacturers of certain kinds of products to achieve minimum standards of energy efficiency or fuel consumption. The chief examples are federal standards for appliances and lighting, and the Corporate Average Fuel Efficiency (CAFE) standards for motor vehicles.

More recently, buildings—which consume about 40 percent of all energy used and three-fourths of all electricity generated in the United States—have become the subject of intense regulation, mostly at the state and local levels, as well as under voluntary standards.

The climate bill that passed the House in June 2009 but died in the Senate contained extensive additional technology standards. In the absence of climate legislation, the U.S. Environmental Protection Agency (EPA) has been utilizing its authority under the existing Clean Air Act. In developing a permitting program for GHG emissions from stationary sources under this law, EPA is encouraging energy efficiency measures under the rubric of the best available control technology requirements.

Retrofitting. Most technology standards apply to new products, vehicles and buildings. However, buildings, in particular, may have a very long life, and there are many opportunities to retrofit them to improve their energy efficiency. Weatherization and changes in lighting are in some places either required or subsidized.

Information. The government still allows many energy-guzzling appliances and vehicles to be manufactured. For some of these products, it requires labeling of energy or fuel consumption so that consumers can at least make informed purchasing decisions.[8]

System Benefit Charges. Many state public utility commissions require regulated electric and gas utilities to set aside a certain amount of money every year from "system benefit charges" for use in energy efficiency programs and other purposes that benefit the public.

Urban Density. GHG emissions from motor vehicles are mostly a product of three factors: the fuel economy of the vehicles (as regulated by the CAFE standards); the carbon content of the fuels (as regulated by biofuel standards); and the number of vehicle miles traveled (VMT). VMT, in turn, is inversely proportional to urban density: The more densely populated an area, the more likely it is to be served by mass transit, and the shorter the trips that are not taken by mass transit.[9] Apartment buildings, with their vertical and horizontal stacking of dwellings, also tend to use less energy per occupant for heating and cooling than single-family homes. Thus, encouraging urban density and discouraging sprawl are central to energy conservation.

Urban land use is primarily a matter of state and local regulation. Federal programs, such as federal assistance for highways, sewers and various housing types, have a significant effect on land use development patterns, but federal efforts to overtly determine land use patterns have been met with ferocious resistance.[10] Some states, led by California, have taken tentative steps to regulate this linkage.[11]

Portfolio Standards. Each electric utility satisfies customer demand through its own portfolio of measures, typically including a mix of various kinds of generation sources, the purchase of power from outside its service territory, and

actions to reduce or change the time of electricity use. Many states have begun requiring their regulated utilities to include in their portfolios a certain amount of renewable energy through "renewable portfolio standards." More recent variations involve energy efficiency resource standards, under which utilities must spend certain amounts of money on energy efficiency measures, or achieve a certain amount of demand reduction.[12]

These portfolio standards have been adopted at the state level. A national portfolio standard has been included in several of the energy and climate bills that have been considered by Congress.

Carbon Price. Burning fossil fuels creates negative externalities, including the accumulation of GHGs in the atmosphere. Being able to do so for free can be seen as a subsidy. To correct this and to impose a price on emitting GHGs (for which "carbon" is shorthand), two methods have been intensely debated in recent years—a carbon tax and cap-and-trade. However imposed, a price on carbon would narrow the cost advantage of fossil fuels over renewables and efficiency. However, in the current political climate, such a price is nowhere in sight.

Tax and Non-Tax Incentives. A broad range of special tax provisions and subsidies aim to encourage certain kinds of efficiency improvements as well as renewables (and also fossil fuels).

Government Procurement. The federal government spends more than $24 billion per year on energy purchases, and is the largest volume purchaser of energy-consuming products in the world.[13] The federal government and some state and local governments have undertaken extensive efforts to purchase energy-efficient products.

Impediments to Efficiency

If energy efficiency measures are so cost-effective and environmentally sound, why aren't many more of them undertaken? Below are some of the most prominent reasons.[14]

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.[15] Likewise, in an apartment complex where the landlord pays for the electricity, many tenants may leave the air conditioning on all day.

Low Energy Prices. One of the central objectives of U.S. energy policy has long been to keep energy prices low. This reduces the incentive to spend money on energy efficiency by, for example, buying appliances that cost more up front but yield energy savings over time.[16]

Capital Budgeting. Energy efficiency measures typically require capital expenditures and yield reductions in operating expenses. Many organizations have separate capital and operating budgets, and they are not always well-coordinated. Moreover, many entities have little ability to borrow capital money, even for projects with an assured return. High transaction costs and high internal discount rates also discourage investments.[17] A number of government programs are helping provide the missing capital, and energy service companies (ESCOs) have emerged to provide the capital and reap some of the operating expense rewards.[18]

Capital Stock Turnover. Some energy-consuming 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.

One of the central objectives of U.S. energy policy has long been to keep energy prices low. This reduces the incentive to spend money on energy efficiency by, for example, buying appliances that cost more up front but yield energy savings over time.

Utility Rate Systems.[19] Cost-of-service ratemaking, the traditional means by which utility rates have been set in the United States, 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. "Decoupling" legislation that separates utility revenues from the amount of electricity sold has severed this linkage in some states.

Invisibility of Waste. Energy 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. Some "smart meter" programs are beginning to address this problem.

Time will tell whether sufficient legal techniques are adopted to increase efficiency to overcome the impediments.

1. International Energy Agency, "Energy Technology Perspectives 2010—Scenarios & Strategies to 2050" (2010), p. 49.
2. United Nations Foundation, "Realizing the Potential of Energy Efficiency: Targets, Policies, and Measures for G8 Countries" (2007).
3. Priya Sreedharan, "Energy efficiency potential in the U.S.: A review and comparison of recent estimates," Energy and Environmental Economics (E3), June 29, 2010.
4. Lawrence Livermore National Laboratory, "Americans using less energy, more renewables," Aug. 23, 2010.
5. National Academies of Science, "Real Prospects for Energy Efficiency in the United States: Report in Brief" (2009).
6. Karen Ehrhardt-Martinez and John A. "Skip" Laitner, "The Size of the U.S. Energy Efficiency Market: Generating a More Complete Picture," American Council for an Energy-Efficient Economy, May 2008, p. 29.
7. McKinsey Global Energy and Materials, "Unlocking Energy Efficiency in the U.S. Economy," July 2009, pp. iii-v.
8. See Hunt Allcott and Sendhil Mullainathan, "Behavior and Energy Policy," 327 Science 1204 (March 5, 2010); Abhijit Banerjee & Barry D. Solomon, "Eco-labeling for energy efficiency and sustainability: a meta-evaluation of U.S. programs," 31 Energy Policy Issue 2 at 109 (2003).
9. See Reid Ewing et al., "Growing Cooler: The Evidence on Urban Development and Climate Change" (Urban Land Institute 2008).
10. See Esposito, "State Plans for Clean Air: Have the Section 179 Sanction Provisions Become the Achilles Heel of the Clean Air Act?" 15 Tep. Envtl. L. & Tech. J. 241 (1996).
11. See Henry Stern, "A Necessary Collision: Climate Change, Land use, and the Limits of A.B. 32," 35 Ecology L.Q. 611 (2008); Patricia Salkin, "Sustainability and Land Use Planning: Greening State and Local Land Use Plans and Regulations to Address Climate Change Challenges and Preserve Resources for Future Generations" 34 Wm. & Mary Envtl. L. & Pol'y Review 121 (2009).
12. Laura A. Furrey et al., "Laying the Foundation for Implementing a Federal Energy Efficiency Resource Standard" (American Council for an Energy-Efficient Economy, March 2009).
13. Statement of Richard Kidd, Program Manager, Federal Energy Management Program, Office of Energy Efficiency and Renewable Energy, Department of Energy, before the Senate Subcommittee on Federal Financial Management, Government Information, Federal Services and International Security, Committee on Homeland Security and Government Affairs, Jan. 27, 2010.
14. Various lists of impediments to energy efficiency can be found in Neil Peretz, "Growing the Energy Efficiency Market Through Third-Party Financing," 30 Energy L.J. 377 (2009); McKinsey Global Energy and Materials, "Unlocking Energy Efficiency in the U.S. Economy," July 2009, pp. 22-7; Richard L. Ottinger et al., "Renewable Energy in National Legislation: Challenges and Opportunities," in Donald N. Zillman, et al., "Beyond the Carbon Economy: Energy Law in Transition" (Oxford 2008), 183-206.
15. Neil Peretz, "Growing the Energy Efficiency Market Through Third-Party Financing," 30 Energy L.J. 377, 386 (2009).
16. Kenneth Gillingham et al., "Energy Efficiency Economics and Policy," 2009 Annu. Rev. Resour. Econ. 597, 601.
17. David Hodas, "Imagining the Unimaginable: Reducing U.S. Greenhouse Gas Emissions by 40%," 26 Va. Envtl. L.J. 271, 288-289 (2008).
18. Kenneth Gillingham et al., "Energy Efficiency Economics and Policy," 2009 Annu. Rev. Resour. Econ. 597, 607.
19. See Noah M. Sachs, "Greening Demand: Energy Consumption and U.S. Climate Policy," 19 Duke Envtl. L. & Pol'y F. 296 (2009); National Action Plan for Energy Efficiency, "Aligning Utility Incentives with Investment in Energy Efficiency" (2007).