ENERGY EFFICIENCY
Public Policy Issues and Recommendations

Authors: Howard Geller, Southwest Energy Efficiency Project
and Sheryl Carter, Natural Resources Defense Council

The West's economy operates with significant untapped energy efficiency potential. Exploiting this potential would generate hundreds of millions of dollars in direct cost savings to ratepayers and dramatically increase the productivity of the economy, while offering considerable health and environmental benefits. These efficiency gains can be realized through the promotion of public policy to develop market infrastructure, establish standards, and create financing mechanisms.

Increasing the energy efficiency of appliances, lighting products, heating and cooling systems, new buildings, factories, vehicles, and other devices yields a number of benefits including:

- saving consumers and businesses money;
- enhancing the reliability of the power grid and natural gas supply systems;
- reducing oil and natural gas imports;
- cutting local and regional polluting emissions;
- restraining the growth of climate changing emissions;
- saving precious water resources;
- keeping money in local economies while adding jobs; and
- improving economic productivity and competitiveness.

Saving energy through energy efficiency improvements costs much less than supplying energy from new power plants and associated transmission and distribution facilities. For example, saving electricity typically costs 2 to 3 cents per kWh saved, two to three times less than the delivered cost of electricity from new power plants (Nadel and Kushler 2000; Geller 2003). And this comparison does not include the costs from pollutant emissions or other "externalities" associated with conventional energy supply.

Improving the energy efficiency of homes and businesses will lead to a net increase in jobs due to the labor required to manufacture, sell and install energy efficiency measures, as well as the shift in expenditures away from energy supply (which is not labor intensive) to other more labor-intensive sectors of the economy. For example, it is estimated that steadily increasing the efficiency of electricity use in six southwest states (AZ, CO, NM, NV, UT and WY) could lead to a net increase of 20,000 jobs in the region by 2010 and 58,000 jobs by 2020 (SWEEP 2002).

Increasing the efficiency of electricity use is especially important in rapidly growing, arid western states. End-use efficiency improvements reduce water consumption by power plants, reduce emissions that are contributing to urban air quality problems, and reduce emissions that are causing haze and deteriorating visibility in our region's national parks

and wilderness areas. Increasing the efficiency of electricity use also would reduce the strain on the electricity grid and thus increase the reliability of electricity supply.

During the 2001 California energy crisis, state and utility energy efficiency programs contributed to critically-needed reductions in energy use. Relative to 2000, electricity consumption fell about 6% and peak demand declined by nearly 8%, after adjustment for economic growth and weather conditions. These energy savings were the main reason California did not experience further costly power outages during the summer of 2001. This experience demonstrated that expanding energy efficiency programs can be an effective strategy for addressing a short-term electricity supply-demand imbalance, in addition to the other benefits (NRDC and SVMG 2003).

In short, improving energy efficiency is a win-win strategy for our economy, environment, and security. But a number of market flaws and barriers limit the investment in energy efficiency measures in the "real world." These market flaws and barriers include:

- Energy prices do not reflect the full costs to society associated with energy production and use;
- Households and businesses may not be aware of energy savings opportunities;
- Households and businesses make many purchase in a hurry without considering lifecycle cost;
- In some cases, those making construction and purchase decisions are not responsible for paying energy bills, e.g., in rental property; and
- Energy represents a relatively small fraction of total costs for most businesses, meaning that increasing energy efficiency is not a high priority.

In spite of these market barriers and flaws, energy efficiency improvements have already made a major contribution. In 2002, the United States used 44% less energy per unit of GDP than in 1973 (EIA 2003). Some of this decline was due to structural changes such as the shift towards a service economy, but much of it was due to real energy efficiency measures (Schipper, Howarth, and Geller 1990; Murtishaw and Schipper 2001). However, there is still tremendous potential for cost-effective energy efficiency improvements throughout the U.S. economy (Interlaboratory Working Group 2000; Geller 2003).

Utility and/or State Efficiency Programs

Many electric and gas utilities operate programs to expand the adoption of cost-effective energy efficiency measures. Comprehensive programs include promotion, education and training, technical assistance, financing, and/or rebates for households as well as businesses. In effect, all customers are given the opportunity to participate. Utilities implement these efficiency programs in most states, while in a few cases implementation is done by state agencies or third party program administrators. All of these approaches can work as long as adequate funding and oversight is provided

Energy efficiency programs in leading states such as California, Connecticut, Minnesota and Wisconsin reduced electricity use by 5-7% in 2000 as a result of their cumulative efforts (York and Kushler 2002). Furthermore, the top states or utilities, ranging from the investor-owned utilities in Connecticut to Xcel Energy in Minnesota to the statewide program in Vermont, are saving on the order of 1% of electricity use annually. And some states and utilities in the West, including the state of California and municipal utilities in Austin, TX and Fort Collins, CO, are embracing a goal of reducing electricity use and peak demand by 1% per year or more through energy efficiency programs.

In response to restructuring and to stem resulting reductions in energy efficiency investments, a small surcharge on all electricity and/or natural gas sales, also known as a public benefits charge, has become the primary source of funding for utility and state energy efficiency programs since the mid-1990s. About 20 states have adopted a small electricity surcharge to fund energy efficiency programs and other public benefit activities. In the leading states, the energy efficiency surcharge ranges from 2 to 3 percent of utility revenues (Kushler and Witte 2001).

Total funding for utility and other state-based energy efficiency programs is on the rise. Funding for electricity conservation efforts increased from about $0.9 billion in 1997 to $1.1 billion in 2000, mainly due to adoption of public benefit charges (York and Kushler 2002). Funding is continuing to increase as more states and utilities seek the broad energy and economic benefits offered by greater energy efficiency. Funding also is increasing as more states and utilities consider energy efficiency as a critical resource in strategic planning. In 2003, it is estimated that funding for utility and state-based energy efficiency programs reached about $1.45 billion nationwide (ACEEE 2003). California recently increased funding by investor-owned utilities for energy efficiency progams to over $400 million per year in 2004 and 2005, nearly doubling the projected energy savings compared to levels achieved in previous years and avoiding the equivalent of another large power plant each year.

But the support and funding for energy efficiency programs is still very uneven. Leading states including California are investing over $10 per capita in cost-effective energy efficiency programs, while a number of states invest less than $1 per capita (York and Kushler 2002). Arizona and New Mexico (and their utilities) are included in the latter category.[1]

States and utilities that are operating minimal energy efficiency programs are wasting energy, paying unnecessarily high energy bills, and diminishing electric system reliability at the local and regional level. These states and utilities are also producing more pollution than would be the case if they had stronger energy efficiency programs, thereby adversely affecting regional and national efforts to reduce air pollution including greenhouse gas emissions.

Codes and Standards

[1] Colorado and Nevada also spent less than $1 per capita on utility energy efficiency programs as of 2000, but newer initiatives subsequently increased funding above this threshold.

State-of-the-art building energy codes reduce electricity use, peak electric demand, and natural gas use in new homes and commercial buildings by 15-30 percent on average. Codes are a very cost-effective way to reduce energy use and lower energy bills over the lifetime of a building. As of the end of 2003, about 24 states had adopted a state-of-the-art code, defined as the 2000 or more recent version of the International Energy Conservation Code (IECC). Some western states including California, Idaho, Oregon, Utah, and Washington had done this, but other western states had not (BCAP 2003).

In order to achieve maximum energy and economic savings, architects and builders need to understand how to comply with codes in a cost-effective manner. Also, builders need to control the quality of their buildings and code officials need to rigorously enforce the codes. If these actions are taken, state-of-the-art building energy codes could reduce overall electricity and natural gas use in the region 4-8% by 2020 (SWEEP 2002).

Building energy codes establish a floor on energy efficiency; they do not "push the envelope." It is possible to reduce energy consumption by 30-50% relative to code requirements, and do so cost effectively, by combining efficiency measures through an integrated design approach. This potential is not speculative—it is already being achieved in thousands of new homes and some commercial buildings recently built in the western U.S. (Kinney, Geller and Ruzzin 2003). But the vast majority of new homes and commercial buildings fall far short of this optimal performance.

National appliance efficiency standards have greatly reduced the energy consumption of major products such as refrigerators, clothes washers, air conditioners, and furnaces, while increasing performance and reducing product cost. It is technically and economically feasible to extend efficiency standards to numerous other products such as TV set top boxes, torchiere light fixtures, ceiling fans, transformers, exit signs, and ice makers. But the federal government is unlikely to do this on a timely basis because it is fully occupied maintaining, reviewing and updating the national standards that already exist.

Because of this situation, states (e.g., California and Maryland) have begun to adopt efficiency standards on these other products. The state standards prohibit the sale of non-complying inefficient products in the state after a reasonable phase-in period. Model legislation has been introduced in a number of other states to copy what California and Maryland have done (ASAP 2004). It is estimated that the model state standards would reduce electricity use in Colorado by about 1% in 2010 and 1.5% in 2020, for example.

Recommendations

For the reasons given above, all western utilities and states should pursue "best practice" with respect to state and/or utility energy efficiency programs. Best practice means reducing electricity use, peak electric demand, and natural gas use by at least 1% per year as a result of state and/or utility programs, relative to forecasted energy use without these programs. Best practice also means adopting a utility bill surcharge or other funding

mechanism and investing at least 2% of utility revenues on energy efficiency programs. And best practice mean including energy efficiency as a strategic resource in utility resource planning, with energy efficiency pursued to its full cost effective potential.

In the area of new buildings, all states and municipalities should upgrade to state-of-the-art building energy codes, meaning the latest version of the International Energy Conservation Code (IECC). States and municipalities should undertake training and technical assistance efforts once new codes are adopted, as well as rigorously enforce energy codes. In addition, states and utilities should promote the construction of new buildings that significantly exceed minimum code requirements. Last but not least, western states should adopt the cost-effective appliance efficiency standards that California and Maryland have recently adopted.

Conclusion

By implementing comprehensive, well-funded cost-effective energy efficiency programs and adopting state-of-the-art building energy codes as well as new appliance efficiency standards, western states could reduce electricity and natural gas use by at least 7% in 2010 and 20% in 2020, relative to projected energy consumption levels without these efficiency efforts. Achieving this amount of energy savings will significantly reduce load growth, meaning the most costly and controversial new plants could be avoided, while providing economic and environmental benefits to citizens and businesses throughout the west.

References

ACEEE 2003. "State Energy Efficiency Programs Keep Growing, in Contrast to Federal Retreat." Press release, April 25. http://aceee.org/press/0304steeprog.htm

ASAP 2004. Appliance and Equipment Efficiency Standards: New Opportunities for States. Boston, MA: Appliance Standards Awareness Project. http://www.standardsasap.org/stateops.htm

BCAP 2003. Status of State Energy Codes. Washington, DC: Building Codes Assistance Project. http://www.bcap-energy.org/newsletter.htm

Geller, H. 2003. *Energy Revolution: Policies for a Sustainable Future*. Washington, DC: Island Press.

Interlaboratory Working Group. 2000. *Scenarios for a Clean Energy Future*. Oak Ridge, TN: Oak Ridge National Laboratory and Berkeley, CA: Lawrence Berkeley National Laboratory.

Kinney, L., H. Geller, and M. Ruzzin. 2003. *Increasing Energy Efficiency in New Buildings in the Southwest*. Boulder, CO: Southwest Energy Efficiency Project.

Kushler, M. and P. Witte. 2001. *A Revised 50-State Status Report on Electric Restructuring and Public Benefits.* Washington, DC: American Council for an Energy-Efficient Economy.

Murtishaw, S. and L. Schipper. 2001. Disaggregated Analysis of U.S. Energy Consumption in the 1990s: Evidence of the Effects of the Internet and Rapid Economic Growth. *Energy Policy* 28: 1069-1080.

Nadel, S. and M. Kushler. 2000. Public Benefits Funds: A Key Strategy for Advancing Energy Efficiency. *Electricity Journal* 13(8): 74-84.

Natural Resources Defense Council and Silicon Valley Manufacturing Group. 2003. *Energy Efficiency Leadership in California: Preventing the Next Crisis*.

Schipper, L., R.B. Howarth, and H. Geller. 1990. United States Energy Use from 1973 to 1987: The Impacts of Improved Energy Efficiency. *Annual Review of Energy* 15: 455-504.

SWEEP. 2002. *The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest*. Boulder, CO: Southwest Energy Efficiency Project.

York, D. and M. Kushler. 2002. *State Scorecard on Utility and Public Benefits Energy Efficiency Programs: An Update.* Washington, DC: American Council for an Energy-Efficient Economy.

Author Contact Information

Howard Geller: South West Energy Efficiency Project, HGeller@swenergy.org, (303) 447-0078
Sheryl Carter: National Resources Defense Council, SCarter@nrdc.org, (415) 771-0220