An ORNL State Partnerships Program Success Story

Analysis of the Potential for Energy Efficiency in Iowa

As states have restructured their electric power industry, many have established "systems benefit charges" to fund activities that will no longer be funded by utilities in the new structure. Weatherization of low-income housing, efficiency programs, and renewable energy development are examples of activities that will need new funding sources.

Iowa is one state that is grappling with this issue. Iowa has long supported its active energy-efficiency programs through surcharges on electricity and gas rates. Now the state is debating the amount and the allocation of future funding through a possible systems benefit charge. One question to be considered is where funding will be most effective. What is the potential for energy efficiency or renewable power, and what can be accomplished given the amount of funding available?

The Project

To assist Iowa in answering this question, the ORNL State Partnerships Program (SPP) and the Iowa Energy Center funded an ORNL project to provide an initial estimate of the potential for energy efficiency in the state. The analysis relied primarily on economic simulation using the National Energy Modeling System (NEMS), used by the Energy Information Administration (EIA) to calculate 20-year projections of energy use for every region of the country. Using EIA's results from the 2000 Annual Energy Outlook as a base case, the project developed projections for Iowa through 2020.

The project examined the residential, commercial, industrial, and power sectors of the economy, focusing on electric energy savings through improvements in equipment. To represent potential savings as realistically as possible, the Iowa study looked at energy-savings measures that have a market potential and that go beyond what would be expected in normal equipment improvements. The focus was on the potential impact of two key policies: (1) voluntary programs to reduce barriers to energy efficiency (e.g., ENERGYSTAR labeling, financing) and (2) standards to eliminate inefficient equipment (water heaters, air conditioners, heat pumps) from the market. Only savings from major equipment were considered, not savings from measures such as insulation, windows, and other building envelope measures.

The Results

The results indicated that in the residential sector, the main savings in energy use would come from increased efficiency in space cooling and water heating, with only slight savings increases from appliances. In these areas, a total of 850 GWh could be saved in electrical use and 2.1 trillion Btu in gas use (see table). In the commercial sector, notable savings are possible in space heating, lighting, and other areas (see graph) through voluntary market-based policies. A total of 605 GWh could be saved in electrical use and 2.3 trillion Btu in gas use.

In the industrial sector, a survey of potential savings from motor drive system improvements was used to calculate the potential economic savings. Motor systems represent about 40% of electrical use within industry; 14% of this amount could be saved through energy efficiency improvements—or a total of 6% of industrial electrical use. While the residential and commercial sector values recognized market barriers in their estimates, the industrial sector values are solely based on economic potential.

There is a good potential for saving at least 5% of energy use in Iowa through a combination of market-based programs and standards, representing over $100 million per year.

Conclusions

The goal of this SPP project was to provide decision makers with information prior to discussions on restructuring in Iowa. Its results indicate that overall, there is a good potential for saving at least 5% of energy use in Iowa through a combination of market-based programs and standards, representing over $100 million per year. Active state and utility programs should be able to achieve well over this amount, especially if applied to broader savings measures than those studied in this project. Recent rises in energy costs provide state residents and businesses with an even greater incentive to save.

Since the completion of the study, a number of Iowa organizations, including the Governor's Energy Policy Task Force, have used the study in their deliberations. The findings of the study helped to convince the Iowa Utilities Board (IUB) to take a careful look at current energy efficiency programs and the potential to do more. As part of the IUB proceedings, the investor-owned utilities are commissioning a more detailed, Iowa-specific study.

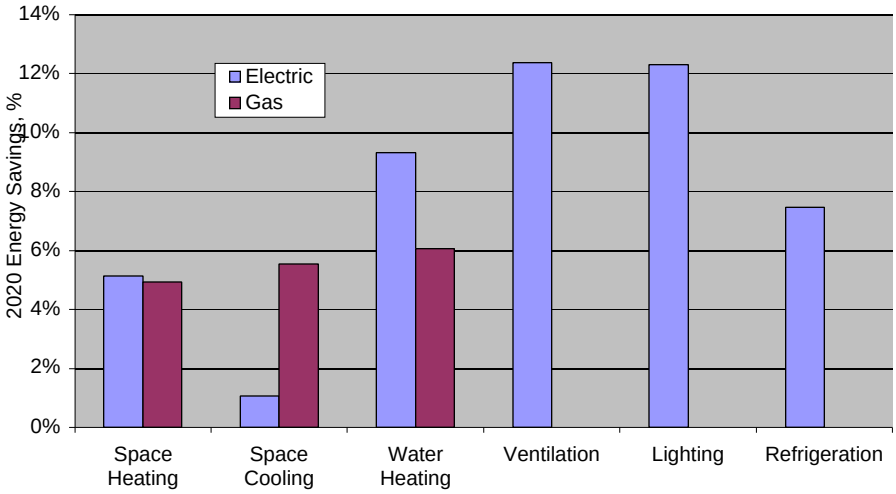
For more information, contact Stan W. Hadley, Oak Ridge National Laboratory, (865) 574-8018, fax (865) 574-9338, e-mail: hadleysw@ornl.gov

Potential energy and cost savings in Iowa by 2020[a]

Sector	Electrical energy savings			Gas use savings			Total cost savings
	%	GWh	Cost	%	Trillion Btu	Cost	
Residential	5.3	850	$47M	2.4	2.1	$12M	$59M
Commercial	5.1	605	33M	3.7	2.3	$13M	46M
Industrial	14.0[b]	930	46M	—	—	—	46M
All sectors	24.4	2385	$126M	6.1	4.4	$25M	$151M

[a] Numbers represent only some of the potential savings and do not include measures such as more energy-efficient lighting in the residential sector, improved insulation, more efficient building standards, and use of distributed energy resources.

[b] Electrical savings only from improvements to motor drive systems, which represent 40% of electrical use in the industrial sector. Values do not reflect market barriers that limit market penetration.



Potential savings by 2020 in the Iowa commercial sector for programs studied.