

Chapter 9: Energy Conservation and Efficiency

For additional data related to energy efficiency and conservation, please refer to the *Kansas Energy Chart Book*, Chapter 9 (http://kec.kansas.gov/chart_book/).

GOAL: Facilitate cost-effective energy conservation in the public, residential, commercial, and industrial sectors.

Reducing demand for energy through conservation and efficiency improvements is an essential component of a comprehensive, long-range strategy to meet the state's future energy needs.

Topic / Issue Description

U.S. energy consumption is expected to grow, though the rate of growth is dependent on trends in population, economic growth, energy prices, and technology adoption. Nationwide, demand for electricity increased 3.2 percent from 2004 to 2005 (the most recent year for which data are available), though the average annual increase of 2.3 percent since 1980 is perhaps a better indicator.¹

In Kansas, electric utility customers used 39,024,283 megawatthours in 2005,² a 5.4 percent increase over 2004. Natural gas consumption also rose slightly: up 2.1 percent from 206,497 thousand Mcf in 2004 to 210,771 Mcf in 2005; nonetheless, statewide consumption of natural gas in 2005 is still significantly lower than it was in 1995, a reflection of consumer response to increased prices in recent years.

The growth in energy consumption occurs amidst discussions by U.S. policymakers and others of the potential for conservation through reduced usage and efficiency gains in the residential, commercial, industrial, and public sectors. Worldwide, businesses and industries are looking for ways to increase efficiency and reduce energy usage, with varying estimates of the potential to be achieved. A recent study by the International Energy Agency estimates that heavy industry could reduce its energy use by 18 percent to 26 percent. Light industries, such as retailing and the food sector, which haven't invested as much to date in efficiency, could reduce energy use even more.³

Here in Kansas, many existing buildings are poorly insulated or have inefficient heating and cooling systems, resulting in excessive energy use and, consequently, excessive energy bills year round. Cost-effective energy conservation measures—such as upgrading attic insulation to at least R-38 or installing an Energy Star

¹U.S. Department of Energy, Energy Information Administration (EIA), 2006, Electric Sales, Revenue, and Average Price 2005: http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html (accessed September 5, 2007).

² EIA, 2006, Historical EPA Electric Sales and Revenue Spreadsheets: http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html, sales_state.xls (accessed September 5, 2007).

³ Leila Abboud and John Biers, 2007, Business Goes on an Energy Diet: Wall Street Journal, August 27, 2007.

qualified furnace—can reduce energy usage by as much as 20 percent,⁴ while providing dollar savings as well. Increased adoption of these measures statewide can have a significant impact on energy consumption in Kansas. Reduced energy consumption through conservation may provide a range of benefits, including downward pressure on all energy-related prices, deferral of energy-related costs such as investment in new power plants and extraction equipment, and reduction in health and environmental costs related to the energy-related emission of pollutants and greenhouse gases. And, finally, energy conservation by individual ratepayers can result in lower monthly utility bills.

Existing Policies and Programs

1. In her Executive Directive 07-373, Governor Sebelius targeted energy conservation and efficiency throughout State government. The directive requires state agencies (primarily the Department of Administration, Kansas Corporation Commission, and Kansas Department of Health and Environment to (1) survey state employees for energy saving suggestions; (2) require energy audits on any facility being considered as leased space and require landlords to make necessary improvements; (3) collect energy data associated with state-owned and leased space and identify locations using excessive energy; (4) ensure that the average EPA mileage rating for auto purchases and leases in 2010 is at least 10% higher than the 2007 average; (5) review purchasing practices to assure 100% compliance with existing energy conservation requirements and develop or increase standards for such products as appliances, light bulbs, and computers using Energy Star as a minimum; (6) turn off all computers not having a technical or operational need when not in use for four or more hours; (7) expand state recycling program to every state office by December 2007; (8) include information on fuel efficiency and driver behavior in driver's handbook and exam; (9) use the Facility Conservation Improvement Program (FCIP) to implement cost-effective conservation and efficiency measures in all state-owned buildings by 2010; (11) accelerate efforts to market FCIP to school districts and local governments; and (12) review all state construction projects, both new and remodeling, that exceed \$100,000 for possible inclusion in FCIP, including Regents facilities. The Governor's directive also established a new Energy Auditor position at the Department of Administration, responsible for oversight of these initiatives.
2. K.S.A. 66-1227, as amended by HB 2036, adopts the International Energy Conservation Code 2006 (IECC 2006) as the applicable energy efficiency standard for new commercial and industrial structures in Kansas.
3. K.S.A. 66-1228, as amended by HB 2036, requires the builder or seller of a new home to disclose to prospective buyers, "at any time upon request or prior to the

⁴ U.S. EPA and DOE Energy Star web site: http://www.energystar.gov/index.cfm?c=heat_cool.pr_hvac and http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_sealing (accessed October 23, 2006).

signing of a contract to purchase and prior to closing,” information regarding the energy efficiency of the structure using a revised, user-friendly form outlined in the statute.

4. The U.S. Department of Energy (DOE), through its Building Technologies Program, funds several initiatives to advance research and development of energy efficient buildings, improve building codes and appliance standards, and promote education. Energy Star, a joint program of the U.S. Environmental Protection Agency (EPA), is a voluntary labeling program designed to identify and promote energy-efficient products; the Energy Star label is now on major appliances, office equipment, lighting, and home electronics, and EPA has extended the label to cover new homes and commercial and industrial buildings. The Building Technologies Program also includes Rebuild America, and Zero Energy Buildings.
5. The Federal Energy Management Program, administered by DOE, targets the federal government for energy efficiency improvements, encouraging energy efficient equipment purchases, construction, retrofitting, and operations.
6. The DOE also administers the Industrial Technologies Program, which focuses on researching new methods, materials, and machinery to conserve energy as well as promoting best practices in industry.
7. Statewide, a number of municipalities have adopted ordinances addressing, to varying degrees, energy efficiency and conservation in residential structures. According to results of a 2007 survey of the 25 cities of the first class, most of the state’s larger cities have adopted some version of the International Residential Code (IRC) or the International Building Code (IBC). Specifically, Overland Park and Prairie Village have adopted the 2006 IRC/IBC standards, which are equivalent to the 2006 IECC; Topeka has adopted the 2006 IRC/IBC (without the energy efficiency requirements); Garden City, Hutchison, Junction City, Kansas City, Lenexa, Manhattan, Newton, Pittsburg, and Shawnee have adopted the 2003 IRC/IBC (with Manhattan and Kansas City also adopting the 2003 IECC); Salina has adopted the 2003 IRC/ IBC (without the energy efficiency requirements); Leawood and Wichita have adopted the 2000 IRC/ IBC; Liberal and Parsons have adopted the 1997 UBC; Wichita has its own ceiling insulation and window and door standards. Emporia, Fort Scott, Lawrence, Leavenworth, Olathe, Salina, and Topeka have not adopted any residential energy efficiency codes, though some of these cities have plan to do so. Enforcement of these codes varies greatly among these cities.
8. The Division of Facilities Management in the Kansas Department of Administration has adopted the 2003 International Energy Conservation Code (IECC) as its standard for all new state-owned facilities. Compliance with these standards will be a contractual requirement and will be enforced by the Division of Facilities Management.

9. Several Kansas utilities offer energy conservation services to their customers, including energy audits and rebates for heating systems, water heaters, and appliances.
10. The Kansas Weatherization Assistance Program (WAP), operated by the Kansas Housing Resources Corporation, provides housing improvements that increase energy efficiency in households with income up to 150% of the federal poverty level or 60% of the state median income, whichever is higher. WAP has historically been funded solely through federal funds (15% of the LIEAP funds from the U.S. Department of Energy). In Fiscal Year 2007, State of Kansas general funds were appropriated to supplement the program.
11. The Facilities Conservation Improvement Program (FCIP), administered by the Kansas Energy Office, is designed to streamline the acquisition and installation of energy conservation measures by public agencies. FCIP connects public agencies (e.g., the state, municipalities, counties, and schools) with qualified private energy service companies (ESCOs) that identify and evaluate energy-saving opportunities and recommend a package of improvements to be paid for through the projected energy savings. The ESCO guarantees that customer savings meet or exceed annual payments to cover all project costs—usually through a contract having a term of between ten and fifteen years. If actual savings don't materialize, falling below the annual payments made to cover the project cost, the ESCO pays the difference. To help ensure savings over the term of the contract, the ESCO offers staff training and long-term maintenance services.
12. In November 2006, the Kansas Housing Resources Corporation (KHRC) launched KEEP, a statewide loan program to promote energy conservation and reduce home heating costs. This new program allows low- and moderate-income homeowners to obtain low-interest loans to finance energy conservation home improvements. With \$2 million in State funding, the program funds half of the loan amount at zero interest (the other half is provided by Sunflower Bank), up to a maximum of \$7,500.
13. In September 2006, the Kansas Corporation Commission opened a generic investigation (Docket No. 07-GIMX-247-GIV), *In the Matter of a General Investigation Regarding Energy Efficiency Programs*. The KCC Staff Report and Recommendation, issued May 8, 2007, concluded, among other things, that the KCC has the authority to approve and require energy efficiency programs, as well as to provide incentives to utilities in addition to an increased rate of return, including implementation of a decoupling mechanism. This staff report also recommended the KCC should require or encourage utilities to evaluate and offer energy efficiency programs to comply with obligations to provide efficient services and to take a number of interim steps. As of September 1, 2007, the Commission had not issued a determination on the various issues and questions raised in the docket.

14. Current state law, K.S.A. 66-177(e), permits the Kansas Corporation Commission to grant an additional 50 to 200 basis points on the utility's allowed rate of return on utility investments in renewable energy and energy conservation and energy efficiency. This higher rate of return may be allowed if it is determined, after public hearing, that these programs or measures provide "a reduction in energy usage by its customers in a cost-effective manner."
15. The U.S. Environmental Protection Agency and the Department of Energy have developed a National Action Plan for Energy Efficiency, the goal of which is "to create a sustainable, aggressive national commitment to energy efficiency through gas and electric utilities, utility regulators, and partner organizations."⁵ Chief among the recommendations released in July 2006 are the recognition of energy efficiency as a high-priority energy resource, a long-term commitment to implementing energy efficiency through stable funding, and the alignment of utility incentives with delivery of cost-effective energy efficiency programs.

⁵ EPA, National Action Plan for Energy Efficiency Web Site:
<http://www.epa.gov/cleanrgy/actionplan/eeactionplan.htm> (accessed October 24, 2006).

Policy and Program Recommendations Requiring Legislative Action

1. Expand weatherization assistance to low-income households.

To help low-income Kansans reduce their energy bills and improve the efficiency of some of the least efficient residential housing stock, the State of Kansas should provide \$2 million in annual funding to expand services provided through the Kansas Weatherization Assistance Program (WAP).⁶

Operated by the Kansas Housing Resources Corporation (KHRC), WAP provides housing improvements that increase energy efficiency in households with incomes up to 150% of the federal poverty level or 60% of the state median income, whichever is higher. The weatherization improvements are provided through local public or private not-for-profit agencies, which apply for the grants from KHRC. Due to the high technical investment and expertise required to operate the grants, the local grants are generally continued from year to year.

The average house in Kansas is over 40 years old, and homes of many lower income Kansans are much older. Most homes occupied by low-income families lack adequate insulation and have older, less efficient (and sometimes dangerous) mechanical systems. In addition to the energy savings, weatherization benefits the residents' health and safety through improvement of indoor air quality, vent repairs for water heaters and furnaces, removal of unvented heaters, duct balancing to eliminate backdrafts, and repair of gas leaks.

Historically, weatherization has increased residential energy efficiency by up to 25%. In 2006, a total of 1,726 homes were weatherized and 453 dangerous furnaces were replaced. Of the households served by WAP, 506 had occupants who were elderly and 370 were occupied by persons with disabilities.

Traditionally, WAP has been funded solely through federal funds (15% of the LIEAP funds transferred from SRS and annual allocations from the U.S. Department of Energy), which varies from year to year. In Fiscal Year 2007, State of Kansas general funds were appropriated to supplement the program, which allowed WAP to increase the number of homes weatherized by about 30 percent.

With predictable State funding, WAP would not only be able to weatherize more low-income Kansas households, but also improve program performance at the local level. In addition, State funding would allow the program to consider some changes to increase efficiency in weatherized homes.

⁶ According to a recent study conducted for LIEAP, nearly 43,000 Kansas households spend 44.7% of their income on home energy bills and another 27,564 households spend 18.0% of their income on energy bills. Source: *On the Brink: 2006: The Home Energy Affordability Gap*, April 2007.

2. Provide funding for energy conservation education in the public schools (K-12).

Because educating school children is an essential component of a statewide educational campaign to promote energy conservation, the State should provide funds to establish a K-12 energy conservation education program.

This program should be implemented by the Kansas Association for Conservation and Environmental Education (KACEE), a private, non-profit association that has been working with teachers and school districts since 1969 to promote and provide “effective, non-biased and science-based” conservation and environmental education. KACEE has an established statewide network that includes partnerships with the Kansas State Board of Education and Department of Education, the Kansas Association of Teachers of Science, numerous schools and school districts throughout the state, as well as supporting public and private entities that work to promote and provide environmental education throughout the state. These established partnerships uniquely position KACEE to work with audiences that will generate the most impact for the educational outreach effort.⁷

KACEE already has acquired curriculum materials targeting energy conservation—a program called Project Learning Tree Energy and Society. Project Learning Tree’s Energy and Society program was developed nationally to provide teachers with non-biased and science-based hands-on activities that promote critical thinking and problem-solving related to energy and energy issues. This is a supplemental program that can be used to help teachers attain state standards in reading, writing, math, science and social studies, while engaging students in exploring energy, energy use, natural resources and energy conservation. The materials have been evaluated by the North American Association for Environmental Education’s Guidelines for Excellence and have been found to be high-quality energy conservation education materials.

In addition, KACEE is currently working with the Kansas Department of Health and Environment, Bureau of Air and Radiation to implement a Green Schools program, which includes energy audits and on-site conservation and service learning projects. Because of the strong statewide partnerships KACEE has established, they can use this and other related initiatives in combination with the proposed K-12 energy conservation education program to offer a comprehensive and exciting program for students throughout the state.

KACEE staff estimates that they could provide energy conservation training for about 200 educators in geographically diverse regions of the state for approximately \$30,000 a year. These teachers would reach an estimated 6,000 school children in the first year, with the numbers nearly doubling in the second year, tripling in the third, etc., as trained teachers go on to teach each year’s students. KACEE is also in the process of exploring opportunities to offer these courses to teachers in an online setting, which would allow

⁷ More information about KACEE is available on their web site (www.kacee.org).

even greater access to the energy conservation education program and materials, thus potentially significantly increasing impact.

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3. Amend Existing Laws Relating to Energy Efficiency Standards for Commercial and Industrial Structures

To ensure that the State standard for new construction in the commercial and industrial sectors has more than symbolic value, K.S.A. 66-1227 needs to be amended to clarify where the standard applies and allow for enforcement.

During the 2007 legislative session, K.S.A. 66-1227 was amended by HB 2036 to read:

“The International Energy Conservation Code 2006 (IECC 2006) is hereby adopted as the applicable energy efficiency standard for new commercial and industrial structures in this state (Section 1.(a)).”

However, subsequent provisions seem to prohibit enforcement, at least by the KCC, and suggest that less stringent standards may be adopted by local jurisdictions:

“The state corporation commission has no authority to adopt or enforce energy efficiency standards for residential , commercial or industrial structures (Section 1.(b)).”

“Nothing in this section shall be construed to preclude a city or county from adopting or enforcing energy efficiency standards for structures within the jurisdiction of such city or county (Section 1.(c)).”

According to a memo from the KCC Legal Division staff, the statute and its subsequent amendments are vague and do not provide the substantial degree of guidance necessary to reach definitive conclusions.

To ensure that new commercial and industrial buildings are built to the statewide energy efficiency standard adopted by K.S.A. 66-1227, the statute should, therefore, be amended to (1) clarify its application in local jurisdictions and (2) to provide a mechanism and funding for enforcement.

K.S.A. 66-1227 should also be amended to allow the Kansas Energy Office, a division of the Kansas Corporation Commission (KCC), to develop model energy efficiency building codes for voluntary local adoption. The current wording of Section 1.(b) of the current statute—the KCC has “no authority to adopt or enforce energy efficiency standards for residential, commercial, or industrial structures”—could be interpreted as preventing the KEO from developing and promoting model codes (see Administrative Recommendation, p. 10).

Policy and Program Recommendations Requiring Administrative Action

1. Adopt energy efficiency standards for all new publicly funded structures.

To set an example for local government statewide, the Kansas Department of Administration should adopt minimum energy efficiency standards for all new State construction. Although many activities are underway throughout State government to improve efficiency and reduce consumption in existing public buildings, the State needs to adopt standards to ensure that all new public structures incorporate cost-effective energy efficiency and conservation measures.

The Governor's January 2007 Executive Order (07-373) targets energy conservation in existing State-owned and leased facilities. Specifically, the Department of Administration is directed to (1) require energy audits on all facilities being considered as leased space and require landlord to make necessary improvements and (2) collect energy data associated with state-owned and leased space and identify locations using excessive energy. In addition, the Facility Conservation Improvement Program (FCIP) at the Kansas Energy Office is directed to: (1) to implement cost-effective conservation and efficiency measures in all state-owned buildings by 2010, (2) accelerate efforts to market FCIP to school districts and local governments, and (3) review all state construction projects, both new and remodeling, that exceed \$100,000 for possible inclusion in FCIP, including Regents facilities.

To build on these efforts, the State also needs to adopt robust and comprehensive energy efficiency standards for all new construction in the public sector, including Regents facilities.

[Note: The Kansas Legislature's Special Committee on Energy, Natural Resources and the Environment will be meeting on September 17 and September 20. One of the topics they will be discussing is the adoption of energy efficiency standards for publicly financed structures.]

2. Expand existing low-interest revolving loan program to facilitate adoption of energy conservation improvements by all Kansans.

To improve the energy efficiency of the State's residential structures and increase energy conservation statewide, the Kansas Housing Resources Corporation (KHRC) should redesign the current low-interest energy efficiency loan program (KEEP) and broaden the income eligibility requirements.

In November 2006, the KHRC launched the Kansas Energy Efficiency Program (KEEP), which provides low-interest loans to qualified Kansas homeowners to make improvements to increase energy efficiency. As of August 2007, KHRC had received 17 applications, and 11 loans had been made. Currently, the program is limited to individuals who have income at or below 120 percent of the median income for their area (which is \$77,915 for a family of four). KHRC funds half of the loaned amount at zero percent, up to a maximum of \$7,500, with the other half provided by Sunflower Bank, currently the only Kansas bank participating in the loan program.

In the redesigned loan program, homeowners with income over 120 percent of median income would be allowed to participate; however, KHRC's portion of the funding would be loaned at one-half the bank rate (effectively, lowering the blended interest rate by one-quarter). This would enable all Kansans to participate in the program, while reserving the lowest blended rate for homeowners with incomes at or below 120 percent of the state's median. KHRC staff will review the successful Nebraska loan program as a basis for potential additional improvements, with the goal of benefiting both borrowers and lenders by simplifying the process.⁸

To promote the redesigned loan program, KHRC would partner with the Kansas Energy Office (KEO). The KEO should include the loan program in its statewide energy conservation education efforts. KHRC will continue to promote the KEEP program through energy providers' meetings and forums, public outreach such as public libraries and county extension offices, and mass mailings to contractors that make energy improvements for Kansans.

⁸ The Nebraska Energy Office has operated a highly successful revolving loan program, the 5% Dollar and Energy Saving Loan Program, since 1990. Nebraska funded its loan pool with \$24 million of oil overcharge funds from 1980 and 1990 court cases. Given its proven track record, the Nebraska program offers a good model for Kansas.

3. Develop program to promote voluntary adoption of residential energy efficiency codes by local units of government.

Following up on the recommendation in the *Kansas Energy Plan 2007*, the Kansas Energy Office (KEO) should work with an advisory group to develop an effective program to promote adoption of residential energy efficiency codes at the local level. The advisory group will include homebuilders and representatives of local government, especially city managers and local building code officials.

In June and July 2007, the KEO surveyed the 24 Kansas cities of the first class for information on their local residential energy efficiency codes. The survey suggests that discussion and adoption of energy efficiency codes is on the rise at the local level and could benefit from state-level support and education.

With input from the advisory group, the KEO should identify the primary components of the new program by April 1, 2008, in order to include in their annual funding request to the Department of Energy, State Energy Program (SEP). Possible components of this new program include: (1) model energy efficiency codes for voluntary local adoption, (2) training building code officials on energy efficiency code enforcement, (3) disseminating latest information on national energy efficiency building codes to city managers and building code officials.

The program would be ready for implementation by July 1, 2008.