

## Chapter 9: Energy Conservation and Efficiency

### Overview

U.S. energy consumption varies with changes in population, economic growth, energy prices, and technology adoption. Total energy consumption declined slightly from 2005 to 2006 (the most recent year for which data are available).<sup>1</sup> Although overall energy consumption is expected to increase, the rate of growth is projected to be much slower through 2030 than in past decades, due to higher prices and increased efforts to improve efficiency<sup>2</sup>—and, in the near term, as a result of the global economic slowdown.

Nationwide, total retail sales of electricity in 2006 (the most recent year for which historical data are available) were 3,670 million MWh, up 0.2 percent from 2005, compared with the 1.8 percent average annual growth since 1995. Sales to the residential sector decreased by 0.6 percent from 2005 to 2006, marking only the second such decrease since 1974. Sales to the commercial sector increased by 1.9 percent, and sales to the industrial sector decreased 0.8 percent.<sup>3</sup>

U.S. natural gas consumption in 2007 was 23,054,056 million cubic feet, an increase of 4.7 percent from 2005.<sup>4</sup> Although natural gas usage per customer has declined for more than twenty years, total consumption is expected to grow. The average U.S. residential natural gas consumption on a weather-adjusted basis declined by 1 percent annually from 1980 to 2000 and by 2.2 percent annually from 2000 to 2006, according to the American Gas Association (AGA).<sup>5</sup>

In Kansas, electric utility customers used 39,751,000 megawatthours in 2006,<sup>6</sup> a 1.9 percent increase over 2005. Natural gas consumption by consumers in 2007 was 230,716 million cubic feet (Mcf), compared to 211,662 Mcf in 2006—nonetheless, statewide consumption of natural gas in 2006 is still significantly lower than it was a decade ago.<sup>7</sup>

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<sup>1</sup> U.S. Dept. of Energy, Energy Information Administration (EIA), 2008, Table 1.3, Primary Energy Consumption by Source, Selected Years, 1949-2007, linked to Annual Energy Review: <http://www.eia.doe.gov/emeu/aer/overview.html> (accessed December 18, 2008).

<sup>2</sup> EIA, 2008, New EIA Energy Outlook projects flat oil consumption to 2030, slower growth in energy use and carbon dioxide emissions, and reduced import dependence: EIA press release, December 17, 2008: <http://www.eia.doe.gov/neic/press/press312.html> (accessed December 18, 2008).

<sup>3</sup> EIA, 2008, Electric Sales, Revenue, and Price: [http://www.eia.doe.gov/cneaf/electricity/esr/esr\\_sum.html](http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html) (accessed December 18, 2008).

<sup>4</sup> EIA, 2008, Natural Gas Consumption by End Use: [http://tonto.eia.doe.gov/dnav/ng/ng\\_cons\\_sum\\_dcu\\_nus\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm) (accessed December 18, 2008).

<sup>5</sup> The total reduction from 2000 to 2006 was 13.1 percent; see American Gas Association, 2007, Response of the American Gas Association to the U.S. House of Representatives, Committee on Energy and Commerce, on Questions Regarding Climate Change, March 19, 2007: [http://energycommerce.house.gov/Climate\\_Change/Solicited%20Responses/AGA.031907.resp.pdf](http://energycommerce.house.gov/Climate_Change/Solicited%20Responses/AGA.031907.resp.pdf) (accessed November 2007).

<sup>6</sup> EIA, 2008, Table 2. Sales to Bundled and Unbundled Consumers by Sector, Census Division, and State 2006: spreadsheet linked to [http://www.eia.doe.gov/cneaf/electricity/esr/esr\\_sum.html](http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html) (accessed December 18, 2008).

<sup>7</sup> EIA, 2008, Natural Gas Consumption by End Use: [http://tonto.eia.doe.gov/dnav/ng/ng\\_cons\\_sum\\_dcu\\_SKS\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_SKS_a.htm) (accessed December 18, 2008).

U.S. policymakers and others continue to discuss the potential for reduced usage through greater efficiency and conservation in the residential, commercial, industrial, and public sectors.<sup>8</sup> A November 2008 report from the National Action Plan for Energy Efficiency sets a goal of achieving all cost-effective energy efficiency by 2025—this aggressive pursuit of energy efficiency “may be able to meet 50 percent or more of the expected load growth over this time frame, similar to meeting 20 percent of electricity consumption and 10 percent of natural gas consumption.”<sup>9</sup>

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.<sup>10</sup>

Here in Kansas, no one doubts that there are opportunities for cost-effective energy conservation and efficiency improvements. 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 qualified furnace—may reduce energy usage by as much as 20 percent,<sup>11</sup> 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, last but not least, energy conservation efforts by individual consumers can result in lower monthly utility bills.

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<sup>8</sup> See Energy Efficiency Potential Study for the State of Kansas: Final Report, prepared by Summit Blue Consulting, submitted to the Kansas Energy Council, August 11, 2008: [http://www.kec.kansas.gov/reports/KEC\\_DSM\\_Final\\_081108.pdf](http://www.kec.kansas.gov/reports/KEC_DSM_Final_081108.pdf).

<sup>9</sup> See National Action Plan for Energy Efficiency Vision for 2025: A Framework for Change, Executive Summary, November 2008: [http://www.epa.gov/cleanenergy/documents/vision\\_execsumm.pdf](http://www.epa.gov/cleanenergy/documents/vision_execsumm.pdf) (accessed December 19, 2008).

<sup>10</sup> Leila Abboud and John Biers, 2007, Business Goes on an Energy Diet: Wall Street Journal, August 27, 2007.

<sup>11</sup> U.S. Environmental Protection Agency and U.S. Dept. of Energy, 2007, Energy Star web site: [http://www.energystar.gov/index.cfm?c=heat\\_cool\\_pr\\_hvac](http://www.energystar.gov/index.cfm?c=heat_cool_pr_hvac) and [http://www.energystar.gov/index.cfm?c=home\\_sealing.hm\\_improvement\\_sealing](http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_sealing) (accessed October 23, 2006).