

A Profile of Missouri Energy Use

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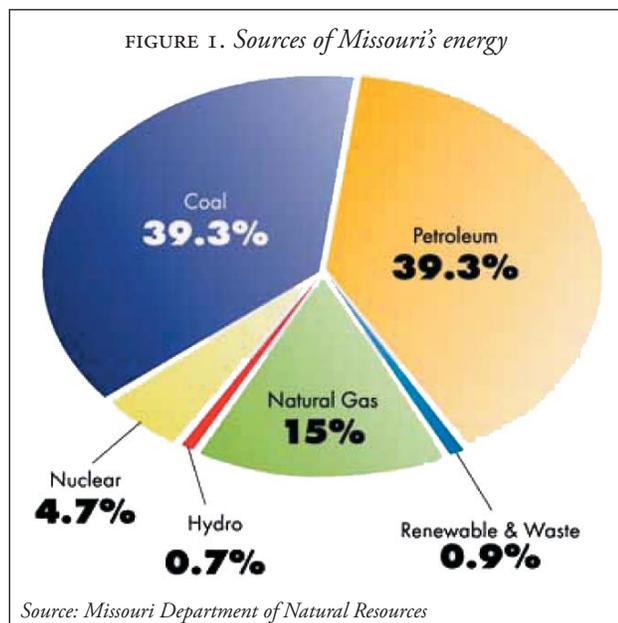
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With the rising prices of energy, and concern over supply shortages, there has been a renewed focus upon energy conservation within the United States. Due to the strong relationship between energy use, environmental quality and economic vitality, energy consumption is a relevant topic for Missouri citizens. The kinds of energy sources we use influence the quality of our environment and the amount of energy we use affects our economy.

SOURCE OF MISSOURI'S ENERGY

Missouri was the first state west of the Mississippi River to produce coal commercially, but output today is minimal (U.S. Department of Energy, 2007). As can be seen from FIGURE 1, almost eighty percent of Missouri's energy comes from coal and petroleum, with the remaining twenty percent of energy in the form of natural gas, nuclear, hydroelectric, and renewable energy. Today, ninety-four percent of Missouri's energy sources are imported from outside the state and almost all occur in the form of fossil fuels (Missouri Department of Natural Resources, 2007). Importing energy costs Missourians approximately \$13 billion each year.



ENERGY CONSUMPTION

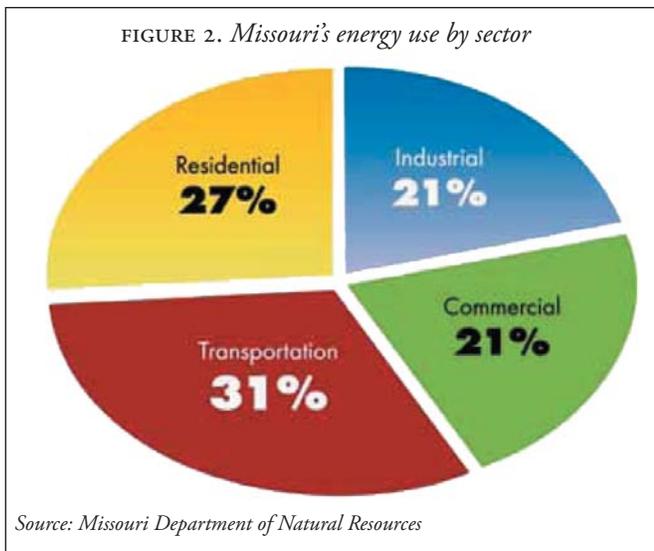
In 2003, Missouri ranked 18th in the nation for population size, at 5.7 million people, and ranked 19th in the nation in total state energy consumption, using 1,841.8 trillion British thermal units (BTUs) (U.S. Department of Energy, 2007). One BTU is approximately equal to the energy released in the burning of a wood match (Missouri Department of Natural Resources, 2006). Missouri accounted for almost 2 percent of the share of total U.S. energy consumption. In 2003, Missouri ranked 10th in the nation in coal consumption, with 795.6 trillion BTUs, and 15th in residential energy consumption, with 498 trillion BTUs (U.S. Department of Energy, 2007). By comparison, the state consumed only 11.6 trillion BTUs of hydroelectric power and 10.7 trillion BTUs of ethanol, both of which are renewable energy sources.

POPULATION DEMAND COMPARED TO ENERGY DEMAND

The impact of Missouri's energy consumption may best be evaluated against a comparison to its population growth. Between 1990 and 2000, Missouri's population grew by 478,138, or 9 percent, while the state's total energy consumption grew by 17 percent (U.S. Census Bureau, 2007). Missouri's total energy consumption grew from 1521.3 trillion BTUs in 1990 to 1787.5 trillion BTUs in 2000 (U.S. Department of Energy, 2003). This highlights how the state's energy use is greatly outpacing its population growth.

ENERGY USE BY SECTOR

Besides total energy use, the state's consumption can be broken down into the amount used for four different sectors of the energy economy: residential, industrial, transportation, and commercial (see FIGURE 2). The residential sector comprises household usage, while the commercial sector is non-industrial businesses and organizations. Together, these two sectors consumed 886 trillion BTUs of energy in 2003 (U.S. Department of Energy, 2003). The transportation sector measures the amount of energy used for all vehicles in the state. This sector consumed 589 trillion BTUs of energy, representing 2.2% of the share of total U.S. energy consumption and 31% of Missouri energy consumption. The industrial sector consumed 366 trillion BTUs of energy.



These data can be used to direct conservation efforts and measure the impacts.

EMISSION LEVELS

Energy use translates into emissions levels. Combustion processes, such as burning coal, diesel fuel, gasoline, natural gas, wood and waste materials, have increased emissions of greenhouse gases, such as carbon dioxide. The two largest sources of greenhouse gas emissions in Missouri are from coal combustion at power plants and petroleum combustion by motor vehicles (Missouri Department of Natural Resources, 2007). Not surprisingly, Missouri ranks in the top twenty states in both energy use and emissions levels. According to the U.S. Environmental Protection Agency, in 2005, Missouri ranked 11th in state carbon dioxide (CO₂) emissions, 14th in state sulfur dioxide (SO₂) emissions and 10th in state nitrogen oxides (NO_x) emissions (U.S. EPA, 2007). Energy use is the predominant source of air pollutants in Missouri. Ninety-four percent of Missouri's total NO_x emissions and 80 percent of SO₂ emissions come from energy use. Specifically, transportation fuel use is the source for about 60 percent of Missouri NO_x emissions, and

fuel use by electric utilities and building owners accounts for an additional third of NO_x (U.S. EPA, 2007). In addition, more than 60 percent of Missouri's sulfur dioxide emissions come from power plants. As can be seen from TABLE I, Missouri's CO₂ emissions have grown every year since 1990, and are projected to grow through the year 2010. Electric utility production accounts for most of the CO₂ emissions, with transportation a close second. This information is useful because reductions in energy use translate into reductions in CO₂ emissions.

POLICY OPTIONS

There are a number of initiatives underway to reduce energy consumption in the state. These include legislation proposed in 2007 to increase the use of alternative fuels, such as E-85, to permit consumers to sell energy generated from alternative renewable fuels to utilities, and to encourage environmentally sustainable energy design. Legislation enacted in 2007 (HCS/SCS/SB54) requires utilities to credit consumers who meet some of their own energy needs (net metering) and sets voluntary targets for electric utility use and renewable energy technologies.

CONCLUSION

Missouri obtains almost all of its energy from other states at considerable cost to Missourians. If consumption continues at the current rate, imports of fossil fuel into the state would have to more than triple by mid-century (Missouri Department of Natural Resources, 2006). Actions taken by the state, commerce and industry and by citizens to reduce the rate of energy consumption will financially benefit Missourians while simultaneously reducing the production of greenhouse gasses and other contaminants.

TABLE I. Missouri's carbon dioxide emissions†

	1990	1995	2000	2005*	2010*
Electric utility	51,539	60,243	71,730	71,378	72,751
Transportation	36,782	42,351	47,150	49,821	51,554
Commercial	4,625	4,991	5,329	5,323	5,330
Industrial	10,284	9,073	9,634	9,506	9,515
Residential	8,242	9,073	9,634	9,506	9,515
TOTAL	111,472	127,156	144,434	148,291	150,860

†in thousands of tons per year

*projections calculated using the department's Energy Center Report from 1990

Source: Missouri Department of Natural Resources



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AUTHOR BIOGRAPHY

Ashley Kluver graduated from the Harry S Truman School of Public Affairs in 2007 with a master's in Public Policy. She earned a bachelor's degree in Public Administration from the University of Northern Iowa. She currently works as a supervisory survey statistician for the U.S. Census Bureau in the Dallas, Texas, office.

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