



## Energy Fact Sheet

While the United States represents 4.4 percent of the world's population it consumes about 18 percent of the energy produced—*U.S. Dept. of Energy (DOE), Energy Information Agency (EIA)*

The United States has more than twice the per capita energy consumption than Japan, United Kingdom, and German combined—*Organization for Economic Cooperation and Development (OECD)*

Approximately 1.2 billion people on earth do not have access to electrical power—*International Energy Agency (IEA)*

In Missouri \$4,340 is spent per person on energy annually—about 17 percent of the median per capita income—*MO Division of Energy*

Fossil fuels provide about 90 percent of the energy needs of Missouri—*MO Division of Energy*

### ENERGY EFFICIENCY AND USE BY SECTOR

Nationally, the industrial sector is the largest energy consumer with almost 32 percent. The transportation sector is second with over 28 percent, and the residential and commercial sectors consume over 21 and 18 percent of energy, respectively. In Missouri the residential and industrial sectors are the largest consumers—*DOE, EIA*

The average American utility customer uses 10,932 kilowatt-hours of electricity each year, three times higher than average world household electricity consumption—*DOE, EIA & World Energy Council*

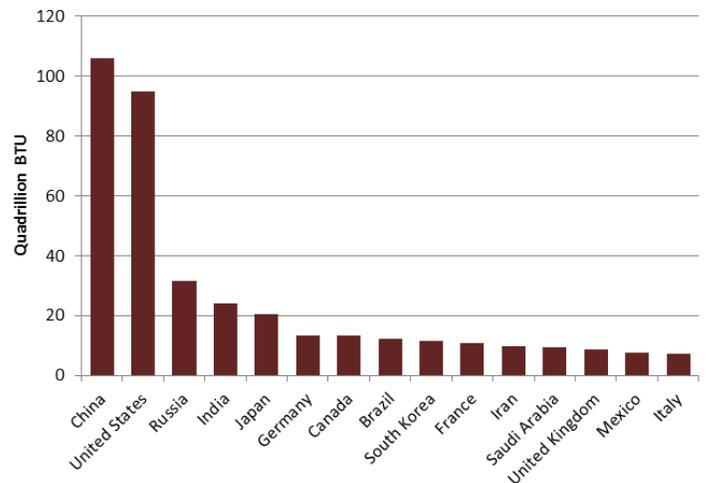
"Homes built between 2000 and 2005 used 14 percent less energy per square foot than homes built in the 1980s and 40 percent less than homes built before 1950." A majority of Missouri homes were built before 1980 and one-fifth before 1950 signifying a large potential for energy savings in Missouri homes—*MO Division of Energy*

There are 200,000 mobile homes in Missouri, roughly 8 percent of all homes. Such buildings tend to be significantly less energy efficient than other forms of housing. A typical manufactured home can use as much as 36 percent more energy than a single family home of equivalent size—*MO Division of Energy*

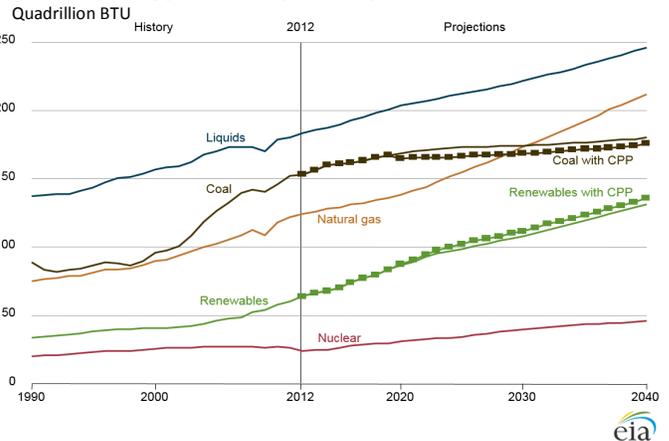
"By 2027, widespread use of LEDs could save about 348 TWh (compared to no LED use) of electricity: This is the equivalent annual electrical output of 44 large electric power plants (1000 megawatts each), and a total savings of more than \$30 billion at today's electricity prices."—*DOE*

## Top 15 Global Energy Consuming Countries

Data from EIA

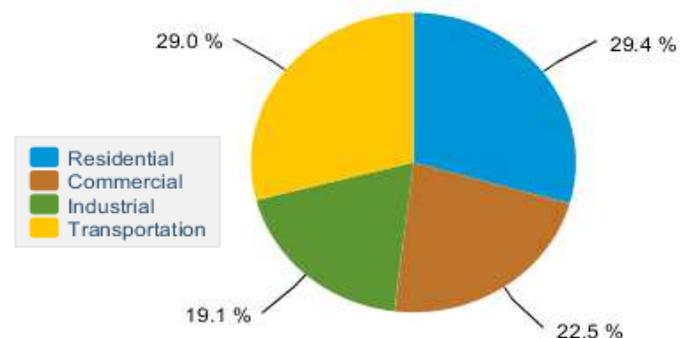


## World Energy Consumption by Source 1990-2040



Energy is often measured in BTU's. This stands for British Thermal Unit and is the amount of energy required to raise one pound of water one degree Fahrenheit. This is the equivalent to the energy released when a single wooden match is burned.

## Missouri Energy Consumption by End-Use Sector, 2014



Source: Energy Information Administration, State Energy Data System

In 2014 ENERGY STAR products comprised 69% of residential clothes washers, 75% of refrigerators, 81% of doors, windows, and skylights, 92% of dishwashers, 93% of notebook computers, 95% of DVD players, and 99% of all televisions—*ENERGY STAR*

U.S. residents spend more than twice the money per year generating hot water than in meeting air-conditioning needs—*DOE, EIA*

The two largest applications of energy by residential buildings are space heating (41.5 percent) and water heating (17.7 percent) (see graphic on right)—*DOE, EIA*

The largest energy consumption in commercial buildings is devoted to space heating (25 percent), lighting (10 percent), refrigeration (10 percent), ventilation (10 percent), and cooling (9 percent)—*DOE, EIA*

### COAL, NATURAL GAS, AND ELECTRICITY

In 2014, the U.S. consumed an average 2.5 million short tons of coal per day—Data from DOE, EIA

Coal is currently mined in 25 states. The leading coal producing states are Wyoming, West Virginia, Kentucky, Pennsylvania, and Illinois—Data from DOE, EIA

More than nine out of every 10 tons of coal mined in the United States is used to generate electricity—*DOE, EIA*

Generating electricity from coal is not very efficient (<35 percent) with most of the energy being lost as heat or during electrical transmission—*DOE, EIA*

Only four other states used more coal than Missouri in 2014: Texas, Illinois, Indiana, and Pennsylvania—*DOE, EIA*

Missouri spent more than \$1.6 billion importing coal to the state in 2013. The second largest per capita expenditure of all states—*MO Division of Energy*

Missouri generates about 80 percent of its electrical needs using coal while the average for the rest of the United States is about 33 percent, and 30 percent globally—*DOE, EIA*

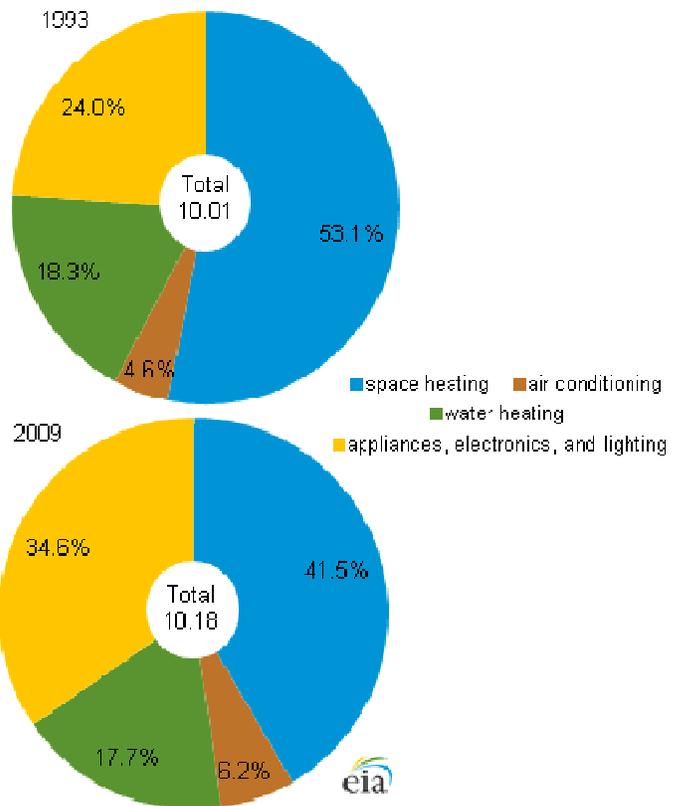
Missouri emitted 131 million metric tons of CO<sub>2</sub> in 2013. Ranking 13th in the U.S. and higher than six of seven bordering states: Oklahoma, Tennessee, Iowa, Kansas, Arkansas, and Nebraska—*DOE, EIA*

Missouri released 1.4 tons of Mercury from coal plants in 2011. Fourth highest in the U.S.—*MO Division of Energy*

Bituminous coal produces 43 percent more carbon dioxide than natural gas—*DOE, EIA*

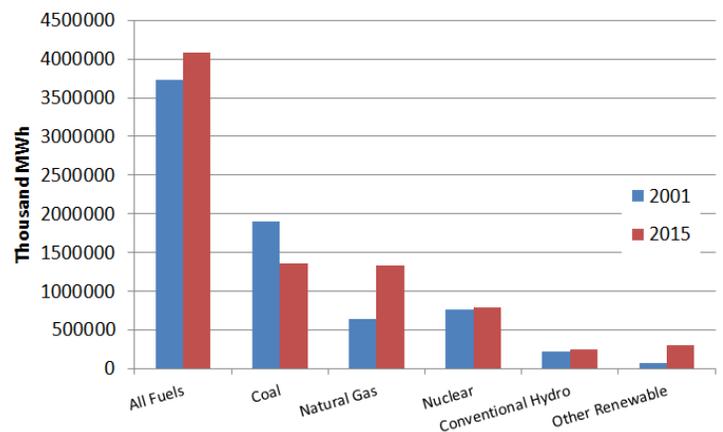
Natural gas provides 29 percent of the United States energy needs—*DOE, EIA*

**Energy consumption in homes by end uses**  
quadrillion Btu and percent



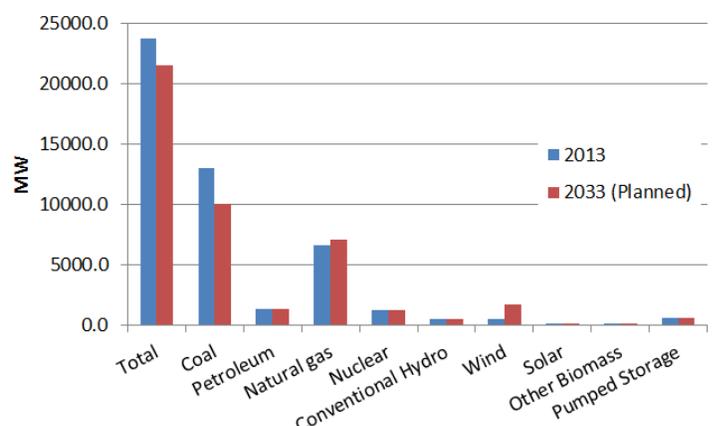
**U.S. Electricity Generation 2001 vs 2015**

Data from EIA



**Missouri Electricity Generation 2013 vs 2033 (Planned)**

Data from MO Division of Energy



Natural gas is the fastest growing fossil fuel and its use is projected to increase by almost 1.9 percent/year globally surpassing coal in 2030—DOE, EIA

It is estimated that Missouri has two trillion cubic feet of natural gas reserves—one of the lowest in the U.S. Most gas producing states have 50 to 500 times this amount—MO Division of Energy

### PETROLEUM AND TRANSPORTATION

Petroleum products (such as gasoline, diesel fuel and jet fuel) are used to meet 89 percent of U.S. transportation needs—DOE, EIA

The U.S. consumes 19.4 million barrels of oil a day, with 9.4 million of those barrels being imported (just under 50%). Missouri consumes 330 thousand barrels of oil a day, the equivalent of each individual citizen consuming 20 barrels of oil a year—DOE, EIA

American refineries produce 2.1 billion gallons of motor oil a year. Just one gallon of improperly disposed oil can pollute 1 million gallons of water—the supply of 50 people for an entire year—American Petroleum Institute, CalRecycle, and EPA

Missouri citizens drive a total of 70.6 billion miles every year—U.S. Federal Highway Administration, Office of Highway Policy Information

Missouri consumed 121 million barrels of petroleum in 2012, paying \$17 billion and releasing over 52 million metric tons of CO<sub>2</sub>—MO Division of Energy

There are over 250 million vehicles registered in the United States—U.S. Federal Highway Administration, Office of Highway Policy Information

While the world population increased 126 percent between 1960 and 2010, the number of automobiles increased by 714 percent. It is predicted that number will double from the 1 billion in 2010 to 2 billion by 2035—Data from Oak Ridge National Laboratory and Ward's Automotive Analysis

### RENEWABLE ENERGY SOURCES

Only 10 percent of the energy used in the U.S. comes from renewable energy sources—DOE, EIA

Traditionally, renewable energy in the U.S. has come primarily from biomass and hydropower, but since 2001 wind power consumption has increased by over 3000 percent and solar photovoltaic power by over 700 percent since 2005—DOE, EIA

In a DOE comparison of levelized costs (a standardized comparison across all electricity generation methods), wind power (\$73.6/MWh) is now cheaper than conventional coal (\$95.1/MWh) and natural gas (\$75.2/MWh)—DOE, EIA

From 2010 to 2015 the cost of installing solar arrays decreased 54% for utility, 63% for commercial, and 55% for residential installations—DOE

It is estimated that Missouri has a greater potential for solar energy than the entire country of Germany—which currently leads the world in installed solar power capability—MO Division of Energy

### NONRENEWABLE ENERGY SOURCES:

Energy sources based on limited reserves created several million years ago by unique geological and physical conditions. Such reserves will eventually run out as the available deposits are depleted.

Examples:

Petroleum, Coal, Natural gas

### RENEWABLE ENERGY SOURCES:

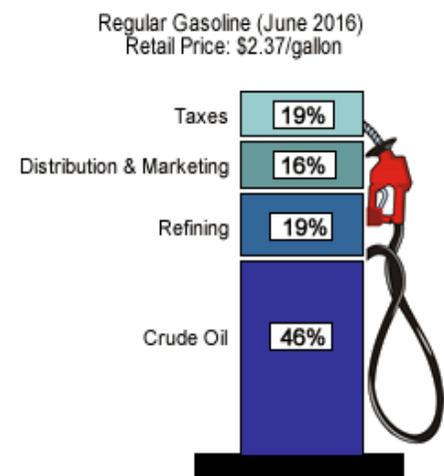
Energy sources based on natural cycles that are replenished in a relatively short time frame. These resources can be managed to meet long-term power needs and will not run out. Trees and crops can be replanted. The sun shines each day. Rivers flow to the sea and winds can be expected to continue to blow.

Examples:

Geothermal energy, Solar energy, Biomass energy, Wind energy, Hydropower

### What we pay for in a gallon of gas:

Source: EIA



China is the world's leading supplier of hydroelectric power, followed by Brazil, Canada, and then the U.S.—*DOE, EIA*

Less than 10 percent of dams in the U.S. are used to produce power. Retrofitting existing dams could add more than 65 GW of power capacity providing 347.4 TWh of annual power (about 44 percent of total hydroelectric power production in the U.S. in 2014)—*DOE*

Iceland heats 90 percent of its homes using geothermal power—*National Energy Authority of Iceland*

In a comparison of levelized costs (a standardized comparison across all electricity generation methods), geothermal is the cheapest electricity production method at \$44.4/MWh. Conventional coal costs \$95.1/MWh and conventional natural gas \$75.2/MWh—*DOE, EIA*

Missouri has the fourth highest biodiesel production capacity in the U.S. Biodiesel is made from vegetable or soybean oil and is nontoxic, biodegradable, and releases fewer emissions when burned than conventional petroleum products—*MO Division of Energy*

Approximately 90 percent of gasoline in the U.S. is now blended with ethanol. Total production of ethanol has increased 739 percent since 2000—*DOE, Alternative Fuels Data Center*

#### THE FUTURE OF ENERGY

Energy consumption is expected to increase 56 percent worldwide by 2040. The largest increases are projected for non-OECD countries, especially in Asia—*DOE, EIA*

Renewable fuels are predicted to be the fastest growing sources of global energy through 2040, followed by nuclear, and then natural gas. Coal is predicted to be the slowest growing energy source, and in some places declining—*DOE, EIA*

By 2040, renewables (29 percent), natural gas (28 percent), and coal (28 percent) are predicted to provide equal shares of global electricity generation—*DOE, EIA*

Missouri is expected to transition away from coal during the next twenty years with a predicted 23 percent decrease in the use of coal, a 7 percent increase in natural gas, 260 percent increase in wind, and a 625 percent increase in the use of solar energy—*MO Division of Energy*

#### MAJOR ENVIRONMENTAL ISSUES RELATED TO ENERGY USE:

Global Climate Change: Warming of the planet as a result of greenhouse gases. Global levels of carbon dioxide have increased 25 percent in the last 100 years. Fossil fuels produce large amounts of carbon dioxide during their use.

Air Pollution: Most metropolitan areas, including St. Louis and Kansas City, are facing problems with smog, ozone levels and a general degradation of air quality. The majority of air pollution issues are the result of energy applications such as automobile exhausts and power plant emissions.

Acid Deposition: "Acid Rain" has been linked to coal-fired power plant emissions and automobile exhausts. Acidic precipitation (rain and snow) causes damage to forest and aquatic ecosystems. As a result of prevailing weather patterns and local geology this problem is especially pronounced in the north-eastern United States.

Land Disturbance and Water Quality Degradation: Mine tailings and mining land disturbance have been associated with water quality problems related to toxic metals, acidification and sedimentation.

Ecosystem Disturbance: Biological systems are often adversely impacted from energy related activities. Impacts occur during mining and drilling (Example: strip mining for coal and Deepwater Horizon), transport (Example: Exxon oil spill), fuel use (Example: mercury emissions from coal/related fish consumption advisories) and disposal (Example: used motor oil and water quality impacts).

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#### For more information:

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