



Transforming America's Energy Future

Missouri Energy Profile

Developed by



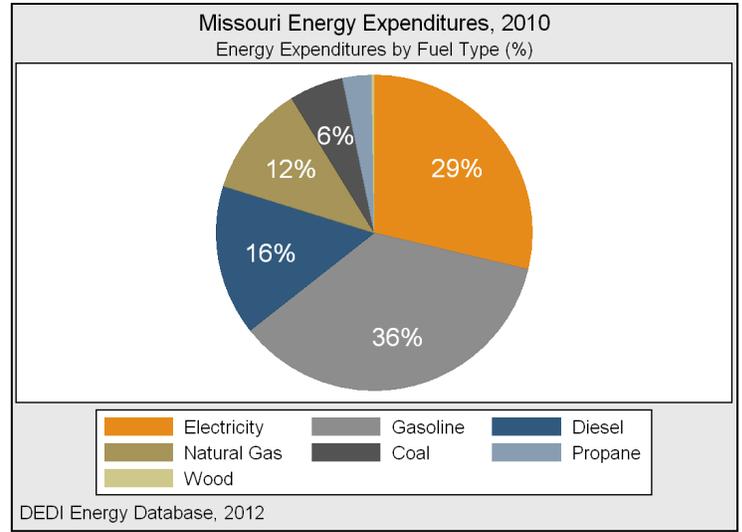
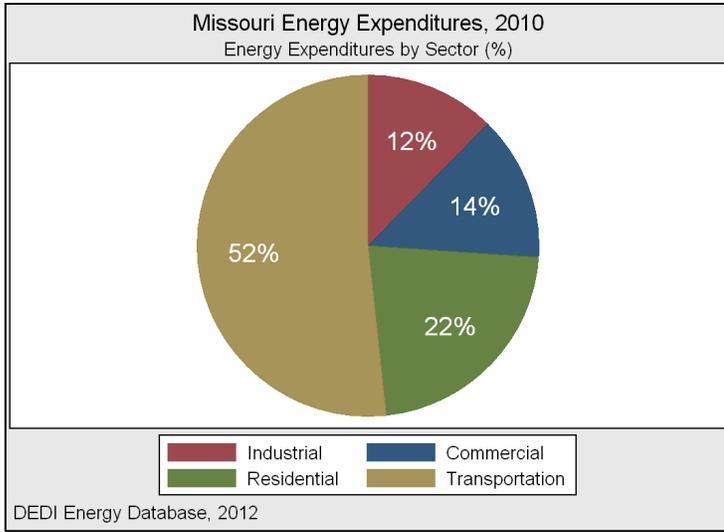
Summary

The first edition of the Missouri Energy Profile is offered by the National Association for State Energy Officials (NASEO) and the Kentucky Department for Energy Development and Independence (DEDI) to function as a quick reference for energy information particular to the State of Missouri. Data has been collected for the most-recent year available from a variety of sources such as the Energy Information Administration (EIA), the U.S. Environmental Protection Agency (EPA), the Bureau for Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), and the U.S. Census. This document provides data on the dynamics of energy expenditures, energy consumption, energy production, and electricity generation that describe the economy of Missouri. Summary state-level statistics are provided in aggregate, as well as for specific sectors of the economy and individual commodities. Overall, Missouri was net importer of energy in 2010, maintained a transportation sector that was the leading consumer of energy resources, and had electricity rates lower than most other states.

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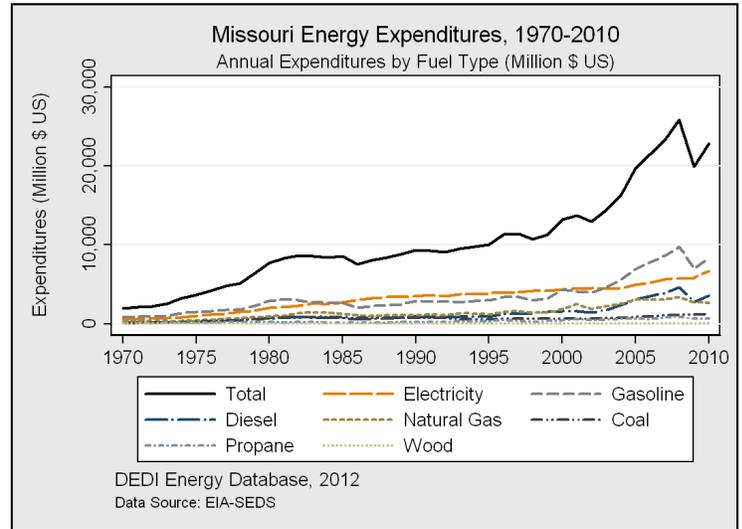
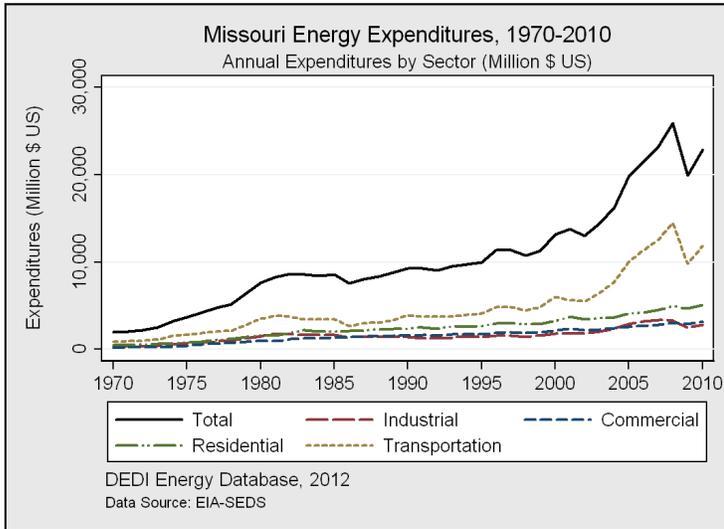
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Missouri Energy Expenditures



Sector	Million (\$ US)	Percentage
Total	22,885	100%
Transportation	11,829	52%
Residential	5,086	22%
Commercial	3,138	14%
Industrial	2,832	12%

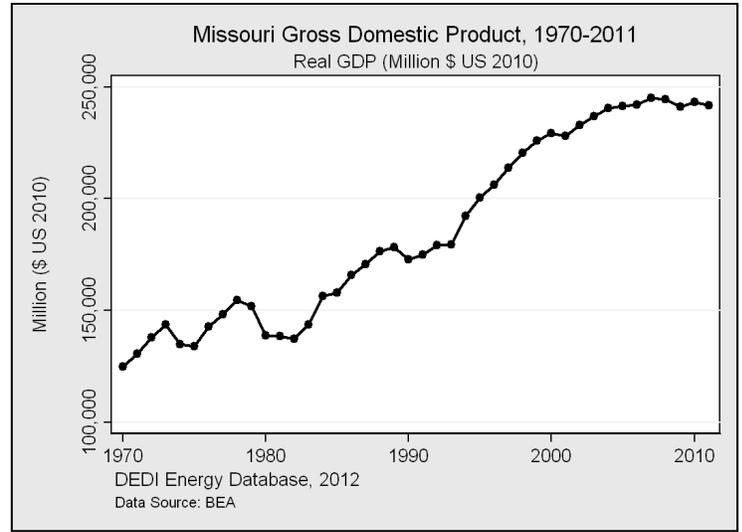
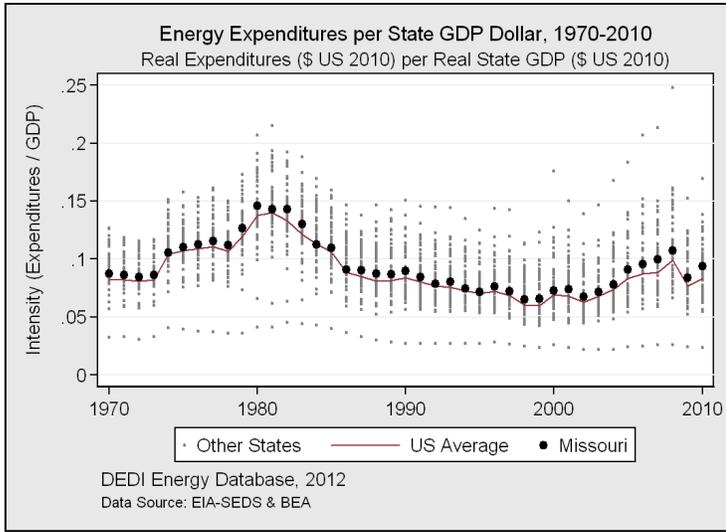
Fuel Type	Million (\$ US)	Percentage
Total	22,885	100%
Gasoline	8,321	36%
Electricity	6,699	29%
Diesel	3,601	16%
Natural Gas	2,664	12%
Coal	1,287	6%



In 2010, total energy expenditures in Missouri were 22.9 billion dollars, an increase of 15% from 2009. Dividing these costs by economic sector, the transportation sector accounted for the largest amount of energy expenditures in 2010.

Analyzing energy expenditures by fuel type, the purchase of gasoline was the highest concentration of expenditures in Missouri in 2010. Compared with 2009, total gasoline expenditures displayed an increase of 18% in 2010.

Missouri Energy Expenditures

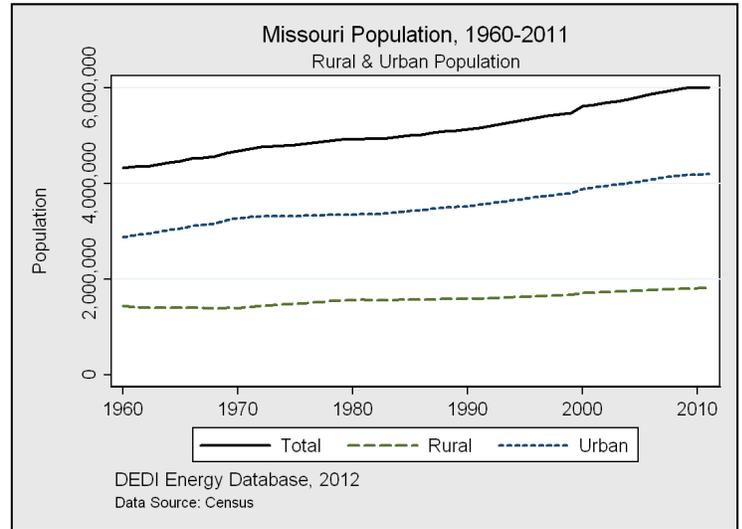
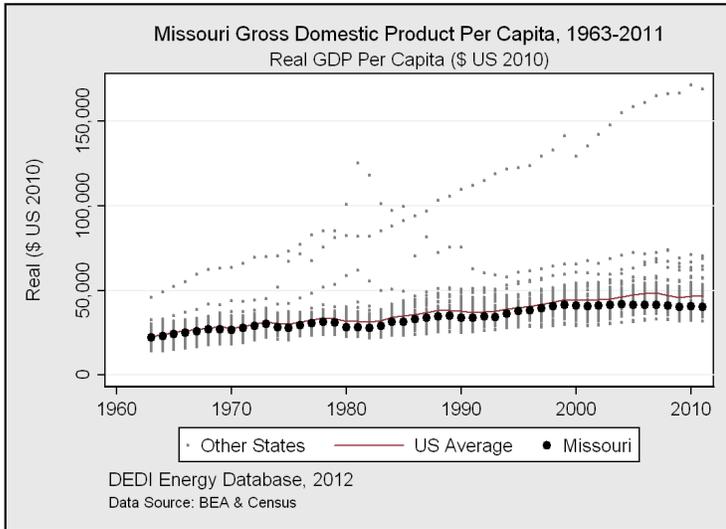


Energy Expenditures & GDP

In 2010, citizens, institutions, and firms in Missouri on average spent \$0.09 on energy commodities and/or energy consumption to produce \$1 of state gross domestic product. This energy expenditure level per dollar of economic output rose by 12% compared with 2009.

Gross Domestic Product

The state gross domestic product of Missouri was \$241.6 billion in 2011. In that year, the state GDP of Missouri fell by 1% in inflation-adjusted 2010 dollars. Since the year 2000, the state gross domestic product of Missouri has risen by 5%.



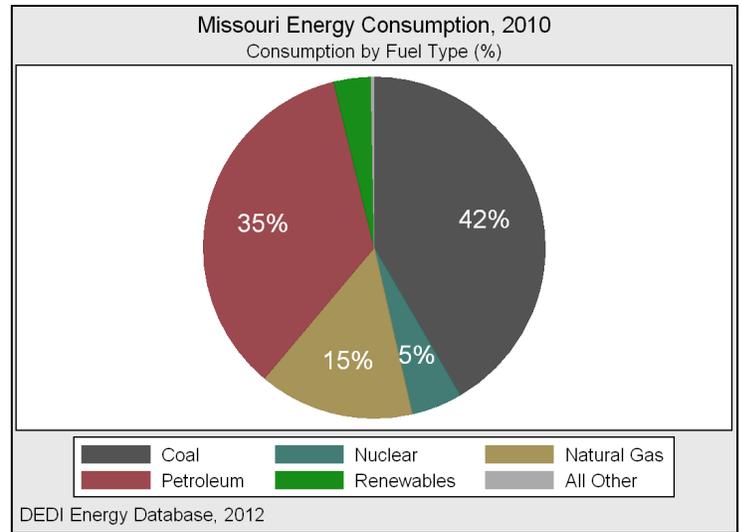
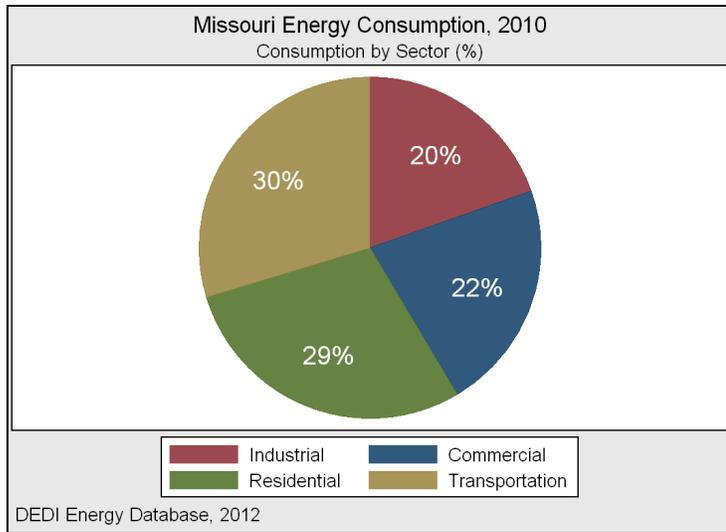
Gross Domestic Product per Capita

The state gross domestic product per capita of Missouri in 2011 was \$40,202. Compared with 2010, state gross domestic product per capita fell by less than 1%. This statistic uses nominal income data adjusted for inflation to 2010 dollars.

Rural & Urban Population

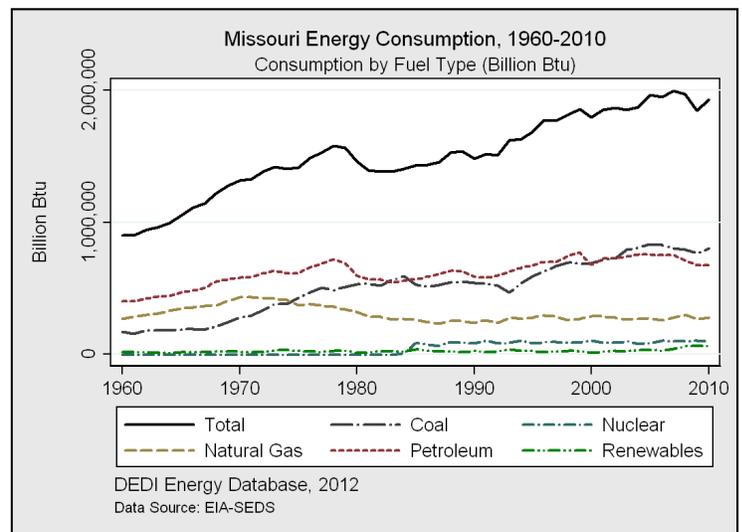
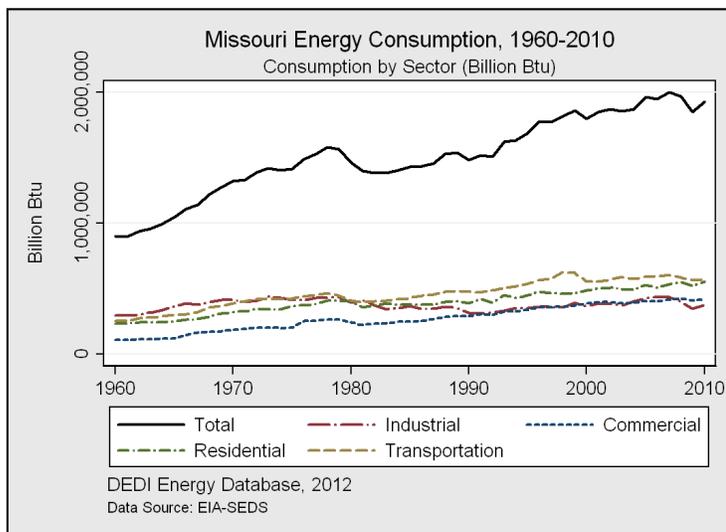
In 2011, the population of Missouri was estimated to be around 6 million, with the majority of the population located in urban areas throughout the state. Since the year 2000, the population of Missouri has risen by approximately 7%.

Missouri Energy Consumption



Sector	Billion Btu	Percentage
Total	1,928,366	100%
Transportation	571,764	30%
Residential	557,177	29%
Commercial	421,379	22%
Industrial	378,046	20%

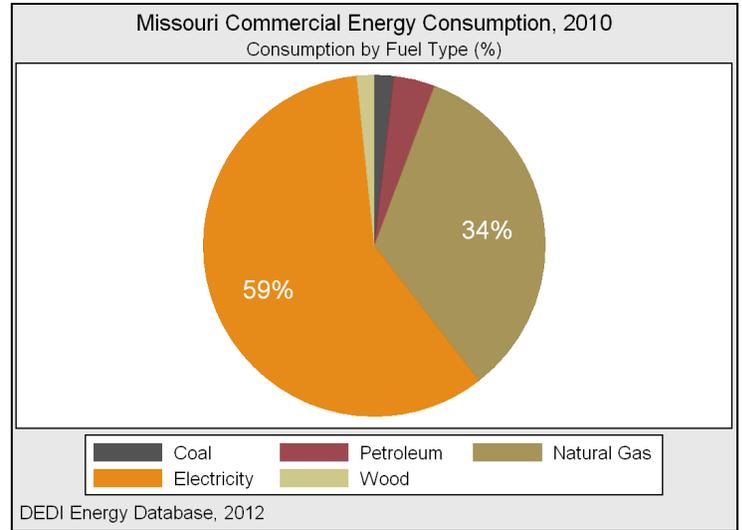
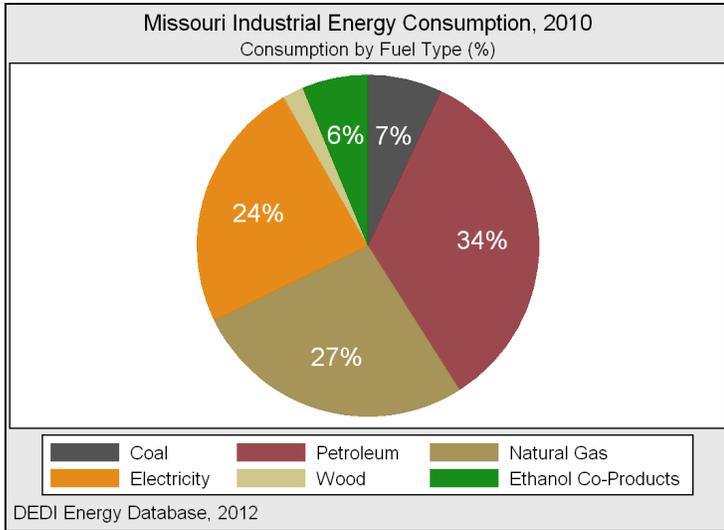
Fuel Type	Billion Btu	Percentage
Total*	1,928,366	100%
Coal	801,793	42%
Petroleum	677,153	35%
Natural Gas	282,138	15%
Nuclear	94,027	5%
Renewables	67,079	3%



In 2010, total energy consumption in Missouri was 1.93 quadrillion Btu, an increase of 4% from 2009. Dividing this consumption by economic sector, the transportation sector accounted for the largest amount of energy consumption in 2010.

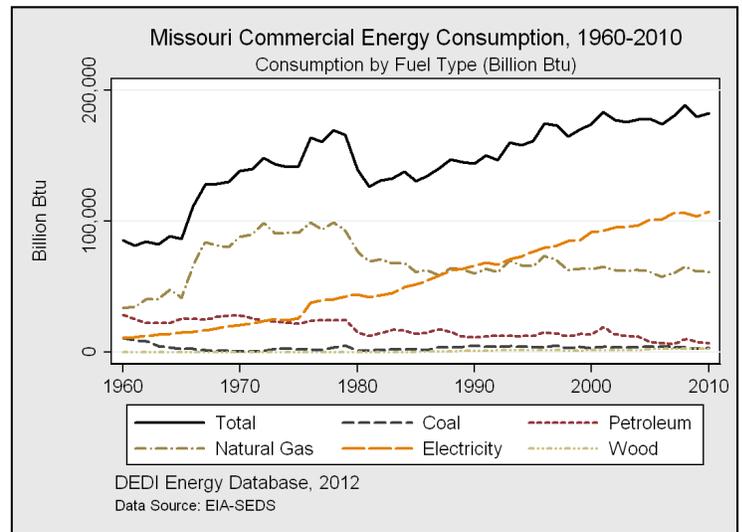
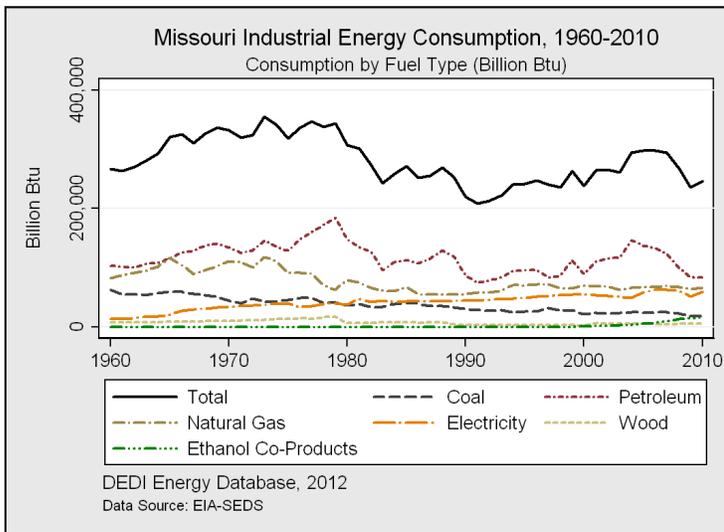
Characterizing energy consumption by fuel type or commodity, the use of coal was the highest concentration of energy consumption in Missouri in 2010. Compared with 2009, the consumption of coal rose by 5% in 2010. *Missouri imported 6,871 Billion Btu of electricity in 2010, which is added to the summation of in-state energy consumption.

Missouri Energy Consumption



Fuel Type	Billion Btu	Percentage
Net Consumed*	246,206	100%
Petroleum	83,609	34%
Natural Gas	65,903	27%
Electricity	59,131	24%
Coal	17,413	7%
Ethanol Co-Products	15,269	6%

Fuel Type	Billion Btu	Percentage
Net Consumed*	182,269	100%
Electricity	107,241	59%
Natural Gas	61,520	34%
Petroleum	7,153	4%
Coal	3,332	2%
Wood Products	3,028	2%

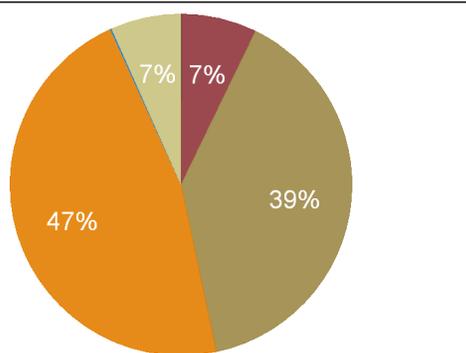


In 2010, net industrial energy consumption in Missouri was 246,206 billion Btu, an increase of 4% from 2009. Accounting for energy use across fuels, petroleum represented the largest amount of industrial energy consumption and rose by 3% compared with 2009. *Net energy consumption does not include the associated energy losses of electricity generation and transmission; therefore, the sum of fuel inputs may differ from the total energy directly consumed by end-users.

Net commercial energy consumption in Missouri rose by 1% in 2010 to over 182,269 billion Btu. During 2010, electricity constituted the largest portion of commercial energy consumption and rose by 3% compared with 2009. *Net energy consumption does not include the associated energy losses of electricity generation and transmission; therefore, the sum of fuel inputs may differ from the total energy directly consumed by end-users.

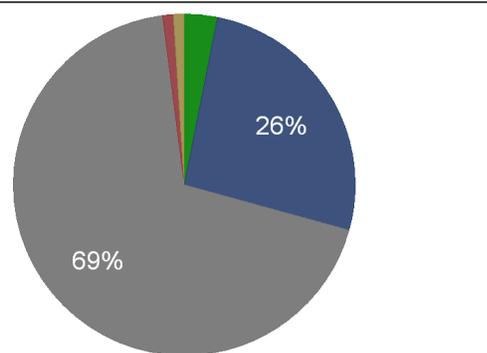
Missouri Energy Consumption

Missouri Residential Energy Consumption, 2010
Consumption by Fuel Type (%)



DEDI Energy Database, 2012

Missouri Transportation Energy Consumption, 2010
Consumption by Fuel Type (%)

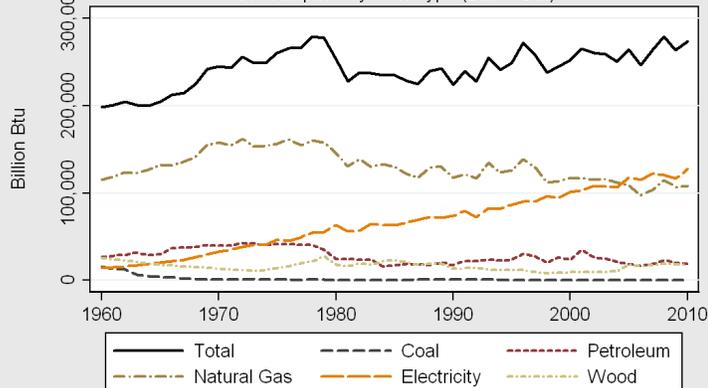


DEDI Energy Database, 2012

Fuel Type	Billion Btu	Percentage
Net Consumed*	273,399	100%
Electricity	127,275	47%
Natural Gas	107,960	39%
Petroleum	19,243	7%
Wood	18,119	7%
Coal	412	<1%

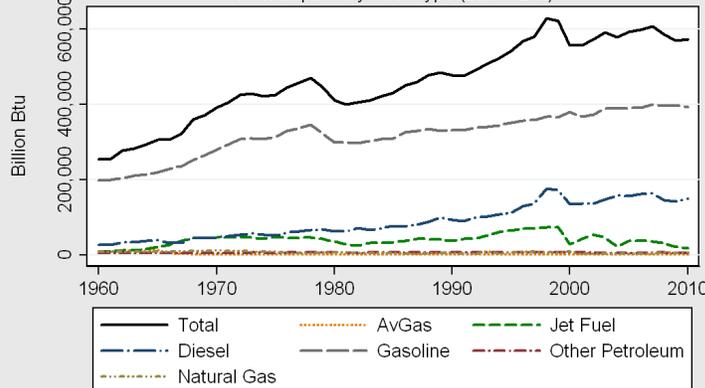
Fuel Type	Billion Btu	Percentage
Net Consumed	571,596	100%
Gasoline	392,365	69%
Diesel	149,400	26%
Jet Fuel	17,733	3%
Natural Gas	5,855	1%
Other Petroleum	5,671	1%

Missouri Residential Energy Consumption, 1960-2010
Consumption by Fuel Type (Billion Btu)



DEDI Energy Database, 2012
Data Source: EIA-SEDS

Missouri Transportation Energy Consumption, 1960-2010
Consumption by Fuel Type (Billion Btu)

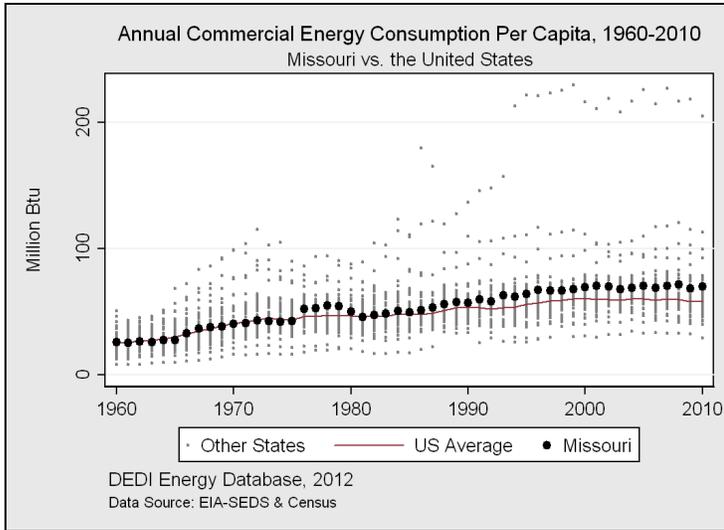


DEDI Energy Database, 2012
Data Source: EIA-SEDS

Net residential sector energy consumption was 273,399 billion Btu in Missouri in 2010. This amount was an increase of 4% compared with 2009. Overall, residential energy consumption was led by electricity use in 2010. *Net energy consumption does not include the associated energy losses of electricity generation and transmission; therefore, the sum of fuel inputs may differ from the total energy directly consumed by end-users.

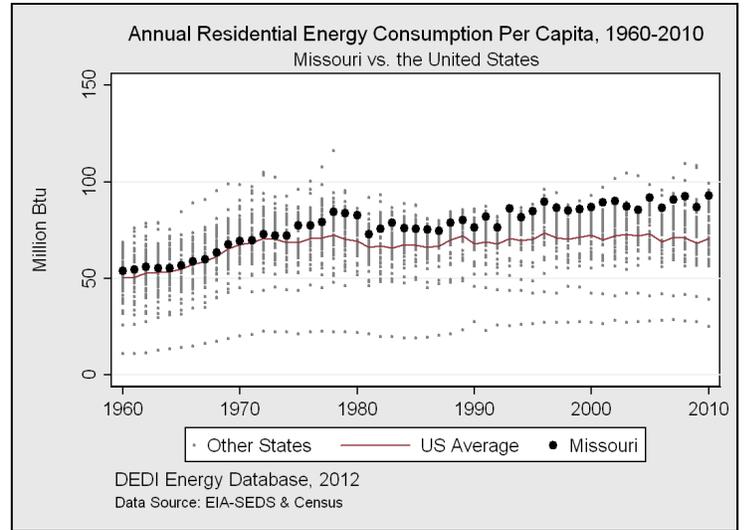
In 2010, the transportation sector of Missouri consumed 571,596 billion Btu of energy commodities. This total reflected an increase of 1% in transportation energy consumption compared with the previous year. Unsurprisingly, gasoline was the largest source of transportation sector energy consumption in 2010.

Missouri Energy Intensity



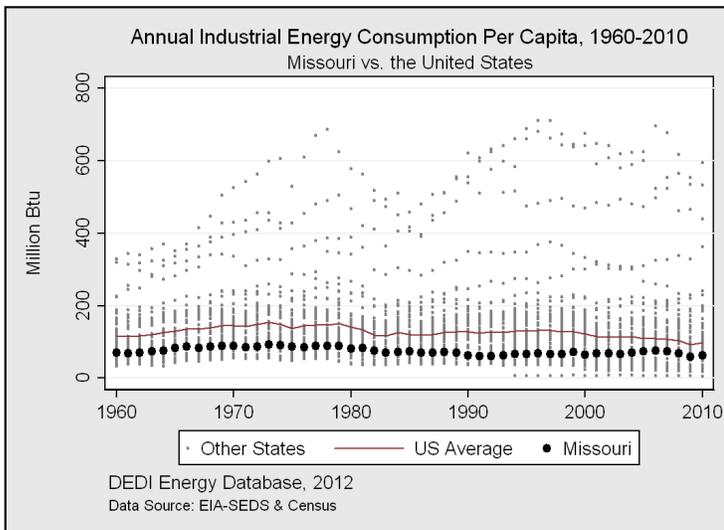
State	MMBtu per Capita	Rank
Wyoming	113	1st
Missouri	70	12th
Hawaii	29	50th

Missouri ranked 12th highest nationally for commercial energy consumption per capita in 2010, an increase of 3% compared with 2009. (MMBtu = 1 Million Btu).



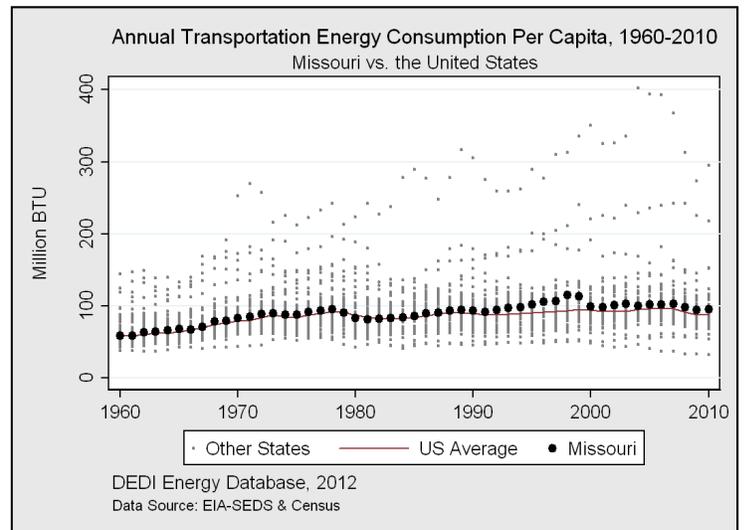
State	MMBtu per Capita	Rank
North Dakota	99	1st
Missouri	93	5th
Hawaii	25	50th

Missouri's residential sector consumed 93 Million Btu of energy per capita in 2010, an increase of 7% from 2009. Missouri ranked 5th highest by state.



State	MMBtu per Capita	Rank
Louisiana	595	1st
Missouri	63	33rd
New York	18	50th

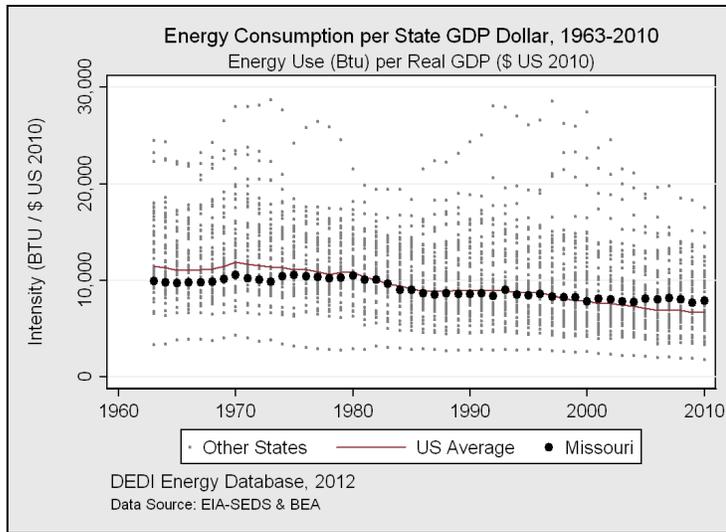
Industrial energy consumption per capita in Missouri was 33rd lowest in the country in 2010. Compared with 2009, industrial energy use per capita rose by 8%.



State	MMBtu per Capita	Rank
Alaska	295	1st
Missouri	95	21st
New York	54	50th

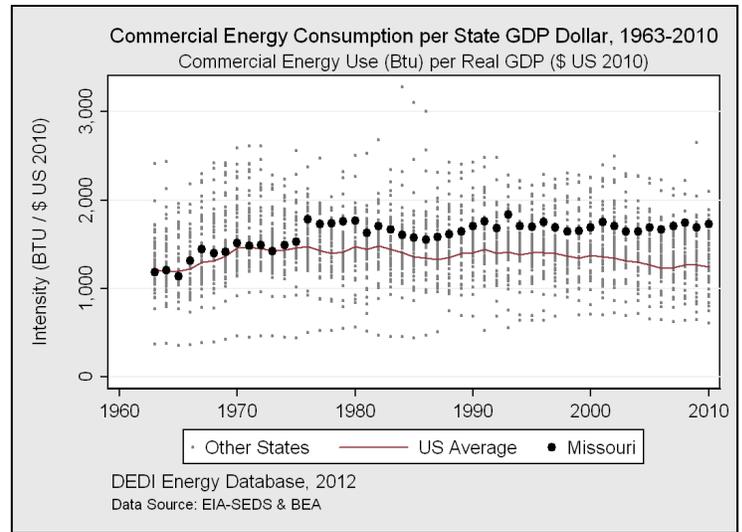
Transportation energy consumption per capita in Missouri rose by 1% in 2010. Missouri ranked 21st highest in the country for this metric.

Missouri Energy Intensity



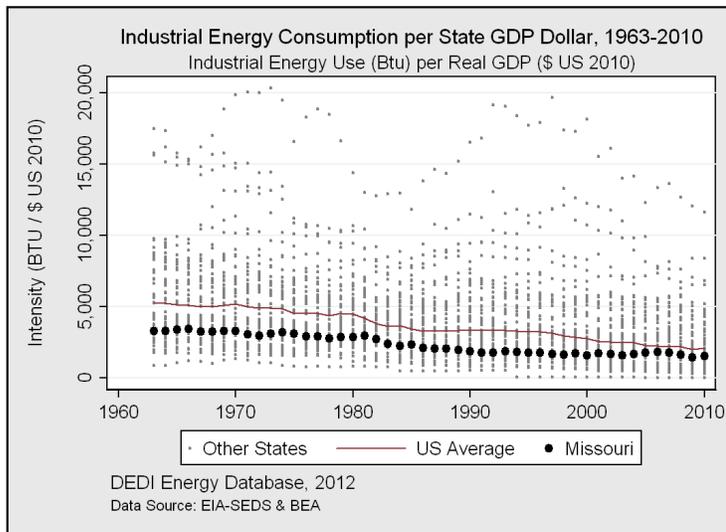
State	Btu / \$US GDP	Rank
Louisiana	17,493	1st
Missouri	7,923	24th
New York	3,303	50th

Missouri ranked 24th highest for energy consumption used to produce one dollar of state GDP in 2010. This measurement rose by 4% compared with 2009.



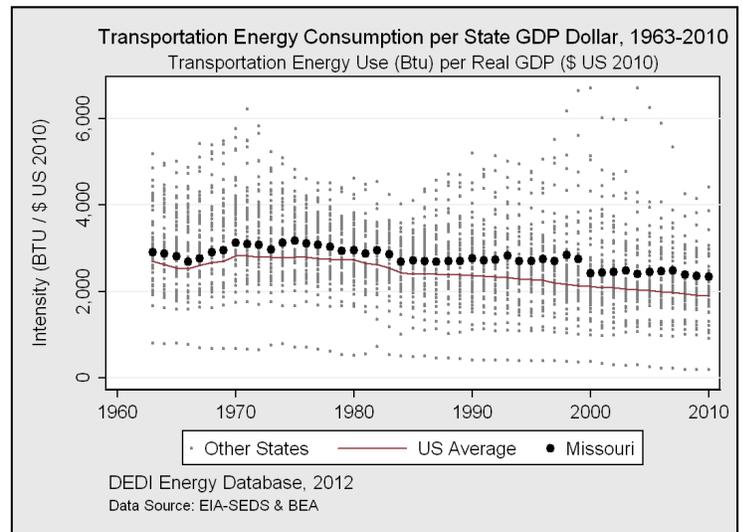
State	Btu / \$US GDP	Rank
Montana	2,095	1st
Missouri	1,731	8th
Hawaii	607	50th

Missouri's commercial sector ranked 8th highest for the ratio of energy use to state GDP dollar in 2010, an increase of 2% from 2009.



State	Btu / \$US GDP	Rank
Louisiana	11,636	1st
Missouri	1,553	33rd
New York	307	50th

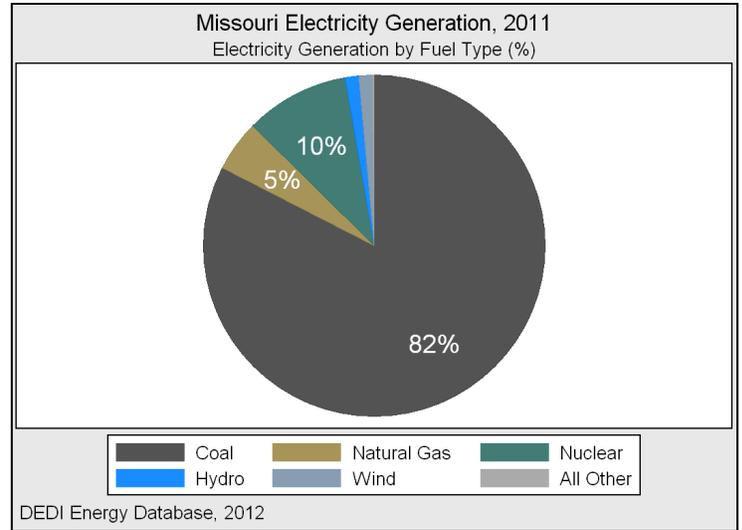
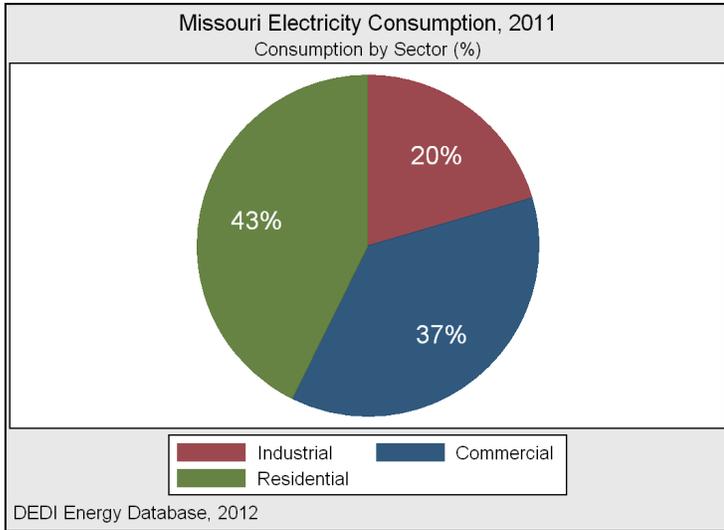
Industrial energy consumption per dollar of state GDP in Missouri was 33rd lowest in 2010. Compared with 2009, industrial energy intensity rose by 7%.



State	Btu / \$US GDP	Rank
Alaska	4,415	1st
Missouri	2,349	19th
New York	923	50th

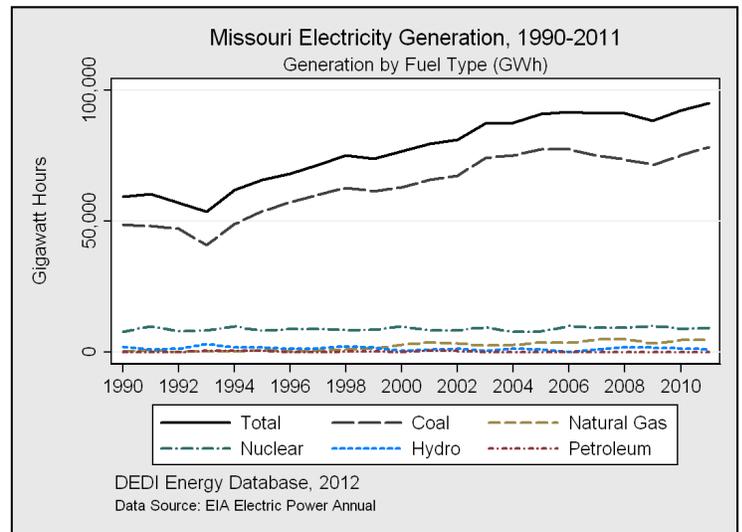
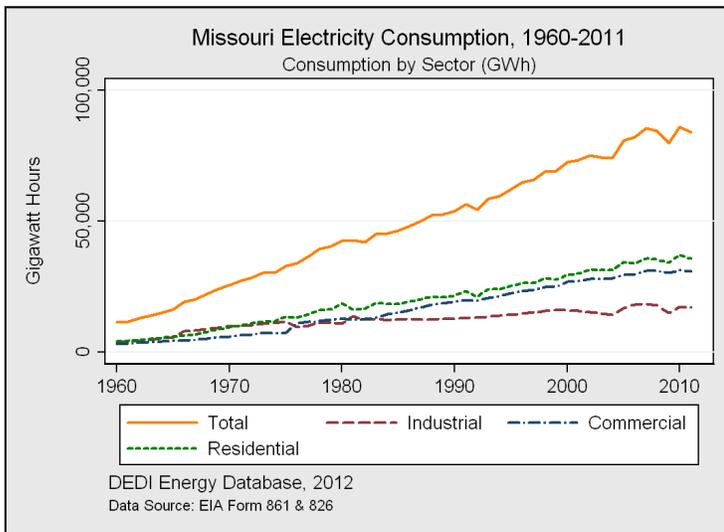
Transportation sector energy intensity per state GDP dollar in Missouri fell by less than 1% in 2010. Overall, Missouri ranked 19th highest in the country for this metric.

Missouri Electricity



Sector	Gigawatt Hours	Percentage
Total	83,837	100%
Residential	35,748	43%
Commercial	30,925	37%
Industrial	17,143	20%

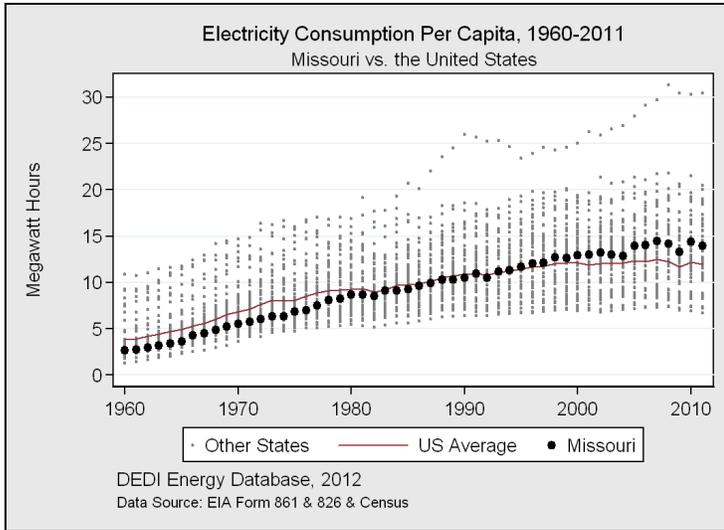
Fuel Type	Gigawatt Hours	Percentage
Total	95,088	100%
Coal	78,342	82%
Nuclear	9,371	10%
Natural Gas	4,657	5%
Hydro	1,200	1%
Wind	1,179	1%



In 2011, citizens, institutions, and firms in Missouri consumed 83,837 gigawatt-hours of electricity. Compared with 2010, total electricity consumption fell by 3%. Dividing electricity consumption by economic sector, residential customers were the largest consumers of electricity in Missouri in 2011.

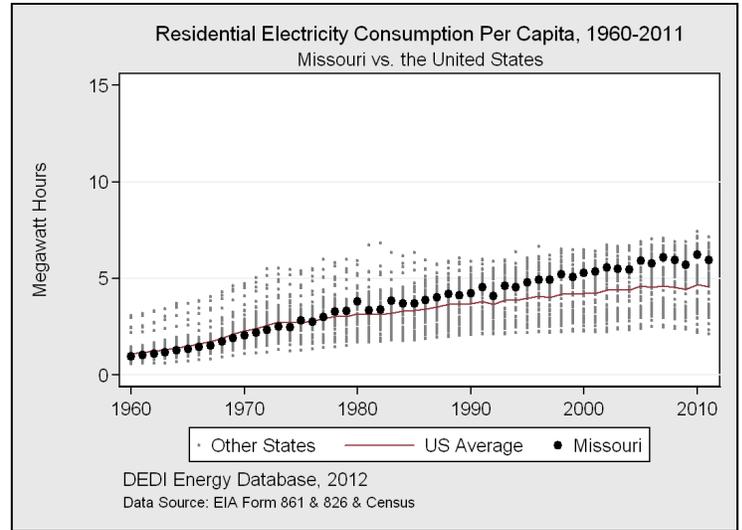
Electric power facilities in Missouri generated over 95,088 gigawatt-hours of electricity in 2011. The use of coal represented the largest portion of this electricity, accounting for 78,342 gigawatt-hours. Overall, electricity generation rose by 3% versus the previous year.

Missouri Electricity Intensity



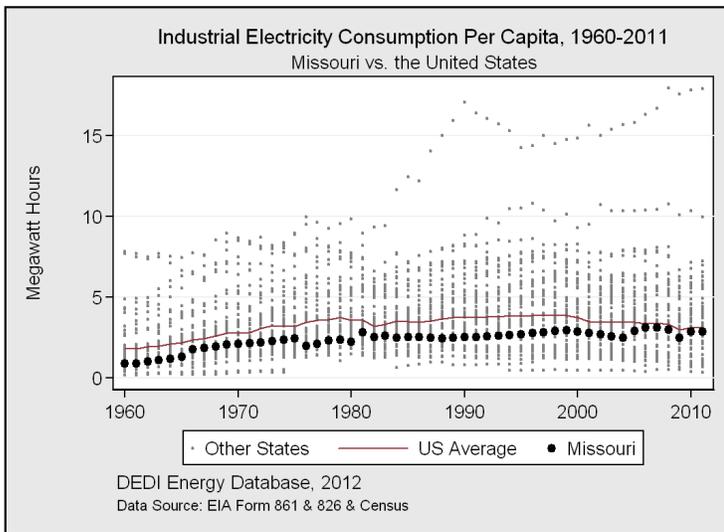
State	MWh per Capita	Rank
Wyoming	30.5	1st
Missouri	13.9	20th
California	6.7	50th

At 13.9 MWh, Missouri ranked 20th highest nationally for total electricity consumption per capita in 2011, a decrease of 3% from 2010.



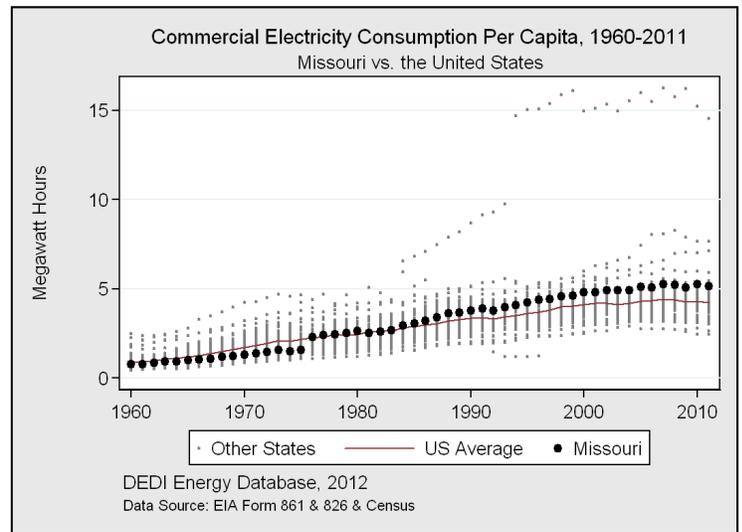
State	MWh per Capita	Rank
Louisiana	7.1	1st
Missouri	5.9	14th
Hawaii	2.1	50th

Residents of Missouri used on average 5.9 MWh of electricity in 2011. Representing a decrease of 4%, this amount ranked Missouri 14th highest by state.



State	MWh per Capita	Rank
Wyoming	17.9	1st
Missouri	2.9	34th
New York	0.7	50th

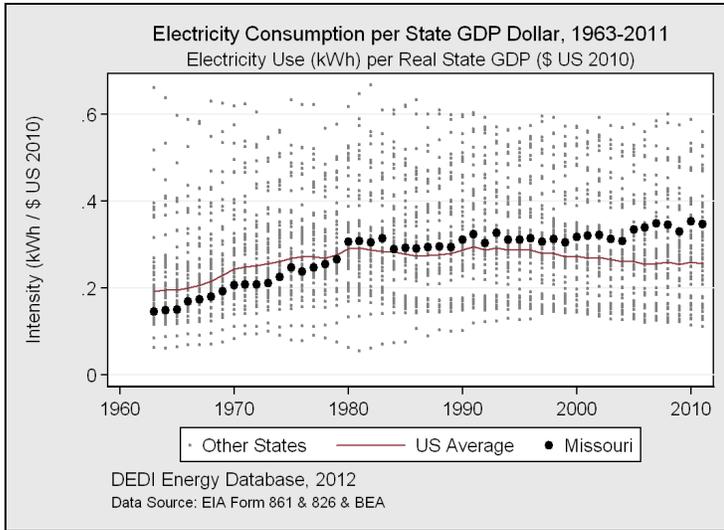
Industrial electricity consumption per capita in Missouri was 34th lowest in 2011. Versus 2010, industrial electricity consumption per capita fell by 1%.



State	MWh per Capita	Rank
Wyoming	7.6	1st
Missouri	5.1	8th
Hawaii	2.4	50th

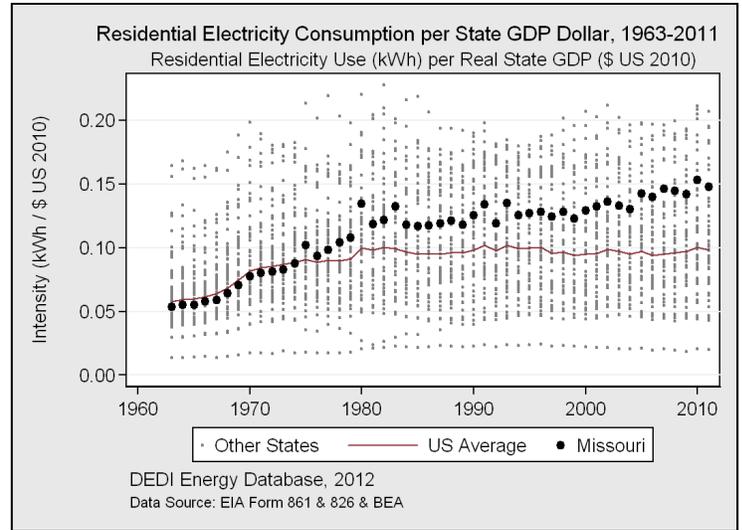
Missouri's commercial electricity consumption per capita fell by 2% in 2011 to 5.1 MWh. Overall, Missouri ranked 8th highest in the country for this metric.

Missouri Electricity Intensity



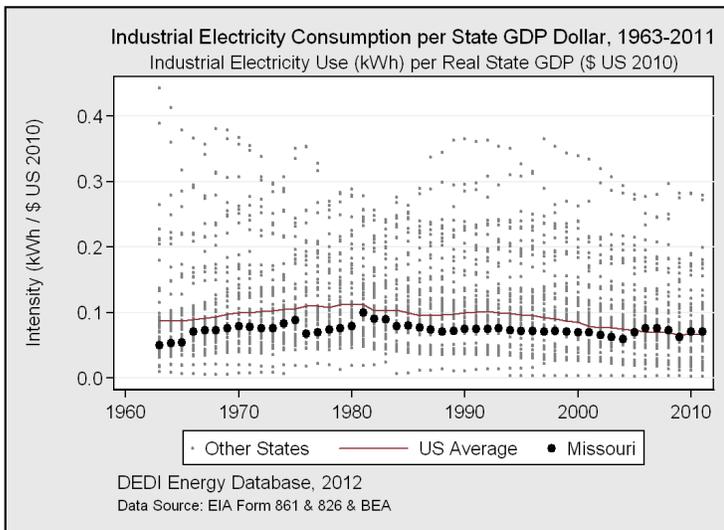
State	kWh / \$ US GDP	Rank
Kentucky	0.56	1st
Missouri	0.35	15th
Alaska	0.13	50th

Missouri ranked 15th highest nationally for total electricity consumption per state GDP dollar in 2011. This amount fell by 2% to 0.35 kWh per dollar for the year.



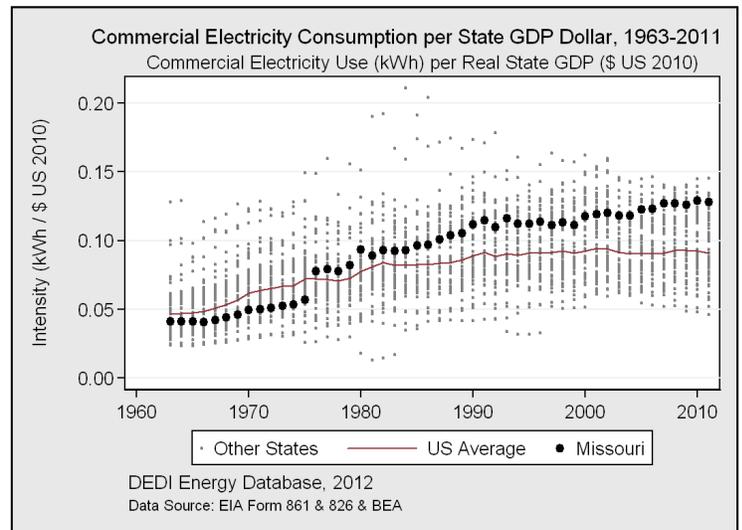
State	kWh / \$ US GDP	Rank
Mississippi	0.21	1st
Missouri	0.15	11th
Alaska	0.04	50th

In 2011, Missouri ranked 11th highest for residential electricity use relative to one dollar of state GDP. This metric fell by 4% compared to 2010.



State	kWh / \$ US GDP	Rank
Wyoming	0.28	1st
Missouri	0.07	29th
New York	0.01	50th

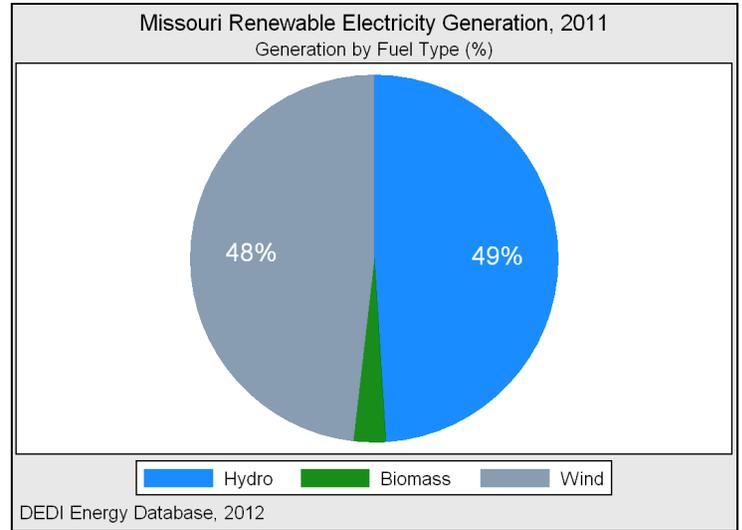
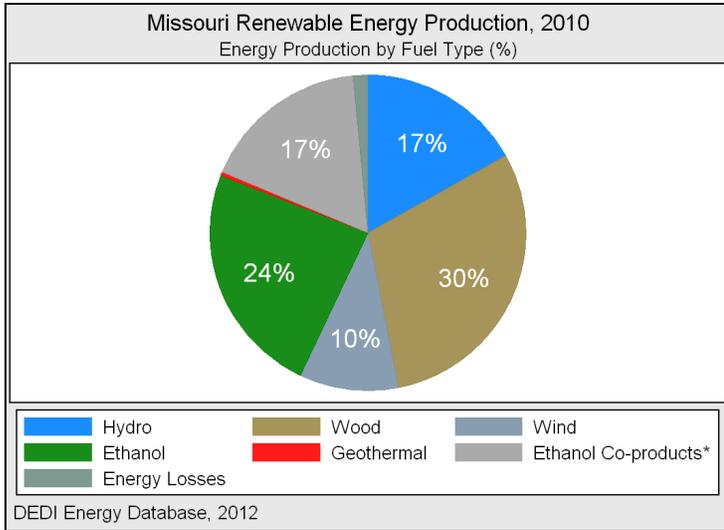
Industrial electricity consumption per state GDP dollar in Missouri was 29th lowest in the country in 2011. Versus 2010, industrial electricity intensity fell by less than 1%.



State	kWh / \$ US GDP	Rank
Mississippi	0.15	1st
Missouri	0.13	6th
Massachusetts	0.05	50th

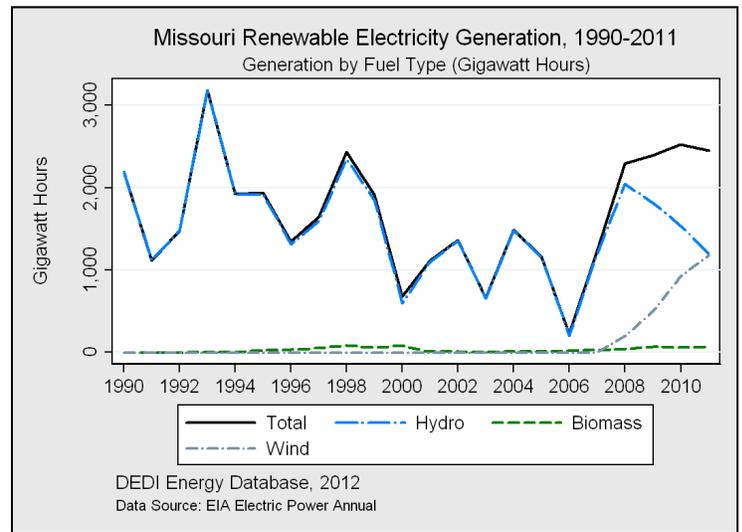
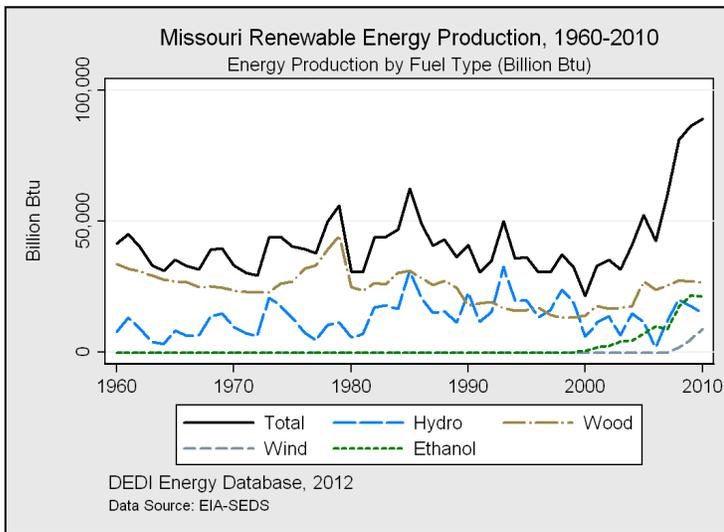
Missouri's commercial sector used 0.13 kWh of electricity to generate one dollar of economic output. A decrease of 1%, this ratio ranked the state 6th highest.

Missouri Renewable Energy



Fuel Type	Billion Btu	Percentage
Total	88,989	100%
Wood & Biomass	26,687	30%
Ethanol	21,232	24%
Ethanol Co-products	15,269	17%
Hydro	15,018	17%
Wind	9,029	10%

Fuel Type	Gigawatt Hours	Percentage
Total	2,617	100%
Hydro	1,200	46%
Wind	1,179	45%
Biomass	70	3%

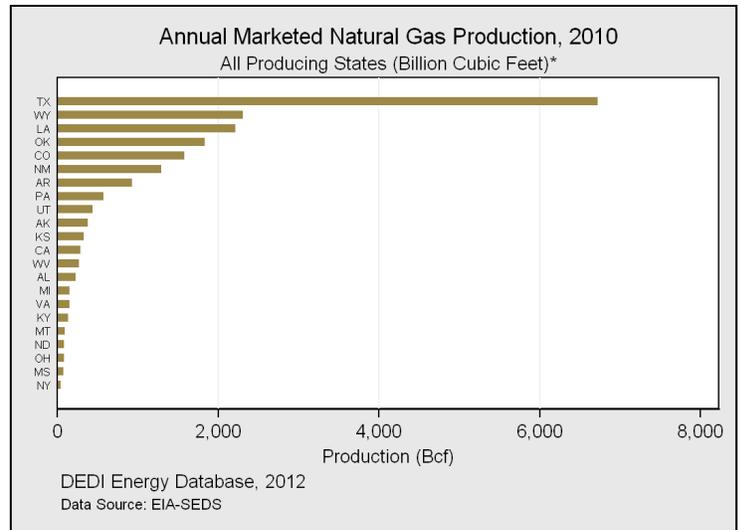
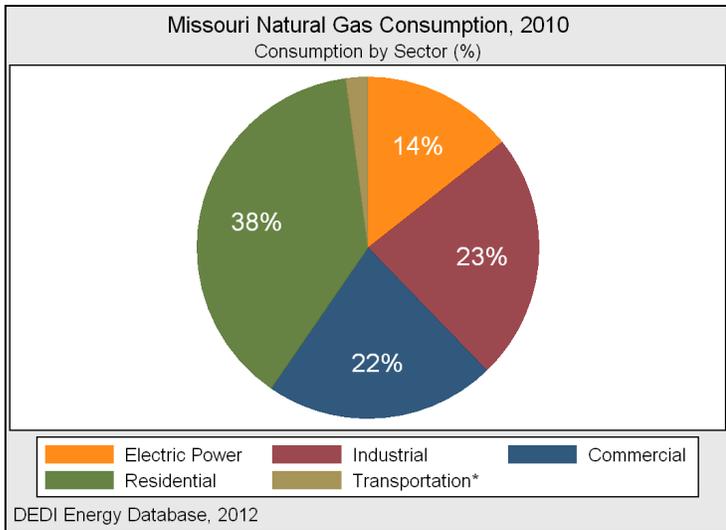


In 2010, renewable energy production in Missouri was 88,989 billion Btu, an increase of 3% from 2009. Dividing this production by fuel type, wood & biomass resources accounted for the largest amount of energy production in 2010.

*Ethanol Co-Products include distillers grain, corn oil, and other by-products that are rendered following fuel ethanol distillation.

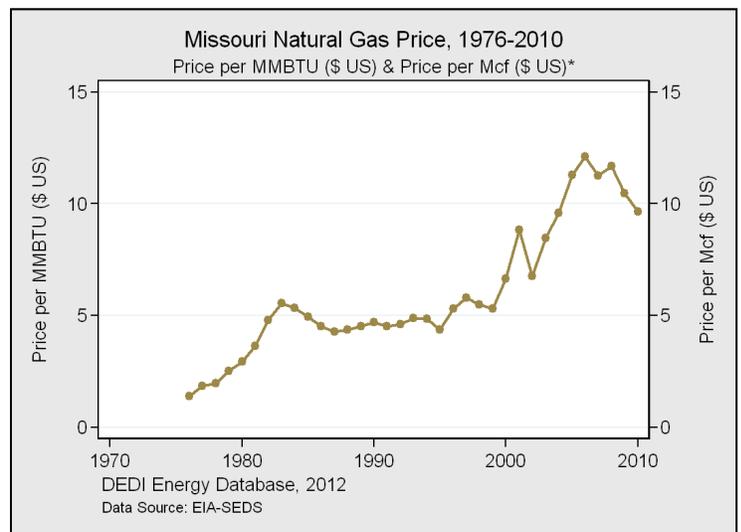
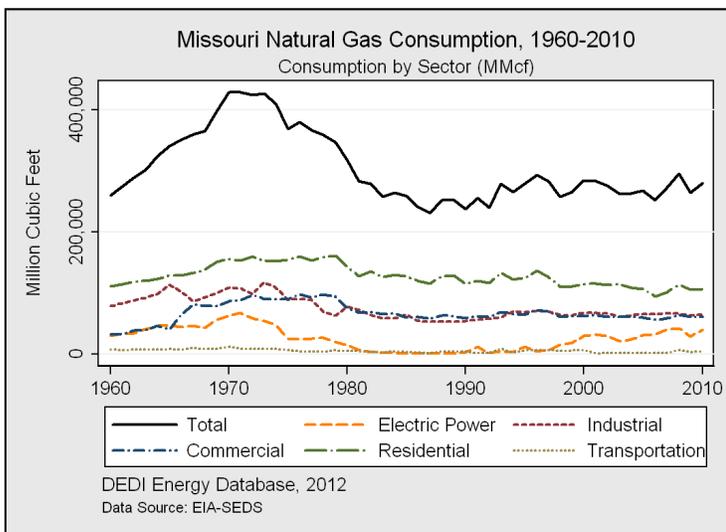
Describing renewable electricity generation by fuel type or commodity, the production from hydroelectric facilities represented the largest portion of renewable electricity generation in Missouri in 2011. Compared with 2010, the electrical output of hydroelectric facilities fell by 22% in 2011. (Total biomass generation is divided between wood products - labeled Wood - and other biomass resources - labeled Biomass - such as landfill gas).

Missouri Natural Gas



Sector	Million Cubic Feet	Percentage
Total	280,177	100%
Residential	107,389	38%
Industrial	65,554	23%
Commercial	61,194	22%
Electric Power	40,216	14%
Transportation	5,824	2%

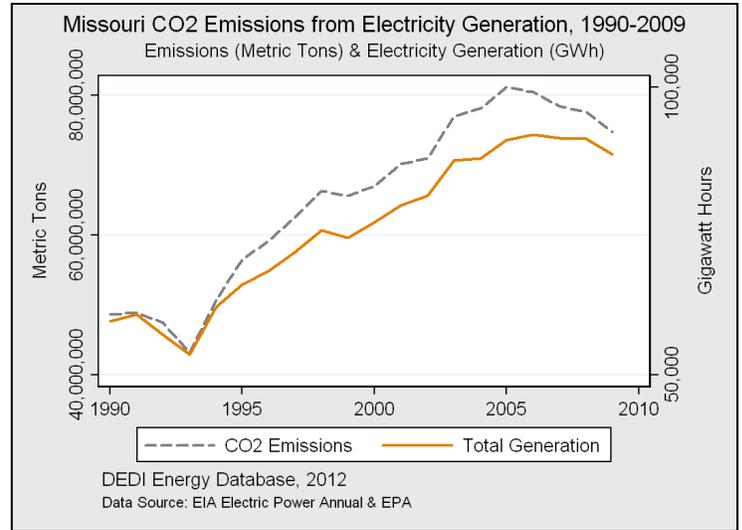
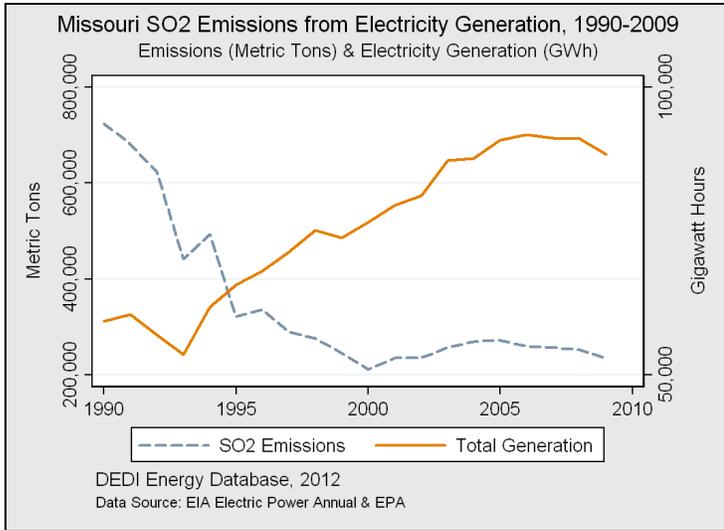
Missouri registered no natural gas production in 2010 according to the EIA SEDS database. As a result of this dynamic, Missouri was a net importer of natural gas supplies for the year. The top three states by natural gas production in 2010 were Texas, Wyoming, and Louisiana, with Texas by far the single largest producer of the commodity.



In 2010, natural gas consumption in Missouri was 280 billion cubic feet. Compared with 2009, total natural gas consumption rose by 6% on the year. Dividing natural gas use by economic sector, the residential sector was the largest consumer of natural gas in Missouri in 2010. (Natural gas consumption by the Transportation Sector is the summation of direct, vehicle fuel use and natural gas used by transmission and distribution pipelines).

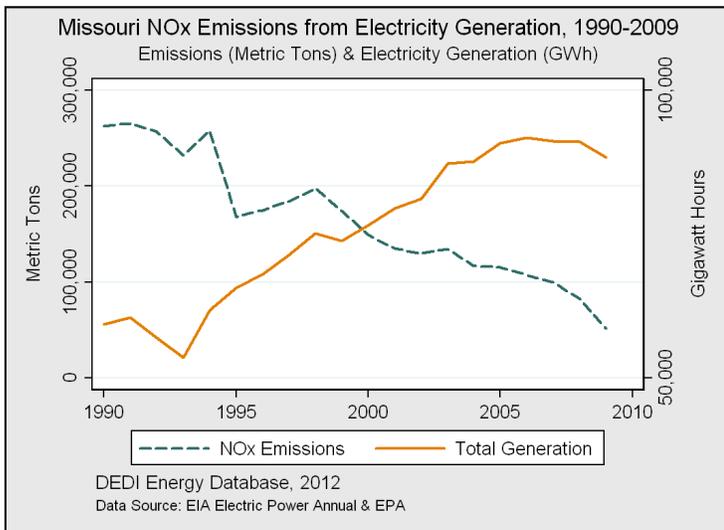
The average city gate price of natural gas in Missouri was \$9.64 per thousand cubic feet in 2010. Versus the previous year, this average annual price fell by 8%. The city gate price of natural gas is typically reported at the connection where a natural gas distribution company or utility takes control of natural gas delivered by a pipeline or transmission company.

Missouri Power Plant Emissions



Emission	Metric Tons	Since 1990
Carbon Dioxide	74,715,725	53%
Sulfur Dioxide	235,573	-67%
Nitrogen Oxides	51,561	-80%

Sulfur dioxide is a highly reactive gas and major pollutant that is monitored and regulated at the State and Federal level. In 2009, the electric power sector of Missouri emitted 235,573 metric tons of sulfur dioxide, representing a decrease of 7% compared with 2008. Overall, the electric power sector of Missouri has decreased sulfur dioxide emissions by 68% since 1990.

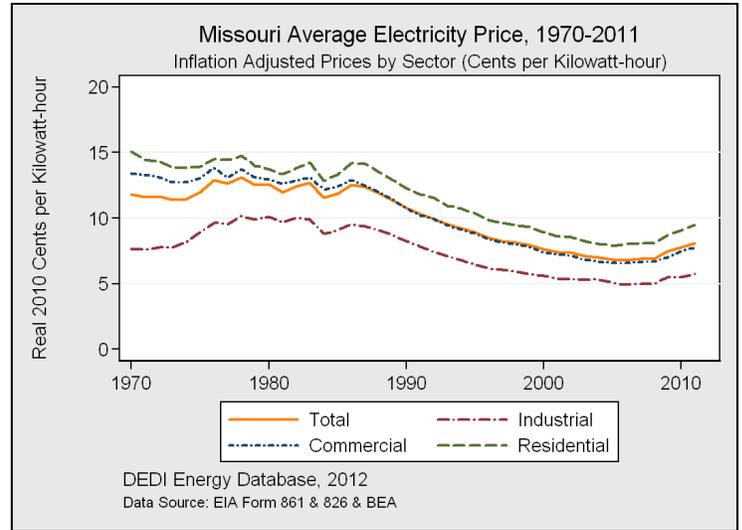
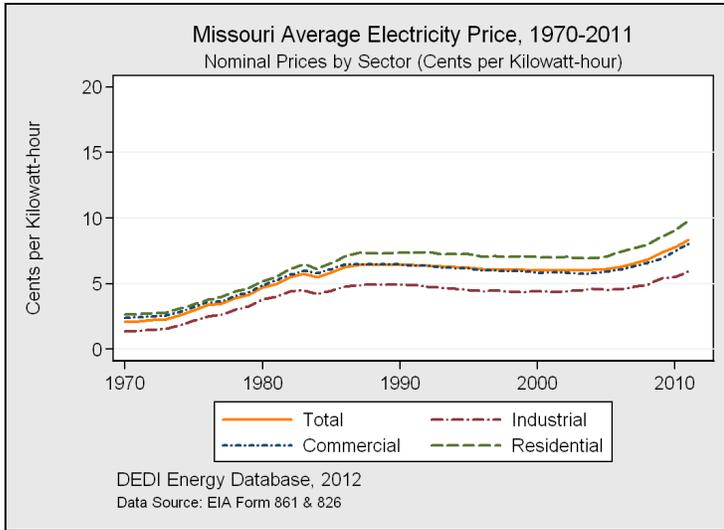


Nitrogen oxides are a group of highly reactive regulated pollutants. In 2009, the electric power sector of Missouri emitted 51,561 metric tons of nitrogen oxides, representing a decrease of 38% compared with 2008. Overall, the electric power sector of Missouri has decreased nitrogen oxides emissions by 80% since 1990.

Carbon dioxide emissions from fossil fuel power plants are monitored at the State and Federal level. In 2009, the electric power sector of Missouri emitted 74,715,725 metric tons of carbon dioxide, a decrease of 4% compared with 2008. Overall, power plants in Missouri have increased carbon dioxide emissions by 53% since 1990.

The last major amendments to the Clean Air Act were implemented in 1990. These amendments focused on National Ambient Air Quality Standards and the mechanisms which would ensure compliance with emission reduction targets. Subsequently, the emission of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) from electric generating plants were regulated and scheduled for reduction. The dual display of electricity generation and regulated emissions indicates that over time, though electricity demand and generation have increased, the release of targeted pollutants has actually decreased. Therefore, both the aggregate emission as well as intensity of emission per gigawatt-hour of criteria pollutants, such as sulfur dioxide and nitrogen oxides, have been decreasing nationally since 1990. The reductions have been made through a combination of fuel switching and the installation of pollution mitigation systems at power plants.

Missouri Electricity Prices



Sector	Cents / kWh	Since 2000
Average	8.35	39%
Industrial	5.95	34%
Commercial	8.04	38%
Residential	9.78	39%

Nominal \$US

Fuel Type	Real Cents / kWh	Since 2000
Average	8.09	6%
Industrial	5.76	3%
Commercial	7.79	5%
Residential	9.47	6%

Real 2010 \$US

Electricity usage in Missouri is billed in terms of cents per kilowatt-hour of electricity consumed, with differences in price by classification and electric utility. However, while the price of electricity varies from sector to sector and from one utility to another, the above data illustrate the average price of electricity delivered to each economic sector.

In 2011, the average price of electricity across economic sectors in Missouri was 8.35¢ per kilowatt-hour. With an increase of 7% versus 2010, this overall, weighted-average price ranked Missouri 34th lowest in the country in terms of electricity. Since 2000, the average price of electricity in Missouri has risen by 39%.

Adjusting for inflation over time, the trends in the real cost of electricity in Missouri between 1970 and 2011 can be placed in context to the adjacent, nominal graphic. Resetting historical price data to inflation-adjusted 2010 values, the price of electricity in real economic terms in Missouri has risen by 6% since the year 2000. Additionally, in 2011 Missouri ranked 34th lowest in the nation for the real price of electricity.

Since 1990, the two most influential factors explaining the changes in both nominal and real electricity prices have been the type of generation portfolio developed within a state, and the price of fossil fuel inputs for the electric power sector. Specifically, these factors involve the type of generation technology (i.e. coal, gas, nuclear) used within a state, the share of each technology in supplying baseload power, and the price of the primary fossil fuel commodities.