2012 Energy Profile

Kentucky Department for Energy Development & Independence

Kentucky Energy & Environment Cabinet

DEDI
KENTUCKY DEPARTMENT for ENERGY DEVELOPMENT & INDEPENDENCE

Foreword

Fellow Kentuckians,

The Energy and Environment Cabinet and the Department for Energy Development and independence (DEDI) present the third edition of the Kentucky Energy Profile to provide a snapshot of energy production and consumption within the Commonwealth. All of the information summarized in this report was obtained from public sources, including a variety of state and Federal Government agencies.

Kentucky continues to be a national leader in energy production. Kentucky is the nation's third largest producer of coal, with 65.5 million tons produced in eastern Kentucky and 40.7 million tons produced in western Kentucky. The Commonwealth also produces natural gas, a limited amount of crude oil, and is home to a 212,000 barrel per day petroleum refinery, two ethanol production facilities, and a biodiesel plant.

In 2010, Kentucky was a leading consumer of energy with the 9th highest per capita energy consumption in the United States. Kentucky consumed a total of 41 million tons of coal, 91 million barrels of petroleum products, and 232 billion cubic feet of natural gas. This energy consumption cost Kentucky's citizens, institutions, and businesses over $19.6 billion, which was 11% of the Commonwealth's total Gross Domestic Product. The majority of this energy was consumed by large manufacturing facilities, which have located in Kentucky in part because of low and stable energy costs.

Clearly, energy is of critical importance to the Commonwealth. We hope that you will find this report informative and useful. We welcome your questions and feedback—please direct all inquiries to Alan Waddell (James.Waddell@ky.gov) or call 1-502-564-7192.

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*For a more detailed perspective on coal production in Kentucky, also reference: *Kentucky Coal Facts, 2012*. (12th Edition). Available online at: energy.ky.gov

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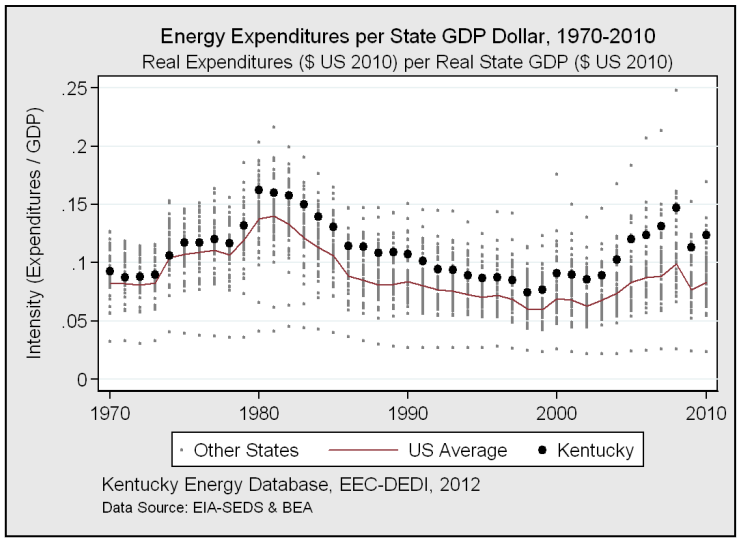
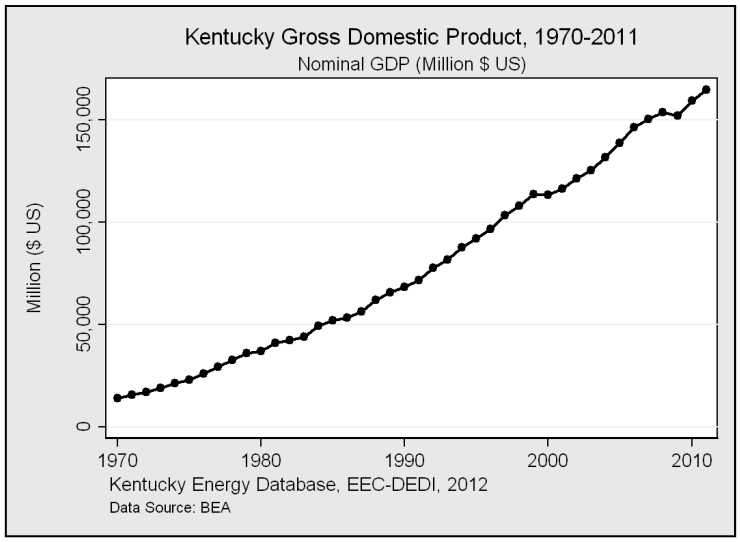
General Statistics



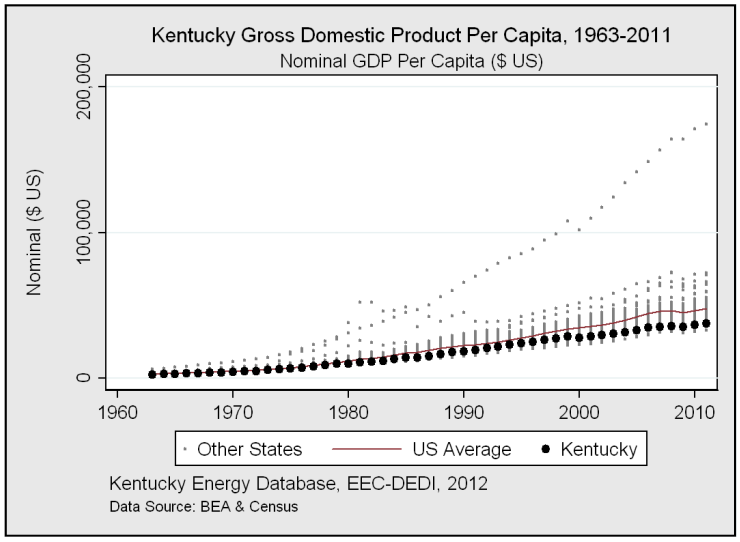
Energy Expenditures & GDP

In 2010, citizens, institutions, and firms in Kentucky on average spent $0.12 on energy commodities and/or energy consumption to produce $1 of State Gross Domestic Product. This metric of energy expenditure intensity ranks Kentucky high nationally in terms of energy expenses relative to state economic output.



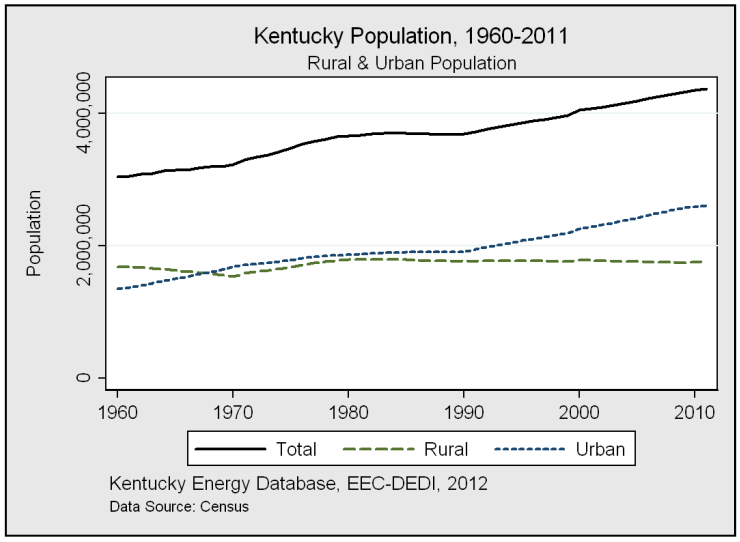
Gross Domestic Product

In 2011, the Gross Domestic Product of Kentucky was $164 Billion. This amount reflected a 3% increase in State GDP compared with 2010. Since 1970, the State GDP of Kentucky has increased by over 1,082% in nominal dollars, with a constant annual growth rate of 6.2%.



Gross Domestic Product per Capita

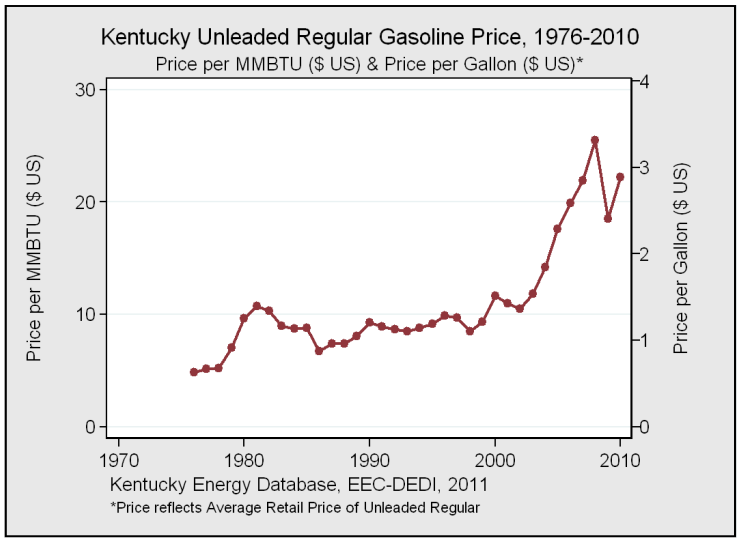
In 2011, the State Gross Domestic Product per capita in Kentucky was $37,717. This per capita income level places Kentucky below the national average of $48,079. Since 1980, GDP per capita in Kentucky has been growing slower than the national average, and in 2011 Kentucky ranked 44th for GDP per capita.



Rural & Urban Population

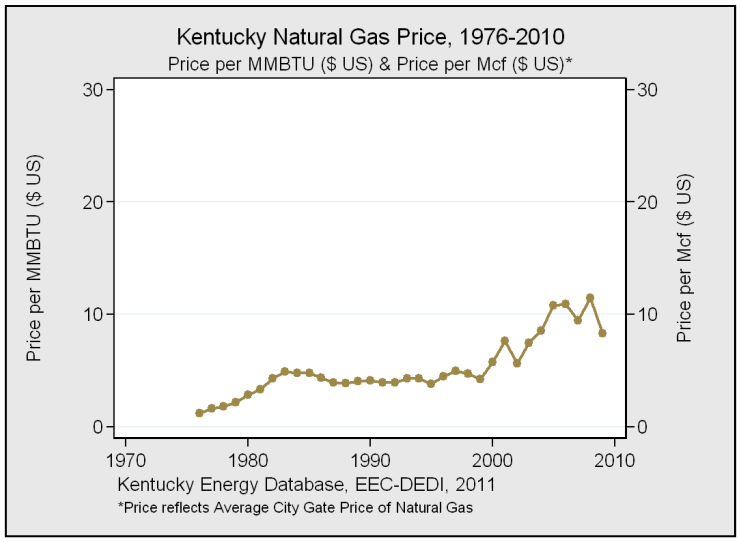
In 2011, the population of Kentucky was estimated to be around 4.36 million. This estimate reflects an 8% increase in Kentucky's population since 2000. Since 1990, Kentucky has witnessed a consistent trend of increasing urbanization and urban population growth.

Kentucky Commodity Prices



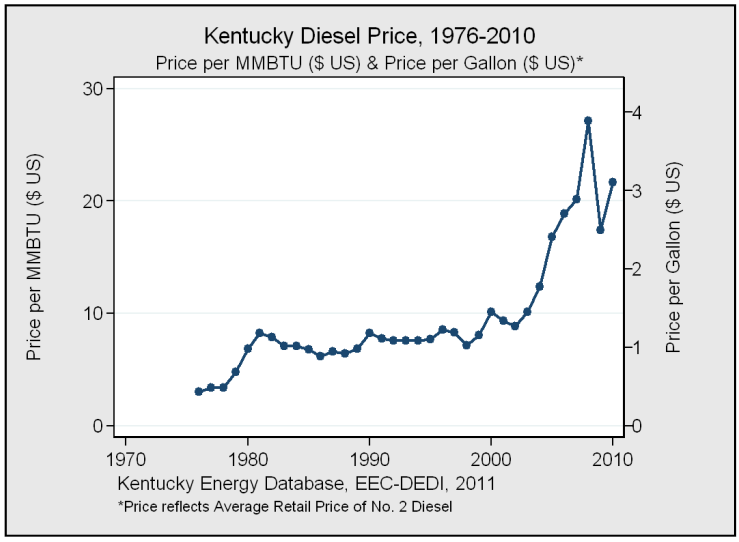
Fuel Type	($US)/MMBTU	($US)/Gallon
Gasoline	22.19	2.75

The average price of gasoline in Kentucky in 2010 was $2.75 per gallon. This represented a 17% increase in the price of gasoline compared with 2009, and was measured by the average retail sales price of gasoline.



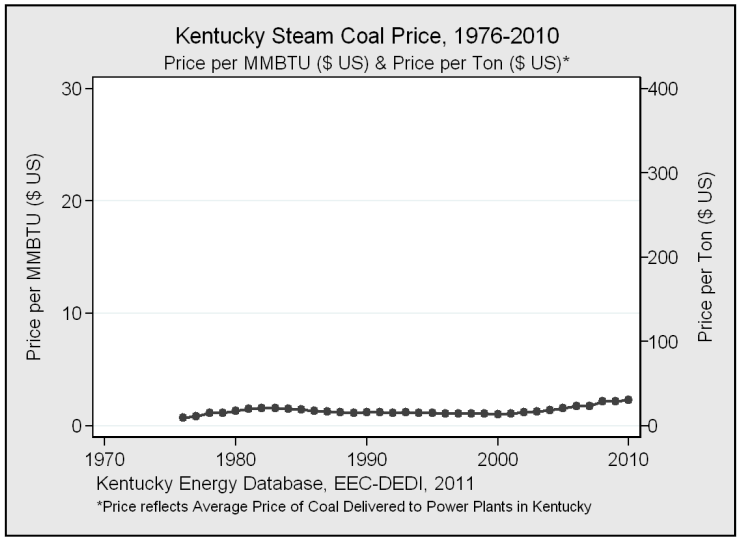
Fuel Type	($US)/MMBTU	($US)/Mcf
Natural Gas	5.77	5.77

The average price of natural gas in Kentucky in 2010 was $5.77 per thousand cubic feet. This represented a 4% decrease in the price of natural gas compared with 2009, and was measured by the average city gate price of natural gas.



Fuel Type	($US)/MMBTU	($US)/Gallon
Diesel	21.68	2.99

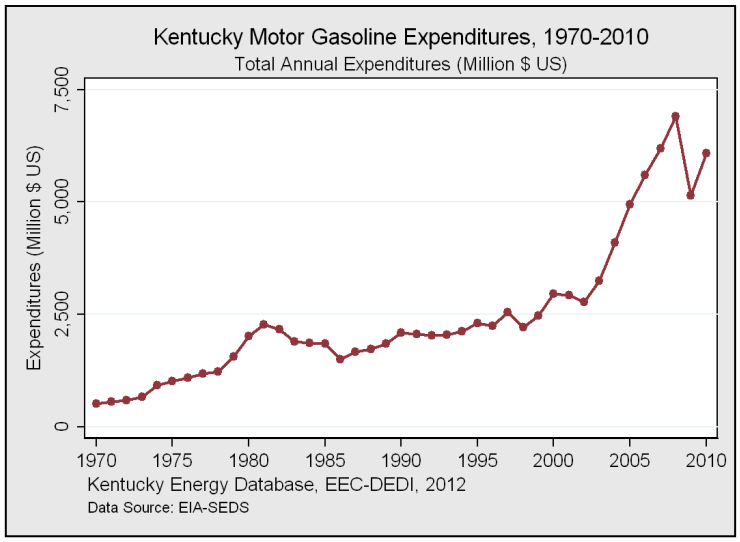
The average price of Diesel in Kentucky in 2010 was $2.99 per gallon. This represented a 23% increase in the price of Diesel compared with 2009, and was measured by the average retail sales price of Diesel.



Fuel Type	($US)/MMBTU	($US)/Ton
Coal	2.26	51.67

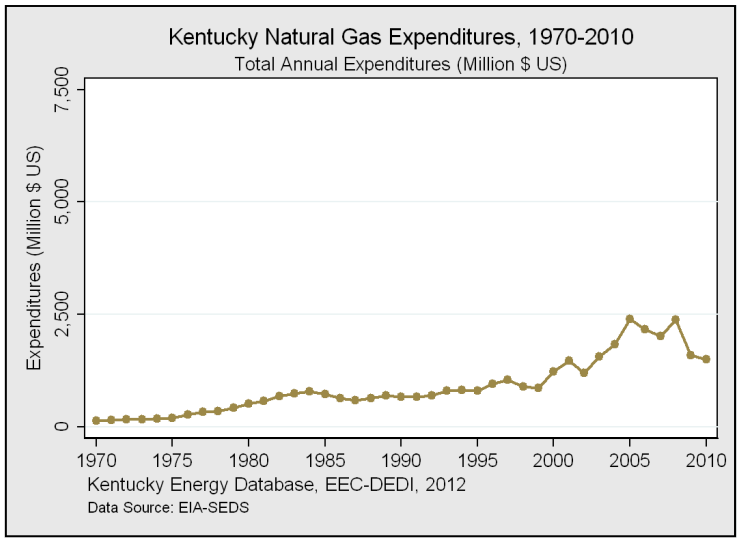
The average price of steam coal in Kentucky in 2010 was $51.67 per ton. This represented a 4% increase in the price of steam coal compared with 2009, and was measured by a weighted average of steam coal prices from the particular coal mine states of origin.

Kentucky Commodity Expenditures



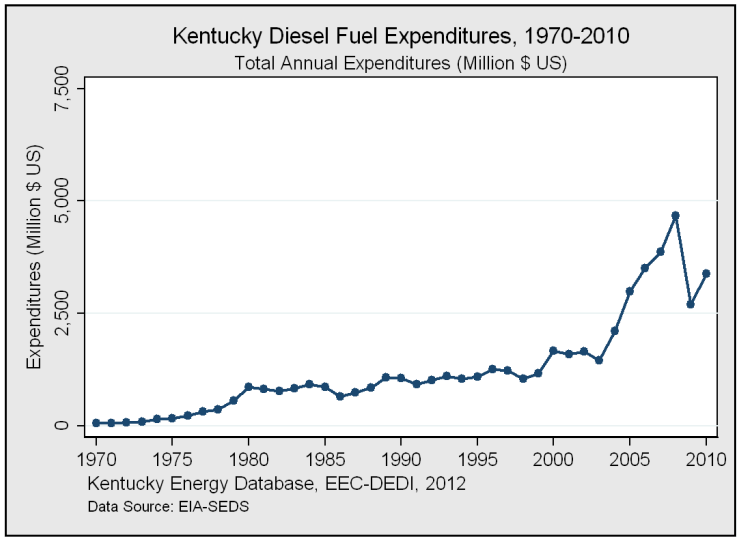
Fuel Type	(Million $ US)	% of Total
Gasoline	6,081	30%

Residents, businesses, and industries in the Commonwealth of Kentucky spent approximately $6.1 billion on gasoline in 2010. This amount represented a 20% increase in gasoline expenditures compared with 2009, and accounted for 30% of energy expenditures in the State.



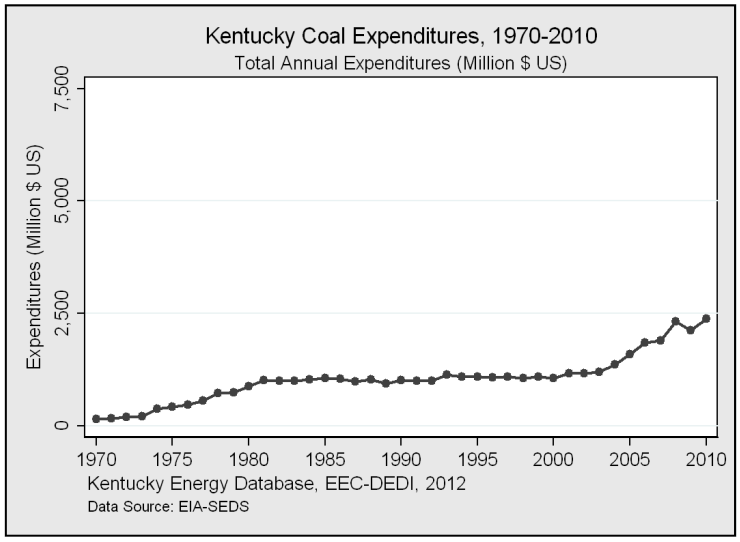
Fuel Type	(Million $ US)	% of Total
Natural Gas	1,497	7%

Residents, businesses, and industries in the Commonwealth of Kentucky spent slightly less than $1.5 Billion on natural gas in 2010. This amount represented a 5% decrease in natural gas expenditures compared with 2009, and accounted for 7% of energy expenditures in the State.



Fuel Type	(Million $ US)	% of Total
Diesel	3,384	17%

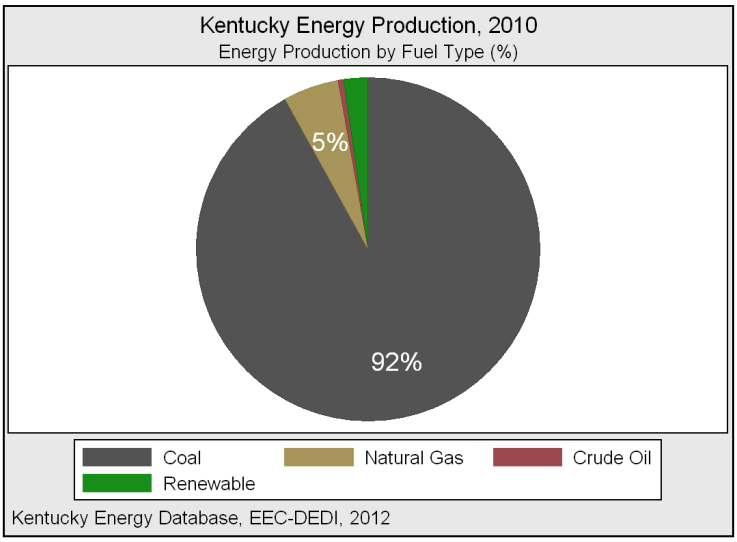
Residents, businesses, and industries in the Commonwealth of Kentucky spent approximately $3.3 billion on diesel in 2010. This amount represented a 22% decrease in diesel expenditures compared with 2009, and accounted for 17% of energy expenditures in the State.

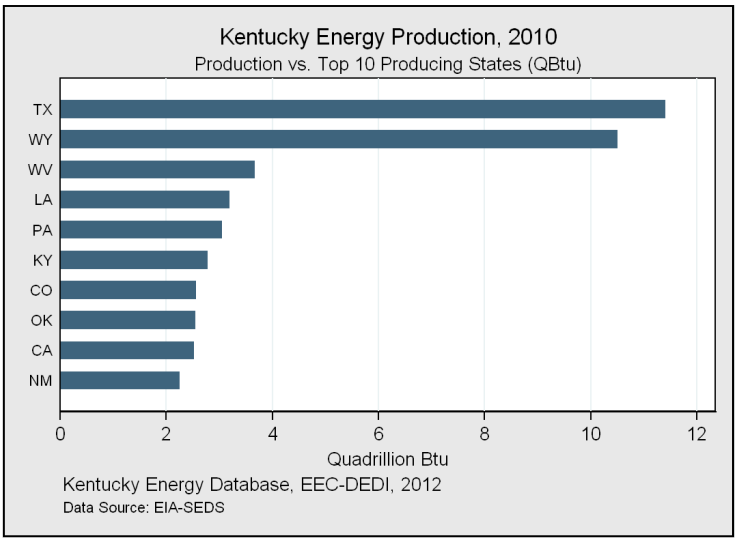


Fuel Type	(Million $ US)	% of Total
Coal	2,383	12%

Electric utilities, municipalities, public institutions, and industries in the Commonwealth of Kentucky spent approximately $2.3 billion on coal in 2010. This amount represented an 10% increase in coal expenditures compared with 2009, and accounted for 12% of energy expenditures in the State.

Kentucky Energy Production

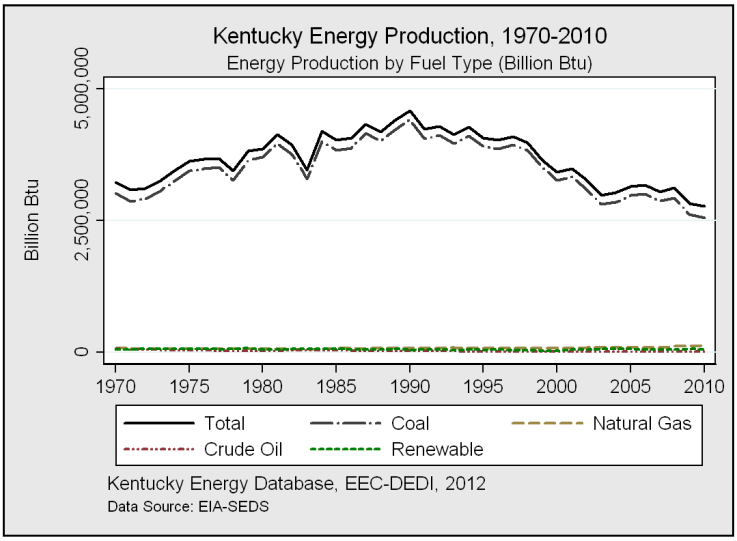


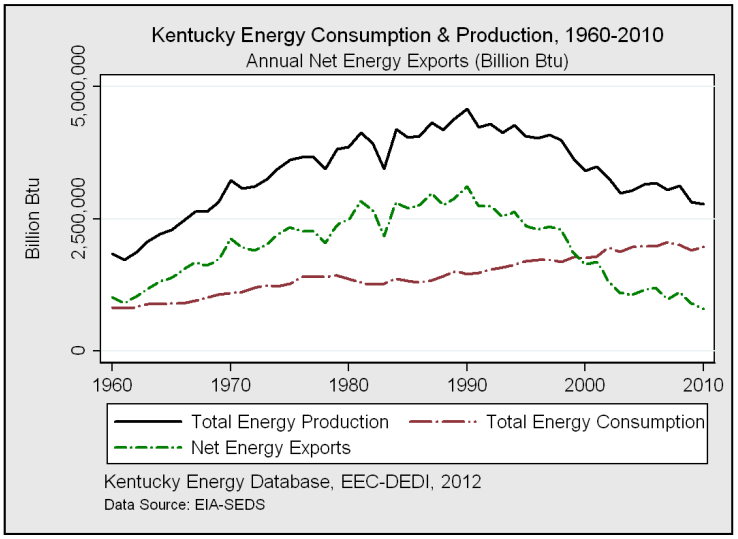


Fuel Type	Billion BTU	Percentage
Total	2,778,584	100%
Coal	2,556,093	92%
Natural Gas	145,231	5%
Renewable	62,649	2%
Crude Oil	14,610	<1%

State	Quadrillion BTU	Rank
Texas	11.41	1st
Kentucky	2.78	6th

Due to decreasing coal production in Kentucky and increasing natural gas production in Pennsylvania, Kentucky fell behind Pennsylvania in energy production during 2010.

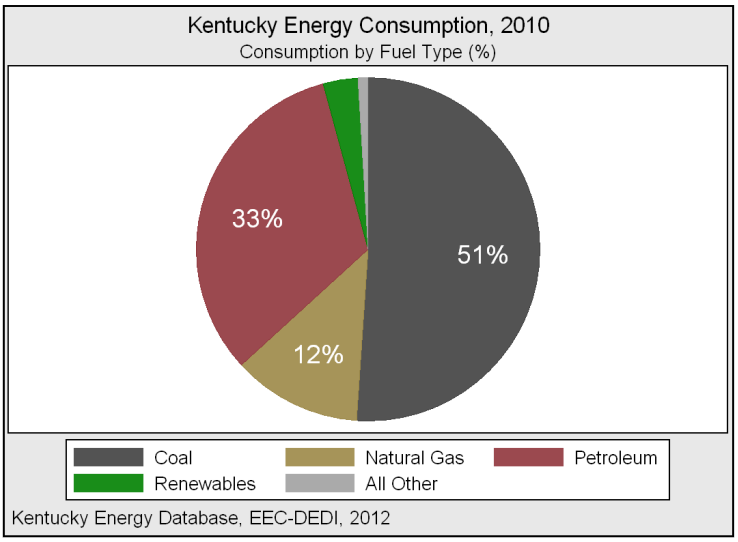


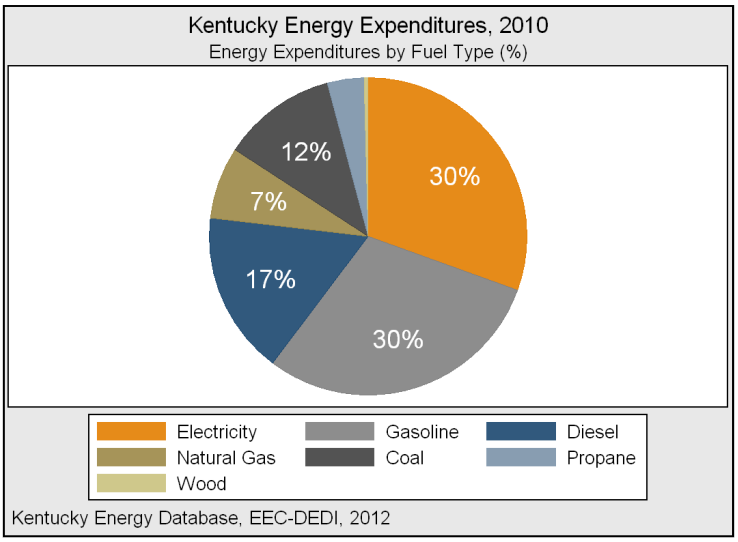


As the third largest coal producer in the nation, the vast majority of energy production in Kentucky is related to the extraction of coal. In 2010, the Commonwealth of Kentucky produced 2.77 Quadrillion Btu of energy. This amount represented a 1% decrease in energy production compared with 2009. Of this amount, coal accounted for 92% of all energy production in Kentucky in 2010. Natural gas, renewable resources, and crude oil comprised the remaining 8% of energy production in the Commonwealth in 2010.

Kentucky has been a net exporter of energy during every year since 1960. During this time coal production has been by far the largest source of energy production in Kentucky. As a result, the trend in coal production in Kentucky has driven the trend in overall energy production. However, with decreasing coal production and increasing energy demand, Kentucky's position as an energy exporter has been declining since 1990.

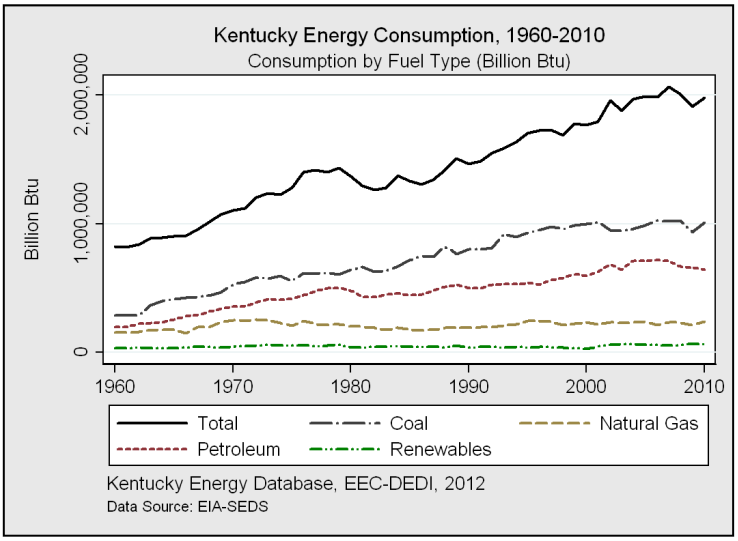
Kentucky Energy Consumption

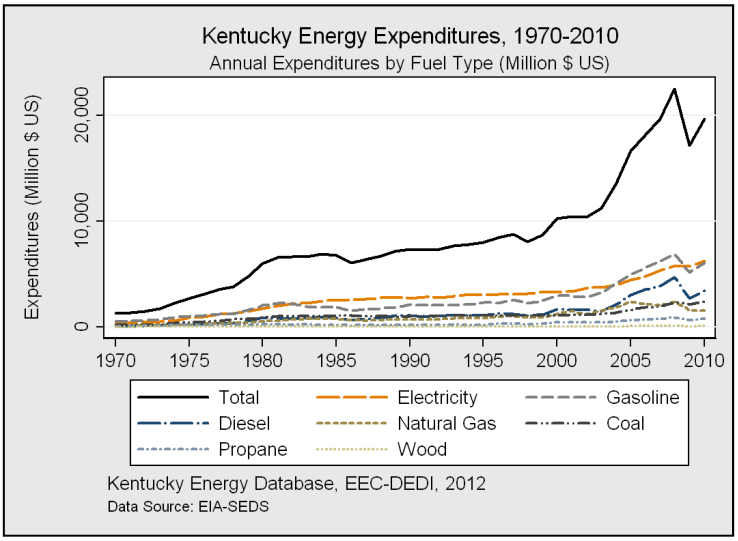




Fuel Type	Billion BTU	Percentage
Total	1,976,514	100%
Coal	1,009,847	51%
Petroleum	644,343	33%
Natural Gas	238,965	12%
Renewables	65,128	3%
All Other	23,779	1%

Fuel Type	Million ($ US)	Percentage
Total	19,675	100%
Electricity	6,224	30%
Gasoline	6,081	30%
Diesel	3,384	17%
Coal	2,383	12%
Natural Gas	1,497	7%

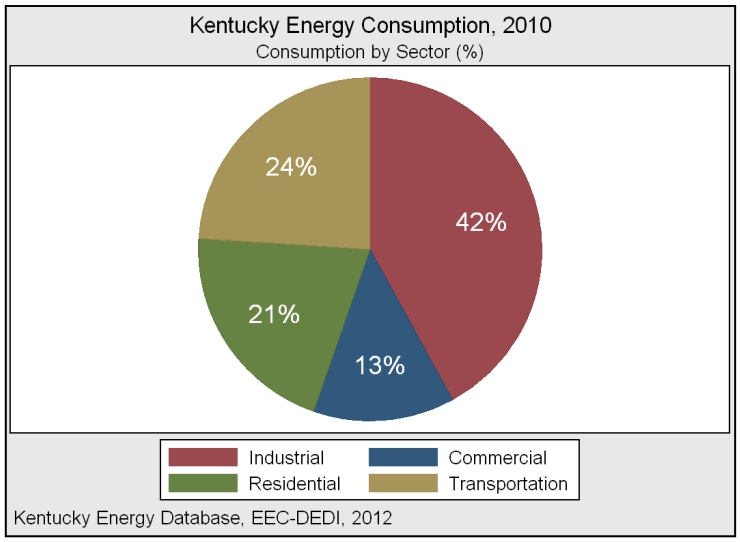


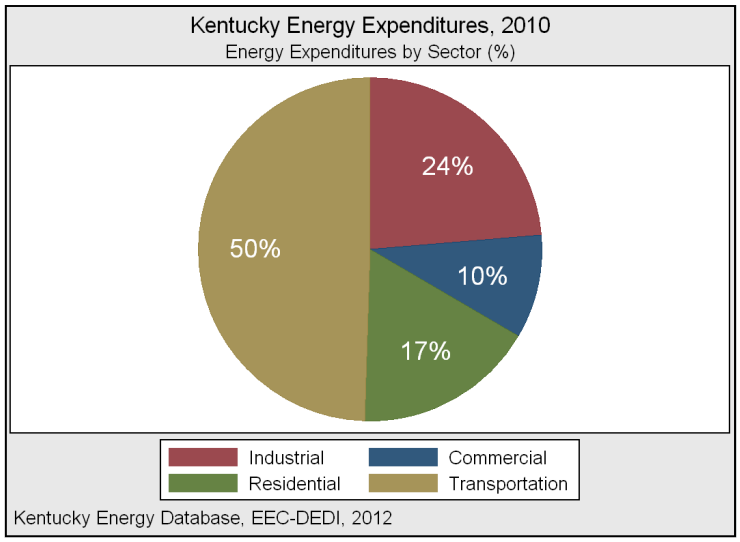


During 2010, the economy of Kentucky consumed approximately 1.97 Quadrillion Btu of energy, an increase of 5% compared with 2009. Coal remained Kentucky's primary energy source, providing 51% of the Commonwealth's energy requirements. Of the coal consumed, 95% was used to generate electricity. Petroleum products were the second largest source of energy consumption at 34%. The remainder of energy consumption was supplied by natural gas (12%) and renewable energy sources (3%).

In 2010, citizens, institutions, and firms spent over $19.6 Billion on energy commodities and energy consumption in Kentucky. This amount reflected a 13% increase in energy expenditures compared with 2009. During the year, electricity and gasoline each represented 30% of energy expenditures in Kentucky. Diesel was the next largest concentration of energy expenditures in 2010 at 17%. Coal and natural gas consumption together accounted for approximately 19% of energy expenditures.

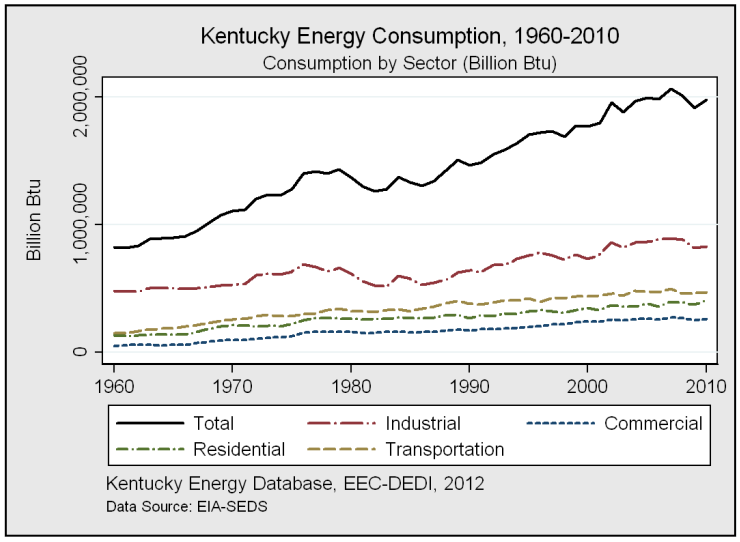
Kentucky Energy Consumption

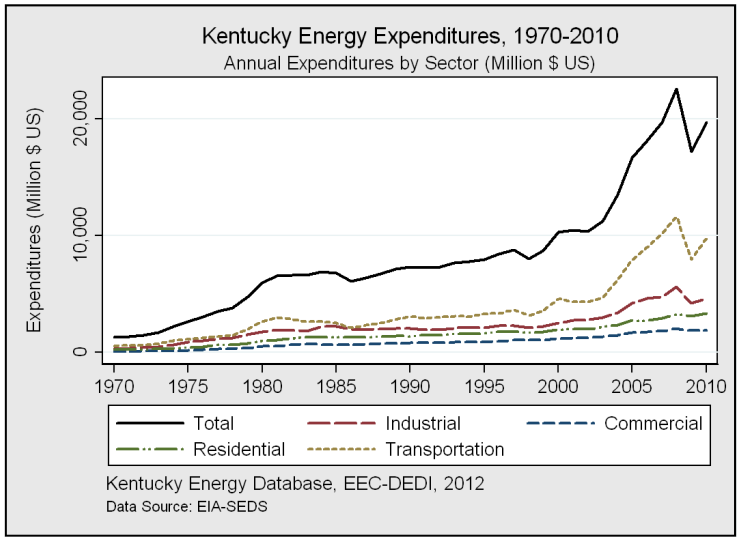




Sector	Billion BTU	Percentage
Total	1,976,514	100%
Industrial	830,881	42%
Transportation	474,294	24%
Residential	407,766	21%
Commercial	263,573	13%

Sector	Million ($ US)	Percentage
Total	19,675	100%
Industrial	9,741	50%
Transportation	4,655	24%
Residential	3,357	17%
Commercial	1,922	10%

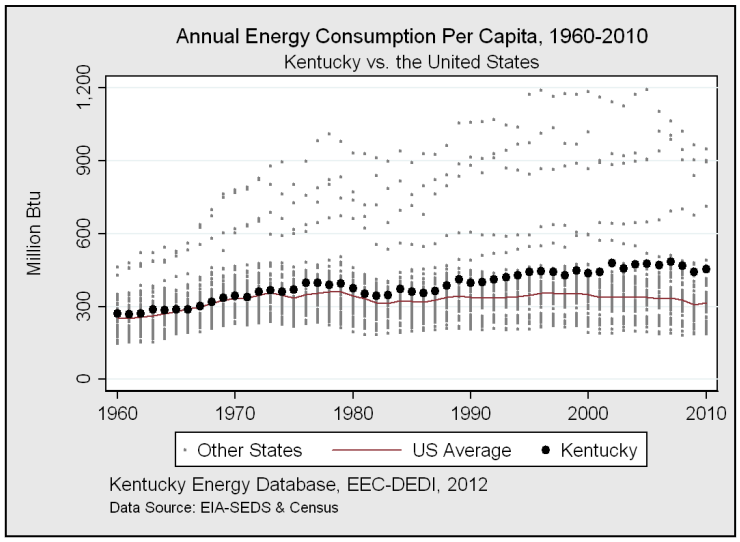




During 2010, the Industrial Sector of Kentucky was the largest consumer of energy in the Commonwealth. Accounting for 42% of energy consumption during the year, the Industrial Sector of Kentucky remains proportionally larger than the national average, which was 31% in 2010. The Transportation Sector was the next largest consumer of energy representing 24% of total energy demand, followed by the Residential Sector at 21%. The Commercial Sector accounted for 13% of energy consumption in 2010.

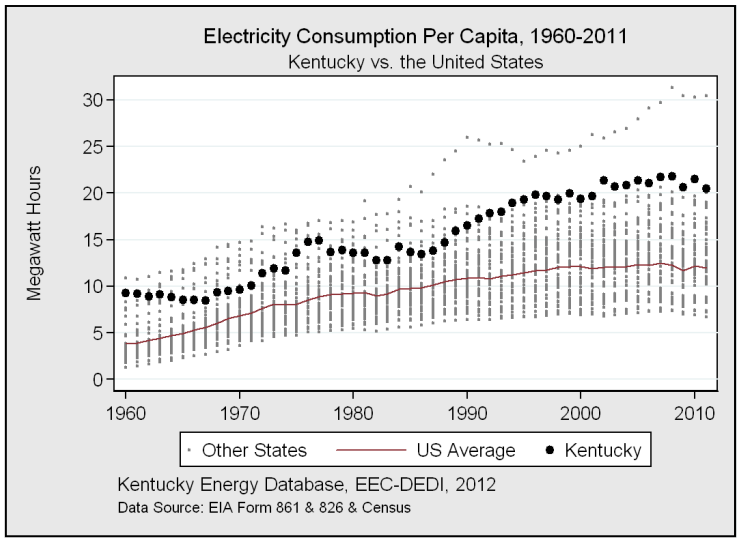
As the largest consumer of energy in 2010, the Industrial Sector of Kentucky also represented the majority of energy expenditures in the Commonwealth during the year. In 2010, the Industrial Sector alone accounted for $9.7 billion in expenditures for various energy commodities. The Transportation Sector—predominantly consuming gasoline and diesel—tabulated $4.6 billion in expenditures, while the Residential and Commercial Sectors represented $3.3 billion and $1.9 billion, respectively.

Kentucky Energy Intensity



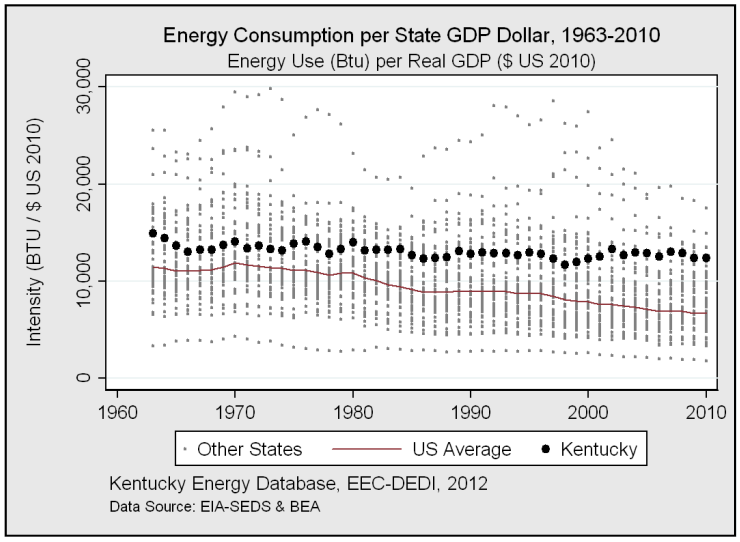
State	MMBtu per Capita	Rank
Wyoming	948	1st
Kentucky	455	9th
Rhode Island	187	50th

In 2010, Kentucky ranked 9th in terms of total energy consumption per capita. Total energy consumption per capita increased by 3% compared with 2009.



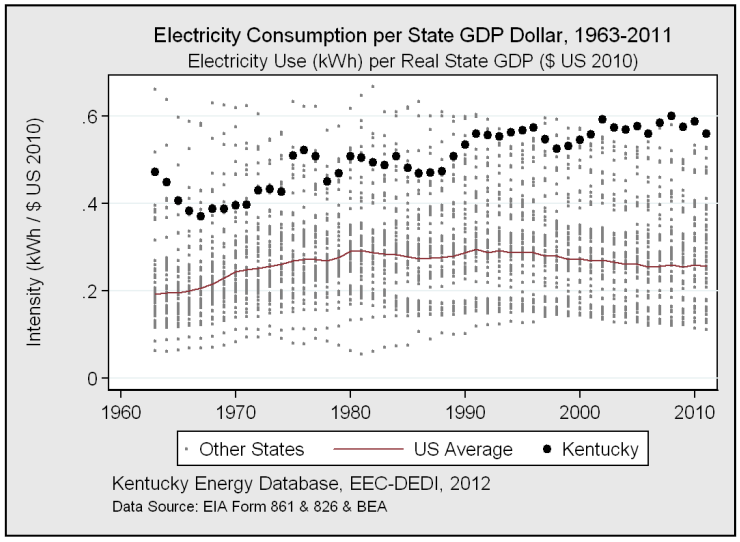
State	MWh per Capita	Rank
Wyoming	30.5	1st
Kentucky	20.4	2nd
California	6.7	50th

In 2011, Kentucky ranked 2nd in terms of total electricity consumption per capita. Total electricity consumption per capita decreased by 5% compared with 2010.



State	Btu / $US GDP	Rank
Louisiana	17,493	1st
Kentucky	12,403	6th
Hawaii	3,304	50th

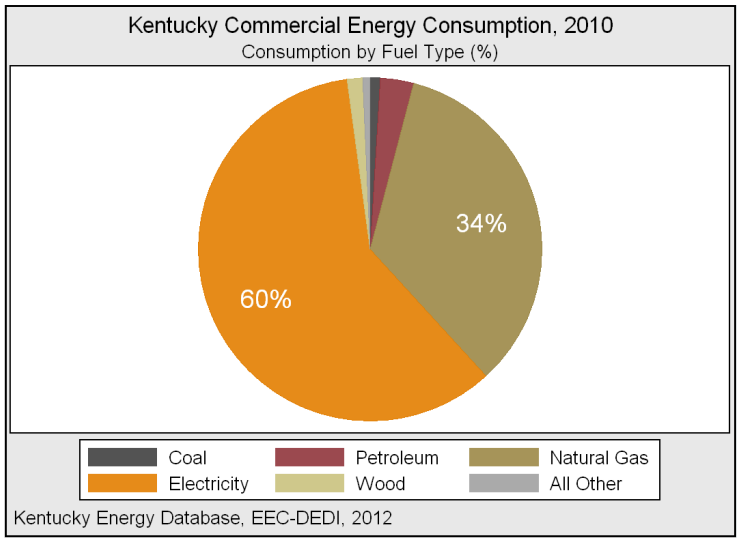
In 2010, Kentucky ranked 12th in terms of total energy consumption per dollar of state GDP. Total energy intensity increased marginally compared with 2009.

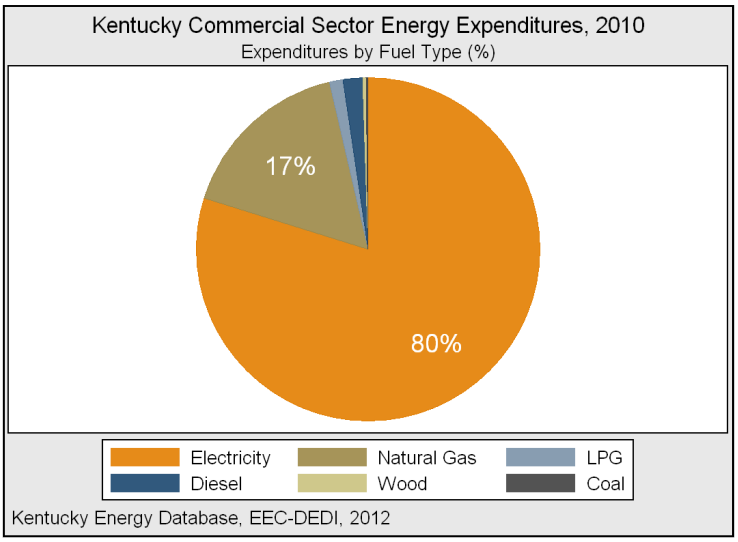


State	kWh / $US GDP	Rank
Kentucky	0.56	1st
Alabama	0.53	15th
Alaska	0.13	50th

In 2011, Kentucky had the single most electricity-intensive economy in the United States, consuming more electricity to produce one dollar of state GDP than any other state. Total electricity intensity decreased by 3% compared with 2010.

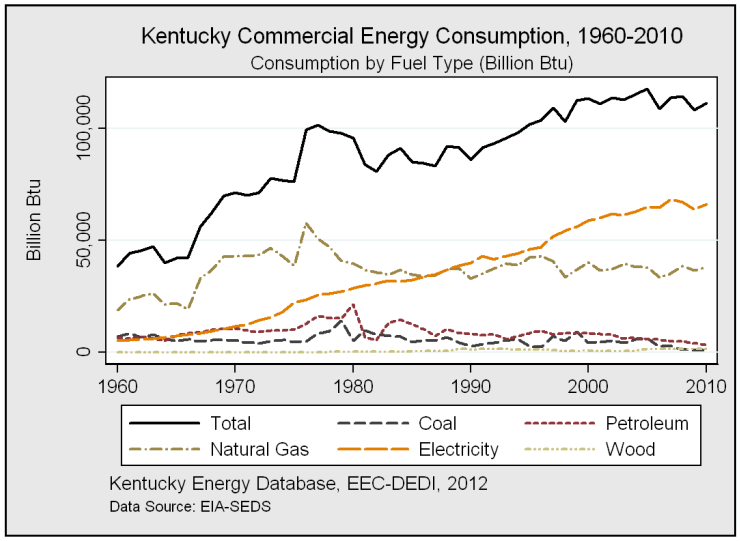
Commercial Energy Consumption

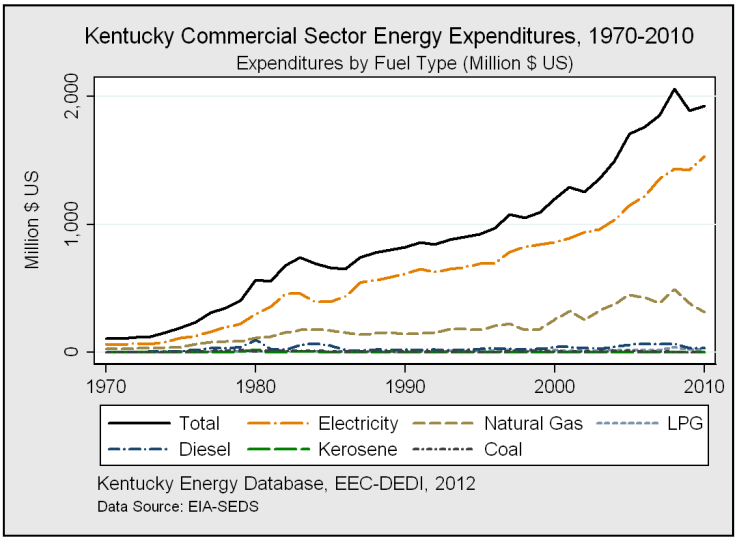




Fuel Type	Billion BTU	Percentage
Total Net*	111,152	100%
Electricity	66,229	60%
Natural Gas	37,952	34%
Petroleum	3,493	3%
Wood	1,666	1%
Coal	1,059	1%

Fuel Type	Million ($ US)	Percentage
Total	1,922	100%
Electricity	1,530	80%
Natural Gas	317	17%
Diesel	35	2%
Liquid Propane Gas	24	1%
Wood	6	<1%

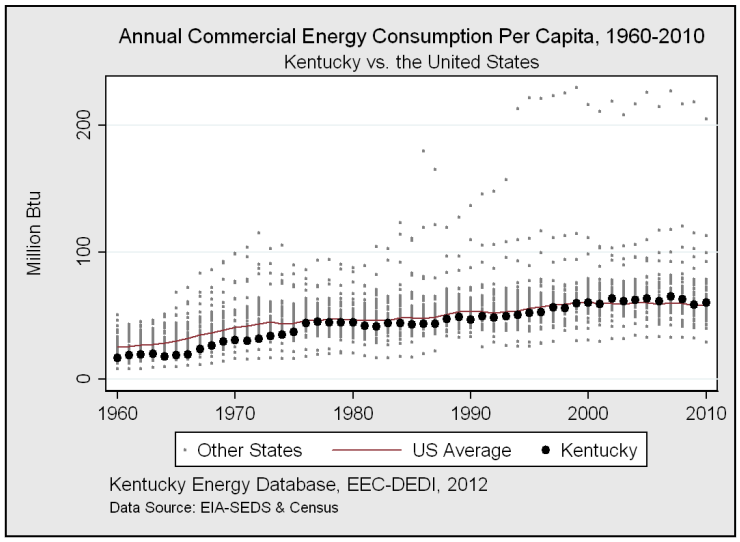




In 2010, the Commercial Sector in Kentucky consumed 111,152 Billion Btu of energy. This amount reflected a 3% increase in net commercial energy consumption compared with 2009. Electricity represented 60% of commercial energy consumption, followed by natural gas at 34%. Other commodities such as petroleum products, wood, coal, and ethanol accounted for approximately 6% of commercial energy consumption in 2010. *(Net energy consumption excludes energy losses associated with electricity transmission).

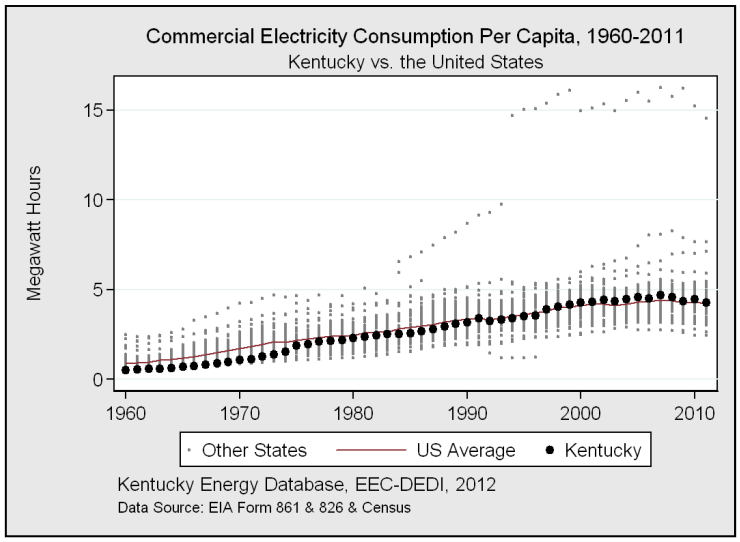
In 2010, the Commercial Sector in Kentucky spent over $1.9 billion on energy commodities and energy consumption. This amount reflected a 2% increase in commercial energy expenditures compared with 2009. Electricity was the largest component of expenditures, accounting for 80% of commercial energy expenditures. Natural gas represented 17% of commercial energy expenditures. Propane, wood, kerosene, and coal accounted for the remainder of commercial energy expenditures in 2010.

Commercial Energy Intensity



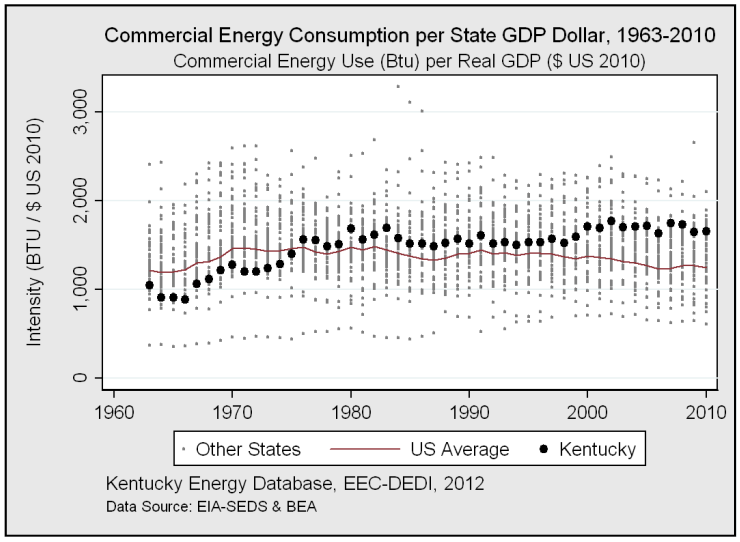
State	MMBtu per Capita	Rank
Wyoming	113	1st
Kentucky	61	26th
Hawaii	29	50th

In 2010, Kentucky ranked 26th in terms of commercial energy consumption per capita. Commercial energy consumption per capita increased by 3% compared with 2009.



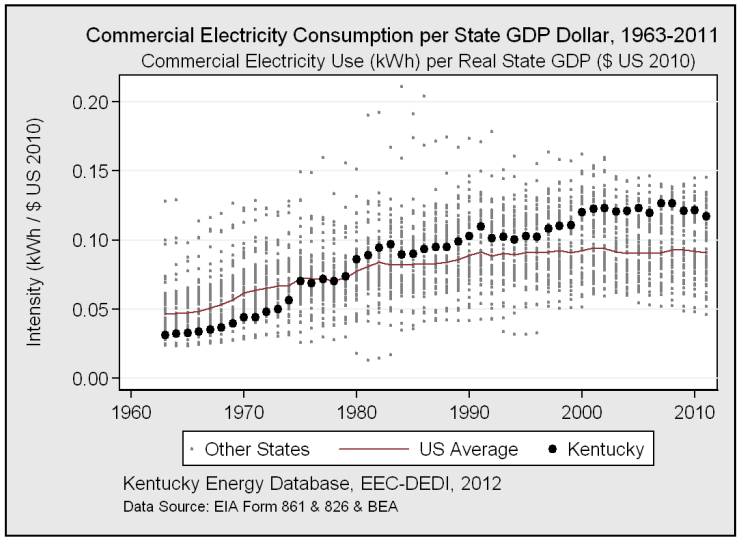
State	MWh per Capita	Rank
Wyoming	7.64	1st
Kentucky	4.28	24th
Hawaii	2.45	50th

In 2011, Kentucky ranked 24th in terms of commercial electricity consumption per capita. Commercial electricity consumption per capita decreased by 4% compared with 2010.



State	Btu / $US GDP	Rank
Wyoming	2,095	1st
Kentucky	1,654	12th
Hawaii	607	50th

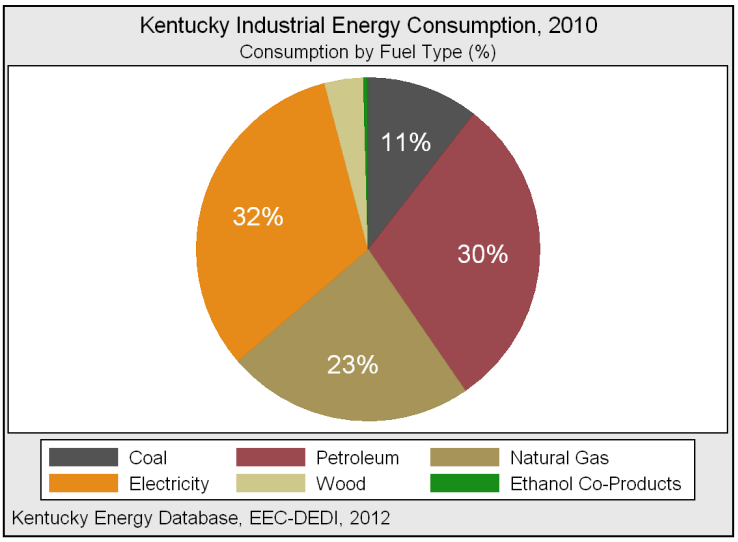
In 2010, Kentucky ranked 12th in terms of commercial energy consumption per dollar of state GDP. Commercial energy intensity increased marginally compared with 2009.

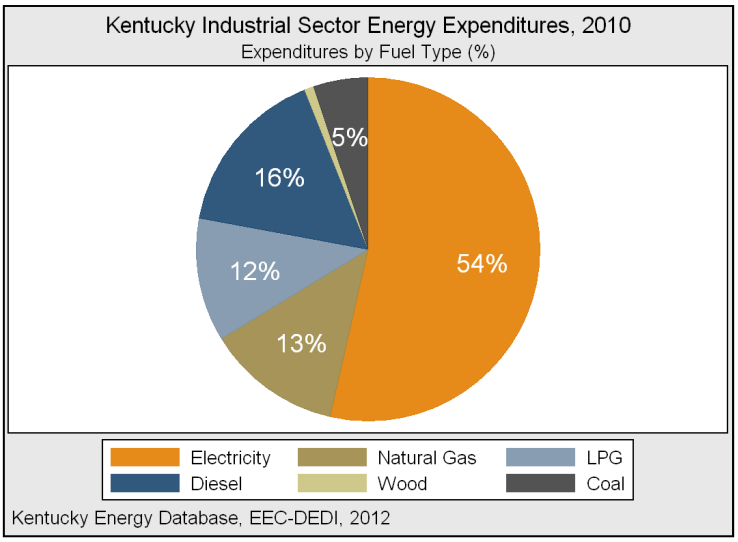


State	kWh / $US GDP	Rank
Mississippi	0.14	1st
Kentucky	0.11	15th
Massachusetts	0.04	50th

In 2011, Kentucky ranked 15th in terms of commercial electricity use per dollar of state GDP. Commercial electricity intensity decreased by 5% compared with 2010.

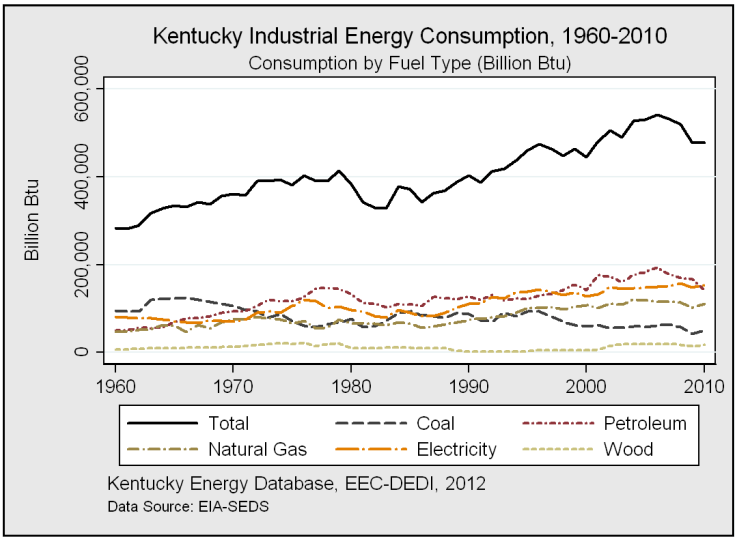
Industrial Energy Consumption

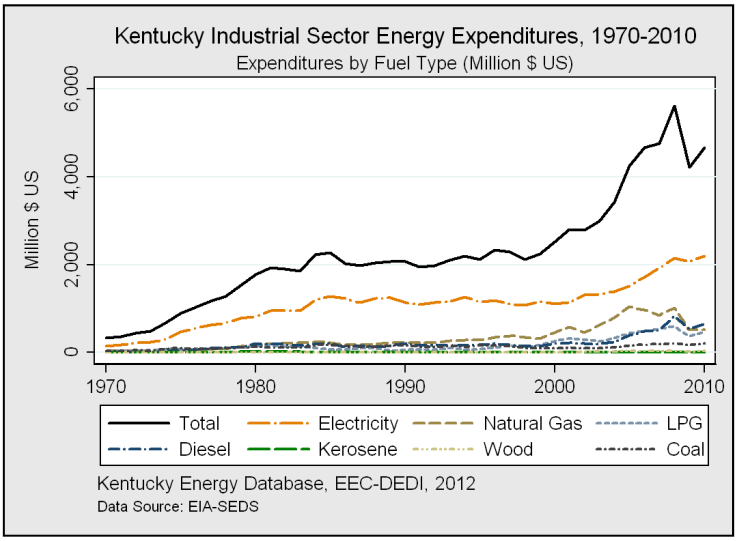




Fuel Type	Billion BTU	Percentage
Total Net*	477,344	100%
Electricity	153,616	32%
Petroleum	142,777	30%
Natural Gas	111,201	23%
Coal	50,218	11%
Wood	17,466	4%

Fuel Type	Million ($ US)	Percentage
Total	4,655	100%
Electricity	2,197	54%
Natural Gas	657	16%
Diesel	520	13%
Liquid Propane Gas	477	12%
Coal	210	5%

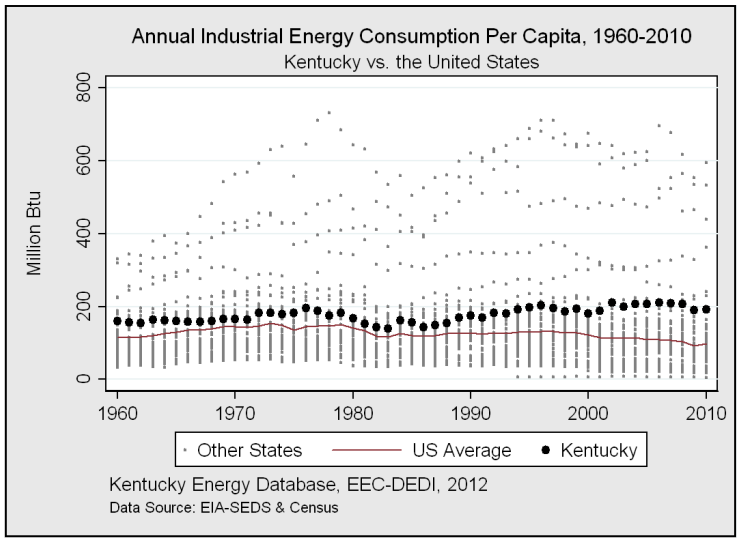




In 2010, industrial firms in Kentucky consumed 477,344 Billion Btu of energy. Compared with 2009, net industrial energy consumption was effectively unchanged. Electricity consumption was the largest component of industrial energy use in 2011, representing 32% of total industrial energy consumption. Assorted petroleum products and natural gas accounted for 30% and 23% of industrial energy consumption, respectively. *(Net energy consumption excludes energy losses associated with electricity transmission).

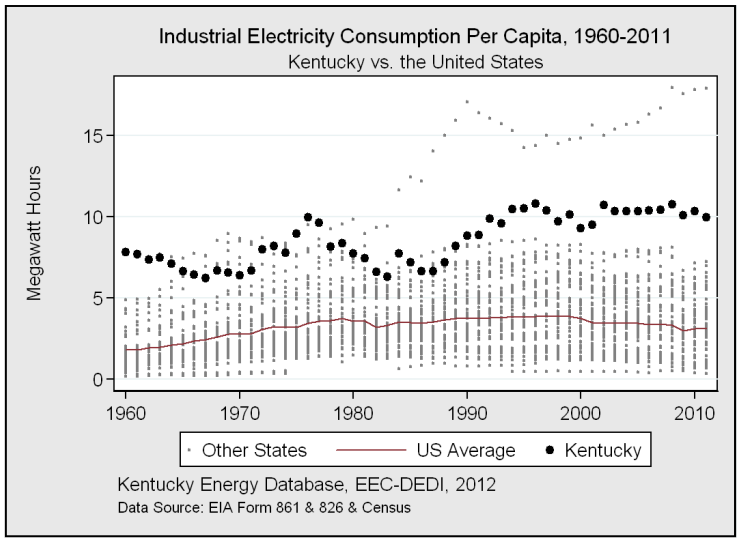
In 2010, firms of the Industrial Sector in Kentucky spent over $4.65 Billion on energy commodities and energy consumption. This amount reflected an 11% increase in industrial energy expenditures compared with 2009. Electricity was the largest concentration of expenditures, accounting for 54% of industrial energy expenditures. Natural gas and diesel accounted for 13% and 12% of industrial expenditures, respectively. Propane, coal, wood, and ethanol accounted for the remainder of industrial energy expenditures in 2010.

Industrial Energy Intensity



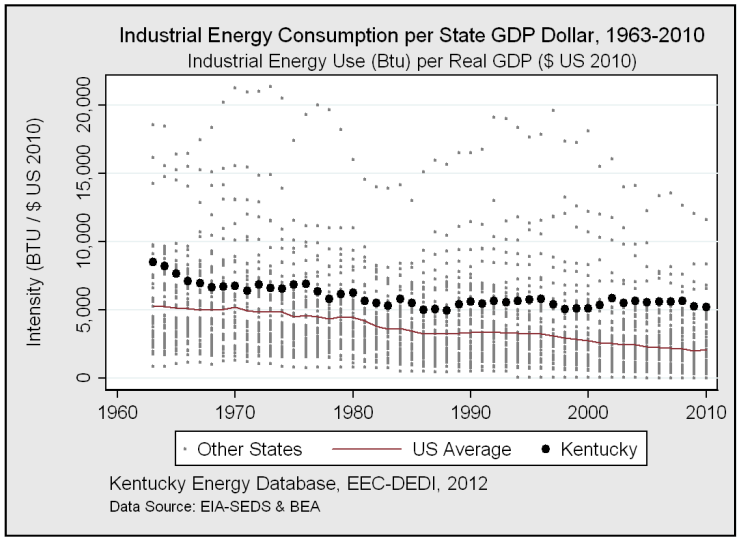
State	MMBtu per Capita	Rank
Louisiana	595	1st
Kentucky	191	9th
New York	18	50th

In 2010, Kentucky ranked 9th in terms of industrial energy consumption per capita. Industrial energy consumption per capita increased by 1% compared with 2009.



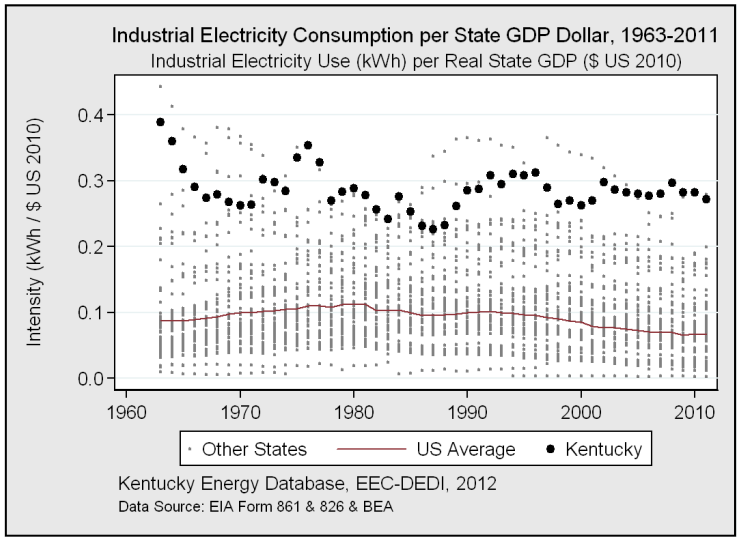
State	MWh per Capita	Rank
Wyoming	17.9	1st
Kentucky	9.9	2nd
New York	0.7	50th

In 2011, Kentucky ranked 2nd in terms of industrial electricity consumption per capita. Industrial electricity consumption per capita decreased by 4% compared with 2010.



State	Btu / $US GDP	Rank
Louisiana	11,636	1st
Kentucky	5,214	5th
New York	307	50th

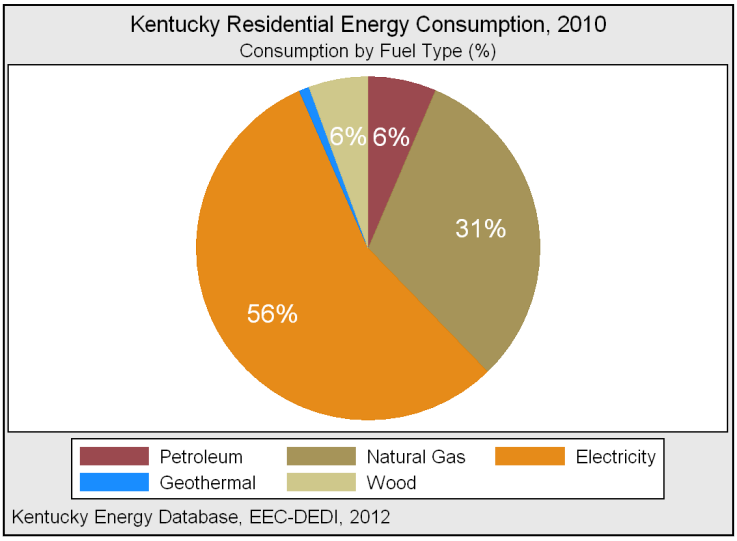
In 2010, Kentucky ranked 5th in terms of industrial energy consumption per dollar of state GDP. Industrial energy intensity decreased by 2% compared with 2009.

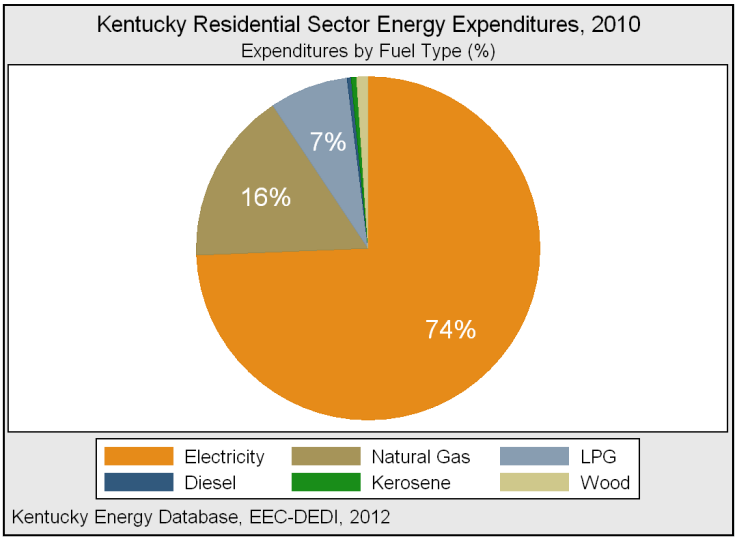


State	kWh / $US GDP	Rank
Wyoming	0.28	1st
Kentucky	0.27	2nd
New York	0.01	50th

In 2011, Kentucky ranked 2nd in terms of industrial electricity use per dollar of state GDP. Industrial electricity intensity decreased by 4% compared with 2010.

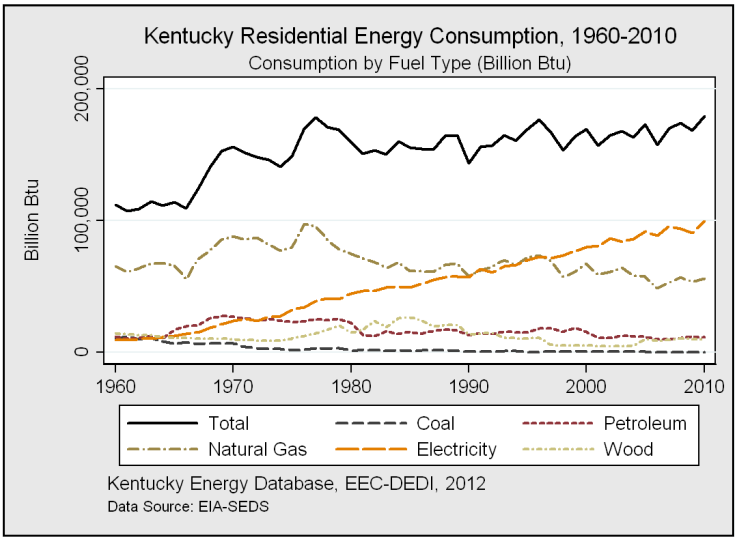
Residential Energy Consumption

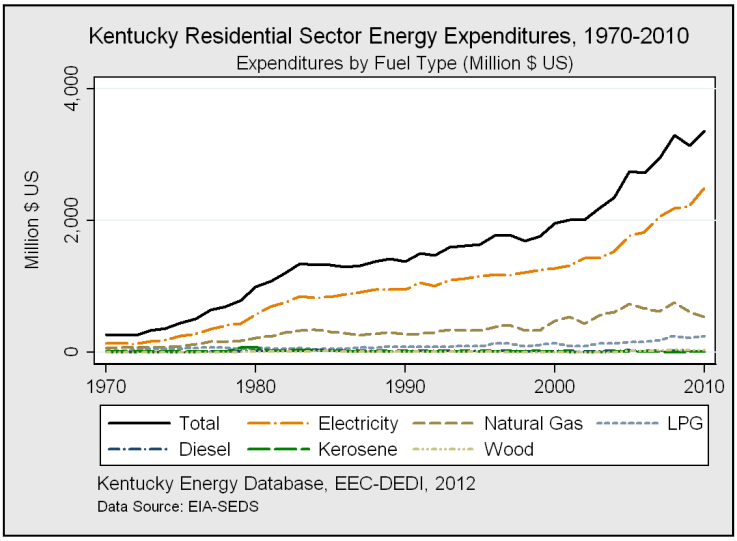




Fuel Type	Billion BTU	Percentage
Total Net*	178,972	100%
Electricity	99,414	56%
Natural Gas	56,060	31%
Petroleum	11,488	6%
Wood	9,967	6%
Geothermal	1,790	1%

Fuel Type	Million ($ US)	Percentage
Total	3,357	100%
Electricity	2,497	74%
Natural Gas	545	16%
Liquid Propane Gas	249	7%
Wood	37	1%
Kerosene	16	<1%

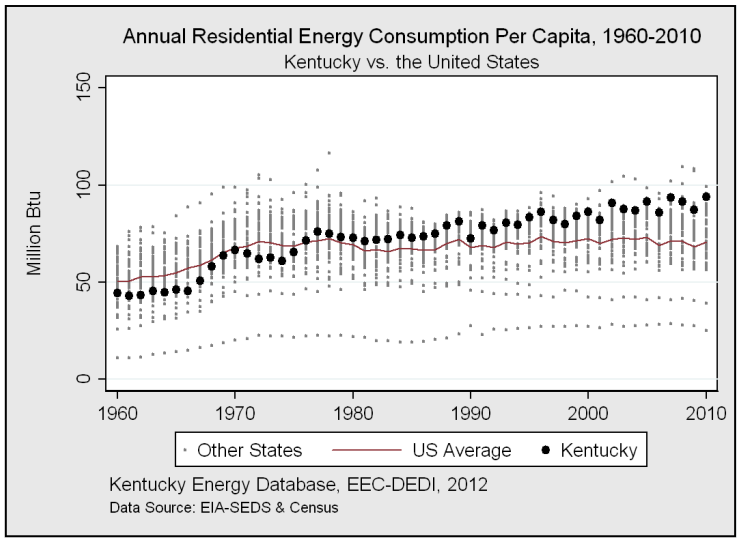




In 2010, residents of Kentucky consumed 178,972 Billion Btu of energy. This amount reflected a 6% increase in net residential energy consumption compared with 2009. Electricity use represented the majority (56%) of residential energy consumption during the year. Natural gas was the second largest concentration of residential energy consumption at 31% in 2010. *(Net energy consumption excludes energy losses associated with electricity transmission).

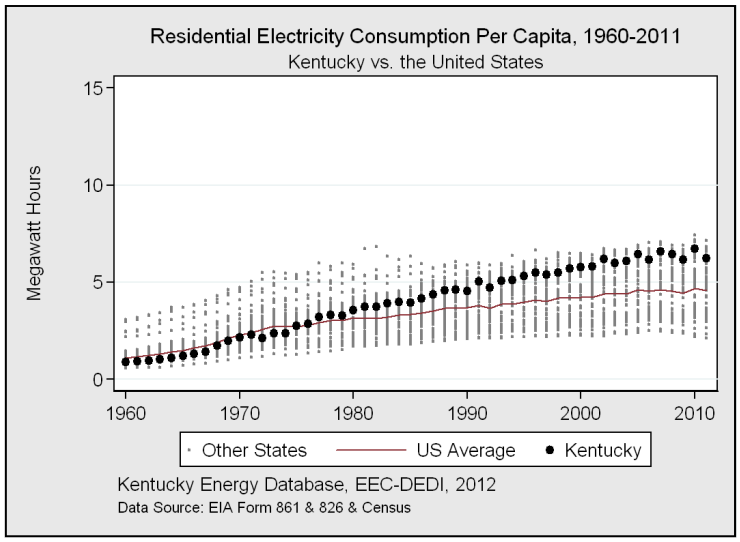
Residents of Kentucky spent over $3.35 Billion on energy commodities and energy consumption in 2010. This amount represented a 7% increase in residential energy expenditures compared with 2009, and was led by electricity expenditures which totaled $2.49 Billion during the year. Natural gas, propane, wood, kerosene, and No. 2 heating oil represented much smaller components of residential energy expenditures relative to electricity in 2010.

Residential Energy Intensity



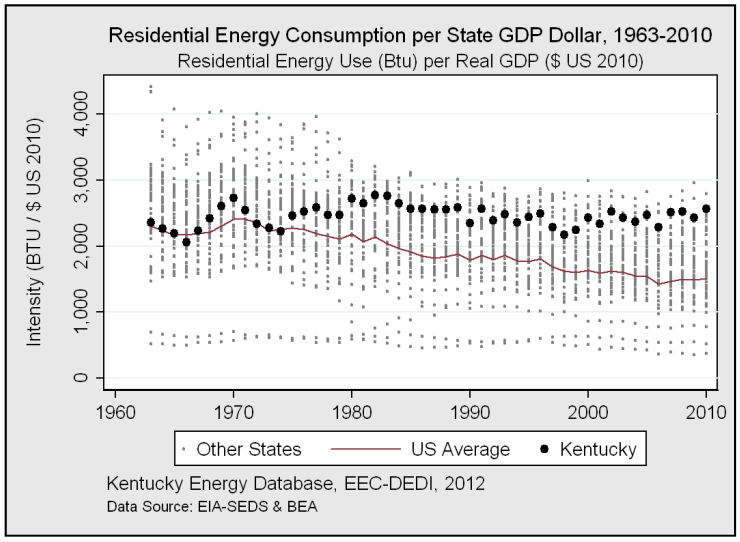
State	MMBtu per Capita	Rank
North Dakota	99.1	1st
Kentucky	93.8	3rd
Hawaii	24	50th

In 2010, Kentucky ranked 3rd in terms of residential energy consumption per capita. Residential energy consumption per capita increased by 8% compared with 2009.



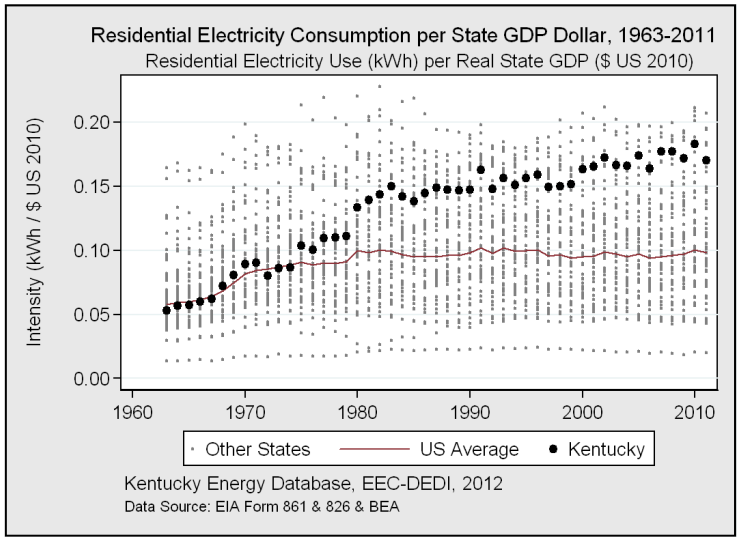
State	MWh per Capita	Rank
Louisiana	7.14	1st
Kentucky	6.22	10th
Hawaii	2.13	50th

In 2011, Kentucky ranked 10th nationally in terms of residential electricity use per capita. Residential electricity use per capita decreased by 7% compared with 2010.



State	Btu / $US GDP	Rank
Wyoming	2,790	1st
Kentucky	2,559	2nd
Hawaii	521	50th

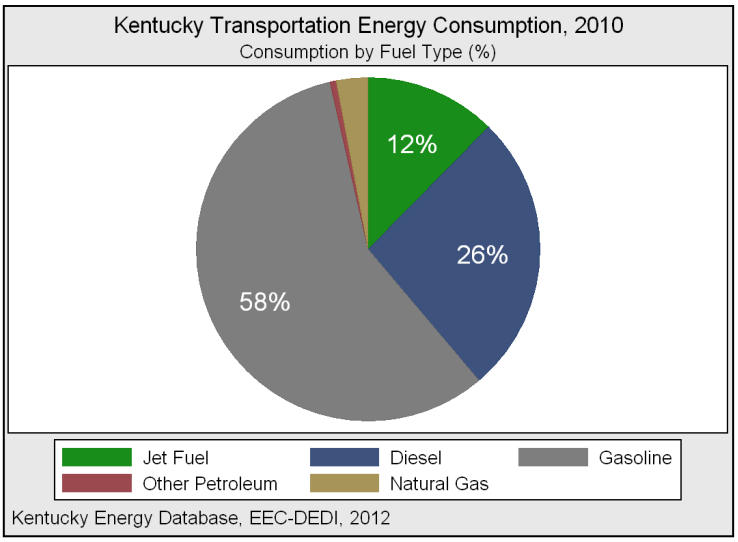
In 2010, Kentucky ranked 2nd in terms of residential energy consumption relative to one dollar of state GDP. Residential energy intensity increased by 5% compared with 2009.

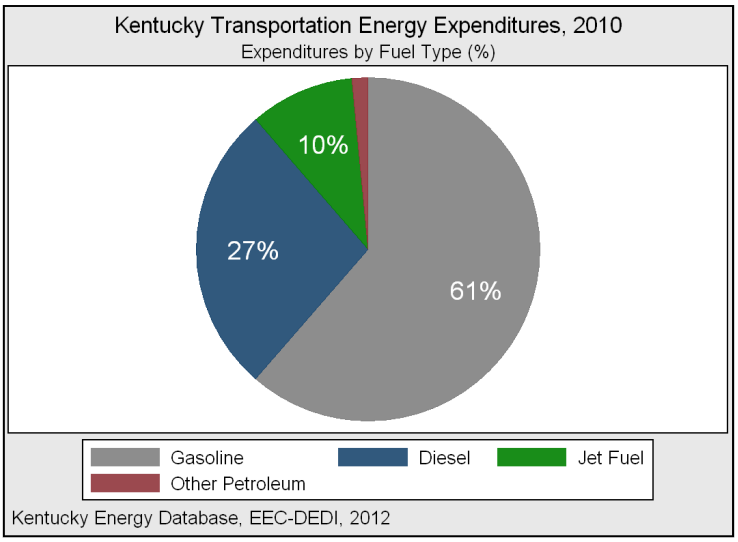


State	kWh / $US GDP	Rank
Mississippi	0.21	1st
Kentucky	0.17	6th
Alaska	0.04	50th

In 2011, Kentucky ranked 6th in terms of residential electricity use relative to one dollar of state GDP. Residential electricity intensity decreased by 6% compared with 2010.

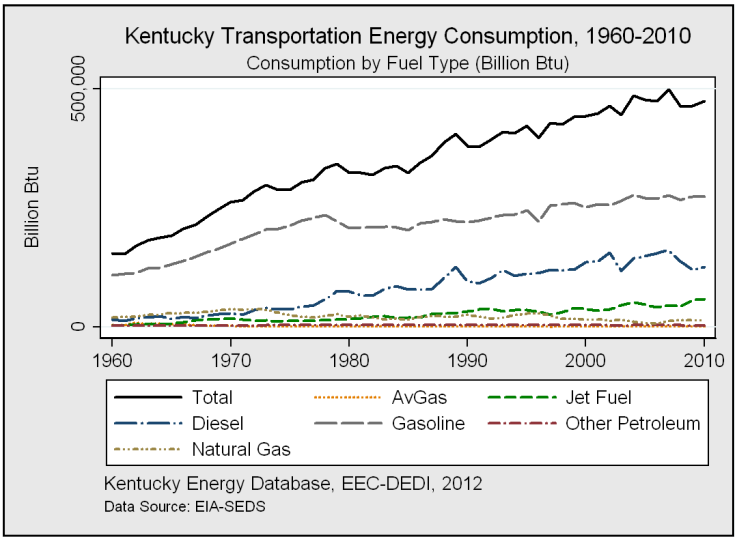
Transportation Energy Consumption

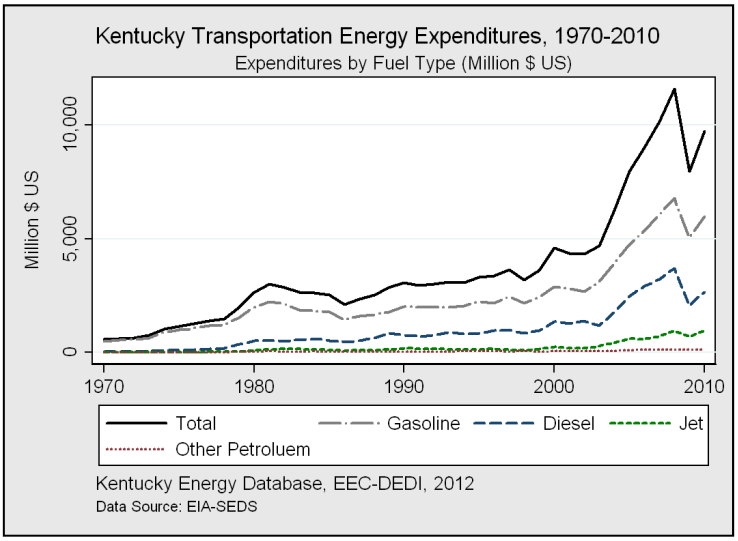




Fuel Type	Billion BTU	Percentage
Total	474,294	100%
Gasoline	272,909	58%
Diesel	125,554	26%
Jet Fuel	58,591	12%
Natural Gas*	14,036	3%
Other Petroleum	2,994	1%

Fuel Type	Million ($ US)	Percentage
Total	9,472	100%
Gasoline	5,977	61%
Diesel	2,656	27%
Jet Fuel	957	10%
Other Petroleum	147	2%



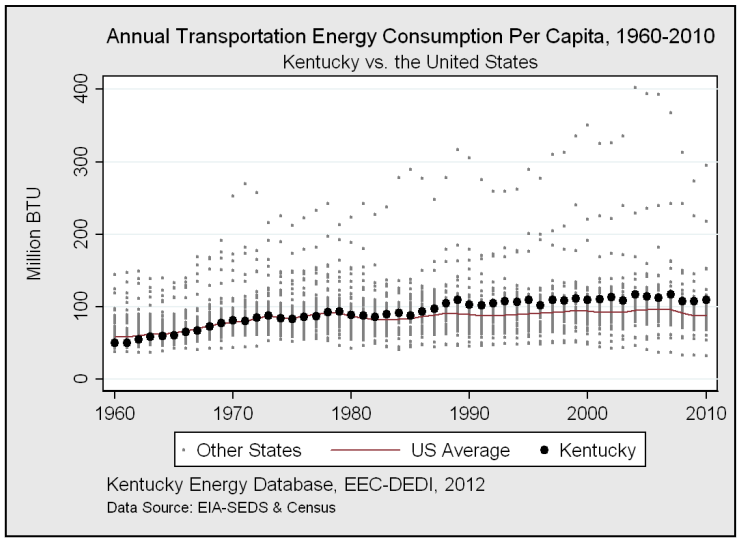


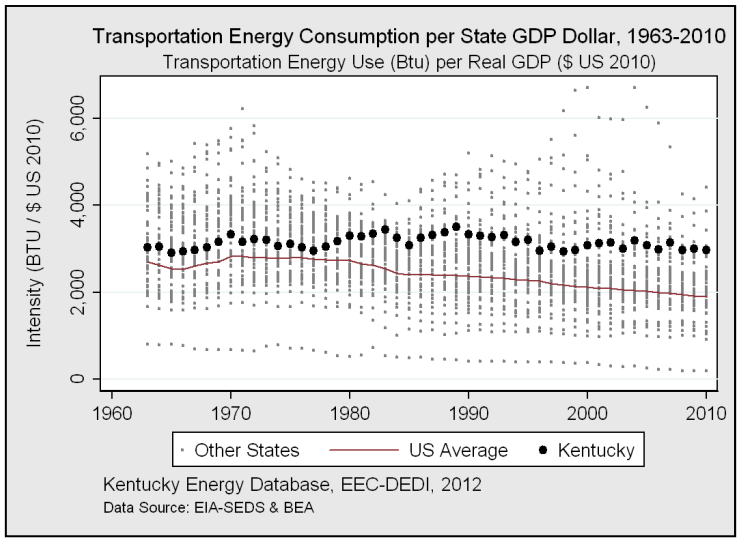
Transportation Sector energy consumption in Kentucky was 474,294 Billion Btu in 2010, a 2% increase compared with 2009. Gasoline represented 58% of transportation energy consumption in 2010, followed by diesel at 26%.

*Natural gas consumption by the Transportation Sector in Kentucky is predominantly consumption by major interstate gas transmission pipelines that bisect the Commonwealth. Direct, vehicle fuel consumption of natural gas in Kentucky is very small—in 2010 it was 4 MMcf or 4 Billion Btu.

Transportation energy expenditures were approximately $9.47 Billion in Kentucky in 2010. Compared with 2009, transportation energy expenditures increased by 19%. Gasoline was the largest component of transportation energy expenditures, representing 61% of spending in 2010. Diesel expenditures accounted for 26% of transportation energy costs in Kentucky in 2010. (Consumption of natural gas by way of transmission pipelines is not tabulated in terms of Transportation Sector energy expenditures).

Transportation Energy Intensity





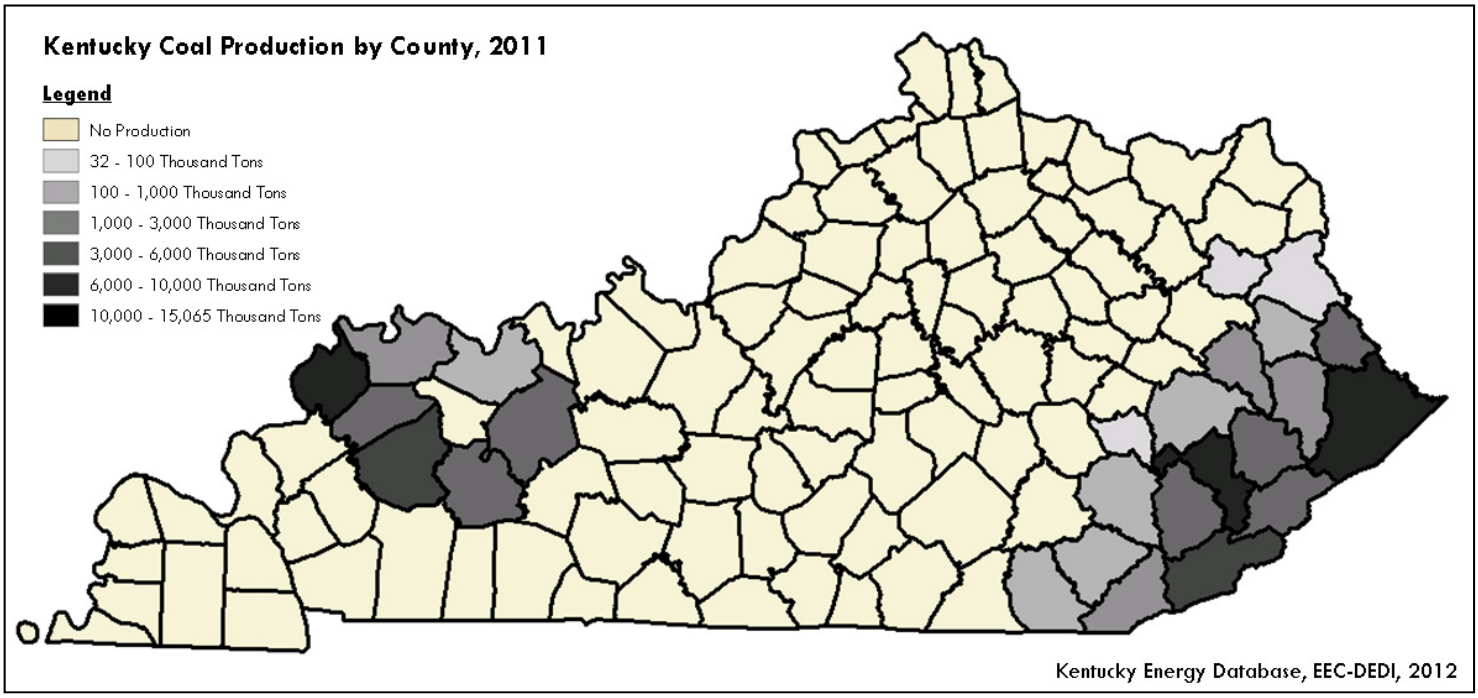
State	MMBtu per Capita	Rank
Alaska	295	1st
Kentucky	109	10th
New York	54	50th

In 2010, Kentucky ranked 10th nationally in terms of transportation energy consumption per capita. Transportation energy consumption per capita increased by 1% compared with 2009.

State	Btu / $US GDP	Rank
Alaska	4,415	1st
Kentucky	2,976	6th
New York	923	50th

In 2010, Kentucky ranked 6th in terms of transportation energy consumption per dollar of state GDP. Transportation energy intensity decreased by 1% compared with 2009.

Kentucky Coal Production



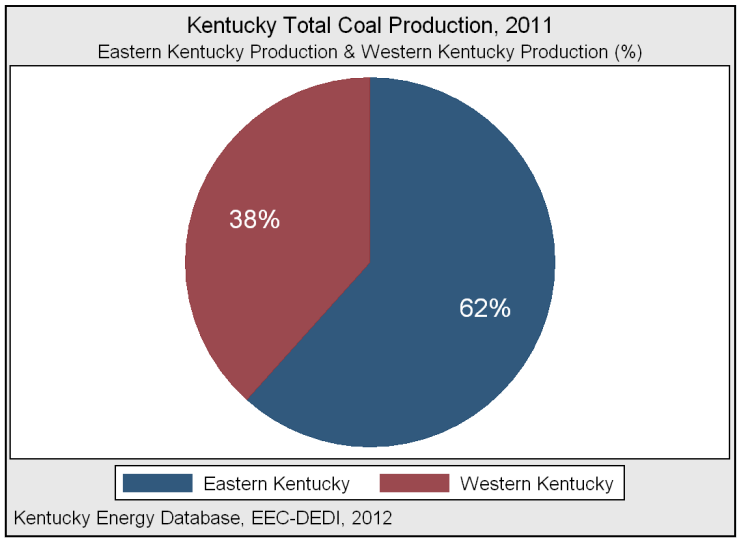
County	Thousand Tons	Percentage	Year Change
Total	106,285	100%	1%
Pike	15,065	14%	- 7%
Perry	12,975	12%	- 7%
Union	12,333	12%	20%
Harlan	9,682	9%	- 8%
Hopkins	8,786	8%	- 33%
Webster	5,731	5%	188%
Ohio	5,528	5%	33%
Muhlenberg	5,518	5%	20%
Martin	5,486	5%	- 1%
Knott	4,853	5%	3%
Letcher	4,544	4%	10%
Leslie	4,094	4%	11%
Floyd	2,702	3%	54%
Henderson	2,471	2%	6%

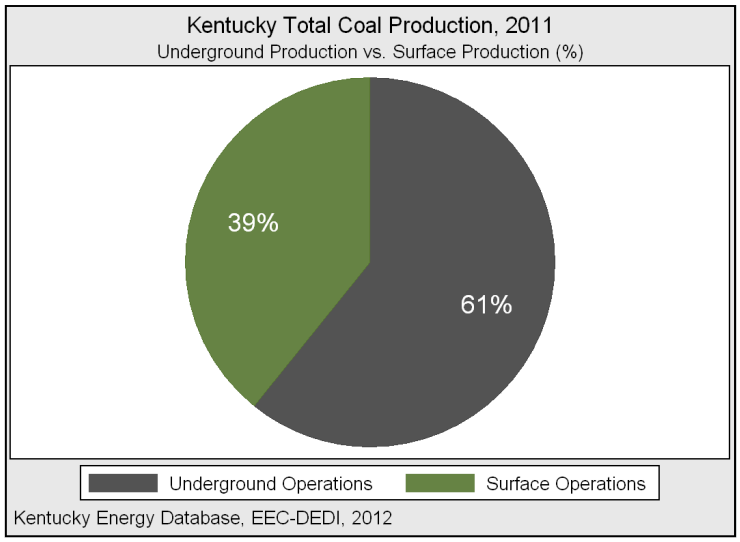
County	Thousand Tons	Percentage	Year Change
Magoffin	2,278	2%	- 16%
Bell	1,495	1%	- 32%
Breathitt	860	1%	- 20%
Daviess	406	<1%	8%
Whitley	405	<1%	15%
Clay	370	<1%	- 24%
Knox	314	<1%	- 37%
Johnson	231	<1%	50%
Lawrence	65	<1%	- 58%
Owsley	61	<1%	13%
Elliot	31	<1%	-

State and County-level statistics are aggregated from MSHA Form 7000-02 quarterly reports through 2011.

In Kentucky, coal mining is divided between two distinct geologic basins: The Central Appalachian Basin of eastern Kentucky, and the Illinois Basin of western Kentucky. Both of these resource fields contain rich deposits of bituminous coal, and have seen coal mining activities in numerous counties for over 100 years. In 2011, coal production in the Commonwealth reached more than 106 million tons, with 62% of tonnage originating in the coal mining counties of eastern Kentucky. Over the last 35 years the Eastern Coal Field has on average accounted for 75% of annual statewide production. However, though Pike County in eastern Kentucky remained the single largest producer with more than 15 million tons, the major coal mining counties of western Kentucky have substantially increased production since 2002 and represented five of the top eight producing counties in 2011.

Kentucky Coal Production



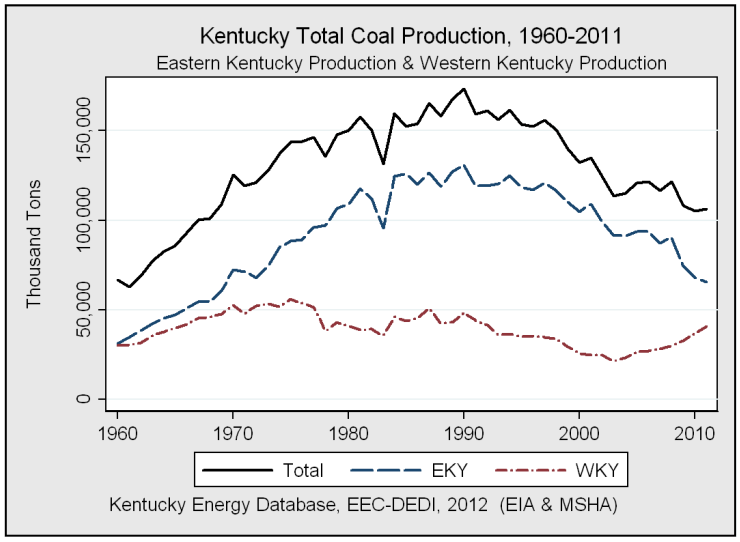


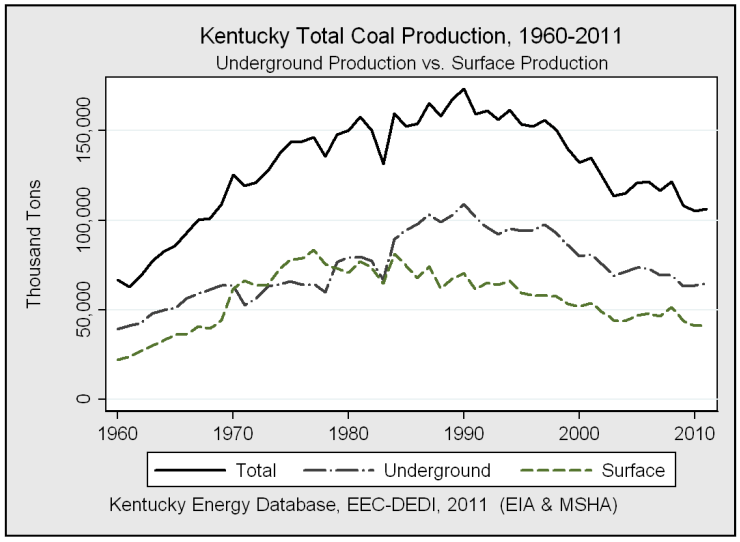
Region	Thousand Tons	Percentage
Total	106,285	100%
Eastern Kentucky	65,514	62%
Western Kentucky	40,771	38%

Eastern Kentucky has on average represented 75% of annual coal production over the last 35 years. During 2011, the region represented 62% of statewide production.

Mine Type	Thousand Tons	Percentage
Total	106,285	100%
Underground	64,635	61%
Surface	41,650	39%

Following the Surface Mining Control and Reclamation Act of 1977 (SMCRA), annual coal production in Kentucky has been consistently led by underground operations.

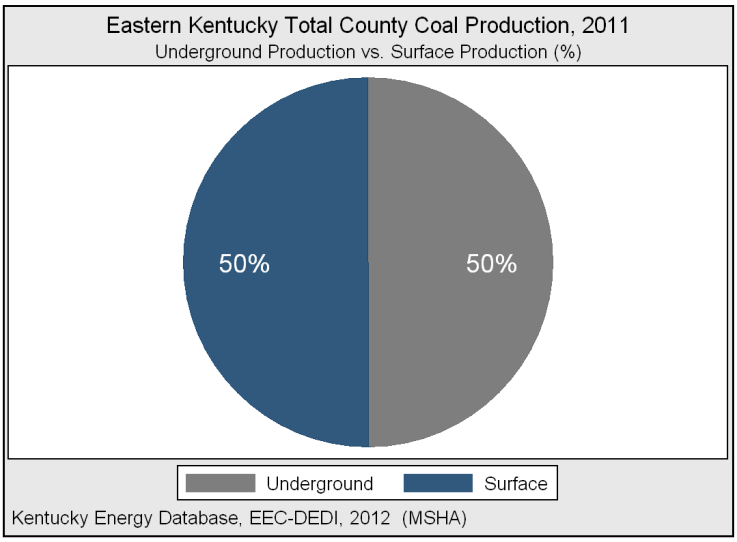


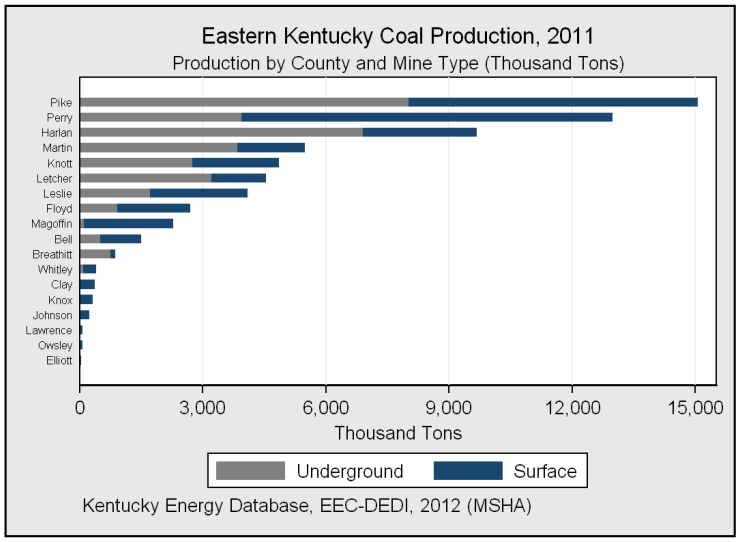


The coal fields of Kentucky produced 106 million tons of coal in 2011. For the year, the coal mining counties of eastern Kentucky remained the largest concentration of production, representing 62% of statewide tonnage. Coal mined in western Kentucky reached 40 million tons, and represented 38% of total production. Overall, the statewide trend in coal production has been downward since 1990. However, recent regional trends have been different, with western Kentucky substantially increasing production since 2002 while eastern Kentucky production has continued to decline.

Coal production in Kentucky was led by underground mines in 2011. Accounting for 64 million tons and 61% of total tonnage, underground operations increased production levels slightly, compared with 2010. Surface mine operations, which generated 41 million tons of coal, also increased production compared to the previous year, with the majority of surface production located in eastern Kentucky. The relative share of production from surface and underground operations has remained fairly stable since the year 2000.

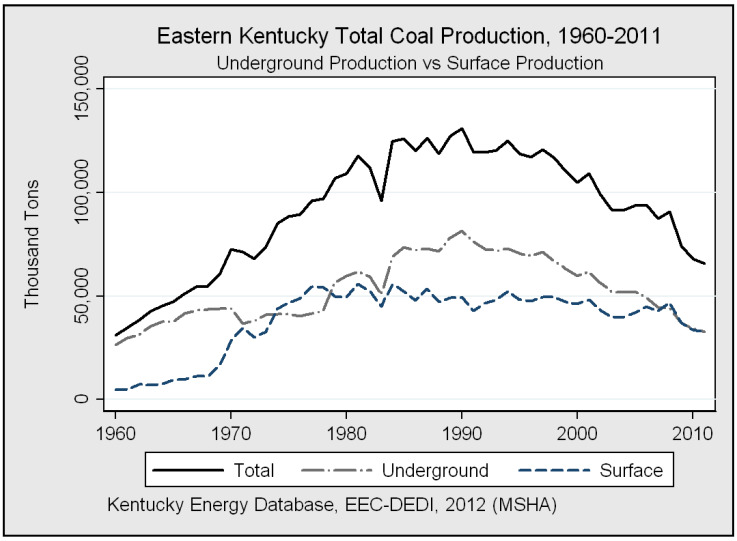
Eastern Kentucky Coal Production





Mine Type	Thousand Tons	Percentage
Total	65,514	100%
Underground	32,732	50%
Surface	32,782	50%

More than 14,600 people were directly employed by coal mines in eastern Kentucky in 2011. Pike County was the single largest employer in the region during the year.



The coal field of eastern Kentucky, part of the Appalachian Basin, contains deposits of bituminous coal characterized by high heat content and numerous beds with low sulfur content. In 2011, production in eastern Kentucky was more than 65 million tons with a nearly even split between underground and surface operations. Pike County remained the largest producer of coal within the region and the state, accounting for 23% of eastern coal production. Perry County and Harlan County were the next largest producers, representing 20% and 15% of regional production, respectively.

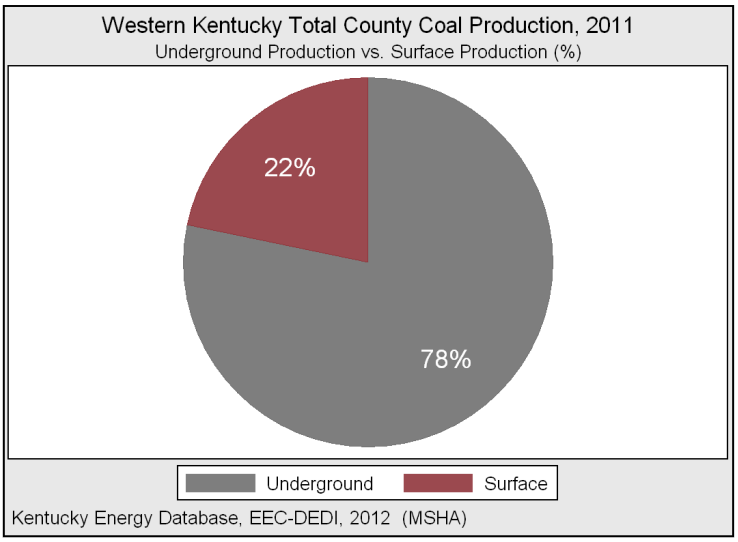
County*	Thousand Tons	Percentage
Pike	15,065	23%
Perry	12,975	20%
Harlan	9,682	15%
Martin	5,486	8%
Knott	4,853	7%
Letcher	4,544	7%
Leslie	4,094	6%
Floyd	2,702	4%
Magoffin	2,278	3%
Bell	1,495	2%
Breathitt	860	1%
Whitley	405	<1%
Clay	370	<1%
Knox	314	<1%
Johnson	231	<1%
Lawrence	65	<1%
Owsley	61	<1%

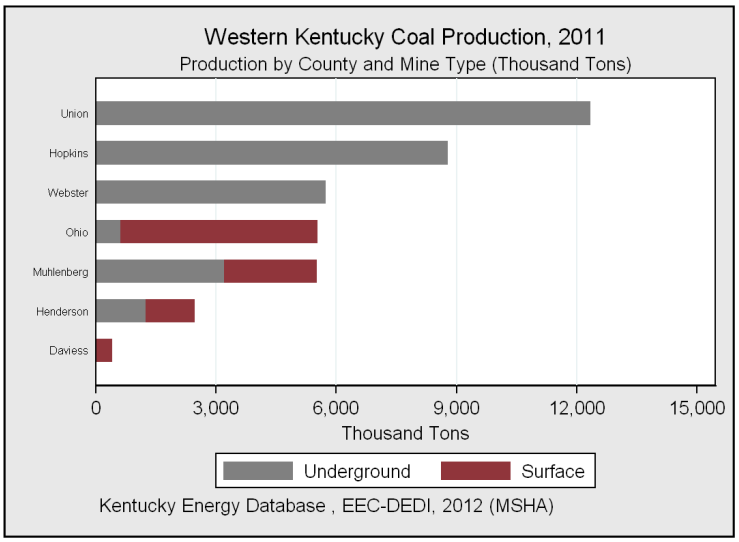
*Counties with less than 50,000 tons not listed.

Active Mines	Underground	Surface
370	153	217

In 2011, the majority of active coal mines in eastern Kentucky involved surface operations. Different from mining in western Kentucky, the Eastern Coal Field has many more active mines as well as a substantial proportion of small mines. These differences are a function of the size and location of accessible coal seams, and the topography of eastern Kentucky. Ultimately, these factors influence mining techniques in the region and help explain the nearly even split in production between surface and underground operations.

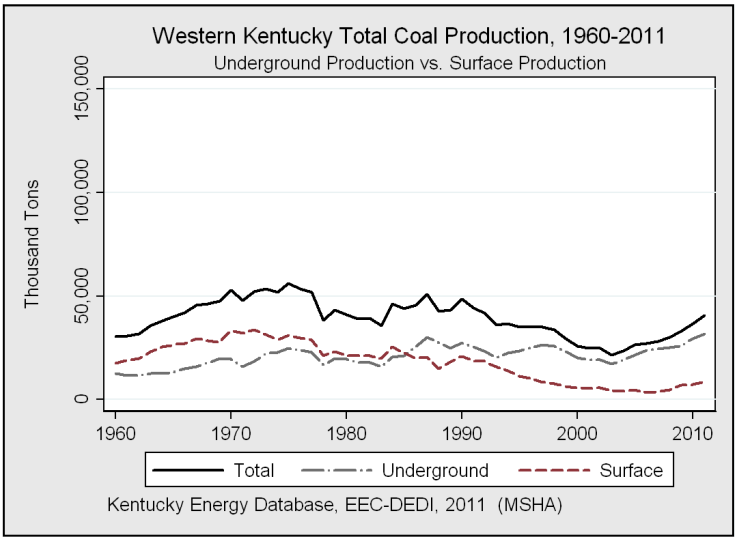
Western Kentucky Coal Production





Mine Type	Thousand Tons	Percentage
Total	40,772	100%
Underground	31,903	78%
Surface	8,869	22%

More than 4,400 people were directly employed by coal mines in western Kentucky in 2011. Union County was the single largest employer in the region during the year.



Coal produced in western Kentucky comes from the Illinois Basin, and typically has a moderately high heat content and high sulfur content. Through 2011, coal mines in the region produced 40.7 million tons with the majority of this total from underground operations. Of the seven counties that registered coal production in 2011, Union County was the largest producer with 30% of regional production. Though the region accounted for 38% of statewide production, five of the top eight most productive counties in the state were located in western Kentucky during the year.

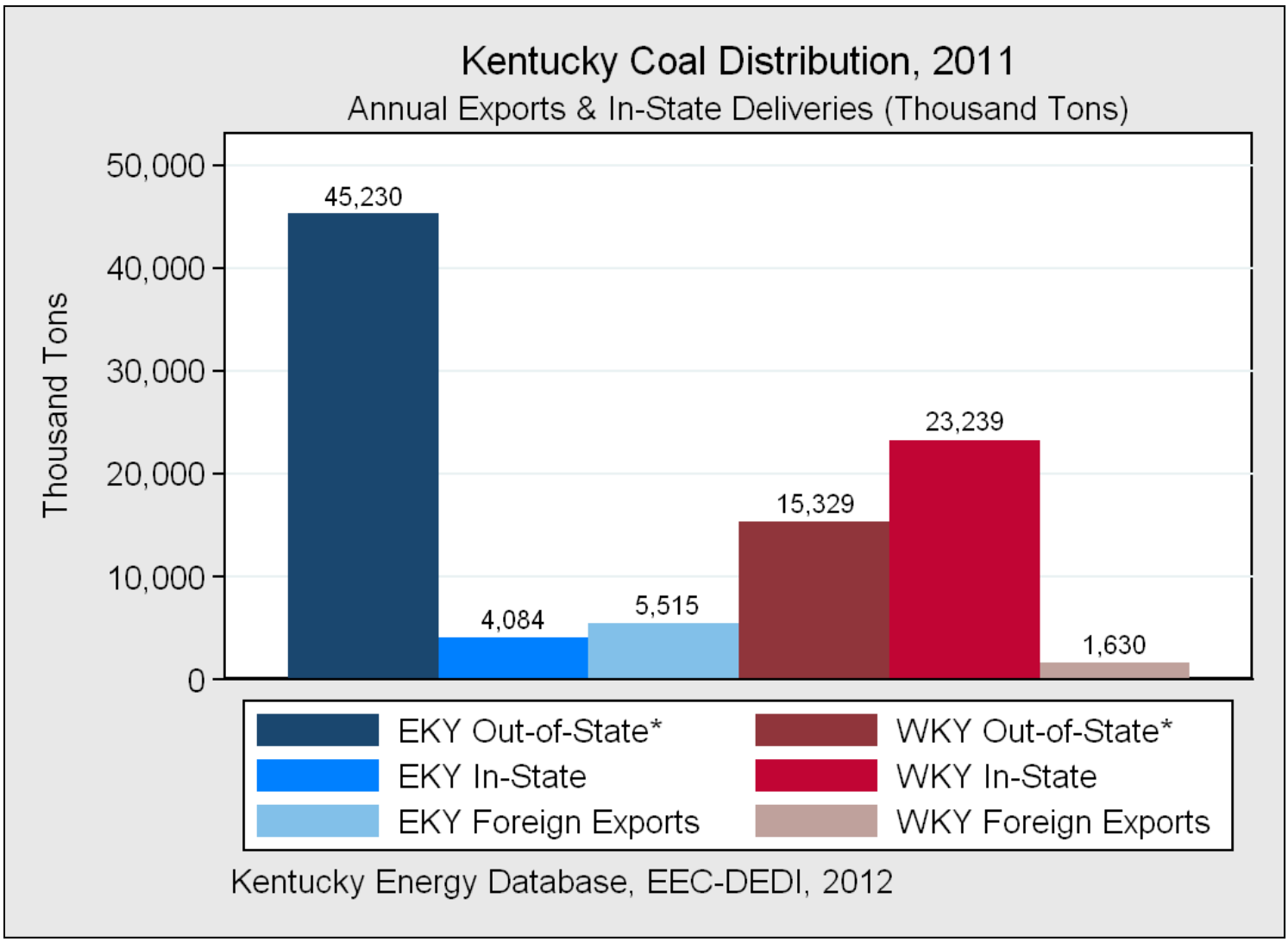
County	Thousand Tons	Percentage
Union	12,333	30%
Hopkins	8,786	22%
Webster	5,730	14%
Ohio	5,528	14%
Muhlenberg	5,518	14%
Henderson	2,471	6%
Daviess	405	<1%

Active Mines	Underground	Surface
26	13	13

Since 2002, underground mine development in western Kentucky counties has resulted in increasing production for the region. Though there were an equal amount of active underground and surface mines in 2011, the size and productivity of underground mines in western Kentucky accounted for 78% of regional production.

In addition, the topographic location of economically accessible coal seams in western Kentucky differs from deposits in eastern Kentucky. The gentle topography and basinal structure of the western Kentucky coalfield limits surface-accessible coal to the outer margin of the basin, and helps explain why surface mining has declined and underground mining has increased in the region since 1988.

Kentucky Coal Distribution



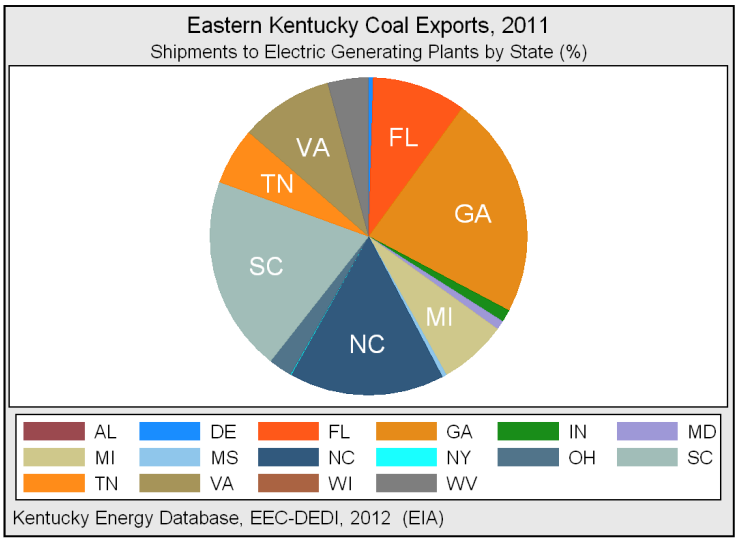
Coal Distribution by Destination, 2011		
Coal & Destination	Thousand Tons	Percentage
Total Distribution	95,027	100%
EKY Out-of-State*	45,230	48%
WKY In-State	23,239	24%
WKY Out-of-State*	15,329	16%
EKY Foreign Exports	5,515	6%
EKY In-State	4,084	4%
WKY Foreign Exports	1,630	2%

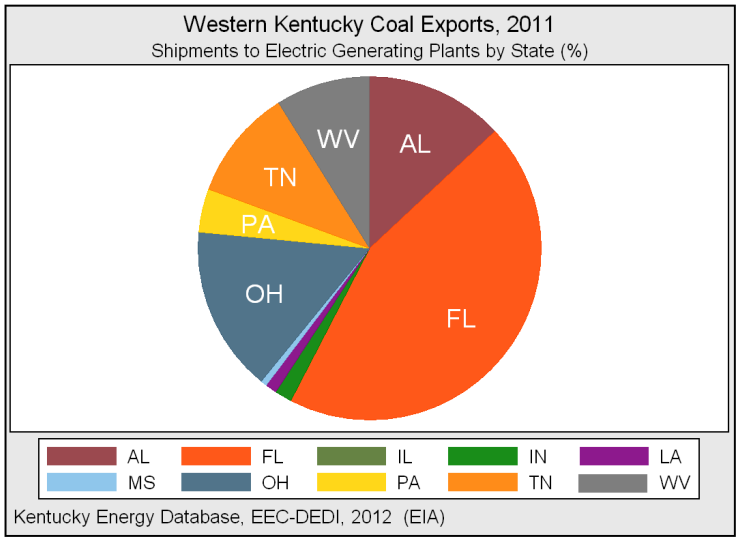
*Totals labeled "Out-of-State" represent shipments of coal to consumers within the United States, and may also be considered domestic exports. A difference of approximately 11.2 million tons exists between total production and total distribution in the table above. This gap can be explained by coal stockpiling, lags in data reporting, calendar year parameters, comparison of statistics across multiple data sources, and reporting errors.

The annual distribution of coal mined in Kentucky is a combination of in-state consumers, out-of-state power plants and factories, and foreign exports. Demand from out-of-state consumers has consistently been the largest component of Kentucky coal deliveries since 1990.

In 2011, the largest portion (43%) of Kentucky coal deliveries were domestic exports of eastern Kentucky coal, involving customers outside of the Commonwealth but within the United States. The next most common destination of Kentucky coal in 2011 was in-state deliveries of coal from western Kentucky, followed by domestic exports of western Kentucky coal. Foreign exports of Kentucky coal represent a small percentage of total production, and combined accounted for approximately 8% of coal shipments in 2011. In-state consumption of eastern Kentucky coal was the smallest portion of Kentucky coal deliveries during the year.

Kentucky Coal Domestic Exports





Importing State	Thousand Tons	Percentage
Total	45,300	100%
Georgia	10,286	23%
South Carolina	9,052	20%
North Carolina	7,155	16%
Florida	4,313	10%
Virginia	4,306	10%
Michigan	3,147	7%
Tennessee	2,609	6%
West Virginia	1,863	4%
Ohio	1,080	2%
Indiana	577	1%
Maryland	423	1%
Delaware	215	<1%
Mississippi	195	<1%
New York	54	<1%
Alabama	12	<1%
Wisconsin	10	<1%

Importing State	Thousand Tons	Percentage
Total	15,329	100%
Florida	6,827	45%
Ohio	2,393	16%
Alabama	1,998	13%
Tennessee	1,612	11%
West Virginia	1,363	9%
Pennsylvania	625	4%
Indiana	251	2%
Louisiana	146	1%
Mississippi	92	1%
Illinois	0.1	<1%

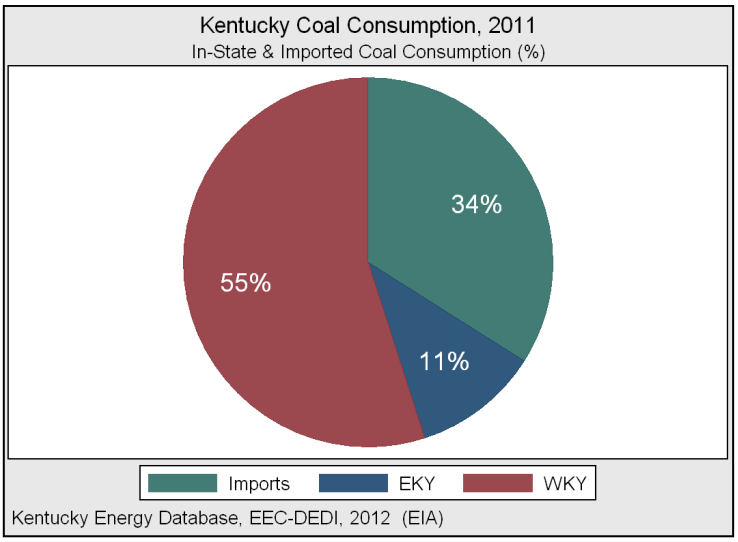
Coal Field	Thousand Tons	Percentage
Total Exports	60,629	100%
Eastern Kentucky	45,300	75%
Western Kentucky	15,329	25%

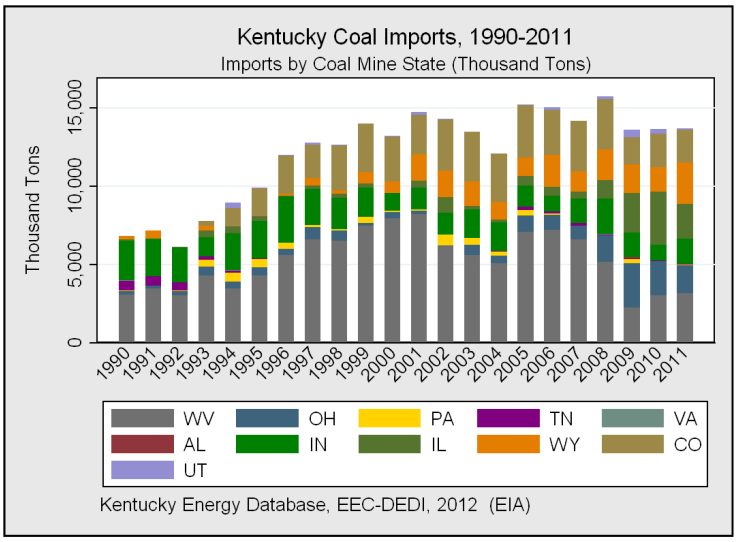
Importing States	Western Kentucky	Eastern Kentucky
Total	10	17

In 2011, coal mined from the Appalachian Basin in eastern Kentucky was exported to 17 different states, with shipments totaling more than 45.3 million tons. Traditionally large consumers of eastern Kentucky coal remain in the Southeast, with Georgia topping all importers at 10.2 million tons in 2011. Other major markets for eastern Kentucky coal during the year were South Carolina, North Carolina, Florida, and Virginia which combined accounted for 56% of shipped tonnage from the region. Compared with 2010, domestic exports of eastern Kentucky coal decreased by 21% in 2011.

Domestic shipments of western Kentucky coal exceeded 15.3 million tons and were delivered to 10 different states in 2011. During the year, electric utilities in Florida were by far the largest external consumers of western Kentucky coal, accounting for more than 6.8 million tons. Ohio, Alabama, and Tennessee were the next largest markets for western Kentucky coal, and combined, represented 41% of all exported tonnage in 2011. Overall, domestic exports of western Kentucky coal decreased by 4% compared with 2010.

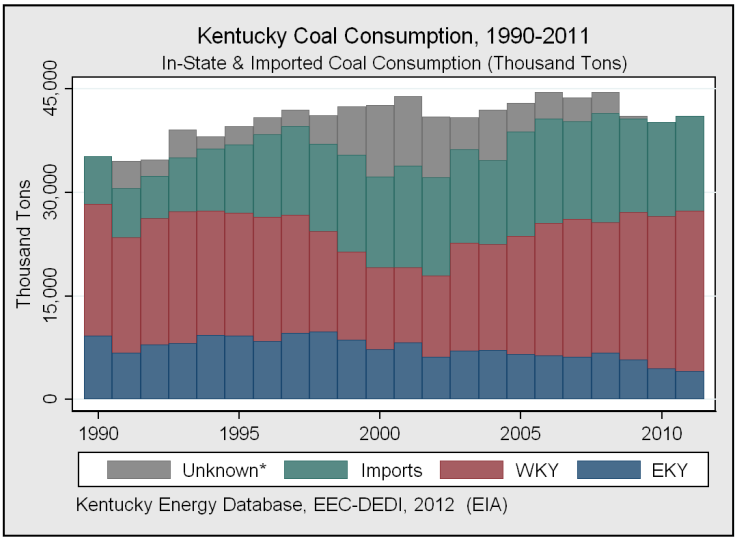
Kentucky Coal Consumption





Origin of Coal	Thousand Tons	Percentage
Total*	41,051	100%
Western Kentucky	23,239	55%
Imports	13,728	34%
Eastern Kentucky	4,084	11%

*The graphics above represent coal consumption by electric power plants. Since 2000, power plants typically consume 95% of the coal used in Kentucky in a given year.

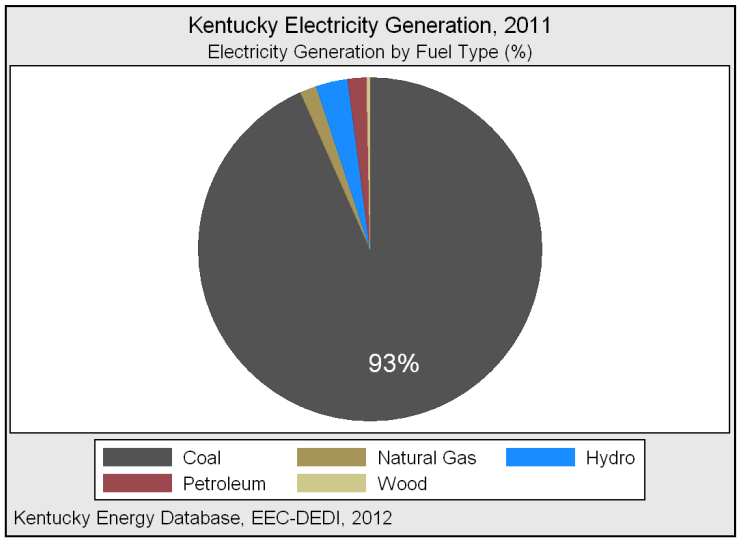


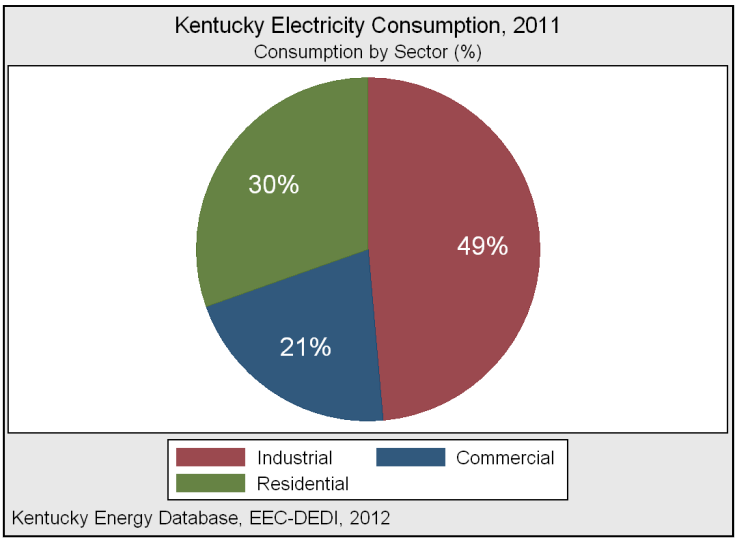
In 2011, electric power plants within the Commonwealth of Kentucky consumed more than 41 million tons of coal. Coal mined in western Kentucky represented 55% of annual consumption, followed by coal from eastern Kentucky with 11% of total demand. However, coal imports from nine different states together accounted for 34% of Kentucky coal consumption during the year. Comparing coal consumption of 41 million tons with coal production of 106 million tons, Kentucky was a net exporter of coal during 2011.

Origin of Coal	Thousand Tons	Percentage
Imports	13,728	100%
West Virginia	3,203	23%
Wyoming	2,638	19%
Illinois	2,222	16%
Colorado	2,078	15%
Ohio	1,778	13%
Indiana	1,621	12%
Utah	91	1%
Tennessee	50	<1%
Pennsylvania	47	<1%

The market variables influencing the use of imported coal in Kentucky primarily involve price, heat content of a particular coal, and the sulfur content of a particular coal. For electrical power generation, electric utilities must balance the financial and environmental costs of these factors when purchasing coal. As a result, electric utilities, municipalities, and power producers blend coal from in-state and out-of-state sources so as to maintain a diversified fuel resource while complying with environmental regulations. Since 1990, electric utilities in Kentucky have increasingly used higher sulfur coal, a trend accelerated by the installation of sulfur dioxide scrubbers on many coal-fired generators throughout the state. (Nationally, many other electric utilities have elected to install similar environmental control systems, thereby altering traditional coal sourcing requirements). The net result of these decisions in Kentucky, specifically, has been an increasing reliance on western Kentucky coal supplies, and a diminishing demand for eastern Kentucky coal. Additionally, the relatively low price of coal from several western states has also increased coal imports for electric power generation.

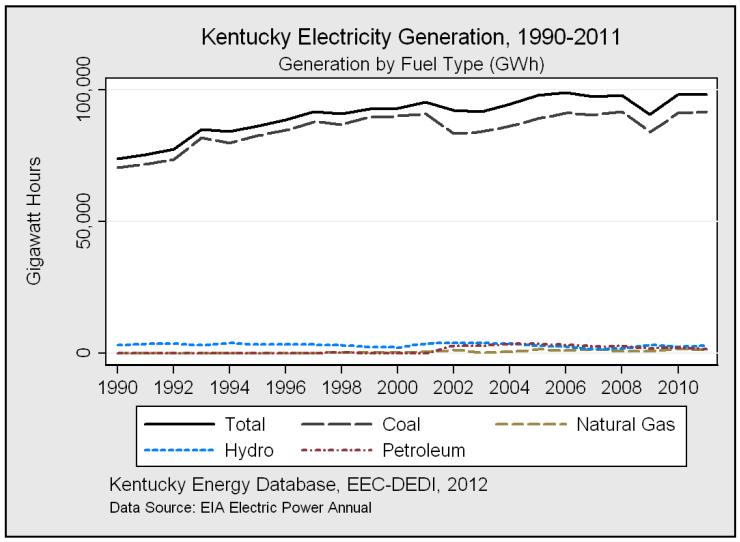
Kentucky Electricity

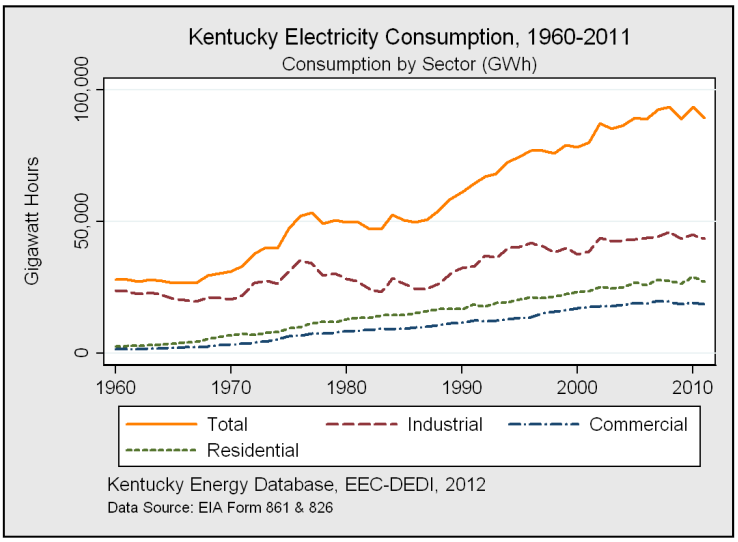




Sector	Gigawatt Hours	Percentage
Total	98,184	100%
Coal	91,570	93%
Hydro	2,941	3%
Petroleum	1,732	2%
Natural Gas	1,496	2%
Wood & Biomass	432	<1%

Fuel Type	Gigawatt Hours	Percentage
Total	89,346	100%
Industrial	43,451	49%
Residential	27,194	30%
Commercial	18,702	21%

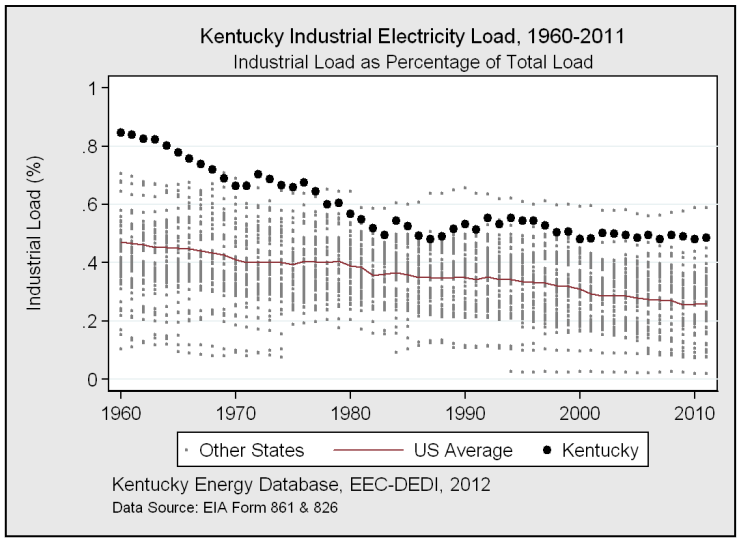




In 2011, electric power plants in Kentucky generated 98,184 Gigawatt-hours of electricity. Of this amount, 93% of the electricity generated in Kentucky was derived through the combustion of coal. Hydroelectric facilities were the next largest source of electricity, supplying approximately 3% of total generation, followed by petroleum, natural gas, and biomass units. Due to the availability of coal resources and existing power plant infrastructure, Kentucky has consistently used coal to meet the vast majority of electricity demand within the Commonwealth.

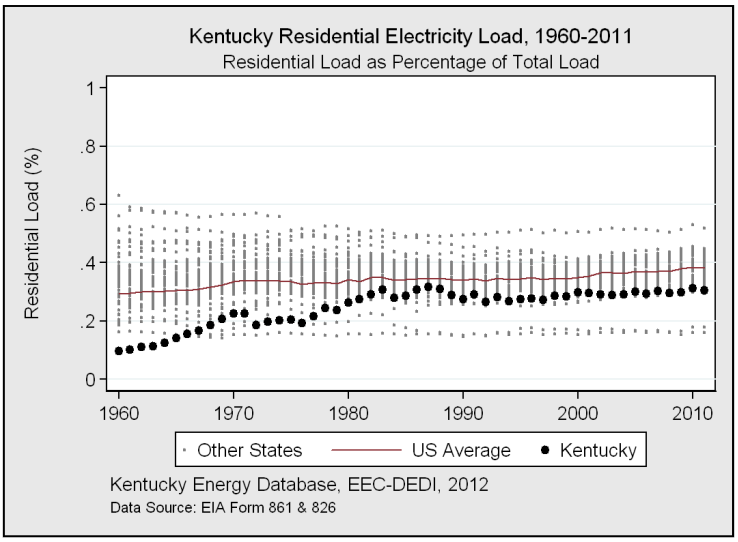
Electricity consumption in Kentucky during 2011 totaled 89,346 Gigawatt-hours, a decrease of 5% compared with 2010. The Industrial Sector remained the largest consumer of electricity in Kentucky, representing nearly 50% of total electricity consumption (the national average for industrial electricity consumption was 26% in 2011). The Residential Sector was the second largest consumer of electricity during 2011 with 30% of consumption, followed by the Commercial Sector with 21%.

Kentucky Electricity Consumption



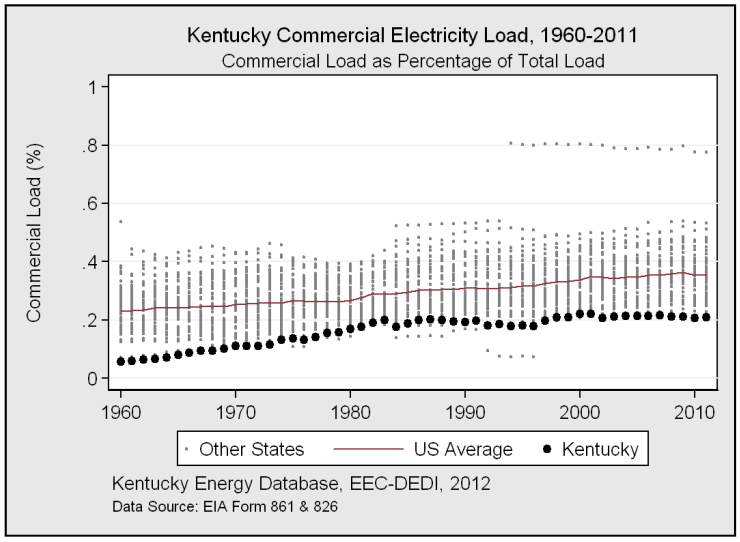
State	Industrial Load	Rank
Wyoming	59%	1st
Kentucky	49%	2nd
Florida	8%	50th

In 2011, Kentucky ranked 2nd nationally in terms of industrial electricity consumption versus total electricity consumption. The U.S. weighted average was 26% in 2011.



State	Residential Load	Rank
Florida	52%	1st
Kentucky	30%	47th
Wyoming	16%	50th

In 2011, Kentucky ranked 47th in terms of residential electricity consumption versus total electricity consumption. The U.S. weighted average was 38% in 2011.

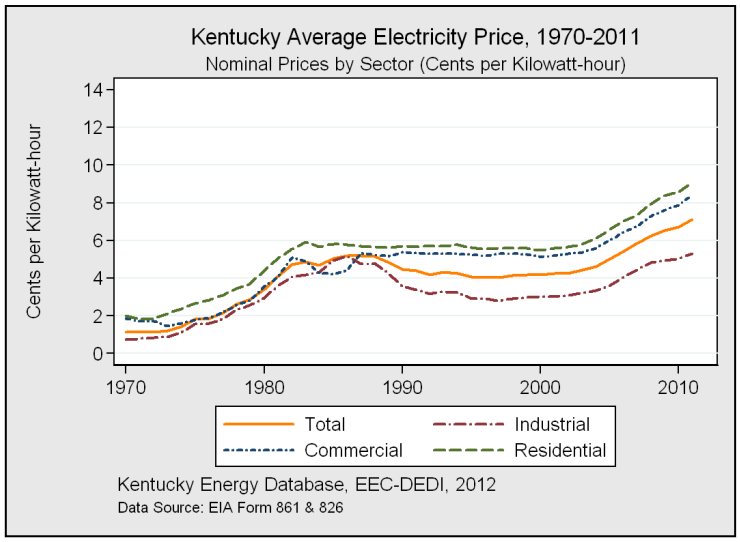


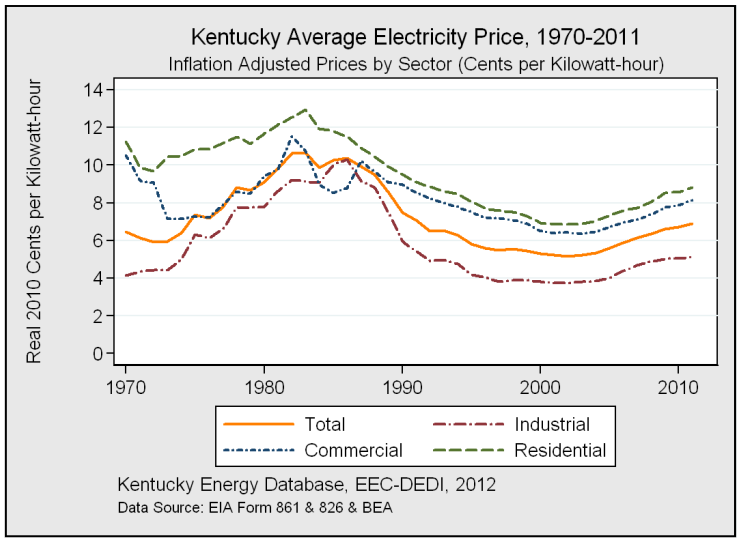
State	Commercial Load	Rank
New York	53%	1st
North Carolina	35%	25th
Kentucky	21%	50th

In 2011, Kentucky ranked last nationally in terms of commercial electricity consumption versus total electricity consumption. The U.S. weighted average was 35% in 2011.

The distribution of electricity load (demand) across economic sectors in Kentucky is significantly different than most other states. Most prominently, the Industrial Sector in Kentucky consumes nearly half of all electricity consumed in the state. This proportion is second highest in the Country, nearly double the national average for the Industrial Sector, and reflects the substantial electricity requirements of manufacturing firms that have located in the Commonwealth. Inversely, Commercial Sector electricity demand as a portion of total demand in Kentucky was the lowest of all 50 States (including the District of Columbia) in 2011. The Residential Sector's share of electricity demand is also below the national average, and ranked Kentucky 47th out of 50 States in 2011. Overall, the breakdown of electricity load in Kentucky is the function of a heavily industrialized, electricity-intensive economy, a less economically prominent Commercial Sector, and a Residential Sector which uses a variety of fuel sources for home heating applications.

Kentucky Electricity Prices





Sector	Cents/kWh	Since 2000
Average	7.1 ¢	+ 70%
Residential	9.1 ¢	+ 66%
Commercial	8.4 ¢	+ 64%
Industrial	5.3 ¢	+ 76%

Nominal $US

Sector	Real Cents/kWh	Since 2000
Average	6.9 ¢	+ 30%
Residential	8.8 ¢	+ 27%
Commercial	8.1 ¢	+ 25%
Industrial	5.1 ¢	+ 35%

Real $US 2010

Electricity prices are expressed above in cents per kilowatt-hour of electricity consumed, and were calculated by dividing total annual electricity expenditures by the total annual kilowatt-hours of electricity consumed for each economic sector.

In 2011, the average price of electricity across economic sectors in Kentucky was 7.1¢ per kilowatt-hour. This average price ranked Kentucky the fourth lowest in the country. The Residential Sector paid the highest price at 9.1¢ per kilowatt -hour, followed by the Commercial Sector at 8.4¢ per-kilowatt hour. The Industrial Sector faced a much lower price of electricity, paying on average 5.3¢ per kilowatt-hour.

As displayed by the historical data, the nominal price of electricity in Kentucky for the period 1990-2002 remained very stable. Two major factors maintained this price stability in the Commonwealth: one, predominantly coal-fired electricity; and two, a consistent, low price of coal for electric utilities. However, since 2002 the price of fossil fuels in general (as well as the price of coal, specifically) have been increasing, causing upward pressure on the price of electricity in Kentucky.

Adjusting for inflation, the trend(s) of electricity prices in Kentucky between 1970 and 2011 is notably different from the adjacent, nominal graphic. Resetting historical price data to inflation-adjusted 2010 dollars, the price of electricity in Kentucky actually decreased from 1980 through 2002. This trend of falling real prices was heavily influenced by the facts that Kentucky used coal primarily to generate electricity, and that the inflation-adjusted price of coal for the Electric Power Sector decreased during this timeframe.

Yet, since 2002 the real price of electricity in Kentucky in inflation-adjusted dollars has been increasing. This period of nine consecutive years of real price increases is contrary to the trend of the previous 20 years. A major factor driving real electricity prices in Kentucky up since 2002 is undoubtedly the rising price of steam coal used by electric utilities.

Additionally, in the near-term the price of electricity in Kentucky will be most affected by fuel prices and environmental regulations. Whether coal use continues at historical levels or more natural gas is integrated, the price of electricity will fluctuate most quickly dependent on the price of fuel commodities consumed by electric utilities. The way in which electric utilities choose to comply with new environmental regulations will also shape future rates and ultimate consumer costs.

Average Price of Electricity by State

State	Cents per kWh	Since 2005	Rank (2011)	Rank (2010)	Primary Fuel	Percent Coal
Idaho	6.48	27%	1	2	Hydro	1%
Wyoming	6.58	28%	2	1	Coal	89%
Washington	6.78	16%	3	3	Hydro	8%
Kentucky	7.11	42%	4	4	Coal	93%
Utah	7.13	20%	5	5	Coal	81%
Arkansas	7.46	18%	6	7	Coal	46%
North Dakota	7.49	27%	7	6	Coal	82%
Iowa	7.59	13%	8	12	Coal	72%
Louisiana	7.74	-4%	9	15	Gas	23%
Oklahoma	7.83	14%	10	11	Gas	44%
Nebraska	7.84	34%	11	9	Coal	64%
West Virginia	7.88	53%	12	8	Coal	97%
Indiana	8.04	37%	13	13	Coal	90%
Oregon	8.08	27%	14	10	Hydro	7%
South Dakota	8.09	23%	15	16	Hydro	33%
Montana	8.23	22%	16	17	Coal	62%
Missouri	8.35	36%	17	14	Coal	81%
Minnesota	8.68	31%	18	20	Coal	52%
North Carolina	8.7	21%	19	24	Coal	56%
New Mexico	8.71	16%	20	19	Coal	71%
Mississippi	8.78	16%	21	22	Gas	25%
South Carolina	8.86	32%	22	21	Nuclear	36%
Virginia	8.87	34%	23	25	Nuclear	35%
Kansas	8.89	36%	24	18	Coal	68%
Nevada	8.96	-1%	25	33	Gas	20%
Illinois	9.01	30%	26	28	Nuclear	46%
Ohio	9.05	28%	27	29	Coal	82%
Tennessee	9.14	45%	28	23	Coal	53%
Texas	9.18	1%	29	31	Gas	36%
Alabama	9.21	43%	30	27	Coal	41%
Colorado	9.39	23%	31	30	Coal	68%
Georgia	9.65	30%	32	26	Coal	53%
Arizona	9.73	25%	33	32	Coal	39%
Wisconsin	10.23	37%	34	34	Coal	62%
Michigan	10.37	43%	35	35	Coal	59%
Pennsylvania	10.49	27%	36	36	Coal	48%
Florida	10.77	23%	37	37	Gas	26%
Delaware	11.53	49%	38	38	Gas	46%
Maryland	12.02	48%	39	39	Coal	54%
Maine	12.58	19%	40	40	Gas	1%
Rhode Island	13.15	10%	41	43	Gas	0%
California	13.79	19%	42	41	Gas	1%
Vermont	13.79	26%	43	42	Nuclear	0%
Massachusetts	14.26	17%	44	44	Gas	19%
New Jersey	14.32	31%	45	45	Nuclear	10%
New Hampshire	14.75	18%	46	47	Nuclear	14%
New York	15.94	14%	47	48	Gas	10%
Alaska	15.96	36%	48	46	Gas	9%
Connecticut	16.33	35%	49	49	Nuclear	8%
Hawaii	31.59	72%	50	50	Petroleum	14%

Kentucky Generation Infrastructure

Capacity

There are approximately 19.9 Gigawatts of electric generating capacity in Kentucky. Capacity is the maximum amount of electricity that can be produced at one moment in time. Of total installed capacity in Kentucky, approximately 14.3 Gigawatts (72%) of capacity is coal fired, 4.7 Gigawatts (24%) is gas or petroleum fired, 0.8 Gigawatts (4%) is hydro power, and .06 Gigawatts (>1%) are biomass units.

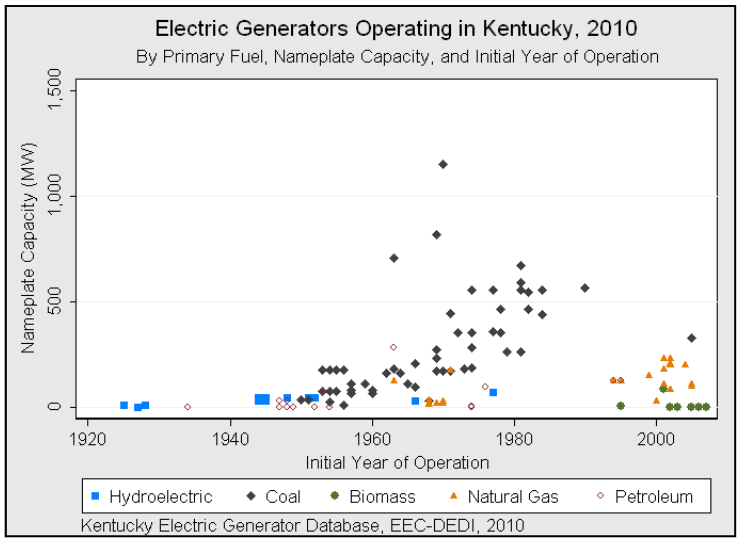
Capacity Factor

The capacity factor of a generating unit is a reflection of actual power output from a unit versus the maximum possible output from a unit, over a period of time. To calculate the maximum possible output of a unit, the rated nameplate capacity (MW) is multiplied by a period of time (typically, hours per year). The actual output (Megawatt-hours) is then divided by the maximum possible output (Megawatt-hours) to determine the capacity factor of the unit, thereby revealing the average level of output for a given unit.

Many variables influence the actual capacity factor of a given generating unit, including: operational costs, operational design, age of a unit, emissions of criteria pollutants, electricity demand fluctuations, and the particular generation and environmental plans of individual power producers.

Generation

Ninety-three percent of electricity generated in Kentucky in 2011 was produced by coal combustion, 3% from hydroelectric power, 2% from petroleum and natural gas combustion, respectively, and less than 1% from other renewable sources. The relative share of each energy source as a part of Kentucky's total generating portfolio has remained very consistent over time, with coal meeting the majority of electricity demand in a given year.



Primary Fuel	Average Unit Age	Average Unit Size
All Units	42	151 MW
Coal	44	300 MW
Natural Gas	19	112 MW
Petroleum	51	38 MW
Hydro	70	27 MW
Biomass	11	1 MW

Coal-fired, hydroelectric, and biomass-fired generators provide all of the baseload electricity in Kentucky because of the low operating costs they enjoy. The coal fleet consists primarily of large generators that were constructed between the mid-1950s and 1990. Most of these plants have been retrofitted with environmental controls to meet air quality emissions standards but many may need further upgrades as the standards become more stringent. Peaking power, the additional electricity needed for short periods of high demand, is provided by natural gas and petroleum. Utilities typically satisfy these short periods of high demand (peaks) with simple cycle natural gas or petroleum generators because they are relatively cheap to build, and can rapidly power up and power down to balance electricity demand. However, peaking units have a significantly higher operating cost than baseload generators due to their operational designs, and are not optimized for baseload generation. These "peaking" generators account for approximately 24% of the installed generating capacity in Kentucky but provide less than 5% of electricity generation.

Electricity Service & Rates

Retail Service:

Electricity in Kentucky is provided to customers by one of the following types of entities, one: retail electric suppliers that are regulated by the Kentucky Public Service Commission (PSC); two: municipally-owned utilities (MOUs); or three: by the Tennessee Valley Authority (TVA) and its associated distributors within the Commonwealth. Furthermore, each electric supplier has the exclusive right to serve the customers within its territory. (See maps on following pages for electric service boundaries).

Electric suppliers that are regulated by the PSC fall into two categories: Investor Owned Utilities and Rural Electric Cooperative Companies (RECCs). There are four investor-owned companies in Kentucky: Duke Kentucky, Kentucky Power Company (aka. AEP), Kentucky Utilities, and LG&E. Each of these companies generates or purchases the power required to meet its respective customers' electricity demands. There are 19 rural electric cooperatives that are regulated by the PSC. Sixteen of these jointly own and purchase power from East Kentucky Power Cooperative (EKPC). The remaining three jointly own and purchase power from Big Rivers Electric Corporation (BREC). A "distribution" cooperative typically receives power from its respective "generation and transmission" cooperative at a substation in the distributor's service territory.

There are five Rural Electric Cooperative Companies (RECCs) and ten municipal companies that secure all of their electricity from TVA. These RECCs and municipalities then resell and distribute electricity to customers within their service territories. Separately, TVA also serves several large industrial customers within Kentucky directly.

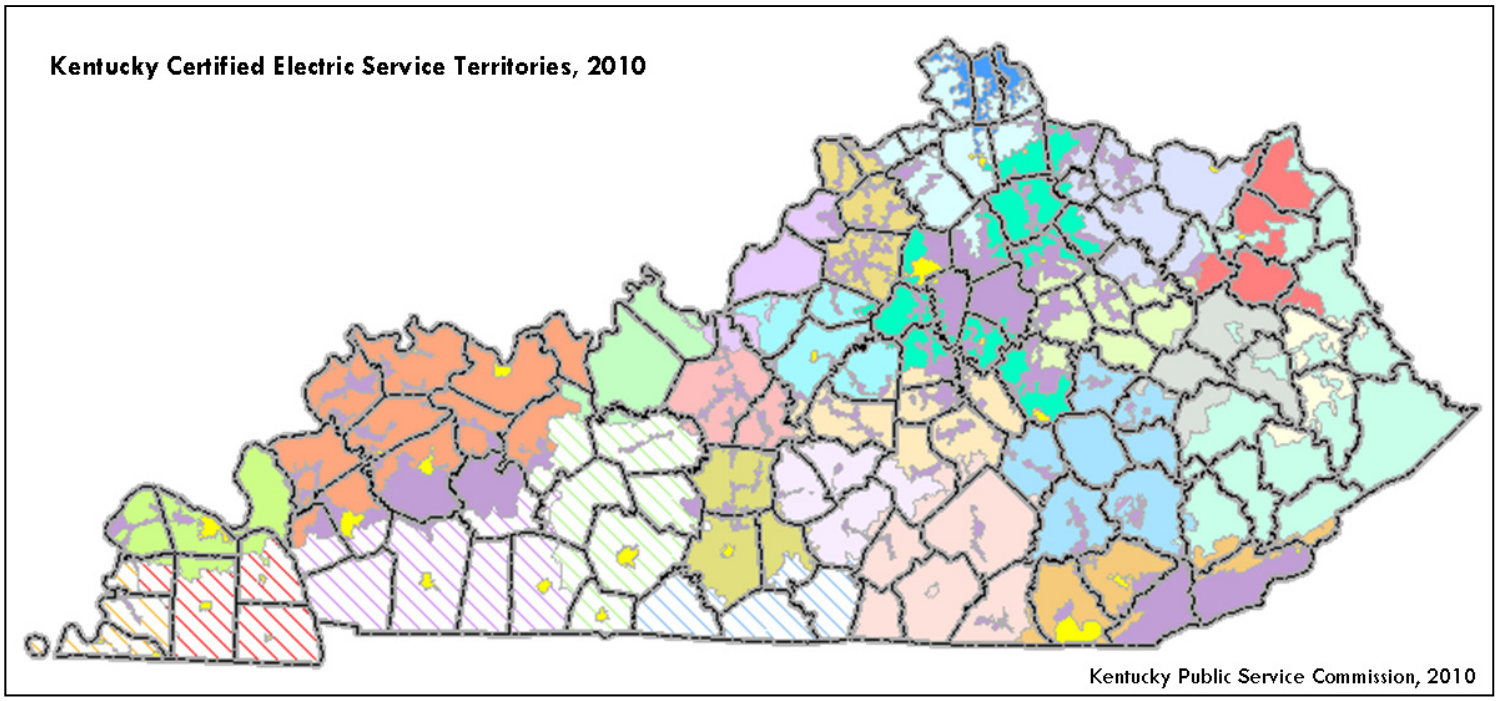
Additionally, there are eighteen municipal electric suppliers that do not receive electricity from TVA. These municipalities either self-generate electricity—by owning and/or operating generating facilities—or purchase power from various sources. In the case of purchased power, a municipality may negotiate a guaranteed delivery of electricity from an investor owned utility or independent power producer, or purchase electricity on the market for distribution within its service area.

Electricity Rates:

Retail electricity rates are set by either the PSC, the owner or board governing a municipal utility, or TVA.* Rates are generally established to cover the operating expenses and the capital costs of the utilities to maintain generation infrastructure and supply electricity. Operating expenses typically include personnel costs, fuel costs, generation costs, and maintenance costs. Capital costs typically include the costs to construct facilities, environmental equipment, and transmission lines, service the outstanding interest on debt, and earn a scheduled return on equity. The particular authority that sets a rate is to ensure that these costs are fair, just, and reasonable.

*The Tennessee Valley Authority sets the wholesale rate for electricity supplied to its distributors, and approves the distributors' retail rate.

Kentucky Electric Service Areas

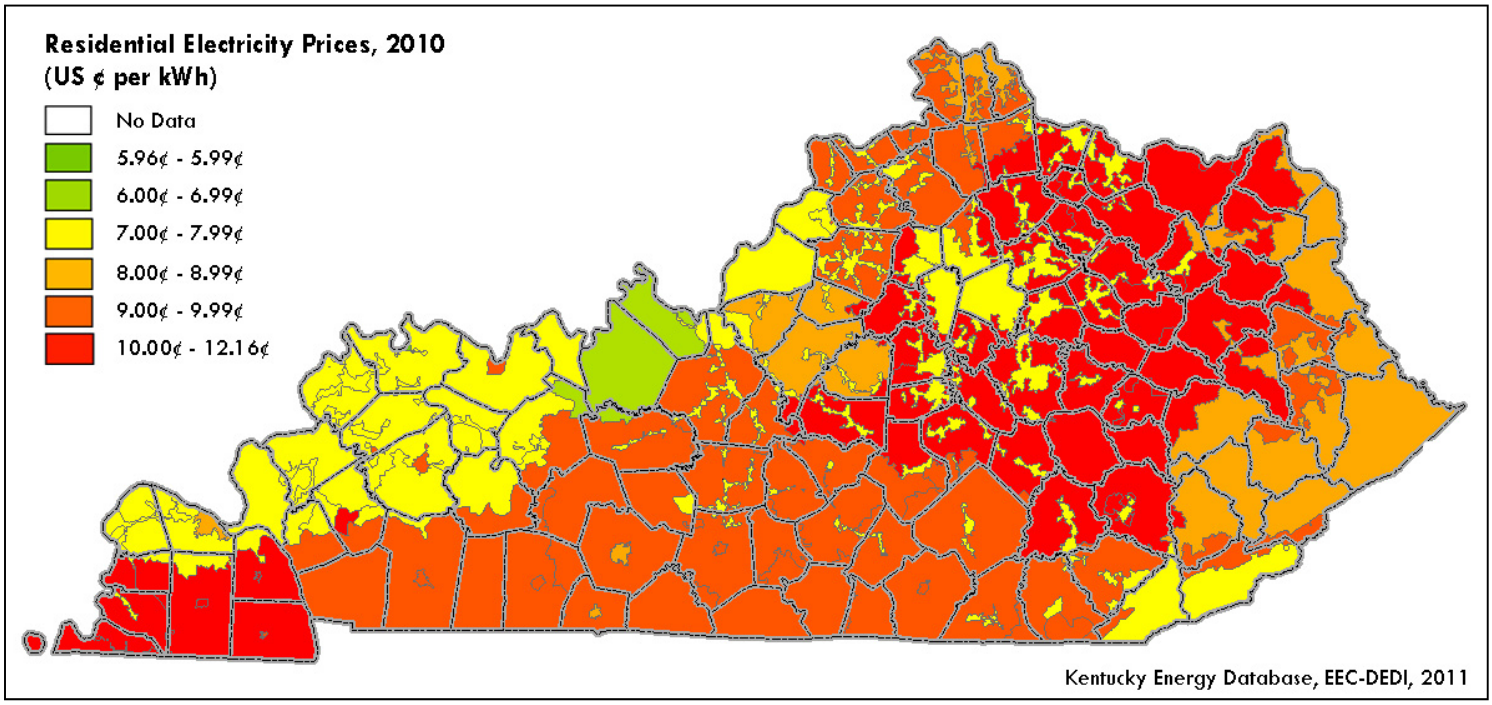


All Municipal Utilities		Kentucky Utilities	
Big Sandy RECC		Licking Valley RECC	
Blue Grass ECC		Louisville Gas & Electric	
Clark ECC		Meade County RECC	
Cumberland Valley RECC		Nolin RECC	
Duke Energy Kentucky		Owen ECC	
Farmers RECC		Pennyrile RECC**	
Fleming-Mason ECC		Salt River ECC	
Grayson RECC		Shelby ECC	
Hickman-Fulton Counties RECC**		South Kentucky RECC	
Inter County ECC		Taylor County RECC	
Jackson ECC		Tri-County Electric Member Corporation**	
Jackson Purchase Energy Corporation		Warren RECC**	
Kenergy Corporation		West Kentucky RECC**	
Kentucky Power			

The Commonwealth of Kentucky is divided into certified electric service territories as determined by the Kentucky Public Service Commission (KRS 278.016). Within these certified electric service areas, electricity service and delivery is restricted to one electricity provider per service area. Providers of electricity in Kentucky are either Investor-Owned Utilities (IOU), Municipal-Owned Utilities (MOU), or Rural Electric Cooperative Corporations (RECC). Municipal Utilities and TVA Distributors are not subject to Kentucky Public Service Commission regulation.

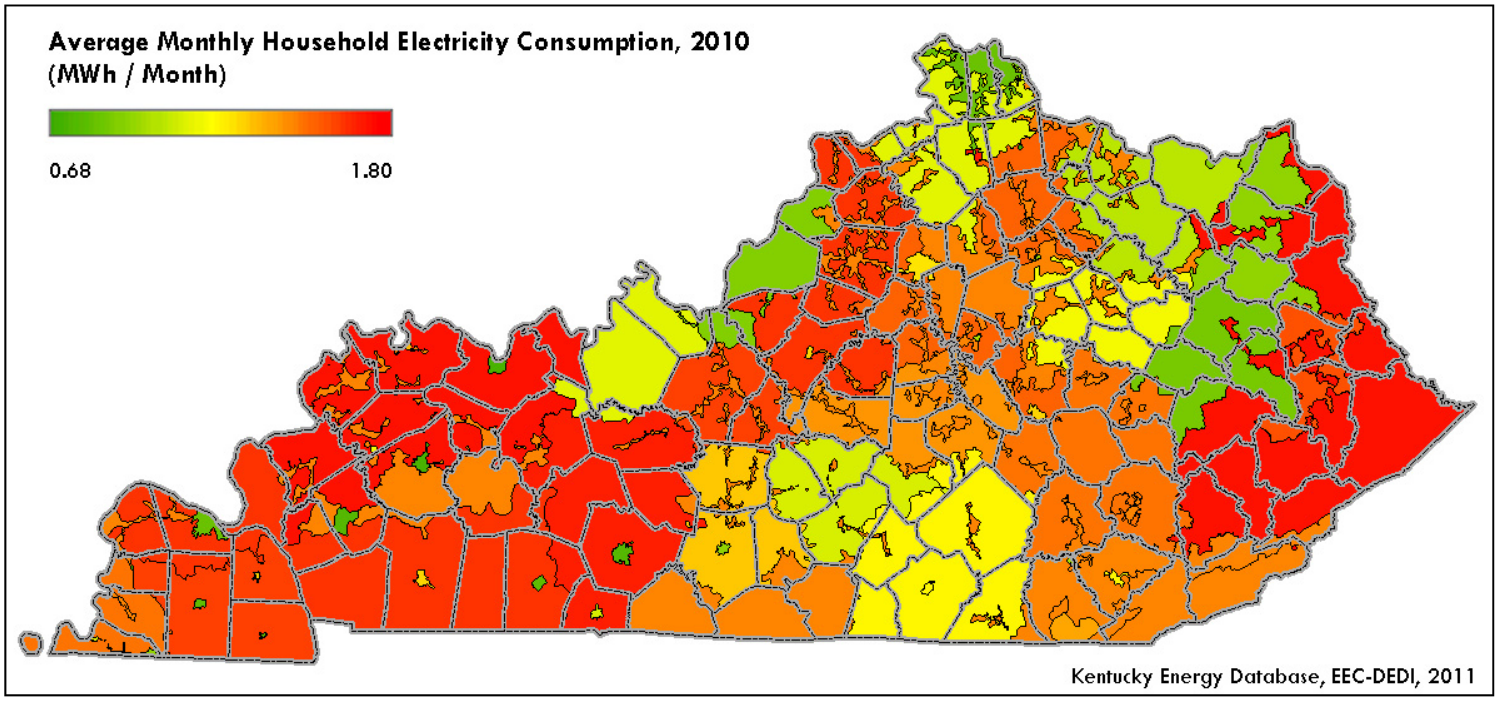
** TVA Distributor

Residential Electricity Prices, 2010



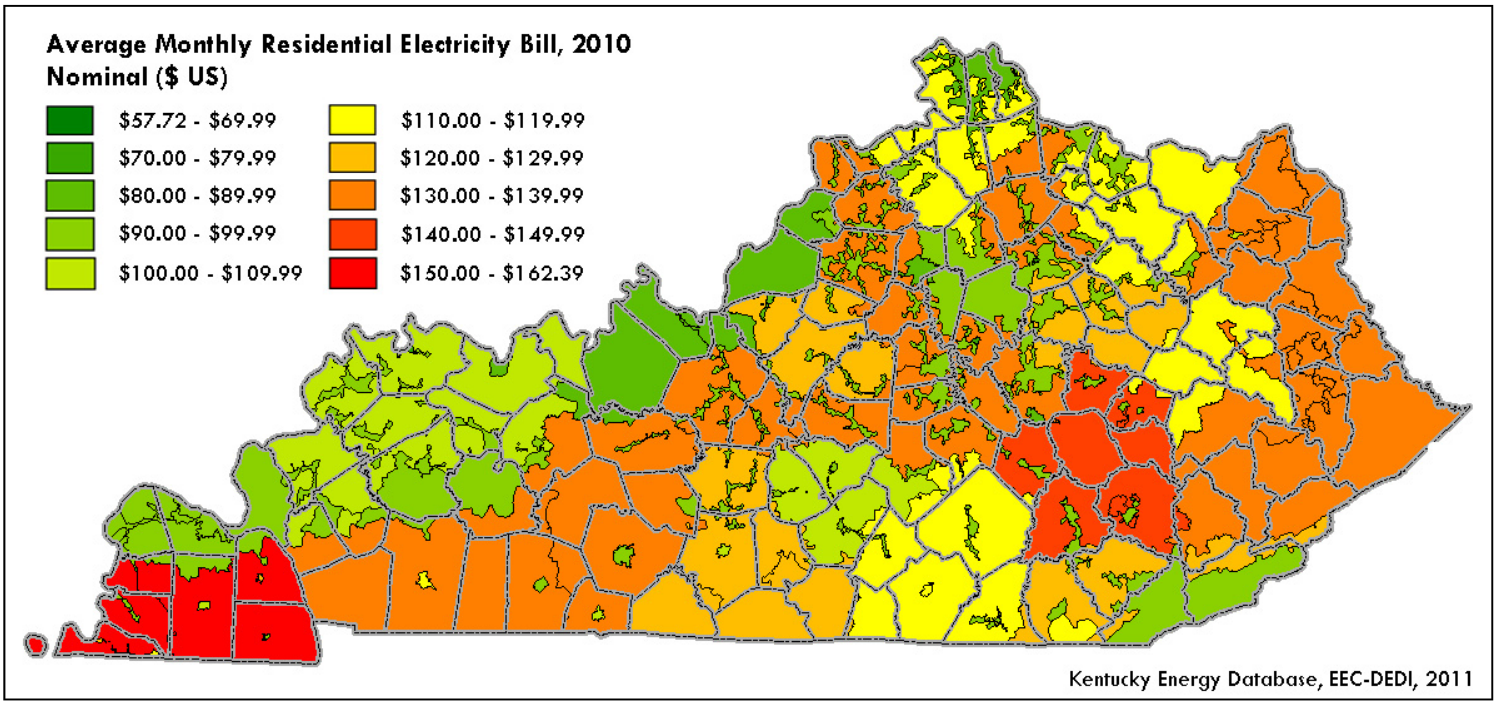
Henderson City Utility Commission	5.96¢	City of Owensboro	9.30¢
City of Paris	6.83¢	Madisonville Municipal Utilities	9.35¢
City of Nicholasville	6.95¢	City of Jellico	9.36¢
Meade County R.E.C.C	6.98¢	Shelby Energy Co-op, Inc	9.36¢
Kenergy Corporation	7.03¢	Warren R.E.C.C	9.38¢
Jackson Purchase Energy Corporation	7.07¢	Tri-County Electric Member Corporation	9.41¢
City of Frankfort	7.11¢	South Kentucky R.E.C.C	9.46¢
City of Benham	7.15¢	Nolin R.E.C.C.	9.50¢
City of Berea Municipal Utility	7.27¢	City of Murray	9.55¢
City of Bardstown	7.48¢	City of Glasgow	9.65¢
Kentucky Utilities Company	7.54¢	Farmers R.E.C.C.	9.82¢
Barbourville Utility Commission	7.78¢	Pennyrile R.E.C.C.	9.84¢
Louisville Gas & Electric Company	7.98¢	Big Sandy R.E.C.C.	9.89¢
Williamstown Utility Commission	8.10¢	Owen Electric Coop Inc	9.96¢
Duke Energy Kentucky, Inc.	8.26¢	City of Fulton	10.01¢
City of Falmouth	8.47¢	City of Mayfield Plant Board	10.05¢
Corbin City Utilities Commission	8.60¢	Blue Grass E.C.C.	10.05¢
Kentucky Power Company	8.64¢	Fleming-Mason Energy Coop Inc	10.06¢
City of Franklin	8.69¢	Clark Energy Coop Inc	10.10¢
City of Paducah	8.74¢	City of Benton	10.28¢
Salt River Electric Coop Corporation	8.79¢	City of Princeton	10.38¢
City of Bowling Green	8.94¢	Inter County Energy Cooperative Corporation	10.43¢
City of Bardwell	9.04¢	Licking Valley R.E.C.C.	10.45¢
City of Hopkinsville	9.07¢	Jackson Energy Coop Corp	10.75¢
Taylor County R.E.C.C	9.08¢	City of Hickman	10.85¢
City of Providence	9.11¢	West Kentucky R.E.C.C.	11.11¢
Cumberland Valley R.E.C.C	9.17¢	City of Vanceburg	11.58¢
City of Olive Hill	9.20¢	Grayson R.E.C.C.	11.67¢
City of Russellville	9.21¢	Hickman-Fulton Counties R.E.C.C.	12.16¢

Residential Electricity Usage, 2010



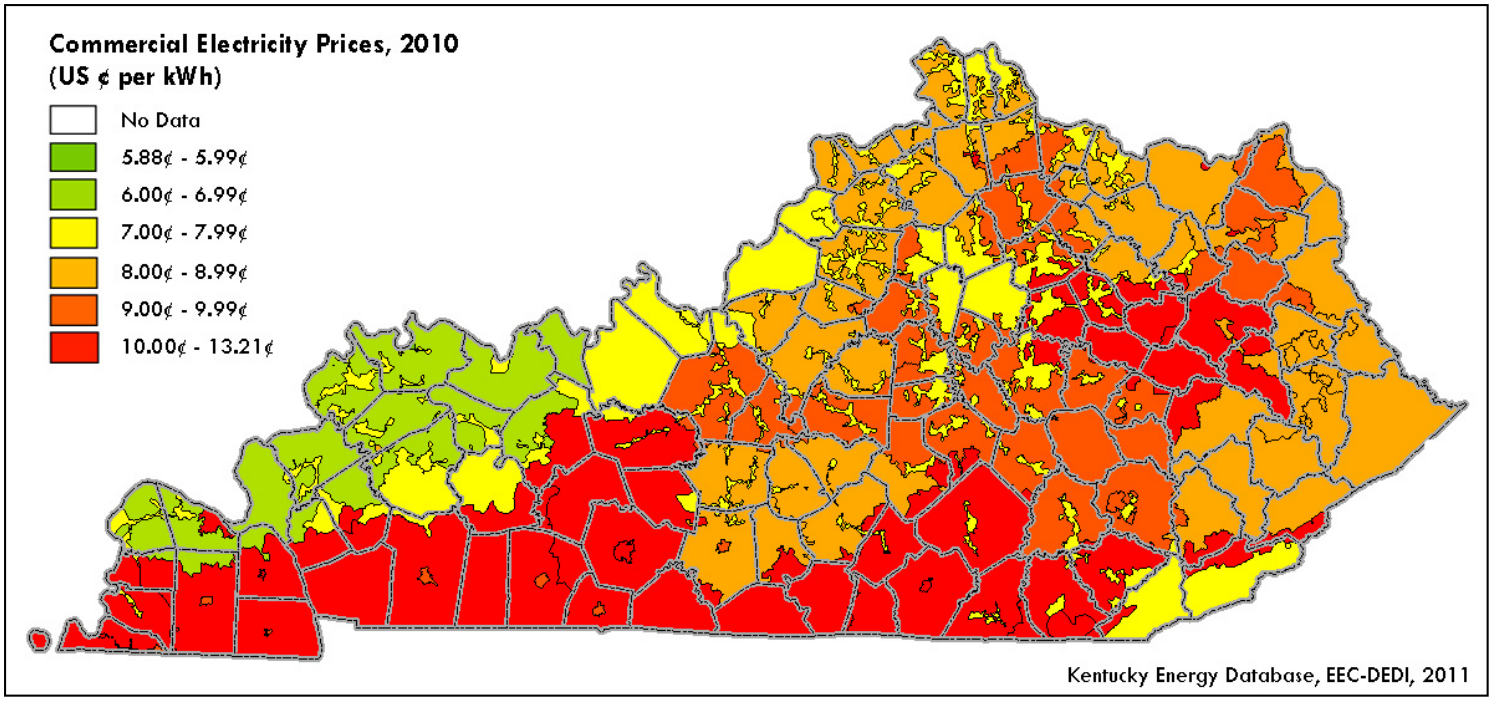
City of Falmouth	0.68	South Kentucky R.E.C.C.	1.20
City of Bardwell	0.78	Barbourville Utility Commission	1.20
City of Owensboro	0.94	City of Frankfort	1.21
Madisonville Municipal Utilities	0.98	City of Hopkinsville	1.23
City of Princeton	1.02	City of Bardstown	1.23
City of Bowling Green	1.04	City of Berea Municipal Utility	1.23
City of Murray	1.04	City of Benton	1.23
City of Mayfield Plant Board	1.05	Farmers R.E.C.C.	1.24
City of Russellville	1.05	Henderson City Utility Commission	1.24
City of Paducah	1.07	City of Jellico	1.25
Duke Energy Kentucky, Inc.	1.08	Inter County Energy Coop Corporation	1.28
Licking Valley R.E.C.C.	1.09	Tri-County Electric Member Corporation	1.32
Louisville Gas & Electric Company	1.10	Kentucky Utilities Company	1.33
City of Vanceburg	1.10	Cumberland Valley R.E.C.C.	1.33
City of Glasgow	1.12	Jackson Energy Coop Corporation	1.33
City of Fulton	1.12	Hickman-Fulton Counties R.E.C.C.	1.34
Grayson R.E.C.C.	1.12	Blue Grass Energy Coop Corporation	1.35
City of Paris	1.13	Big Sandy R.E.C.C.	1.36
Corbin City Utilities Commission	1.13	West Kentucky R.E.C.C.	1.36
City of Nicholasville	1.14	Nolin R.E.C.C.	1.37
Fleming-Mason Energy Coop Inc	1.14	Pennyrile Rural Electric Cooperative	1.40
City of Olive Hill	1.16	Shelby Energy Co-op, Inc	1.40
City of Franklin	1.17	Jackson Purchase Energy Corporation	1.41
Taylor County R.E.C.C.	1.18	Salt River Electric Coop Corporation	1.41
Owen Electric Coop Inc	1.18	Williamstown Utility Commission	1.43
City of Hickman	1.19	Warren R.E.C.C.	1.45
Meade County R.E.C.C.	1.19	Kenergy Corporation	1.50
City of Providence	1.19	Kentucky Power Company	1.52
Clark Energy Coop Inc	1.19	City of Benham	1.80

Residential Electricity Bill, 2010



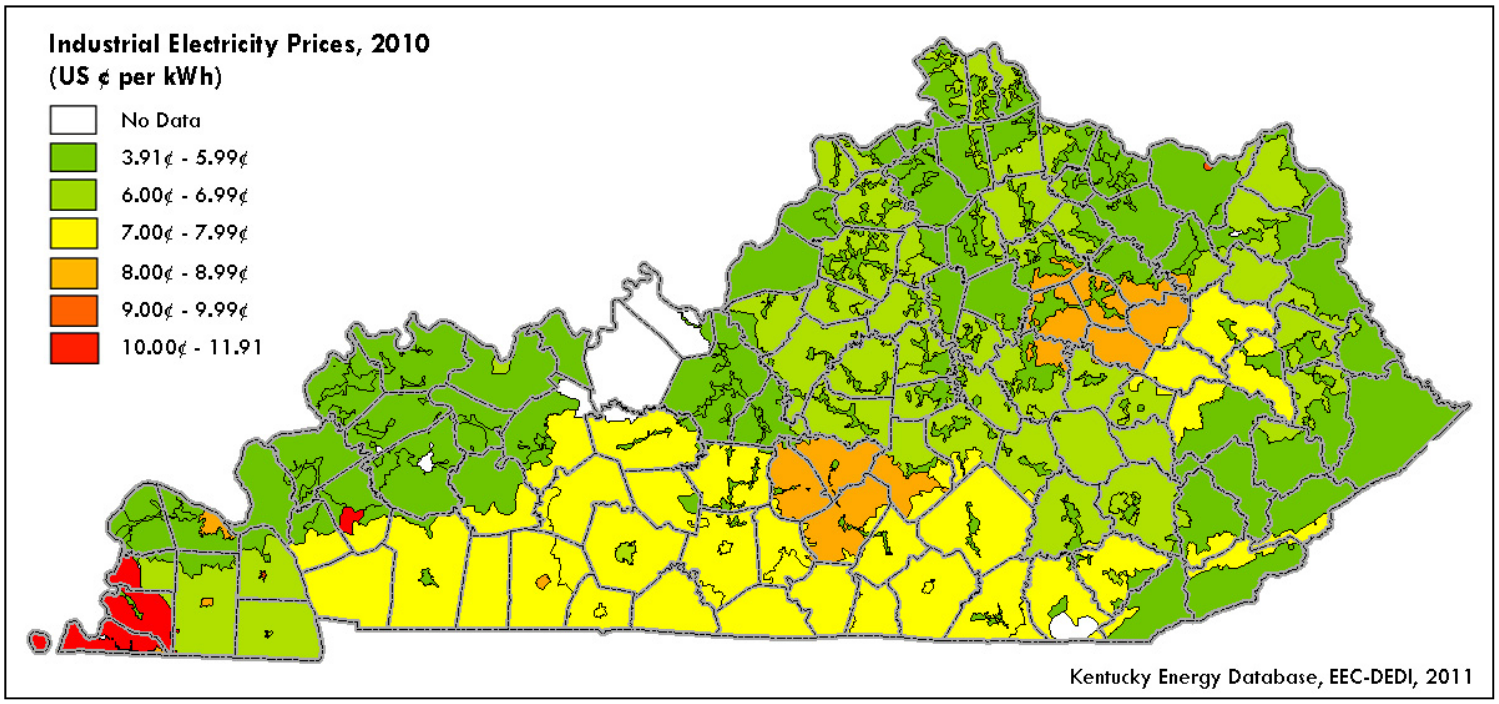
City of Falmouth	$57.72	City of Hopkinsville	$111.21
City of Bardwell	$70.25	City of Fulton	$112.27
Henderson City Utility Commission	$74.14	South Kentucky R.E.C.C.	$113.34
City of Paris	$77.07	Licking Valley R.E.C.C.	$113.80
City of Nicholasville	$78.89	Fleming-Mason Energy Coop Inc	$114.63
Meade County R.E.C.C.	$82.75	Williamstown Utility Commission	$115.90
City of Frankfort	$85.79	City of Jellico	$117.01
Louisville Gas & Electric Company	$87.50	Owen Electric Coop Inc	$117.88
City of Owensboro	$87.57	Clark Energy Coop Inc	$120.17
Duke Energy Kentucky, Inc.	$89.10	Farmers R.E.C.C.	$121.25
City of Berea Municipal Utility	$89.44	Cumberland Valley R.E.C.C.	$121.87
City of Bardstown	$91.70	Tri-County Electric Member Corporation	$123.91
Madisonville Municipal Utilities	$91.94	Salt River Electric Coop Corporation	$124.17
City of Bowling Green	$92.64	City of Benton	$126.52
Barbourville Utility Commission	$93.45	City of Vanceburg	$127.79
City of Paducah	$93.88	City of Hickman	$128.67
City of Russellville	$97.12	City of Benham	$129.03
Corbin City Utilities Commission	$97.49	Nolin R.E.C.C.	$130.37
City of Murray	$99.77	Grayson R.E.C.C.	$131.00
Jackson Purchase Energy Corporation	$99.92	Shelby Energy Co-op, Inc	$131.43
Kentucky Utilities Company	$99.95	Kentucky Power Company	$131.69
City of Franklin	$102.06	Inter County Energy Coop Corporation	$133.20
City of Mayfield Plant Board	$105.19	Big Sandy R.E.C.C.	$134.09
Kenergy Corporation	$105.36	Blue Grass Energy Coop Corporation	$135.67
City of Olive Hill	$106.28	Warren R.E.C.C.	$136.41
City of Princeton	$106.37	Pennyrile Rural Electric Cooperative	$137.23
Taylor County R.E.C.C.	$106.85	Jackson Energy Coop Corporation	$143.20
City of Glasgow	$107.94	West Kentucky R.E.C.C.	$151.65
City of Providence	$108.19	Hickman-Fulton Counties R.E.C.C.	$162.39

Commercial Electricity Prices, 2010



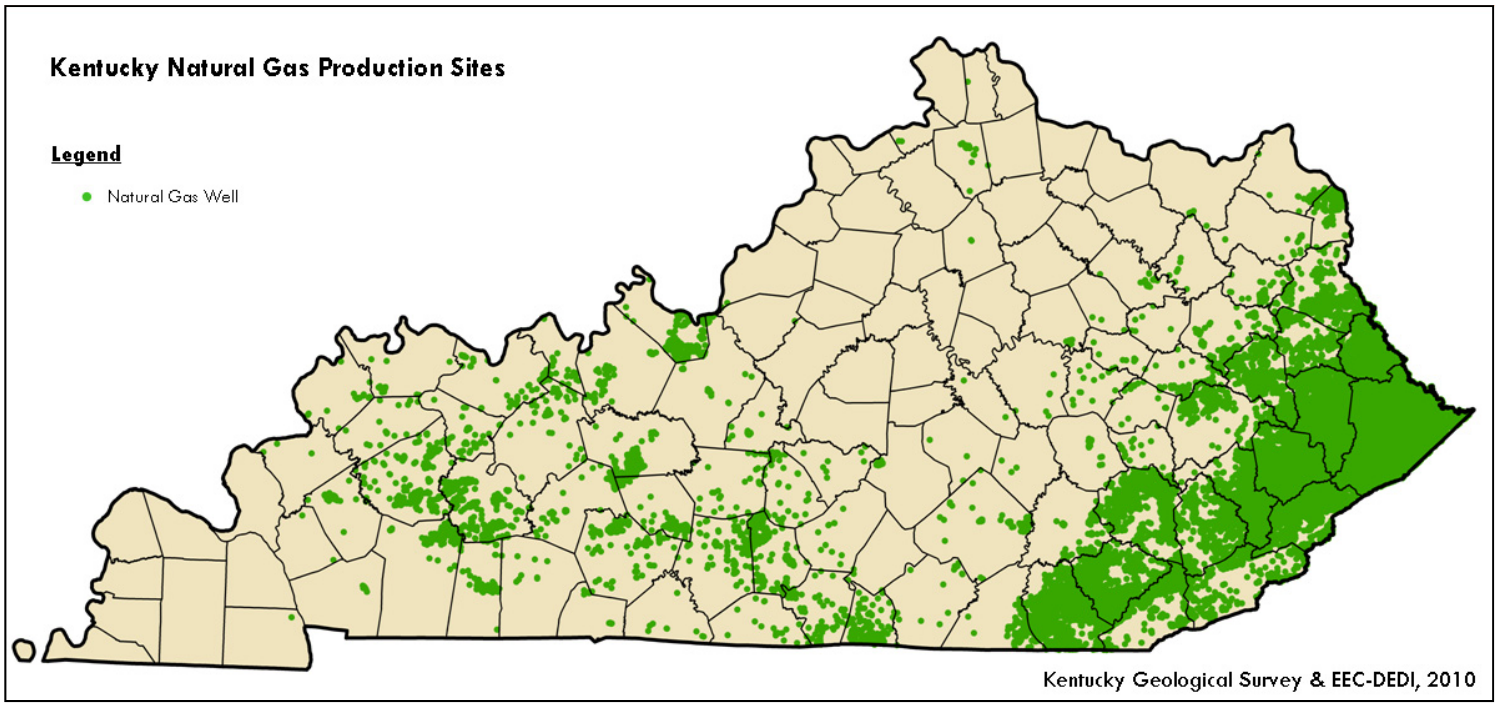
Henderson City Utility Commission	5.88¢	City of Franklin	9.38¢
Jackson Purchase Energy Corporation	6.05¢	Blue Grass Energy Coop Corporation	9.38¢
Kenergy Corporation	6.79¢	City of Hopkinsville	9.57¢
Meade County R.E.C.C.	7.16¢	Jackson Energy Coop Corporation	9.58¢
Louisville Gas & Electric Company	7.16¢	City of Mayfield Plant Board	9.69¢
City of Berea Municipal Utility	7.20¢	Grayson R.E.C.C.	9.78¢
City of Owensboro	7.24¢	City of Murray	9.78¢
City of Benham	7.27¢	City of Russellville	9.82¢
Kentucky Utilities Company	7.31¢	Inter County Energy Coop Corporation	9.85¢
Madisonville Municipal Utilities	7.42¢	City of Glasgow	9.93¢
Duke Energy Kentucky, Inc.	7.52¢	City of Benton	10.01¢
Barbourville Utility Commission	7.57¢	Licking Valley R.E.C.C.	10.10¢
City of Bardstown	7.59¢	Cumberland Valley R.E.C.C.	10.11¢
City of Nicholasville	7.65¢	City of Bowling Green	10.11¢
City of Frankfort	7.96¢	Williamstown Utility Commission	10.20¢
City of Paris	8.01¢	Clark Energy Coop Inc	10.30¢
Shelby Energy Co-op, Inc	8.17¢	City of Paducah	10.35¢
Taylor County R.E.C.C.	8.25¢	Tri-County Electric Member Corporation	10.48¢
Fleming-Mason Energy Coop Inc	8.35¢	Warren R.E.C.C.	10.69¢
City of Falmouth	8.47¢	City of Olive Hill	10.86¢
City of Providence	8.51¢	South Kentucky R.E.C.C.	10.90¢
Salt River Electric Coop Corporation	8.79¢	Pennyrile Rural Electric Cooperative	10.94¢
Owen Electric Coop Inc	8.84¢	City of Bardwell	11.13¢
Kentucky Power Company	8.88¢	City of Jellico	11.20¢
Corbin City Utilities Commission	8.92¢	City of Vanceburg	11.86¢
Farmers R.E.C.C.	8.98¢	City of Princeton	12.03¢
Big Sandy R.E.C.C.	9.00¢	West Kentucky R.E.C.C.	12.77¢
Nolin R.E.C.C.	9.09¢	City of Hickman	13.17¢
City of Fulton	9.34¢	Hickman-Fulton Counties R.E.C.C.	13.20¢

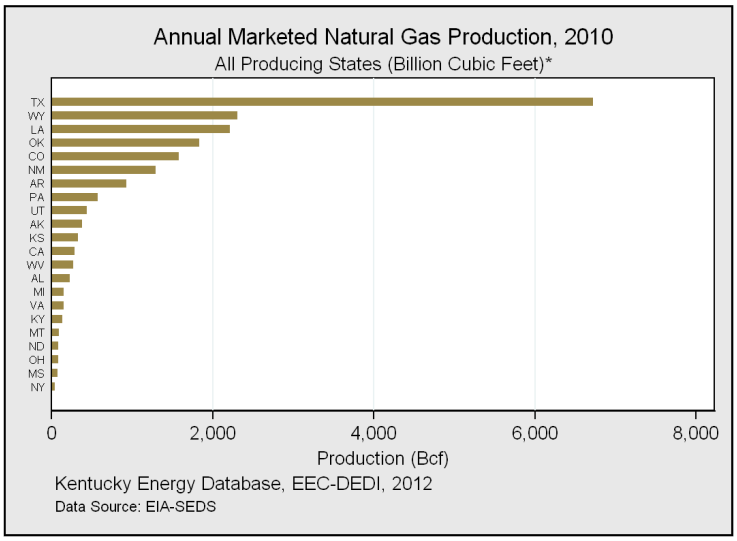
Industrial Electricity Prices, 2010



Kenergy Corporation	3.91¢	Duke Energy Kentucky, Inc.	6.58¢
City of Benham	4.05¢	City of Owensboro	6.68¢
Henderson City Utility Commission	4.07¢	Inter County Energy Coop Corporation	6.69¢
Corbin City Utilities Commission	4.45¢	Williamstown Utility Commission	6.71¢
Tennessee Valley Authority	4.55¢	Jackson Energy Coop Corporation	6.71¢
Electric Energy Inc	4.77¢	City of Murray	6.86¢
Owen Electric Coop Inc	4.82¢	West Kentucky R.E.C.C.	6.89¢
City of Bardstown	5.04¢	City of Glasgow	7.14¢
Jackson Purchase Energy Corporation	5.09¢	City of Franklin	7.24¢
Louisville Gas & Electric Company	5.38¢	Tri-County Electric Member Corporation	7.26¢
Kentucky Utilities Company	5.57¢	Farmers R.E.C.C.	7.28¢
Kentucky Power Company	5.64¢	Licking Valley R.E.C.C.	7.41¢
City of Hopkinsville	5.66¢	Cumberland Valley R.E.C.C.	7.42¢
Nolin R.E.C.C.	5.79¢	Pennyrile Rural Electric Cooperative	7.50¢
Fleming-Mason Energy Coop Inc	5.80¢	Warren Rural Elec Coop Corporation	7.51¢
City of Nicholasville	5.81¢	South Kentucky R.E.C.C.	7.65¢
City of Paris	5.85¢	City of Russellville	8.21¢
City of Bowling Green	6.00¢	City of Fulton	8.38¢
Grayson R.E.C.C.	6.11¢	Clark Energy Coop Inc	8.39¢
City of Frankfort	6.17¢	Taylor County R.E.C.C.	8.50¢
Blue Grass Energy Coop Corporation	6.25¢	City of Mayfield Plant Board	8.72¢
Barbourville Utility Commission	6.26¢	City of Paducah	8.74¢
Big Sandy R.E.C.C.	6.36¢	City of Benton	9.28¢
Salt River Electric Coop Corporatoin.	6.37¢	City of Vanceburg	9.44¢
Shelby Energy Co-op, Inc	6.40¢	City of Princeton	10.15¢
City of Berea Municipal Utility	6.49¢	Hickman-Fulton Counties R.E.C.C.	11.97¢

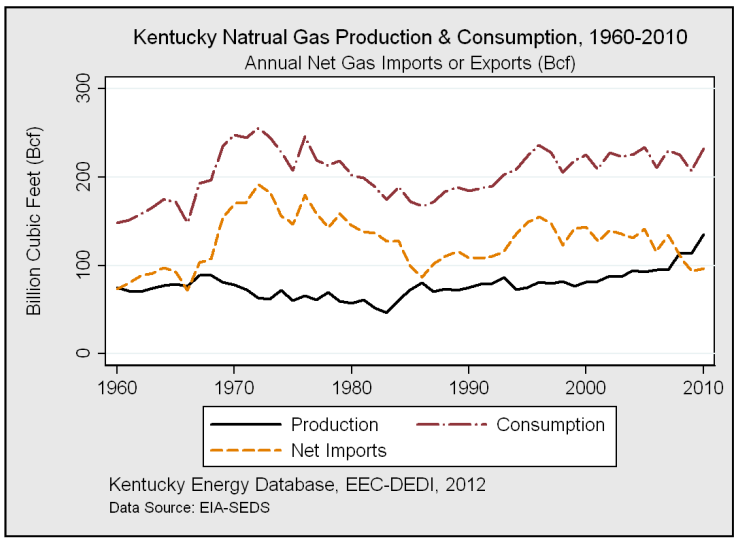
Kentucky Natural Gas Production





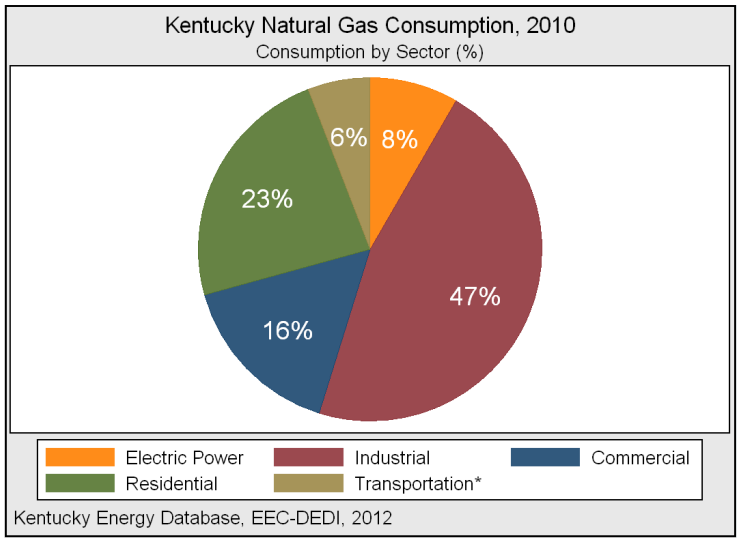
State	Billion Cubic Feet	Rank
Texas	6,715	1st
Kentucky	135	17th

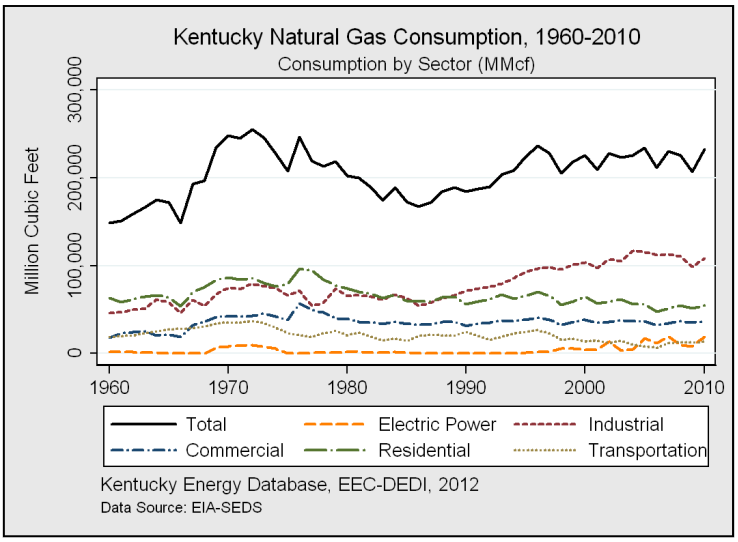
The Commonwealth of Kentucky produced 135 Billion cubic feet (Bcf) of natural gas in 2010. This amount represented a 19% increase in natural gas production compared with 2009. As reflected in the map of Kentucky Natural Gas Production, the preponderance of economically mineable natural gas is located and extracted in eastern Kentucky. While statewide natural gas production is projected to increase substantially, in a national context gas production in Kentucky contributes to less than 1% of total U.S. production.



Additionally, though Kentucky is a natural gas producer, the Commonwealth has been a substantial net importer of natural gas supplies in every year since 1960. During this period, Kentucky has needed to import between 42% and 75% of its actual annual natural gas consumption, as statewide consumption has outstripped statewide production. The 50-year average for net natural gas imports as a portion of annual natural gas consumption in Kentucky is 62%.

Kentucky Natural Gas Consumption





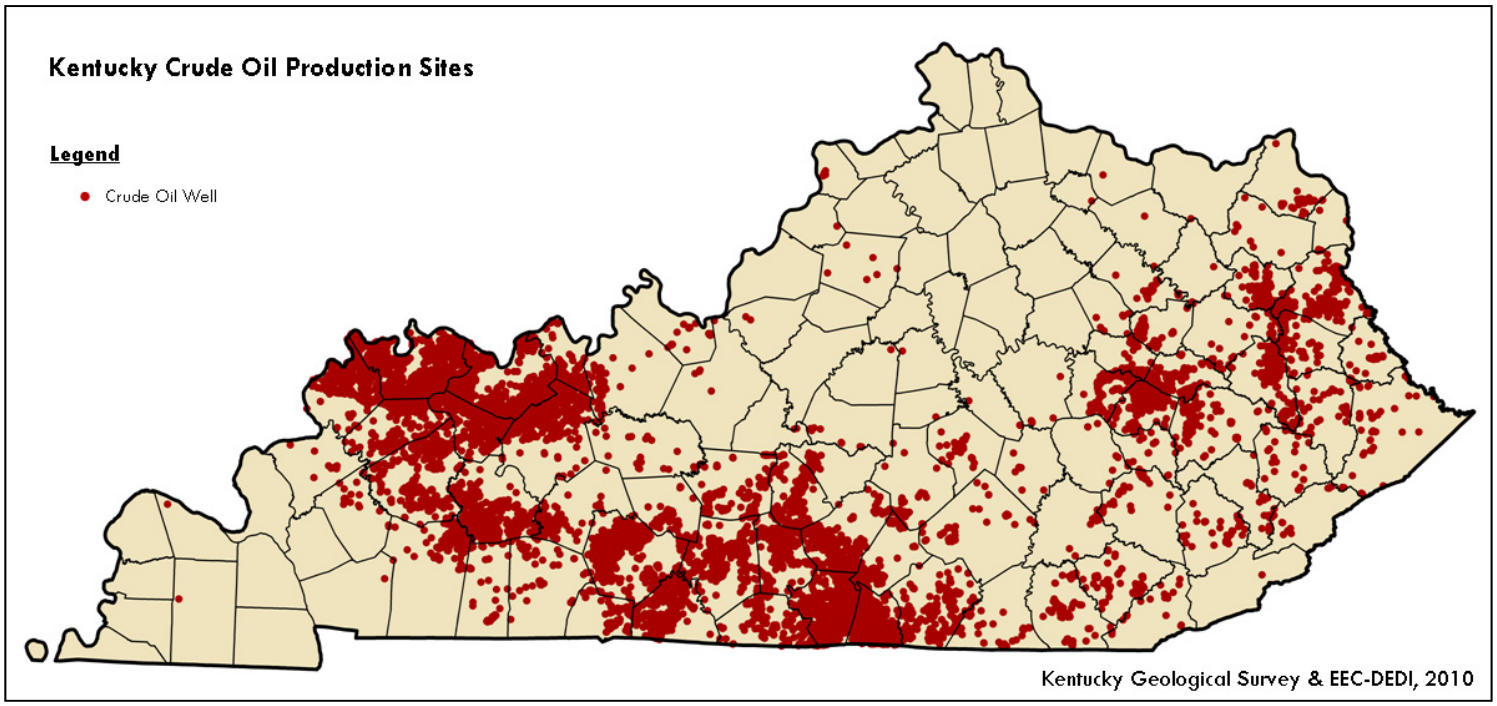
Sector	Million Cubic Feet	Percentage
Total	232,005	100%
Industrial	107,890	47%
Residential	54,391	23%
Commercial	36,822	16%
Electric Power	19,284	8%
Transportation*	13,618	6%

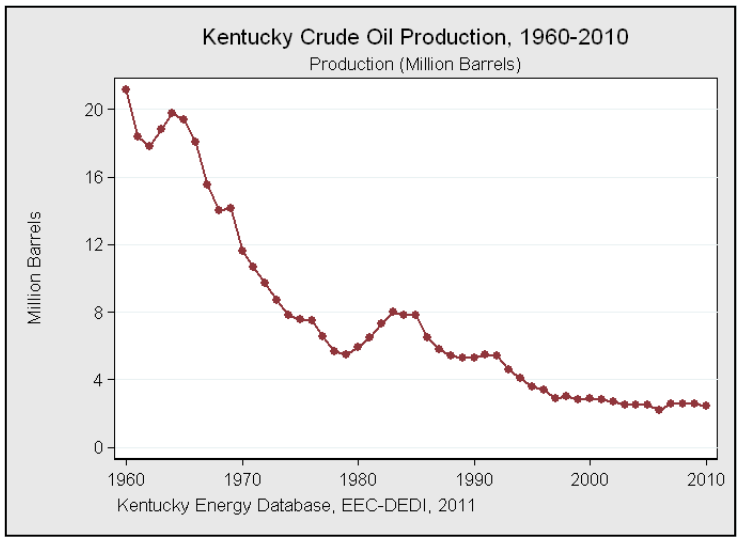
*Natural Gas consumption by the Transportation Sector is the summation of vehicle fuel usage and natural gas used in the movement of natural gas resources through transmission and distribution pipelines. In Kentucky in 2010, direct vehicle fuel usage of natural gas was approximately 4 MMcf. The remainder (13,614 MMcf) was consumed as natural gas pipeline fuel.

In 2010, the Commonwealth of Kentucky consumed 232,005 million cubic feet of natural gas, representing a 13% increase in statewide consumption compared with 2009. The Industrial Sector was by far the largest consumer of natural gas, accounting for 47% of total consumption. The Residential Sector was the next largest consumer of natural gas with 25% of consumption, followed by the Commercial Sector with 16%. Impressively, the Electric Power Sector—which accounted for 8% of total natural gas consumption in 2010—increased its consumption of natural gas by 130% compared with 2009. The Transportation Sector represented 6% of natural gas consumption, though only 4 MMcf of this total was connected to vehicle fuel use.

In the Commercial and Residential sectors natural gas is consumed to generate heat. Consumption follows a seasonal pattern, with notable fluctuation due to weather. In the Industrial Sector, however, natural gas is used as a process feed stock in manufacturing operations in addition to heating applications. As a result, Industrial Sector natural gas consumption is more consistent throughout the year, while the quantity and magnitude of natural gas consumption is reflective of the size and type of industrial firms within Kentucky.

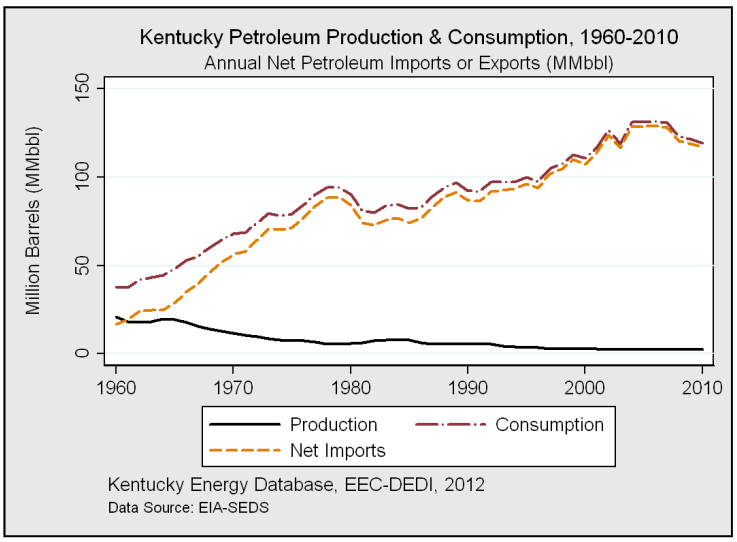
Kentucky Crude Oil Production





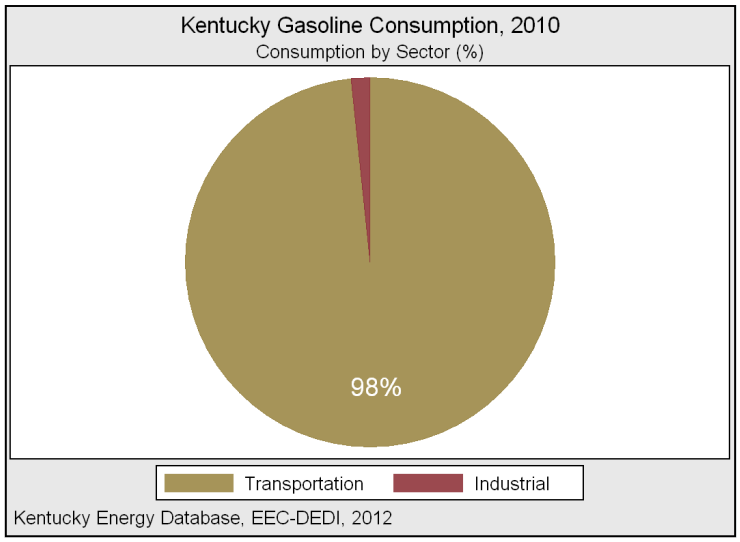
Production	Million Barrels	Rank
Texas	429.3	1st
Kentucky	2.5	20th

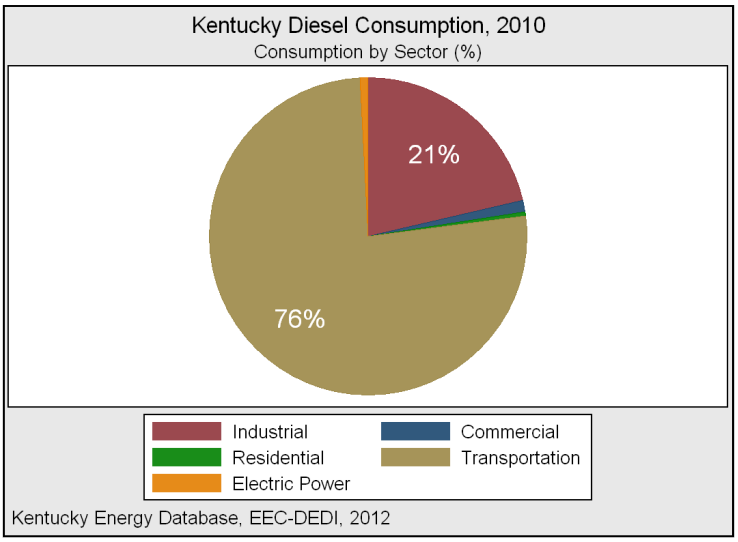
The Commonwealth of Kentucky produced 2.5 Million Barrels of crude oil in 2010. This amount represented a 1% increase in crude oil production in the state, compared with 2009. Annual crude oil production in Kentucky has remained relatively stable—between 2.4 and 2.9 million barrels—since the year 2000. In a national context, crude oil production in Kentucky contributes to less than 1% of total U.S. production, and this position is not expected to improve substantially in the foreseeable future.



As with natural gas, though Kentucky is a producer of petroleum, the Commonwealth has been a substantial net importer of petroleum supplies in every year since 1960. During this period, Kentucky has needed to import between 44% and 98% of its actual annual petroleum consumption, as statewide consumption has outstripped statewide production. The 50-year average for net petroleum imports as a portion of annual petroleum consumption in Kentucky is 87%.

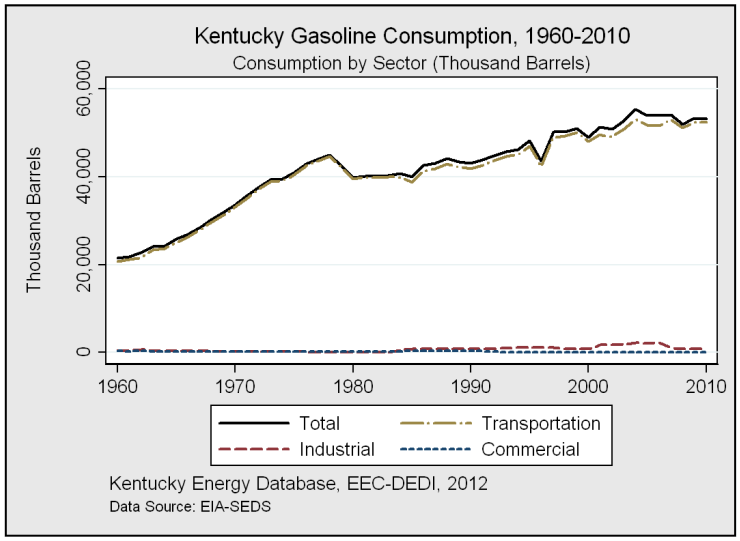
Kentucky Liquid Fuel Consumption

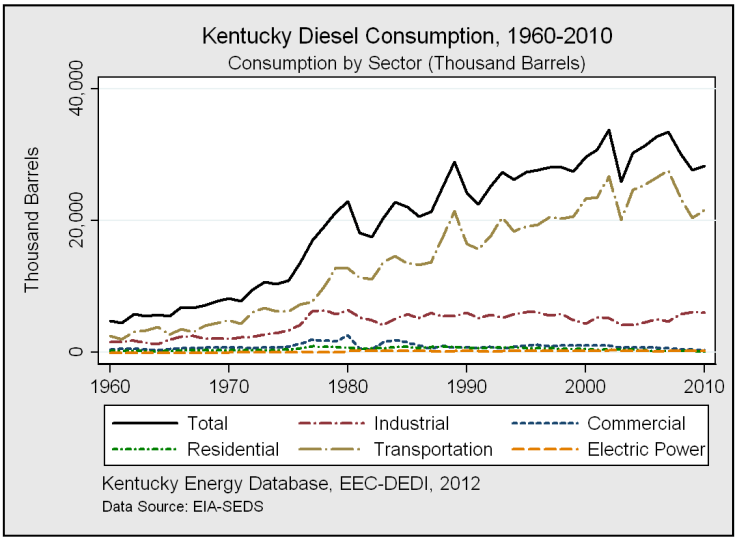




Sector	Thousand Barrels	Percentage
Total	53,214	100%
Transportation	52,301	98%
Industrial	870	2%
Commercial	43	<1%

Sector	Thousand Barrels	Percentage
Total	28,280	100%
Transportation	21,554	76%
Industrial	6,040	21%
Commercial	340	1%
Electric Power	230	1%
Residential	116	<1%

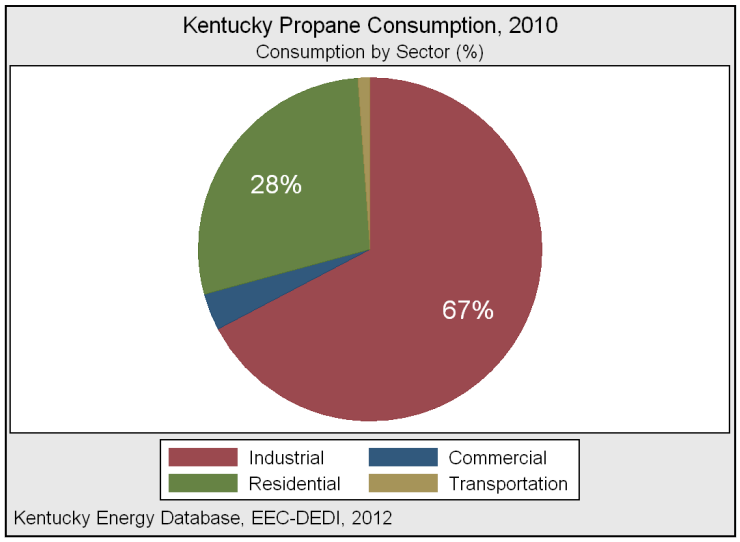


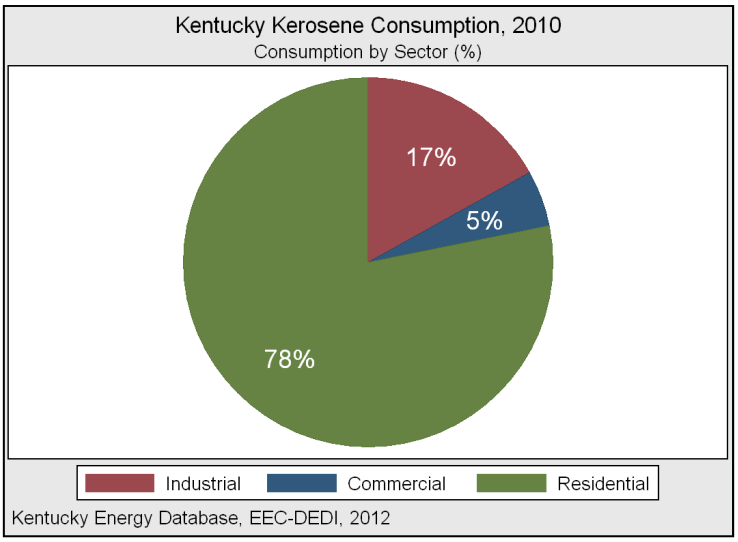


In 2010, residents, businesses, and industries in the Commonwealth of Kentucky consumed 53.2 Million barrels of gasoline, with almost 98% of this amount related to transportation. Compared with 2009, total gasoline consumption in Kentucky decreased slightly.

In 2010, residents, businesses, and industries in the Commonwealth of Kentucky consumed 28.2 Million Barrels of diesel, representing a 2% increase in overall consumption compared with 2009. The Transportation Sector accounted for 76% of diesel consumption, followed by the Industrial Sector with 21%. The Commercial, Residential, and Electric Power sectors made up the remaining 3% of statewide diesel consumption in 2010.

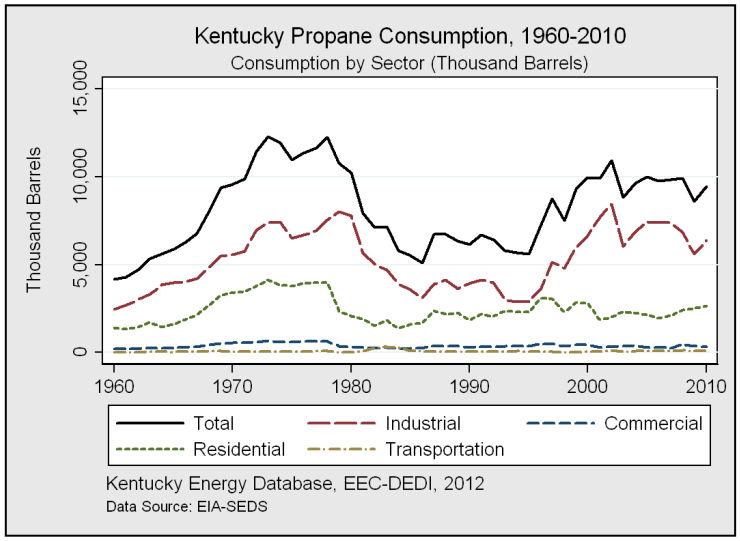
Kentucky Liquid Fuel Consumption

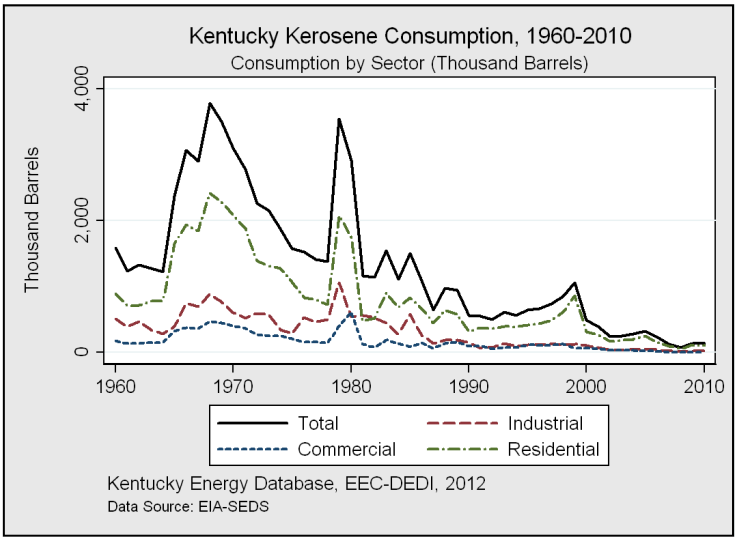




Sector	Thousand Barrels	Percentage
Total	9,499	100%
Industrial	6,362	65%
Residential	2,655	29%
Commercial	325	4%
Transportation	108	1%

Sector	Thousand Barrels	Percentage
Total	142	100%
Residential	111	78%
Industrial	24	17%
Commercial	7	5%



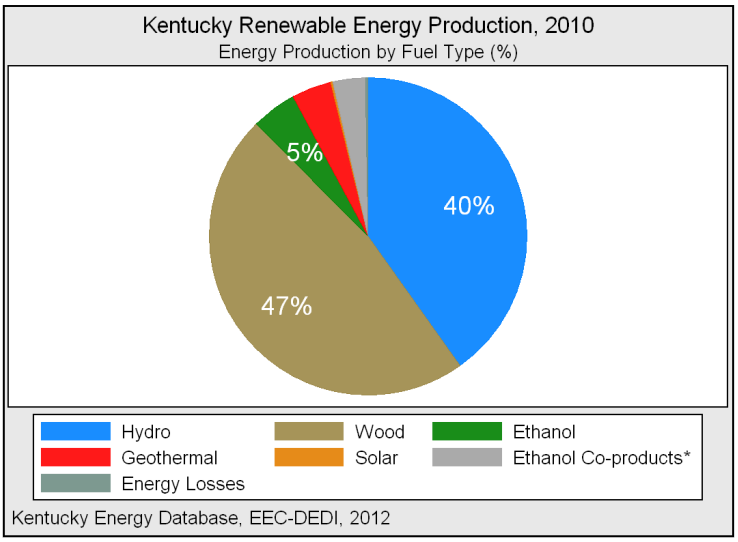


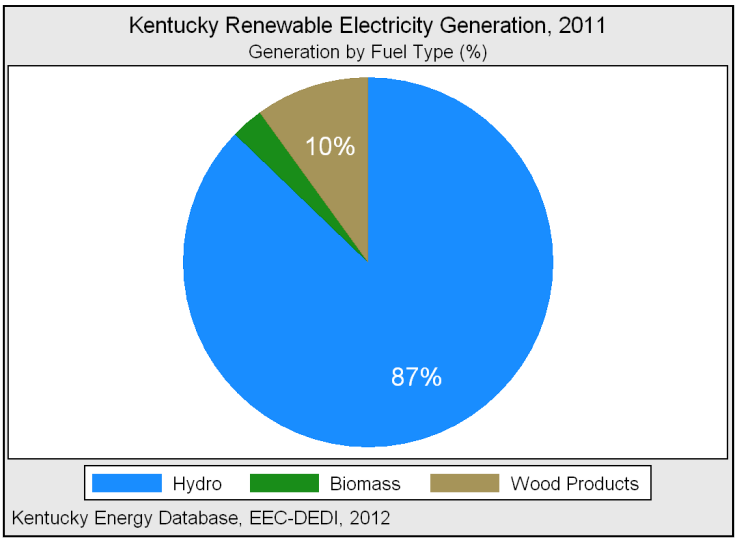
In 2010, residents, businesses, and industries in the Commonwealth of Kentucky consumed 9.4 Million Barrels of liquid propane gas. This amount reflected a 10% increase in total propane consumption compared with 2009. The Industrial Sector was the largest consumer of propane, accounting for 67% of consumption, followed by the Residential Sector with 28% of consumption. The Commercial and Transportation sectors comprised the remaining 4% of propane consumption in 2010.

In 2010, residents, businesses, and industries in the Commonwealth of Kentucky consumed 142,000 Barrels of kerosene. The Residential Sector was by far the largest consumer of kerosene, accounting for 78% of consumption. The Industrial Sector was the next largest consumer with 17% of consumption. The Commercial Sector constituted the remaining 5% of kerosene consumption in 2009. Compared with 2009, Kentucky kerosene consumption was effectively unchanged.

*These quantities exclude kerosene-type jet fuel, which is itemized in transportation energy consumption.

Kentucky Renewable Energy

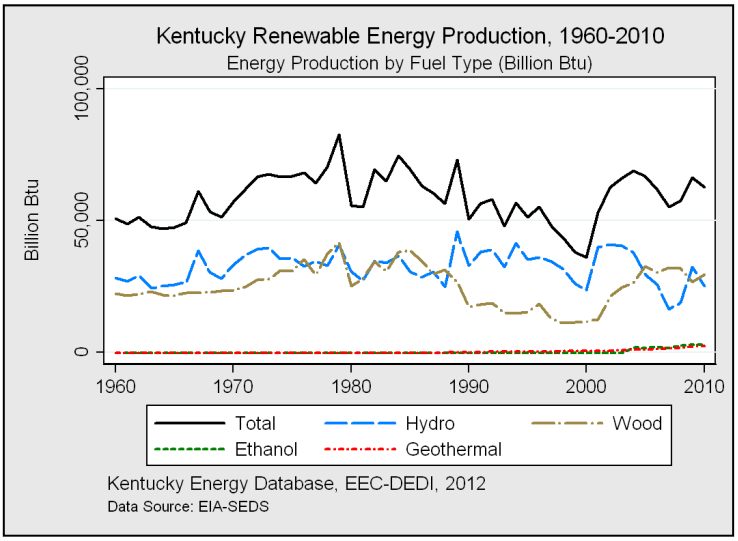


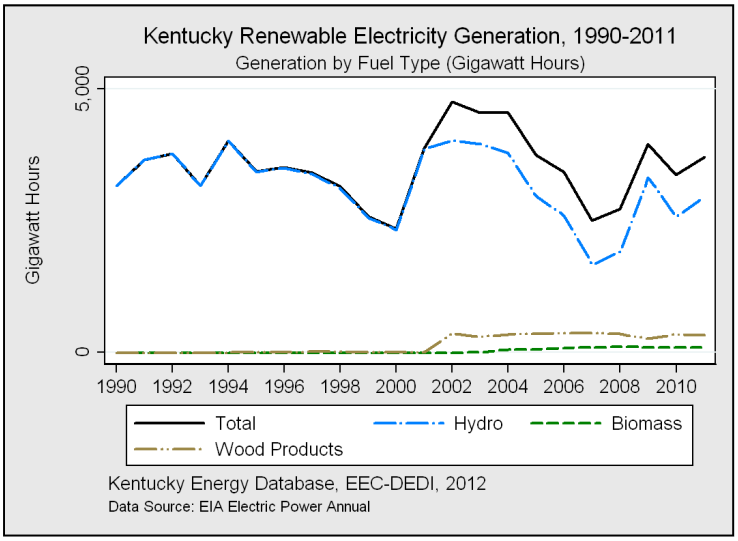


Fuel Type	Billion BTU	Percentage
Total	62,649	100%
Wood & Biomass	29,673	47%
Hydroelectric*	25,173	40%
Ethanol	2,880	5%
Geothermal	2,544	4%
Ethanol Co-products	2,071	3%

Fuel Type	Gigawatt Hours	Percentage
Total	3,038	100%
Hydroelectric*	2,580	87%
Wood & Biomass	458	13%

*Hydroelectric generation is directly accounted through Gigawatt-hour consumption, whereas hydroelectric production (Billion BTU) is a calculated fossil fuel displacement conversion. This conversion represents the amount of fossil fuel energy required to generate an equal amount of electricity.



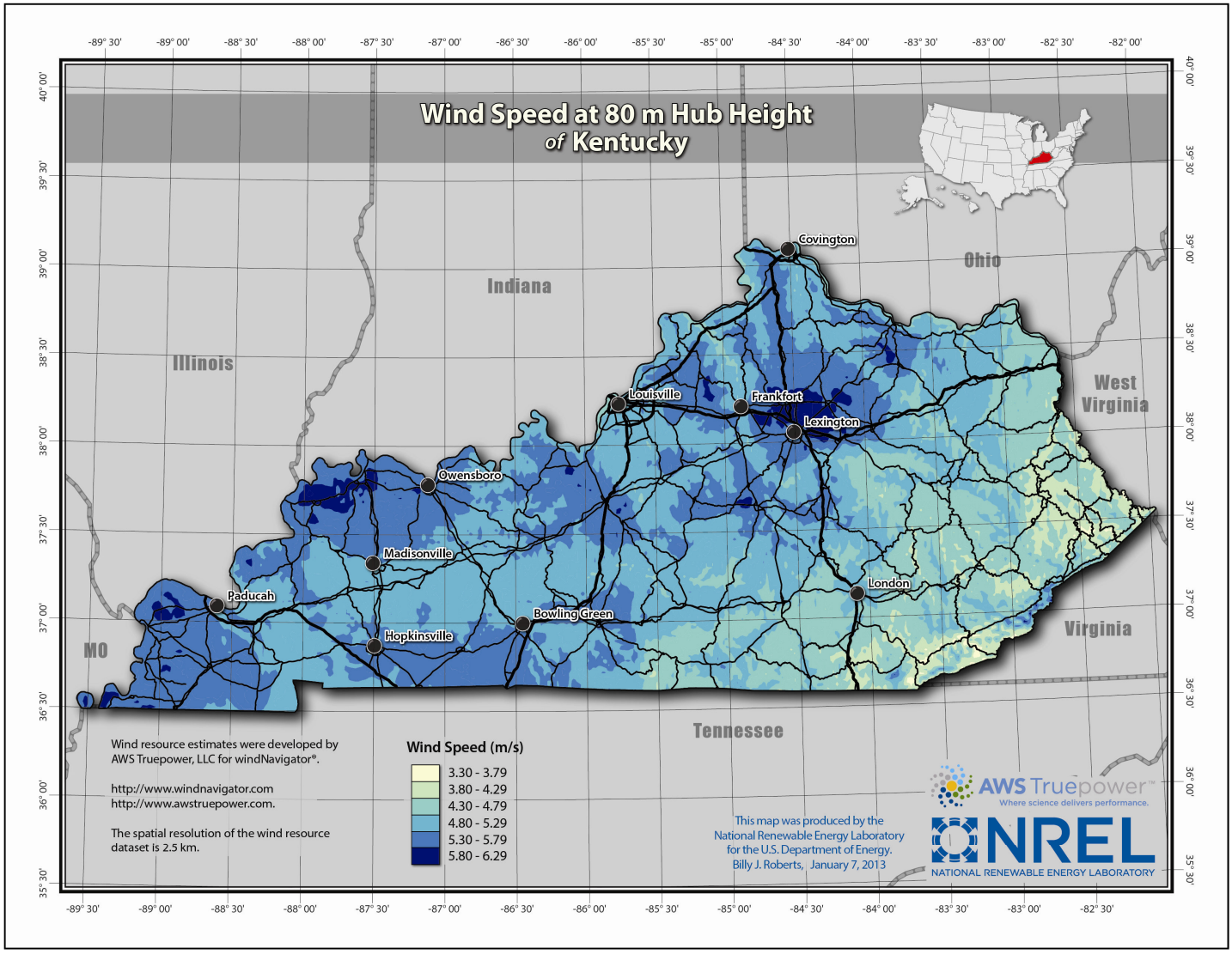


In 2010, Kentucky produced 0.06 Quadrillion Btu of energy from renewable resources, a marginal decrease compared with 2009. During 2010, wood and biomass production accounted for 47% of renewable energy in Kentucky, followed by hydroelectric power with 40%. Fuel ethanol production and geothermal energy systems together accounted for 9% of renewable energy production in Kentucky in 2010.

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

In Kentucky, electricity generation from renewable energy sources primarily involves hydroelectric power. In 2011, renewable energy resources generated 3,373 Gigawatt-hours of electricity. This amount represented a 12% increase in renewable electricity generation compared with 2010. Of this amount, hydroelectric power accounted for 87% of renewable electricity generation, followed by wood and biomass resources with 13% of renewable generation.

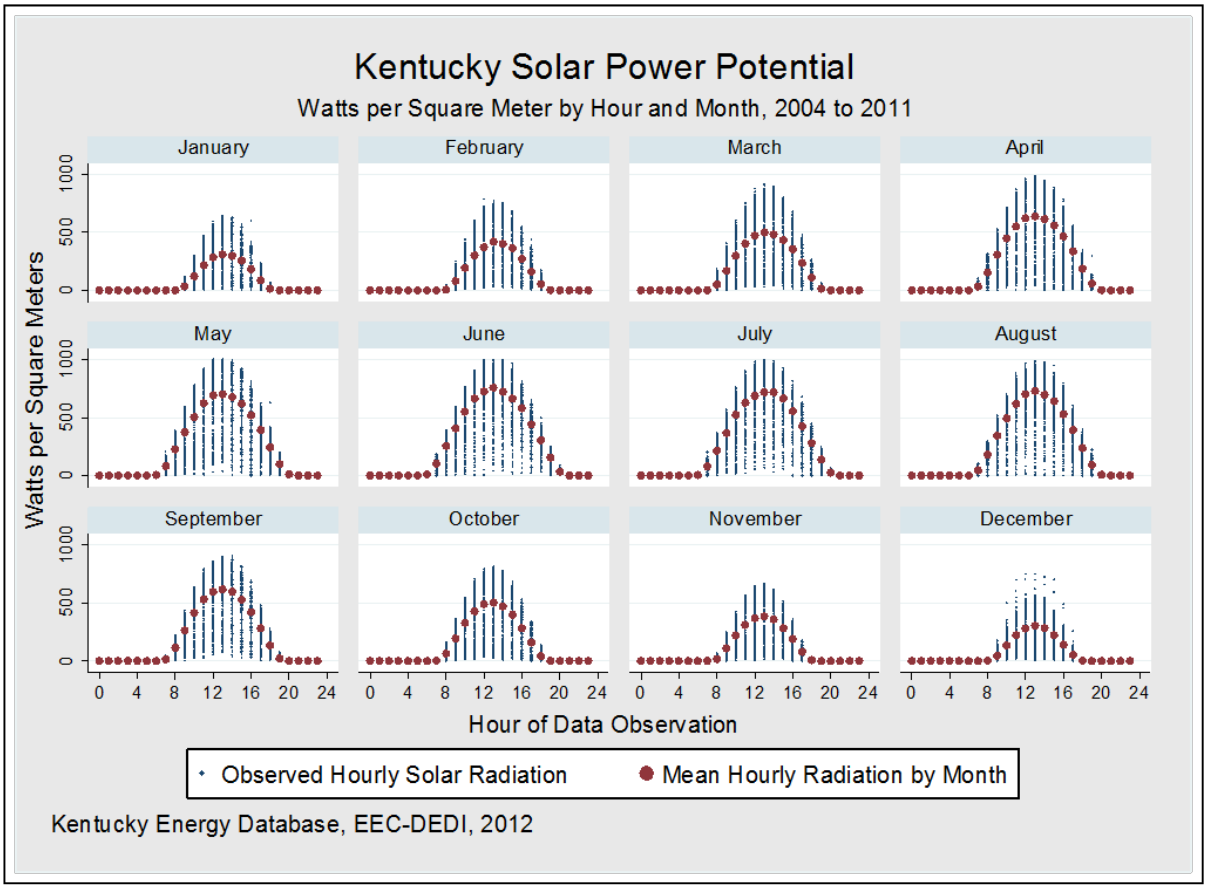
Kentucky Wind Power Potential



Kentucky's wind resource is uncertain but limited compared to most states including Indiana, Ohio and West Virginia. Wind maps published by the National Renewable Energy Lab (NREL) in 2010 provide an initial assessment of the potential resource and establish areas of Kentucky that may be developable for utility-scale wind. This initial assessment is intended to direct wind developers to the windiest parts of the state, and developers have already installed wind speed monitoring equipment in two of these areas. Over time, the collection of higher resolution data on wind speeds and wind patterns will help determine the economic feasibility of wind turbine construction within these areas.

According to NREL, areas with annual average wind speeds of around 6.5 m/s and greater at 80 meters are generally considered to have suitable wind resources for wind development. These windy areas identified by NREL would support wind farms with a gross capacity factor of 30% and higher. Kentucky's wind energy potential at a 30% capacity factor at 80 meters is 60 megawatts (MW). This is a small fraction of the nearly 11 million megawatts potentially available nationally. At 100 meters, Kentucky's wind energy potential increases to 700 MW, which ranks 9th from the bottom, nationally. The NREL assessment does provide wind energy potentials at lower wind speeds. However, NREL does not generally characterize low wind speed areas as suitable for wind development.

Kentucky Solar Power Potential

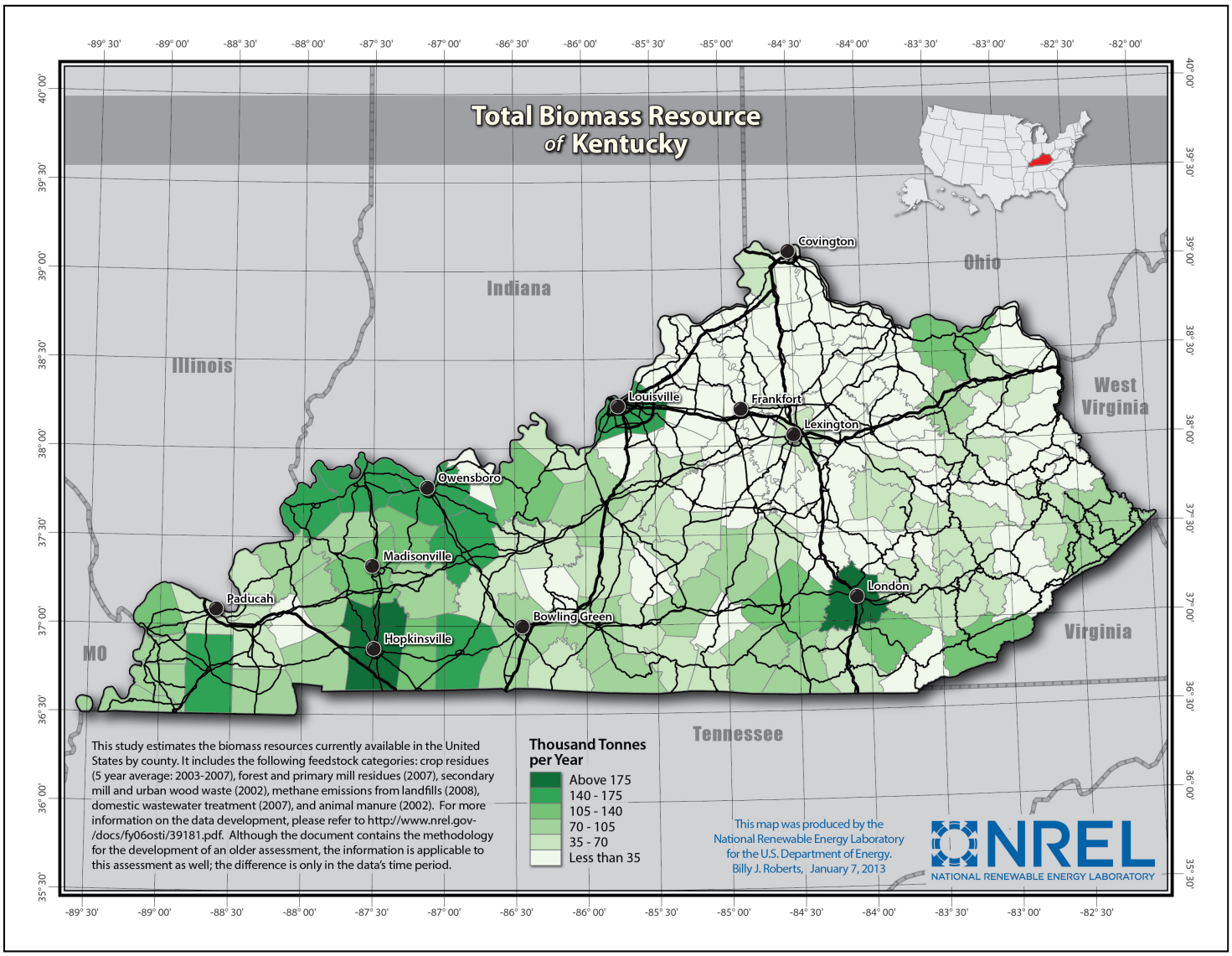


A well-maintained solar photovoltaic panel in central Kentucky could be expected to achieve an annual capacity factor of 14.85%. This means that 1 kilowatt of installed of capacity would, on average, produce just under 15% of the panel's rated capacity, for a total of 1,295 kilowatt-hours annually. The above graphic and table below illustrate how actual generation potential has varied in Kentucky by month and time of day for the past 8 years, ranging from 0 to 100% of rated capacity.

Kentucky Average Maximum Achievable Solar Capacity Factors, 2004-2011

Hour	Annual	January	February	March	April	May	June	July	August	September	October	November	December
24/7	14.85%	6.60%	9.60%	12.87%	18.20%	21.10%	23.34%	22.09%	20.91%	16.56%	12.27%	8.47%	6.14%
5:00	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
6:00	0.196%	0.000%	0.000%	0.000%	0.012%	0.673%	1.192%	0.525%	0.024%	0.000%	0.000%	0.000%	0.000%
7:00	2.997%	0.000%	0.000%	0.115%	3.261%	8.242%	10.378%	7.927%	4.402%	1.355%	0.259%	0.000%	0.000%
8:00	10.651%	0.210%	0.656%	4.967%	15.233%	22.615%	25.471%	21.379%	17.934%	11.319%	6.276%	1.541%	0.080%
9:00	22.358%	3.412%	7.930%	16.790%	30.558%	37.324%	40.458%	36.529%	34.413%	26.143%	19.309%	10.667%	4.435%
10:00	35.151%	12.071%	19.269%	29.657%	44.536%	50.266%	54.952%	52.302%	49.250%	41.347%	32.614%	21.920%	13.331%
11:00	45.633%	21.521%	30.015%	40.180%	54.893%	62.083%	66.078%	62.548%	61.545%	52.872%	42.529%	30.914%	22.198%
12:00	52.219%	28.232%	37.108%	46.994%	62.072%	68.977%	72.146%	68.565%	69.879%	59.308%	48.674%	36.653%	27.839%
13:00	54.647%	30.928%	41.754%	49.742%	63.652%	69.912%	75.576%	71.583%	72.809%	61.501%	50.065%	38.182%	29.999%
14:00	52.430%	29.661%	40.038%	48.129%	61.288%	67.462%	71.968%	71.549%	69.383%	59.444%	46.759%	35.593%	28.040%
15:00	46.760%	25.494%	36.249%	43.110%	55.708%	61.769%	66.218%	66.383%	63.844%	52.556%	39.604%	28.153%	21.972%
16:00	37.260%	18.213%	26.923%	36.366%	46.214%	51.793%	57.906%	55.296%	52.742%	41.795%	28.159%	18.733%	13.908%
17:00	25.275%	8.653%	16.055%	23.433%	33.288%	39.210%	44.043%	42.394%	39.128%	28.148%	15.850%	7.701%	5.212%
18:00	13.378%	1.339%	5.230%	10.832%	18.635%	24.233%	33.032%	27.881%	23.669%	13.263%	4.091%	0.588%	0.209%
19:00	4.833%	0.000%	0.150%	1.492%	5.810%	9.846%	15.339%	13.753%	9.173%	2.097%	0.055%	0.000%	0.000%
20:00	0.669%	0.000%	0.000%	0.000%	0.095%	1.144%	3.249%	2.722%	0.765%	0.002%	0.000%	0.000%	0.000%
21:00	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%	0.005%	0.003%	0.000%	0.000%	0.000%	0.000%	0.000%
22:00	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Kentucky Biomass Resource Potential

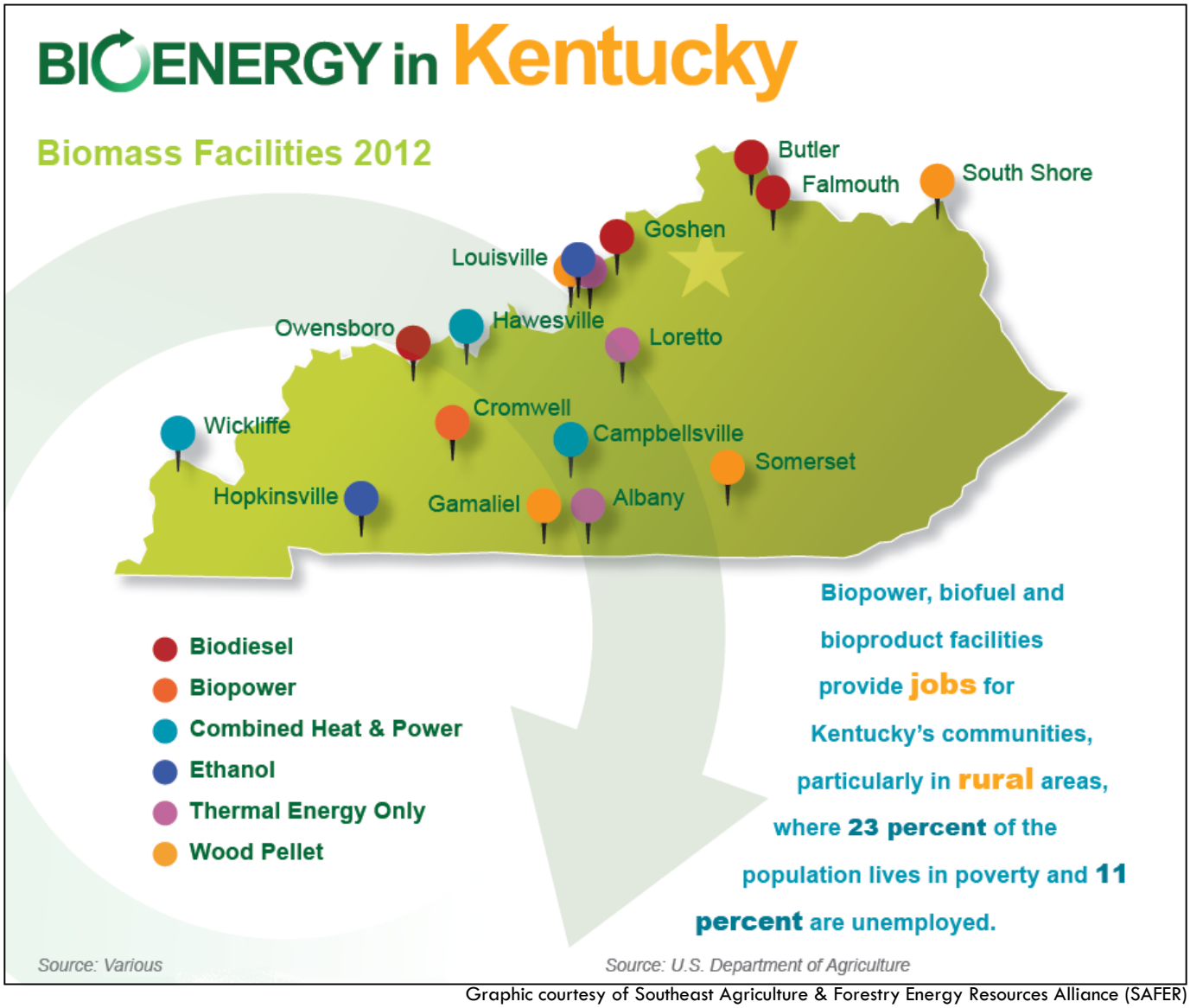


Kentucky has considerable existing biomass resources as well as areas suitable for development in every region of the state. Ranging from woody biomass resources to annual crop harvests, Kentucky's natural climate provides an environment in which a variety of renewable energy sources can be produced. Under proper management, these resources can provide sustainable annual yields of primary energy commodities that can be converted into liquid fuels or electricity. In Kentucky, the refinement of biodiesel and ethanol from soybeans and corn grown on Kentucky's cropland is the most prominent source of biomass-based energy production in the Commonwealth. During 2010, the Commonwealth produced over 884,000 barrels of ethanol. Existing production and refinement capacity coupled with infrastructure assets that include interstates, navigable rivers, railroads, and other energy industries makes Kentucky an ideal location for future development.

Beyond biofuel production, Kentucky also utilizes biomass resources to generate electricity on an annual basis. For example, in 2011 wood, wood wastes, crop residues, and landfill gas resources generated 432 Gigawatt-hours of electricity in Kentucky. However, this biomass-based electricity generation remains less than one percent of total electricity generation in Kentucky, and reflects the current market challenges faced by biomass commodities.

Consequently, many of Kentucky's universities are involved in research efforts that are designed to test the scalability of various biomass projects and promote the commercialization of existing biomass resources.

Kentucky Biomass Facilities



Graphic courtesy of Southeast Agriculture & Forestry Energy Resources Alliance (SAFER)

Biomass: Organic nonfossil material of biological origin constituting a renewable energy source.

Wood energy (Biopower): Wood and wood products used as fuel, including round wood (cord wood), limb wood, wood chips, bark, saw dust, forest residues, charcoal, pulp waste, and spent pulping liquor.

Biodiesel: A fuel typically made from soybean, canola, or other vegetable oils; animal fats; and recycled grease. It can serve as a substitute for petroleum-derived diesel or distillate fuel. For EIA reporting, it is a fuel composed of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM (American Society for Testing materials) D 6751.

Combined heat and power (CHP) plant: A plant designed to produce both heat and electricity from a single heat source. Note: This term is being used in place of the term "cogenerator" that was used by EIA in the past. CHP better describes the facilities because some of the plants included do not produce heat and power in a sequential fashion and, as a result, do not meet the legal definition of cogeneration specified in the Public Utility Regulatory Policies Act (PURPA).

Ethanol (C_2H_5OH): A clear, colorless, flammable alcohol. Ethanol is typically produced biologically from biomass feedstocks such as agricultural crops and cellulosic residues from agricultural crops or wood. Ethanol can also be produced chemically from ethylene.

Thermal Energy Only (Steam): Water in vapor form; used as the working fluid in steam turbines and heating systems

Wood pellets: Saw dust compressed into uniform diameter pellets to be burned in a heating stove

(Definition Source: EIA http://www.eia.gov/tools/glossary/index.cfm)

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and

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Basic Methodology

In December 2009, Kentucky Energy and Environment Cabinet Secretary Len Peters directed the Department for Energy Development and Independence (DEDI) to construct a comprehensive database concerning energy, environmental, and economic statistics for the purposes of quantitative analysis and policy interpretation. The outcome of this effort is the Kentucky Energy Database, a summary time series data set encapsulating energy related statistics for the Commonwealth of Kentucky for the period 1950 to 2010. An outgrowth of this undertaking is the *Kentucky Energy Profile 2011*, which utilizes the summary statistics of the Kentucky Energy Database to provide an annual snapshot of energy consumption and production within Kentucky. The *Kentucky Energy Profile 2011* exists for the following three purposes:

1. To support the Commonwealth Energy Assurance Plan that identifies potential threats to energy systems in the Commonwealth.
2. To serve as an impartial repository of energy statistics for the general public, researchers, and policy makers.
3. To provide an understanding of the dynamics of energy consumption and production within the Commonwealth.

Construction:

The foundation of the *Kentucky Energy Profile 2011*, the Kentucky Energy Database, consists of one summary time series data set and four supporting multidimensional panel data sets, each with a different unit of observation. The majority of the variables located in this database were acquired from publically available resources, primarily the Department of Energy State Energy Data System (SEDS). This data system is produced and maintained by the U.S. Energy Information Administration (EIA).

However, the SEDS database does not contain many critical variables - particularly economic, socioeconomic, and environmental - required for a holistic analysis of energy systems. Accordingly, the Kentucky Energy Database was supplemented with data sets from the following United States Government agencies: Federal Energy Regulatory Commission (FERC), National Renewable Energy Laboratory (NREL), Bureau of Economic Analysis (BEA), National Oceanic Atmospheric Administration (NOAA), U.S. Census Bureau, U.S. Census of Manufacturers, Environmental Protection Agency (EPA), Mine Safety and Health Administration (MSHA), and the Bureau of Labor Statistics (BLS).

Following the construction of the Kentucky Energy Database, DEDI analysts were able to conduct specified research involving economic and energy related issues of the Commonwealth. The collation of data provided a platform on which summary statistics and time series data could be easily generated to answer questions of interest. Such information could then be transformed into accessible tables and graphics for general representation and distribution.

Production:

Incorporating the capabilities of the Kentucky Energy Database, DEDI analysts were able to produce an energy profile for the Commonwealth, which became the *Kentucky Energy Profile 2011*. This document intends to function as a comprehensive assessment of energy consumption and production within the state by supplying detailed summary statistics and identifying time series trends. The data and topics included within the document are represented through quantitative tables, analytic graphics and maps, as well as written analysis.

For a more detailed explanation of the Kentucky Energy Database, please examine the "Kentucky Energy Database Methodology" under the Data & Modeling Section of DEDI Programs (energy.ky.gov).

Glossary

Aviation Gasoline: A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines.

Biomass: Organic non-fossil material of biological origin constituting a renewable energy source.

British Thermal Unit (BTU): The quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).

Central Appalachian Basin: The Central Appalachian Coal Basin is the middle basin of three basins that comprise the Appalachian Coal Region of the eastern United States. It includes parts of Kentucky, Tennessee, Virginia, and West Virginia.(G)

Coal: a naturally occurring, combustible, sedimentary rock containing at least 50% by weight organic matter, a solid "fossil" fuel.(G)

Coal Export: A quantity of coal shipped, delivered, and combusted within a State different from the coal mine State of origin.(D)

Coal Field: A geographic region characterized by coal resources.(G)

Coal Import: A quantity of coal delivered and combusted within a State, but not originating from a coal mine within the same State.(D)

Commercial Sector: An energy-consuming sector that consists of service-providing facilities and equipment of businesses; Federal, State, and local governments; educational institutions, and other private and public organizations, such as religious, social, or fraternal groups.

Diesel: A fuel composed of distillates obtained in petroleum refining operation, or blends of such distillates with residual oil used in motor vehicles.

Electric Power Sector: An energy-consuming sector that consists of electricity only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public (NAICS 22). This sector includes electric utilities and independent power producers.

Electric Service Area: The geographic served exclusively by one retail electricity provider.(D)

Electricity Distribution: The delivery of electrical energy to a customer's home or business through low-voltage lines (typically at 69kV or less).(D)

Electricity Generation: The conversion of energy resources into electric power.

Electricity Rate: The average amount of money charged for each unit of electrical energy (kWh) distributed to a customer.(D)

Electricity Transmission: The movement or transfer of electric energy at high voltage over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers or is delivered to other electric systems.

Energy Consumption: The processes of converting energy supplies into useful forms such as heat, steam, electricity, and motion.(D)

Energy Production: The processes of extraction, collection, or utilization of energy resources for the purpose of creating accessible energy supplies (i.e. - available for sale and distribution).(D)

Ethanol: A clear, colorless, flammable alcohol. Ethanol is typically produced biologically from biomass

Glossary

Gigawatt (GW): A measure of electrical power. Specifically, one billion watts or one thousand mega-watts.

Gigawatt Hour (GWh): A measure of electrical energy defined as a unit of work, measured as 1 Gigawatt (1,000,000,000 watts) of power expended for 1 hour.

Hydroelectric Energy: The use of flowing water to produce electrical energy.

Illinois Basin: The coal producing areas of Western Kentucky, Southern Illinois, and Southwest Indiana.(G)

Industrial Sector: An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing, agriculture, forestry, fishing and hunting; mining, oil and gas extraction, and construction.

Jet Fuel: A refined petroleum product used in jet aircraft engines. It includes kerosene-type Jet Fuel and naphtha-type Jet Fuel.

Kerosene: A light petroleum distillate that is used in space heaters, cook stoves, and water heaters and is suitable for use as a light source when burned in wick-fed lamps.

Kilowatt (kW): A measure of electrical power. Specifically, one thousand watts.

Kilowatt Hour (kWh): A measure of electrical energy defined as a unit of work, measured as 1 Kilowatt (1,000 watts) of power expended for 1 hour.

Megawatt (MW): A measure of electrical power. Specifically, one million watts.

Megawatt Hour (MWh): A measure of electrical energy defined as a unit of work, measured as 1 Megawatt (1,000,000 watts) of power expended for 1 hour.

Metallurgical Coal: Coking coal and pulverized coal containing the proper chemical characteristics to facilitate the production of steel.

Natural Gas: A naturally occurring combustible mixture of light hydrocarbon (primarily methane) and inorganic gases that often occurs in porous and permeable sedimentary rocks, a gaseous "fossil" fuel.(G)

Natural Gas Liquids: Propane and butanes, which are dissolved in natural gas at reservoir pressure but condense into liquids at normal atmospheric pressure. Also called condensates, these liquids are removed from initial natural gas production and refined into a variety of additional energy products.(D)

Net Energy Consumption: The measurement of the total British Thermal Unit (BTU) value of energy resources utilized or combusted, subtracting the quantity of energy lost in the conversion of a primary energy source into a secondary, useful energy source.(D)

Petroleum: A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.

Primary Energy: Energy in the form that it is first accounted for in a statistical energy balance, before any transformation to secondary or tertiary forms of energy.

Propane: A normally gaseous straight-chain hydrocarbon, that is extracted from natural gas or refinery gas streams.

Regulated Emissions: Relating to Sulfur Dioxide (SO_2), Nitrogen Oxides (NO_x), and other particulates, the release of these constituents by electric generating units are restricted by provisions of the Clean Air Act amendments of 1990. Federal and State regulatory agencies are required to monitor the production and movement of these emissions, and ensure their mandated control and reduction.(D)

Glossary

Residential Sector: An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances.

Steam Coal: Coal used in boilers to generate steam for the purpose of electricity generation or heat and power distribution.

Surface Coal Mine Operation: A coal mine operation that produces coal through extraction processes removing surface layers of soil, rock, and coal deposits.(D)

Total Energy Consumption: The measurement of the total British Thermal Unit (BTU) value of primary energy resources utilized or combusted.(D)

Transportation Sector: An energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. This sector includes the natural gas utilized in the movement of natural gas resources through transmission pipeline.

Underground Coal Mine Operation: A coal mine operation that produces coal through solely subterranean extraction processes.(D)

Volt (V): A measure of electrical potential or electromotive force.

Watt (W): The unit of electrical power equal to one ampere under a pressure of one volt. A Watt is equal to 1/746 horse power.

Wood & Wood Waste: Wood and wood products, possibly including scrubs, branches, sawdust, etc., bought or gathered, and used by direct combustion.

*** All definitions are cited from the Energy Information Administration (E.I.A) Glossary unless otherwise noted.

(D) - Kentucky Department for Energy Development and Independence (DEDI)

(G) - Kentucky Geological Survey (KGS)

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