

KENTUCKY ENERGY PROFILE



Executive Summary

The Kentucky Energy and Environment Cabinet (EEC) offers the 2024 Kentucky Energy Profile to serve as an impartial point of reference for the general public and as a foundation for discussing Kentucky's energy future.

Kentucky's low energy costs stimulate economic growth by lowering the costs of doing business. In 2022, Kentucky had the 20th lowest average electricity cost (pp. 9-11). In 2022, 35% of the energy and 38% of electricity consumed in Kentucky went to manufacturing (pp. 12, 40), which remains Kentucky's largest source of revenue and one of the leading sources of employment (p. 5). In addition to large flagship manufacturers, Kentucky is also home to other energy-intensive manufacturing processes and a growing commercial sector. Kentucky is also a transportation and logistics hub, which consume large amounts of transportation fuels to ship manufactured goods around the United States and the world.

Electricity prices do vary across the Commonwealth and between utilities. Electricity in Kentucky is supplied by 173 individual electricity generating units at 53 power plants across the state (pp. 16-17). In 2022, our utility power plants average 32 years of age, with our oldest hydroelectric station being built in 1925 and the newest solar facilities coming online in 2022. Electricity is sold by six major electric utilities and dozens of smaller municipalities, as shown on the maps (pp. 18-19). Each major electric utility is profiled (pg. 24-35).

In 2022, after more than two centuries of commercial mining operations, Kentucky's domestic supply of coal remained a primary source of energy. Kentucky is the fifth-largest coal producing state in the United States with 49% being used in-state (pp. 62-63). Coal accounts for 68% of Kentucky's electricity portfolio (p.12) and 33% of its total energy consumption (p. 55). Although coal is Kentucky's primary energy source (79%), the state also produces small amounts of oil (pg. 66) and natural gas (p. 71). Kentucky also has growing renewable energy resources and opportunities (pp. 75-83).

Renewable and lower carbon energy resources have begun to intensify in the state following federal regulatory actions. Hydroelectric resources have long been a factor in Kentucky's energy mix, accounting for 7% of the state's electricity profile (pp. 82-83). Solar photovoltaics (PV) have increased throughout the state in the last decade. In 2022, utility-scale solar accounted for less than 1% of the total generation (pp. 76-79). However, as seen on the Solar Ordinances and Projects figure (p. 79), there are numerous independent power projects throughout the state that have been approved by the state's siting board. These projects are expected to surpass 5.5GW of electricity generation in the coming years. Biofuel resources have been utilized through much of the state's history, accounting for 16% of Kentucky's renewable energy production in 2022 (pp. 80-81).

Kentucky is exploring hydrogen as a key component in its transition to a cleaner energy mix, focusing on developing hydrogen production facilities and infrastructure. The state aims to leverage its existing industrial base and natural resources to integrate hydrogen into power generation and transportation. Additionally, Kentucky is considering advanced nuclear technology, such as small modular reactors (SMRs), to diversify its energy mix and provide a stable, low-carbon power source. The state is exploring regulatory pathways and partnerships to facilitate the development of nuclear facilities aiming to boost energy resilience while lowering emission intensity.

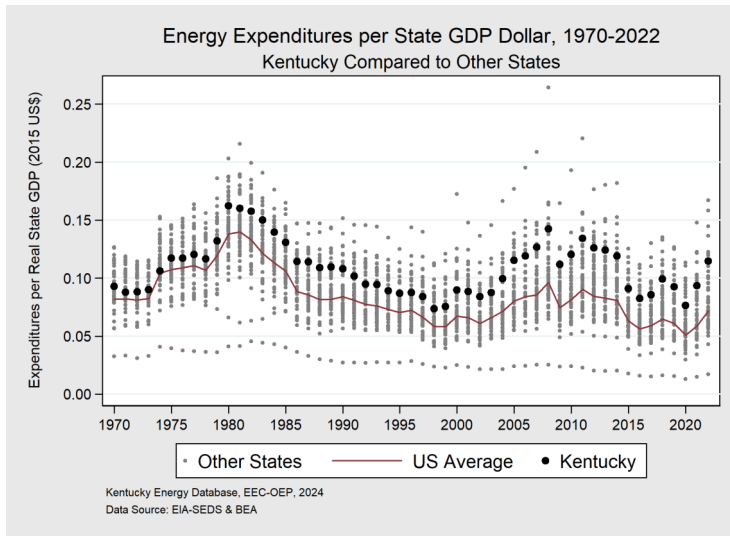
This edition of the Kentucky Energy Profile does not include the power plant profiles that have been available in previous editions. The Office of Energy Policy has created a public dashboard that provides the information in a interactive format. The [Power Plant Profiles Dashboard](#) includes data up to 2023.

Direct all inquiries or feedback to Evan Moser (Evan.Moser@ky.gov). All of the data in this report are public information aggregated from a variety of state and federal government agencies, and are available at: <https://eec.ky.gov/Energy/News-Publications/Pages/Kentucky-Energy-Profile.aspx>

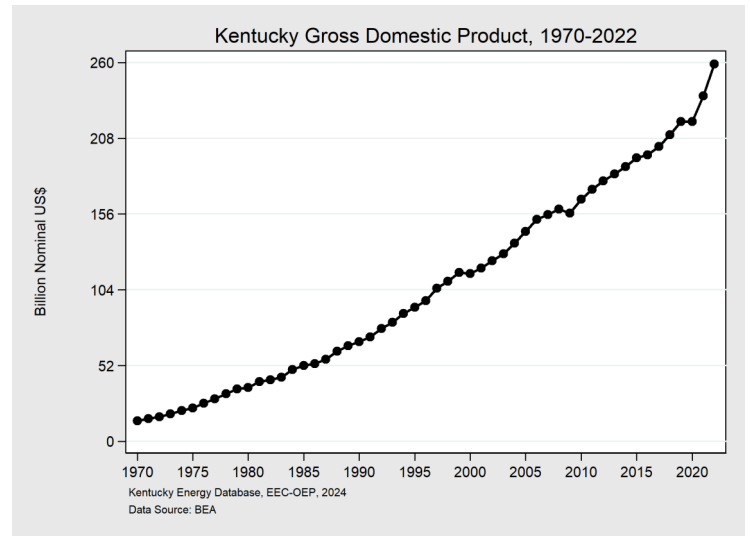
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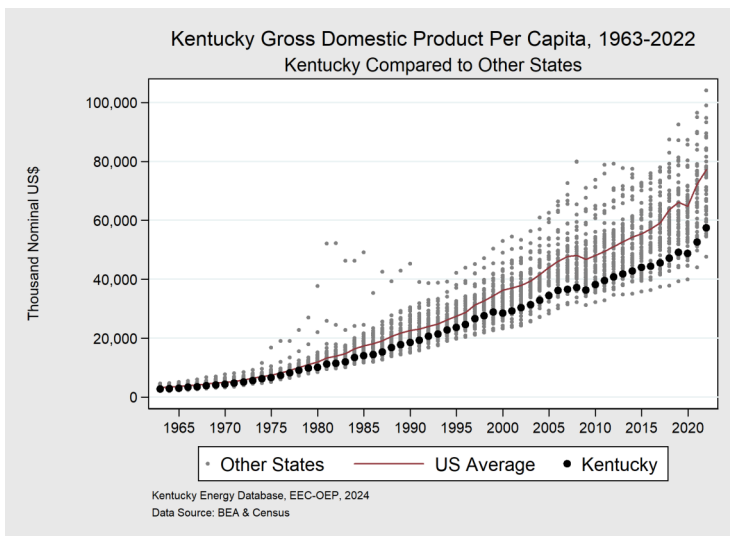
General Statistics



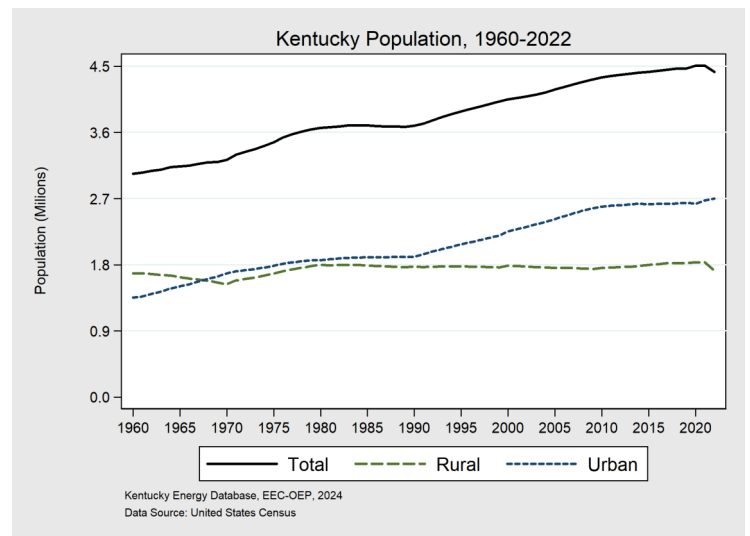
In 2022, on average \$0.11 was spent in Kentucky on energy to produce one dollar of state Gross Domestic Product (GDP). Kentucky ranked 9th in energy intensity of GDP in 2022, and increased its intensity by 22.8% from 2021. Kentucky is home to large, energy-intensive, manufacturing operations which cause Kentucky's electricity intensity to be higher than other states.



In 2022, the gross domestic product of Kentucky was \$259 billion, an increase of 18.4% from 2020. Kentucky has experienced steady growth in nominal GDP over the course of recorded history.

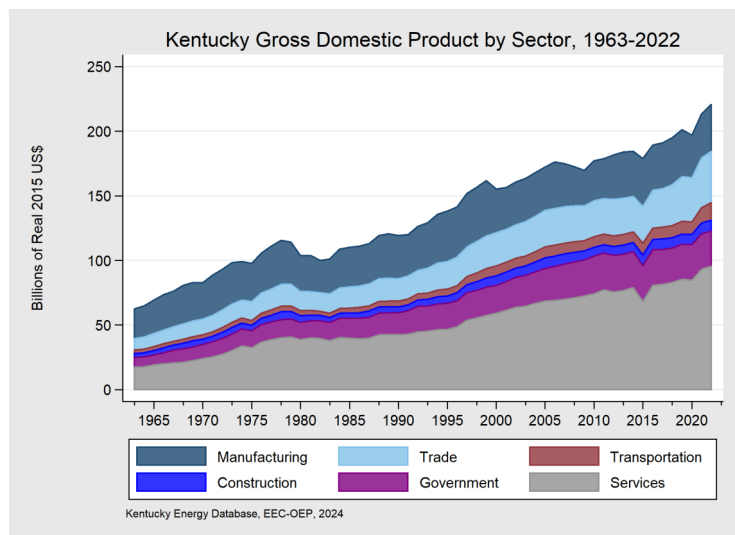


In 2022, Kentucky's GDP per capita was \$57,394, an increase of 17.8% from 2020. Kentucky ranked 44th in the nation in terms of GDP per capita and below the national average of \$77,243 in 2022.

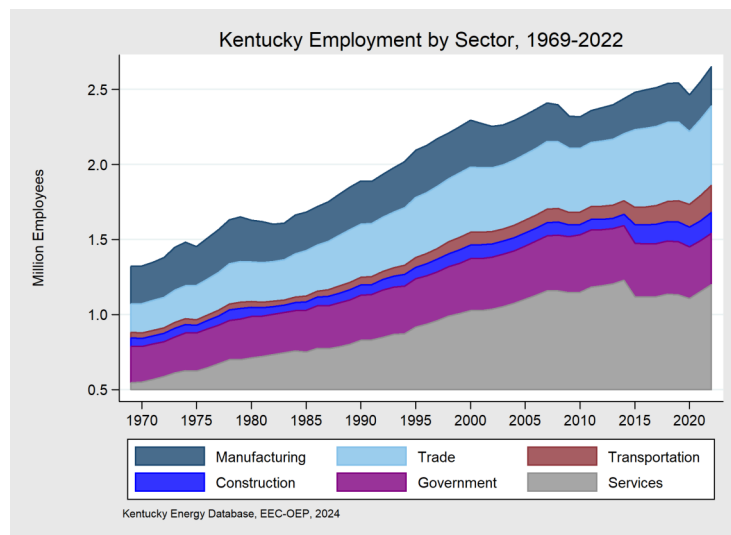


In 2022, Kentucky's population was approximately 4.4 million people, a decrease of 1.9% since 2020. Between 1960 and 2022, Kentucky's urban population has doubled while the rural population has stayed consistent.

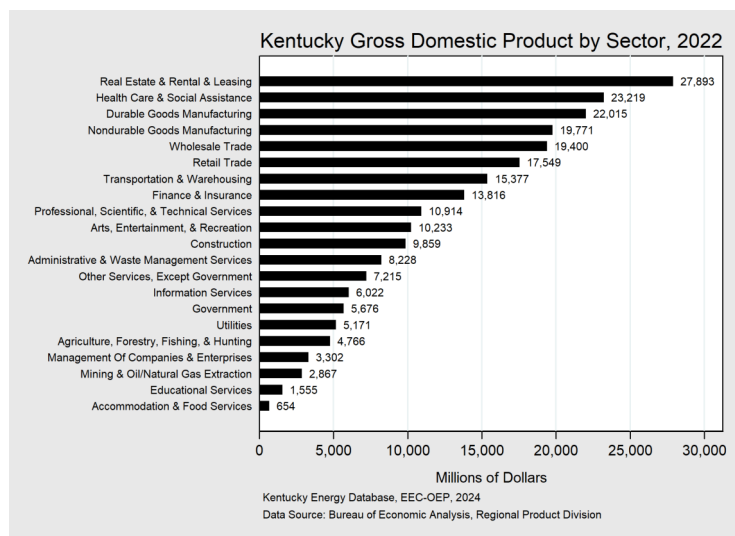
Kentucky's Economy



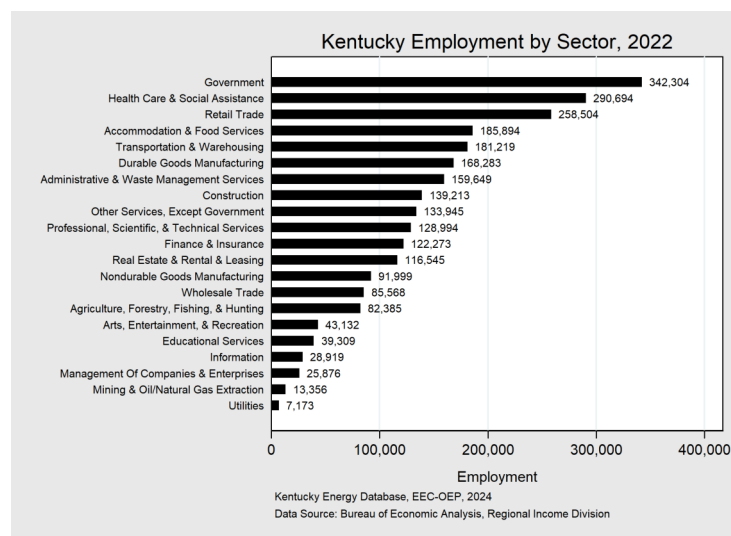
GDP from most sectors has risen gradually in the last 50 years, with output from the service sector rising the most. Manufacturing GDP has been relatively more volatile than that from other sectors. Output in 2022 appears to be another peak in GDP; however, data from 2023 and 2024 will be required to see if the trend continues to increase.



In 2020, total employment across all sectors decreased by 3% compared to 2019. By 2022, employment numbers recovered to surpass pre-covid numbers with a total of 2,658,979 employees in the state, a 7.6% increase from 2020.



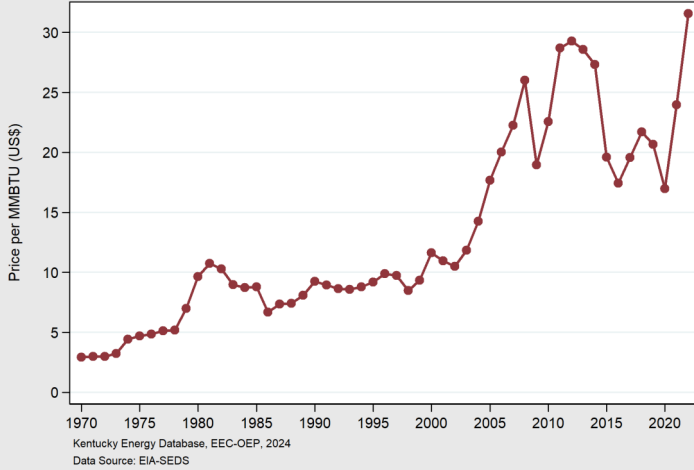
The Real Estate & Rental Leasing industry had the largest portion of state GDP with 11.8%, followed by Health Care & Social Assistance with approximately 9.9% of the total GDP in 2022. Goods manufacturing (Durable and Non-Durable) combined account for 17.7% of the total GDP.



In 2022, the government sector was the single largest employer in Kentucky. Government employment was approximately 12.8% of total employment, healthcare was 10.9%, and retail trade 9.7%. Employment is defined as the average number of full-time and part-time jobs where wages or salaries are paid.

Kentucky Commodity Prices

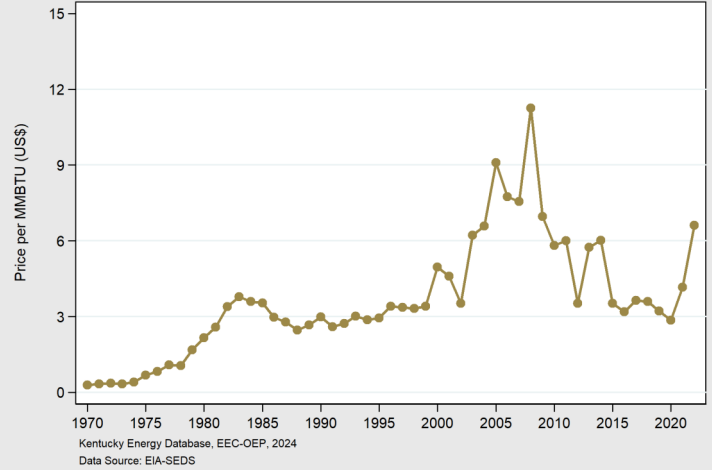
Kentucky Unleaded Regular Gasoline Price, 1976-2022



Fuel Type	U.S.\$/MMBtu	% Change
Gasoline	31.57	+31.7%

Unleaded gasoline in Kentucky cost \$31.57 per MMBtu in 2022, a 32% increase from the previous year.

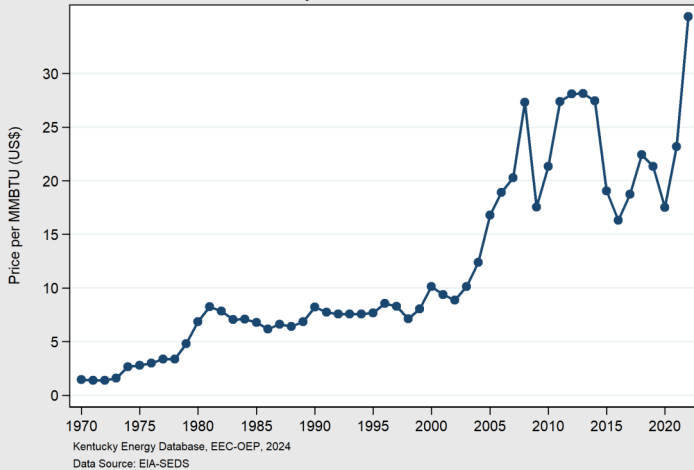
Kentucky Natural Gas Price, 1976-2022



Fuel Type	U.S.\$/MMBtu	% Change
Natural Gas	6.61	+58.9%

The average citygate* price of natural gas in Kentucky in 2022 was \$6.61 per million Btu, a 58.9% increase in the price of natural gas compared with 2021.

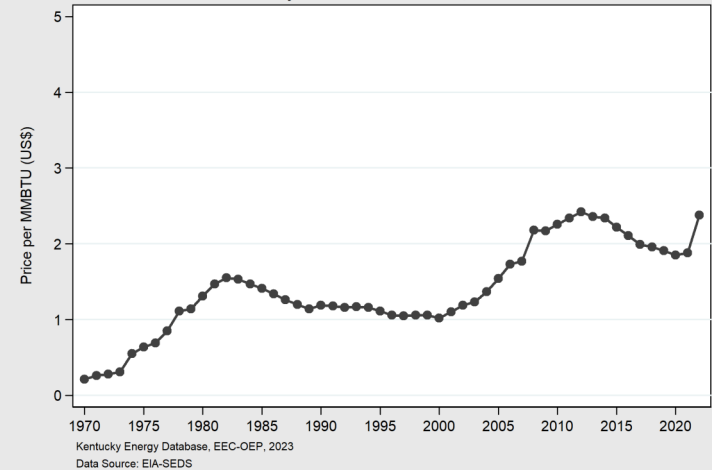
Kentucky Diesel Price, 1976-2022



Fuel Type	U.S.\$/MMBtu	% Change
Diesel	35.3	+52.4%

The average retail price of diesel in Kentucky in 2022 was \$35.3 per million Btu, a 52.4% increase in the price of diesel compared with 2021.

Kentucky Steam Coal Price, 1976-2022



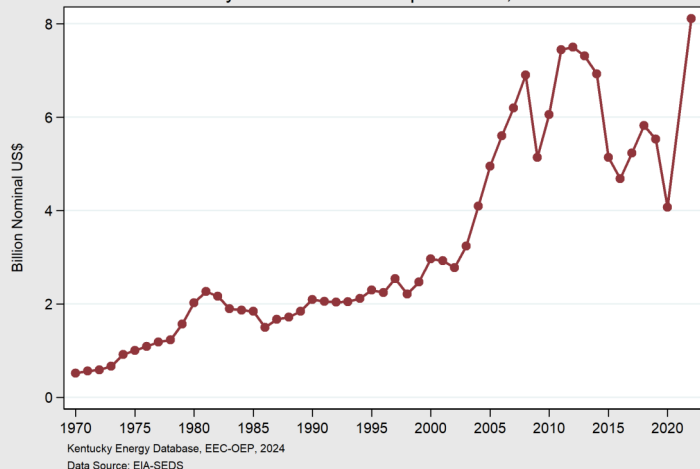
Fuel Type	U.S.\$/MMBtu	% Change
Coal	2.38	+26.6%

The average price of steam coal in Kentucky in 2022 was \$2.38 per million Btu, a 26.6% increase in the price of steam coal compared with 2021.

*Citygate prices are defined as "A point or measuring station at which a distributing gas utility receives gas from a natural gas pipeline company or transmission system."

Kentucky Commodity Expenditures

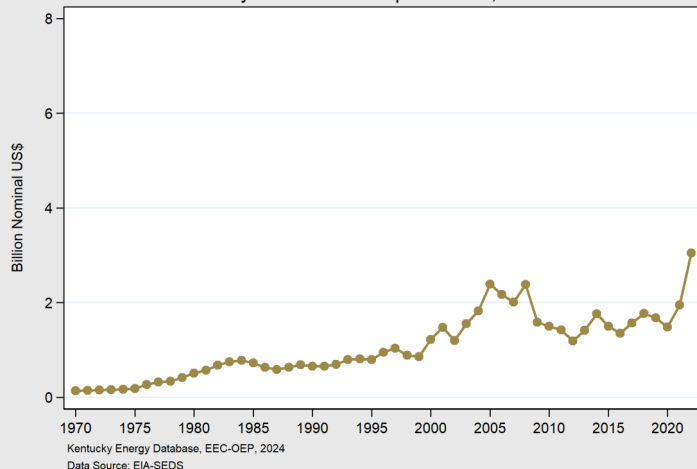
Kentucky Motor Gasoline Expenditures, 1970-2022



Fuel Type	Million U.S.\$	% of Total
Gasoline	8,112	29.7%

Gasoline expenditures in Kentucky were approximately \$8.1 billion in 2022; a 31.4% increase in gasoline expenditures compared with 2021, and accounted for 29.7% of energy expenditures in the state.

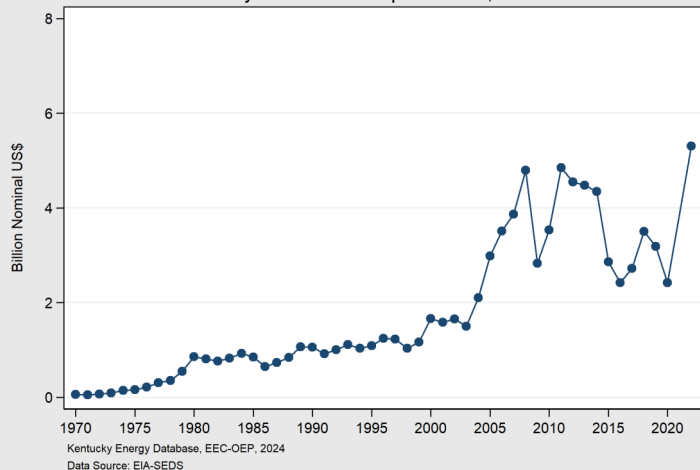
Kentucky Natural Gas Expenditures, 1970-2022



Fuel Type	Million U.S.\$	% of Total
Natural Gas	3,044	11.1%

Total natural gas expenditures in Kentucky were approximately \$3 billion in 2022; a 56% increase in natural gas expenditures compared with 2021, and accounted for 11.1% of energy expenditures in the state.

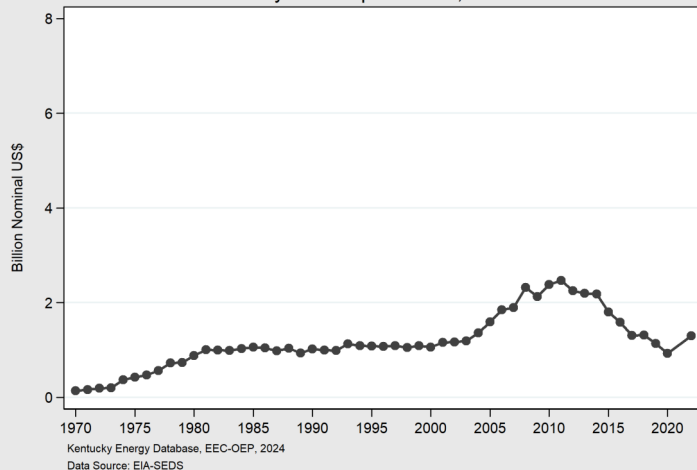
Kentucky Diesel Fuel Expenditures, 1970-2022



Fuel Type	Million U.S.\$	% of Total
Diesel	5,308	19.4%

Approximately \$5.3 billion was spent on diesel in Kentucky in 2022, a 57.6% increase in diesel expenditures compared with 2021, and accounted for 19.4% of energy expenditures in the state.

Kentucky Coal Expenditures, 1970-2022



Fuel Type	Million U.S.\$	% of Total
Coal	1,301	4.8%

Coal expenditures in Kentucky were approximately \$1.3 billion in 2022. Spending on coal increased by 21.3% from 2021 and accounted for 4.8% of energy expenditures in the state.

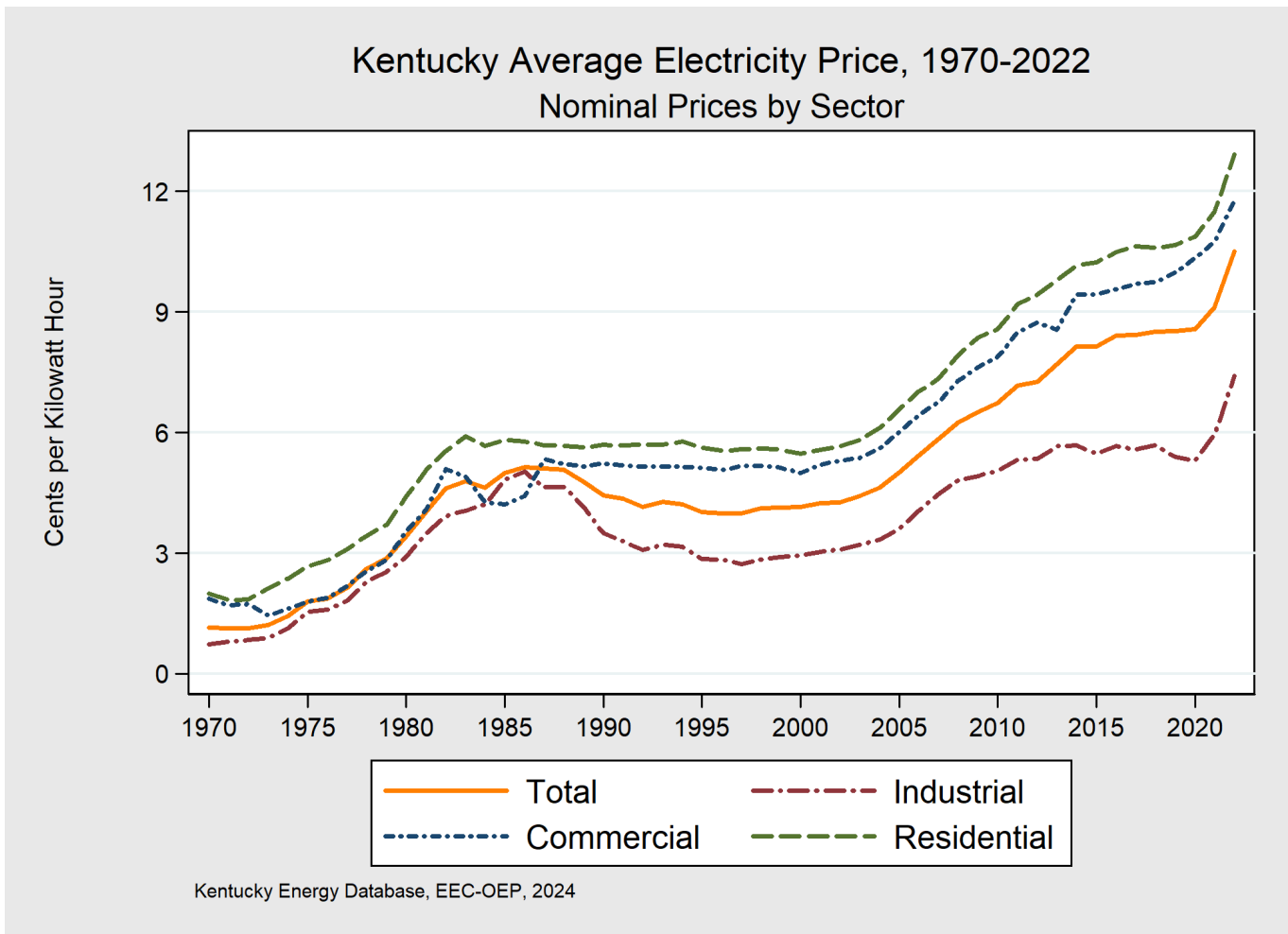
Kentucky Electricity



Average Price of Electricity by State

Rank	State	Primary Generation Source	2022 Average Price (Cents/kWh)	2022 Industrial Price (Cents/kWh)	Inflation Adjusted 1 Year Change	Inflation Adjusted 5 Year Change
1	Wyoming	Coal	8.24	6.89	-6.66%	-14.21%
2	North Dakota	Coal	8.42	7.28	-9.03%	-17.33%
3	Idaho	Hydroelectric	8.51	6.71	-2.65%	-11.18%
4	Utah	Coal	8.8	6.84	-1.39%	-11.79%
5	Nebraska	Coal	8.83	7.21	-6.65%	-24.11%
6	Washington	Hydroelectric	9.05	6.17	-3.34%	-1.74%
7	Oregon	Hydroelectric	9.26	6.81	-3.30%	-9.39%
8	Iowa	Wind	9.57	7.06	-2.04%	-5.50%
9	North Carolina	Natural Gas	9.6	6.54	-3.42%	-8.45%
10	West Virginia	Coal	9.74	6.74	2.62%	-6.70%
11	Arkansas	Coal	9.91	7.38	1.78%	3.43%
12	Montana	Coal	9.97	7.49	-1.92%	-3.65%
13	New Mexico	Coal	10.02	6.56	-4.35%	-9.93%
14	Oklahoma	Natural Gas	10.05	6.96	10.24%	5.66%
15	Texas	Natural Gas	10.16	7.13	3.89%	4.52%
16	Missouri	Coal	10.26	7.67	-2.65%	-11.82%
17	Mississippi	Natural Gas	10.36	6.71	1.92%	-1.75%
18	Louisiana	Natural Gas	10.41	7.54	10.31%	15.20%
19	South Dakota	Wind	10.44	8.04	-6.45%	-10.45%
20	Kentucky	Coal	10.51	7.41	7.70%	5.72%
21	Ohio	Natural Gas	10.64	7.45	1.88%	-6.78%
22	South Carolina	Nuclear	10.74	7.13	0.78%	-7.14%
23	Virginia	Natural Gas	10.75	7.99	9.92%	0.95%
24	Tennessee	Nuclear	10.89	6.55	4.07%	-0.66%
25	Nevada	Natural Gas	10.94	8.5	19.16%	7.66%
26	Arizona	Natural Gas	11.31	7.86	-1.49%	-8.36%
27	Kansas	Wind	11.47	8.3	2.38%	-6.72%
28	Alabama	Natural Gas	11.59	7.72	6.40%	1.64%
29	Indiana	Coal	11.66	8.65	5.19%	2.88%
30	Colorado	Coal	11.75	8.63	0.75%	1.39%
31	Delaware	Natural Gas	11.83	8.79	5.30%	-6.44%
32	Pennsylvania	Natural Gas	11.86	8.21	11.17%	0.93%
33	Illinois	Nuclear	11.94	8.57	10.05%	8.46%
34	Wisconsin	Coal	11.95	8.49	1.44%	-4.26%
35	Georgia	Natural Gas	12	8.65	7.53%	5.24%
36	Minnesota	Coal	12.04	9.25	1.56%	1.06%
37	Florida	Natural Gas	12.51	9.16	9.57%	3.50%
38	Michigan	Coal	13.2	8.33	-4.59%	0.88%
39	Maryland	Nuclear	13.32	10.01	8.44%	-4.15%
40	New Jersey	Natural Gas	14.8	12.12	-1.27%	-4.21%
41	Vermont	Hydroelectric	16.99	11.88	-2.82%	6.60%
42	Maine	Natural Gas	17.44	11.03	16.76%	15.47%
43	New York	Natural Gas	18.33	7.55	6.34%	7.20%
44	Rhode Island	Natural Gas	19.3	17.96	-2.18%	1.33%
45	Alaska	Natural Gas	20.73	18.43	-3.23%	-6.44%
46	New Hampshire	Nuclear	21.07	15.15	13.37%	12.33%
47	Connecticut	Natural Gas	21.08	15.07	7.54%	3.55%
48	Massachusetts	Natural Gas	21.27	17.06	4.29%	7.10%
49	California	Natural Gas	22.33	17.09	6.20%	19.86%
50	Hawaii	Petroleum	39.72	36.71	22.47%	31.44%
	District of Columbia	Natural Gas	14.94	7.74	9.00%	9.15%
	United States	Natural Gas	12.36	8.32	4.07%	1.67%

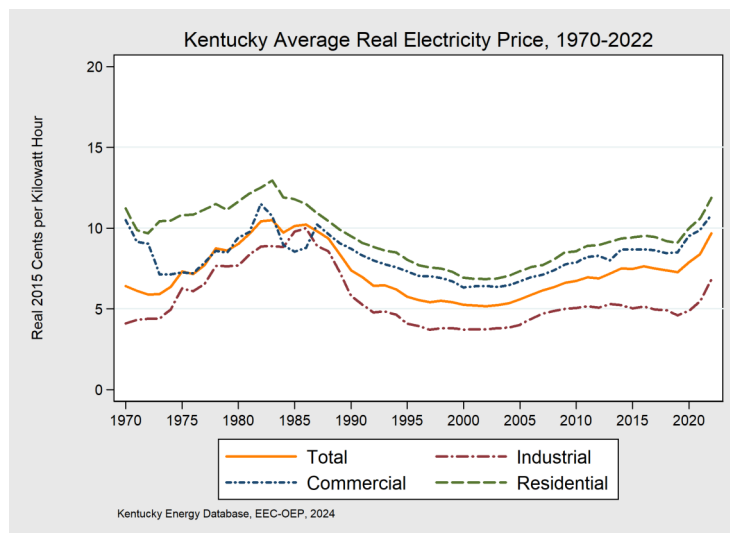
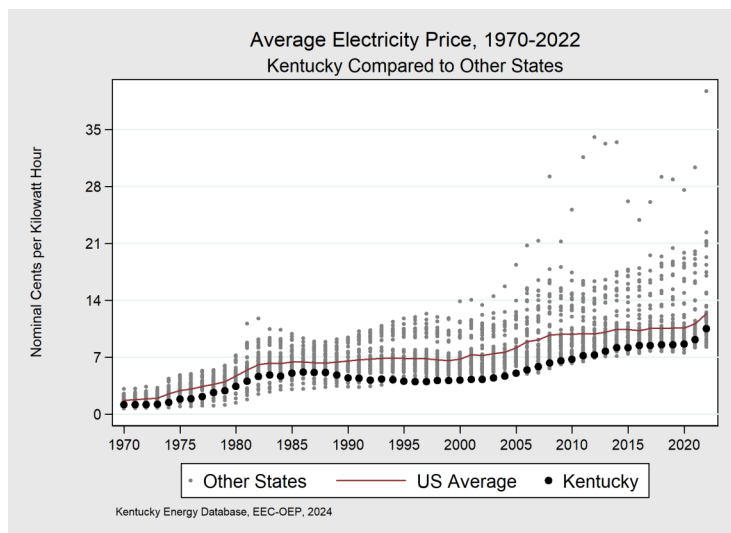
Kentucky Electricity Prices



Sector	Average Cents/kWh (2022)	U.S. Rank
Average	10.51	20th
Residential	12.91	16th
Commercial	11.78	30th
Industrial	7.41	18th

The Energy Information Administration (EIA) calculates these prices as retail electric revenue divided by the corresponding electricity sales to all customers in each end-use sector. The revenue is the operating revenue and includes all charges and taxes collected.

Kentucky Electricity Prices



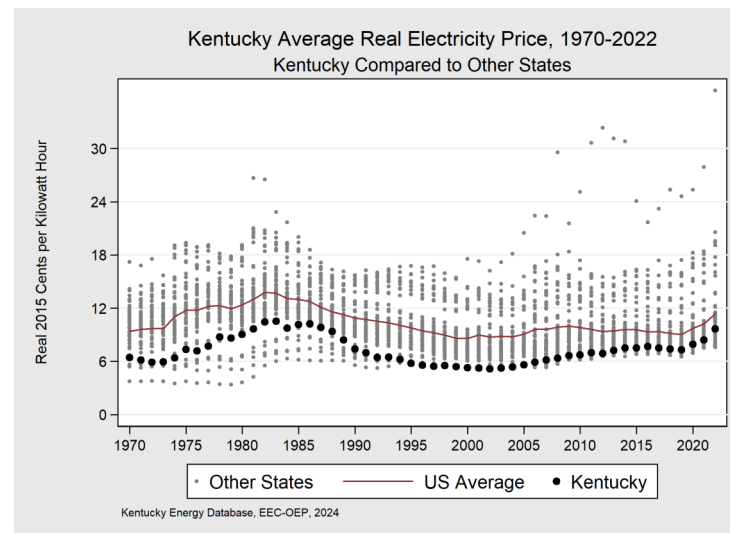
State	Nominal Cents/kWh	Rank
Wyoming	8.24	1st
Kentucky	10.51	20th
U.S. Average	12.36	-
Hawaii	39.72	50th

Sector	Real* Cents/kWh	Since 2020
Average	9.67	+22.5%
Residential	11.88	+18.8%
Commercial	10.84	+13.9%
Industrial	6.82	+39.6%

*Real 2015 \$US

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 & distribution lines, service the outstanding interest on debt, and earn a scheduled return on equity.

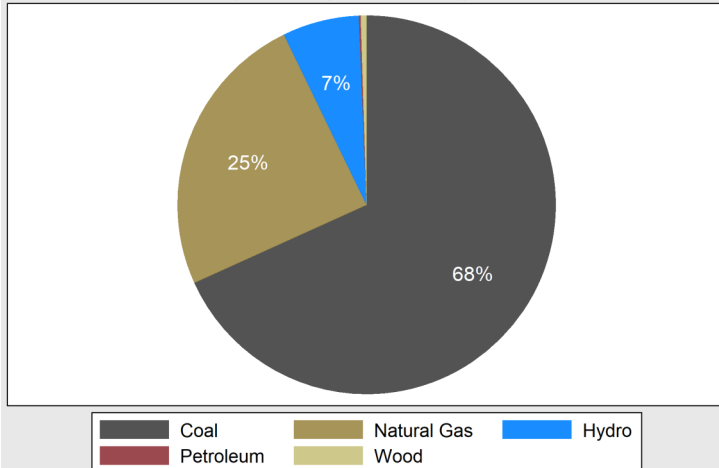
In 2022, the average price of electricity across economic sectors in Kentucky was 10.51¢ per kilowatt-hour. This average price ranked Kentucky electricity prices 20th in the country. The residential sector paid the highest price for electricity at 12.91¢ per kilowatt-hour, followed by the commercial sector at 11.78¢ per-kilowatt hour, and the industrial sector at 7.41¢ per kilowatt-hour, the eighteenth lowest in the country. Since 1970, the average price of electricity in Kentucky has been among the lowest in the United States and well below the national average. Recent years have experienced increasing prices, not dissimilar to other states in the nation.



In inflation-adjusted dollars, the price of electricity in Kentucky actually decreased from 1980 through 2002. However, the real price of electricity in Kentucky in inflation-adjusted dollars has been increasing since 2002. Since the Covid-19 pandemic, electricity price have increased nearly 23% across the sectors. The industrial sector in Kentucky saw the largest change since 2020 at nearly 40% increase.

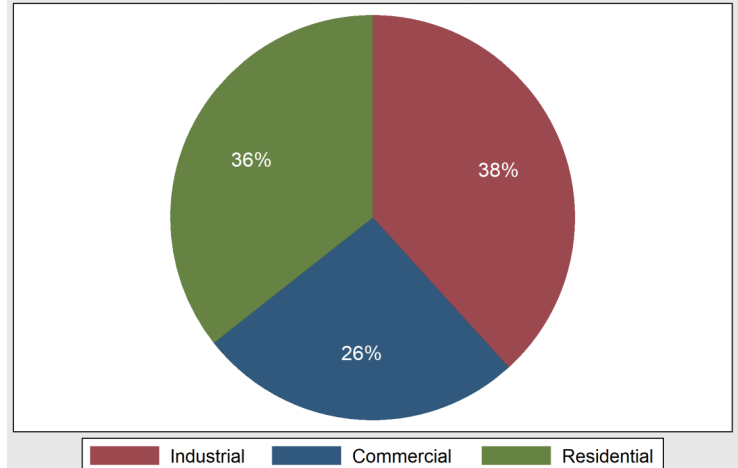
Kentucky Electricity

Kentucky Electricity Generation by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Electricity Consumption by Sector, 2022

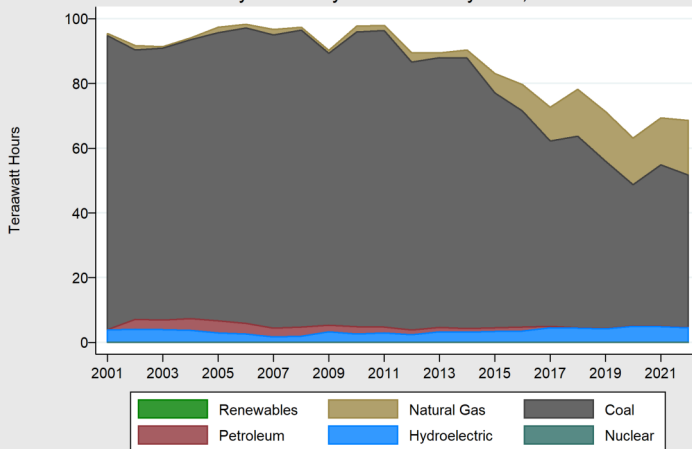


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Gigawatt Hours	1 Year Change
Total	69,147	-1.1%
Coal	47,053	-5.6%
Natural Gas	16,918	+16.1%
Hydro	4,530	-7.1%

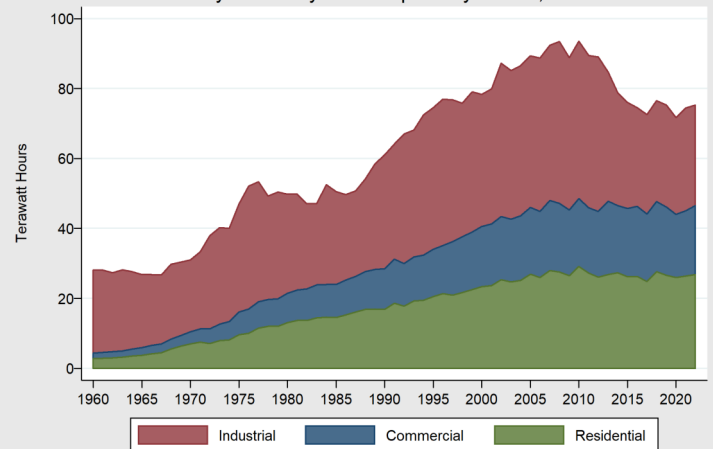
Sector	Gigawatt Hours	1 Year Change
Total*	75,339	+1.1%
Industrial	28,825	-1.9%
Residential	26,840	+1.5%
Commercial	19,674	+5.3%

Kentucky Electricity Generation by Fuel, 2001-2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Electricity Consumption by Sector, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024

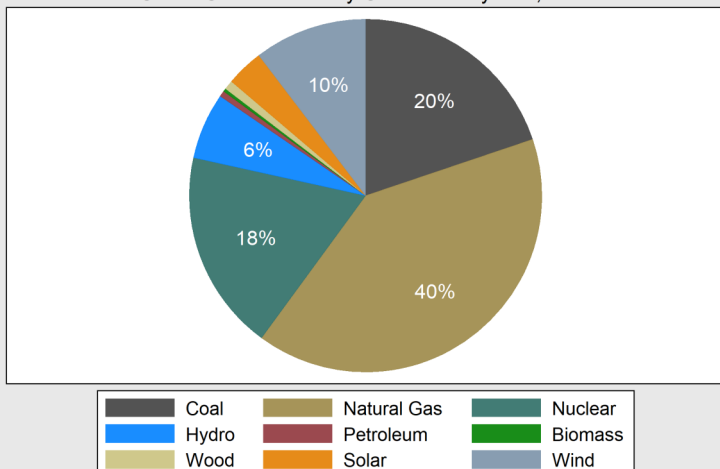
Of the utility electricity generated in Kentucky in 2022, 68% was derived through the combustion of coal. Coal-fired electricity generation decreased 5.6% since 2021. Natural gas facilities were the second-largest source of electricity, increasing 16.1% from 2021 generation levels. Solar made up less than 1% of Kentucky utility electricity generation in 2022.

**The difference between generation and consumption are imports/exports and transmission losses.*

Electricity consumption in Kentucky during 2022 totaled 75.3 terawatt-hours, an increase of 1.1% compared with 2021. The industrial sector became the largest consumer of electricity in Kentucky, representing 38% of total electricity consumption while the national average was 26% in 2022. The residential sector was the second largest consumer of electricity with 36% of consumption, followed by the commercial sector with 26%.

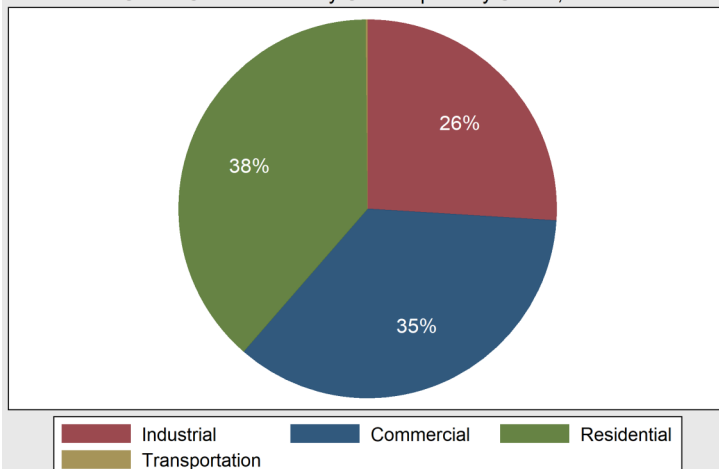
United States Electricity

United States Electricity Generation by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

United States Electricity Consumption by Sector, 2022

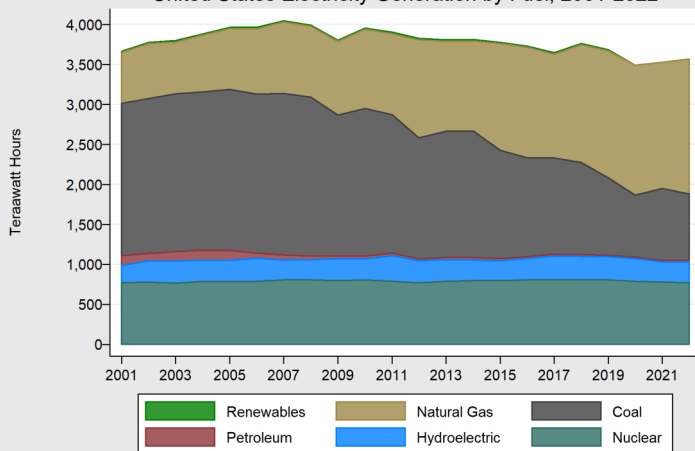


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Gigawatt Hours	1 Year Change
Total	4,230,672	+2.9%
Natural Gas	1,687,067	+6.8%
Coal	831,512	-7.4%
Nuclear	771,537	-1.0%
Hydro	254,789	+1.3%

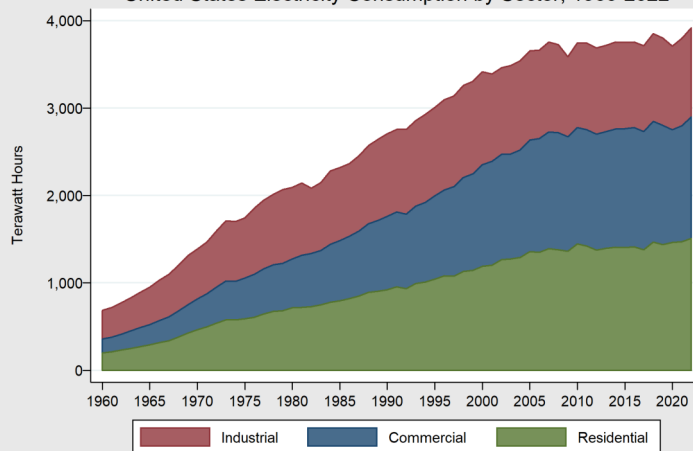
Sector	Gigawatt Hours	1 Year Change
Total	3,927,169	+3.2%
Residential	1,509,233	+2.6%
Commercial	1,390,873	+4.7%
Industrial	1,020,464	+2.0%

United States Electricity Generation by Fuel, 2001-2022



Kentucky Energy Database, EEC-OEP, 2024

United States Electricity Consumption by Sector, 1960-2022

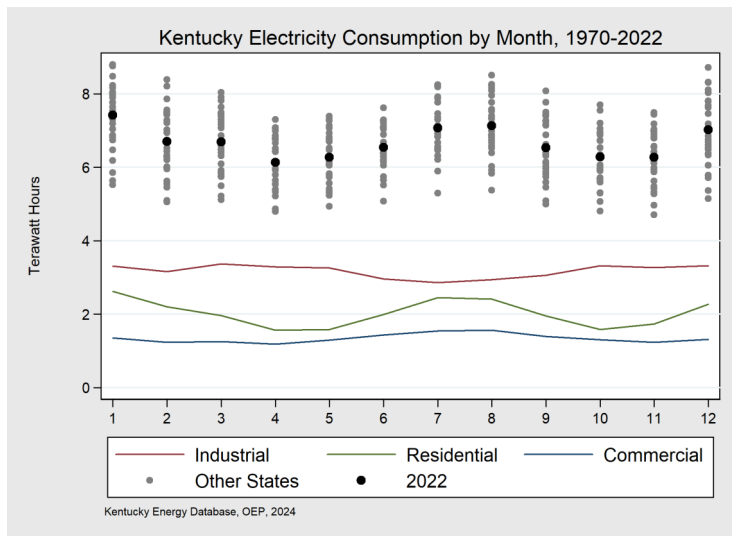


Kentucky Energy Database, EEC-OEP, 2024

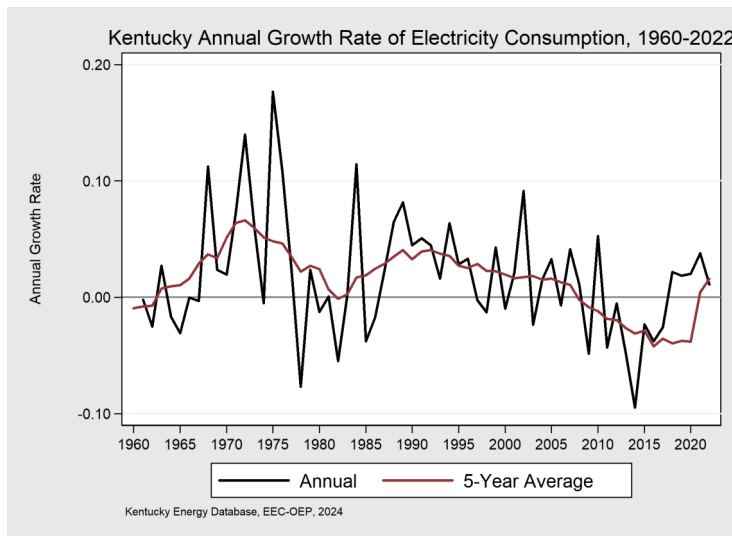
The United States generated more than 4.2 petawatt-hours in 2022, a increase of 2.9% compared to 2021. Electricity generation from natural gas continued to be the largest source of electricity at 40% of total, and increased by 6.8% compared to 2021. Hydro electricity generated 6% of total electricity requirements. Nuclear has remained relatively constant for decades, supplying 18% in 2022. Solar made up 3.4% of generation in 2022, increasing 24.8% compared to 2021.

Total electricity consumption increased by 3.2% in 2022 to 3.9 petawatt-hours. Nationally, residential consumers are the largest share of electricity demand, 38% in 2022. Residential, which is highly responsive to changes in weather, increased by 2.6% in 2022. Industrial demand increased by 2% to just over 1 terawatt-hour. The commercial sector saw the largest increase in year-over-year consumption at 4.7%.

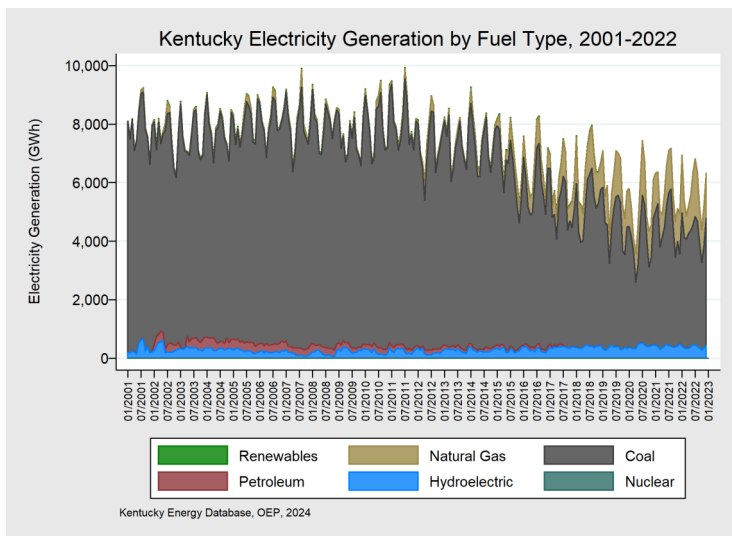
Kentucky Electricity—Monthly



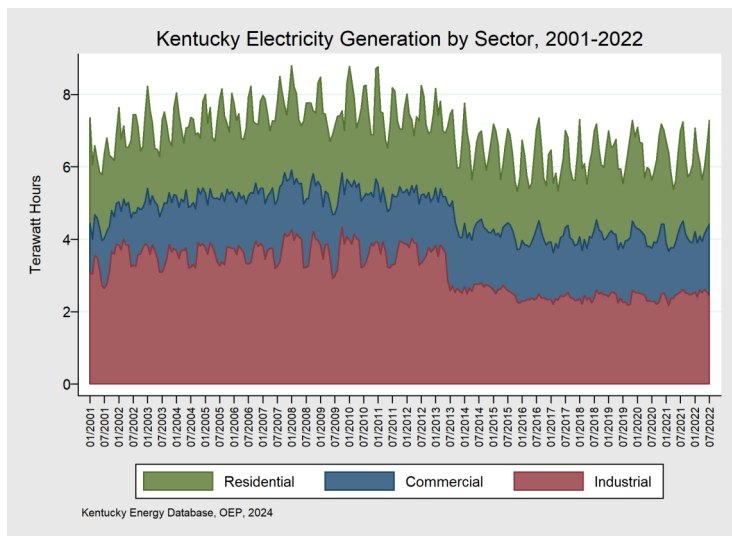
Seasonal fluctuations in Kentucky's electricity consumption are largely the result of the residential sector, which utilizes electricity for air conditioning in the summer and heating in the winter. On average, the highest demand for electricity in Kentucky occurs in summer and winter.



Kentucky electricity demand grew rapidly in the late 1960s to the early 1970s and again from the late 1980s to the early 1990s, but has decreased overall since 2008.

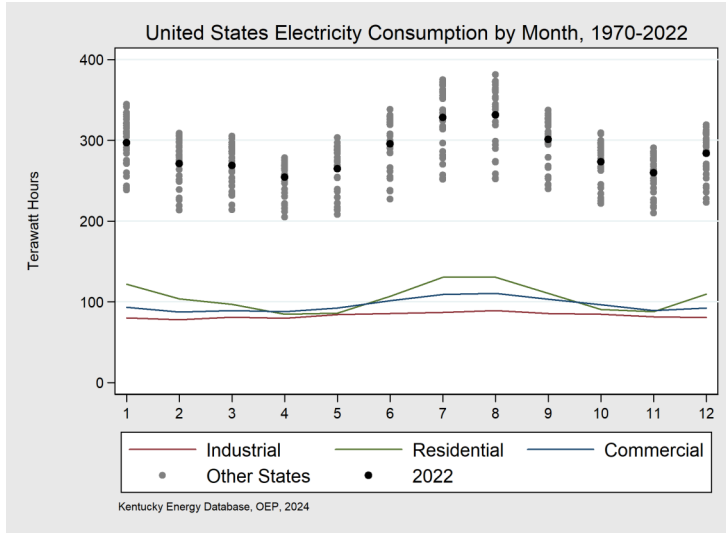


Coal-fired generation supplies the vast majority of electricity in Kentucky. During the spring and fall, electricity demand is lower and some coal plants go offline for maintenance. In the past five years, natural gas has become a bigger contributor to Kentucky's electricity generation as well as an increase in renewable energy sources.

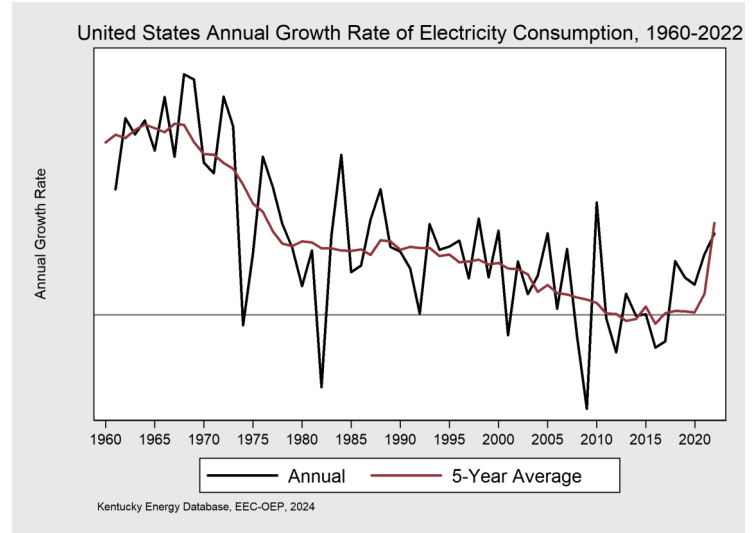


Industrial electricity demand in Kentucky tends to vary little relative to the residential sector. Industrial electricity demand had decreased in 2013, when the United States Enrichment Corporation in Paducah—approximately 15% of Kentucky's total electricity demand—shut down for annual maintenance. However, since the facility's closure in May, 2013 industrial sales have remained steady.

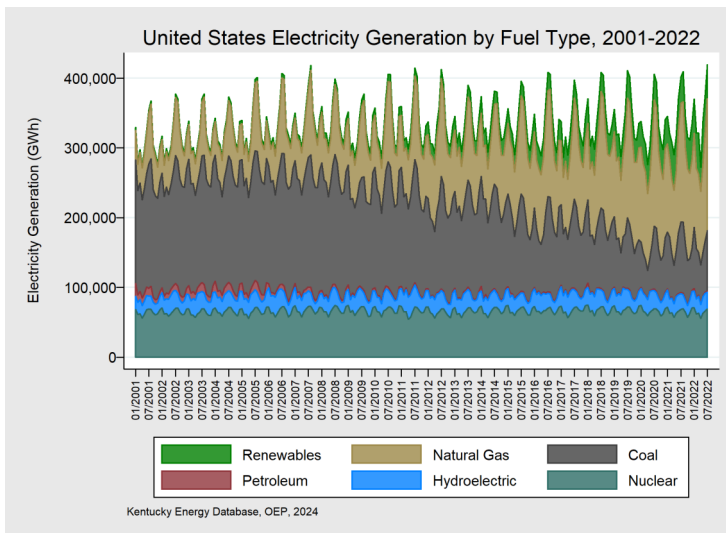
United States Electricity—Monthly



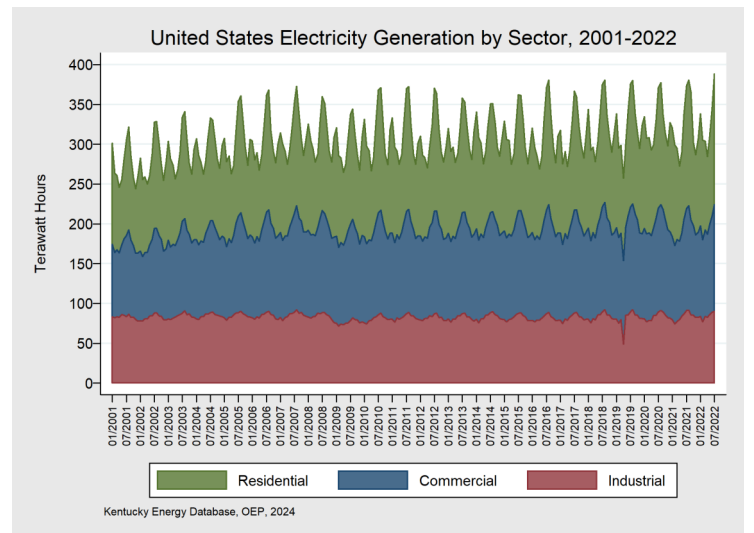
Electricity demand in the United States is approximately the same across all sectors during spring and fall, but demand for heating and air conditioning increases residential and commercial electricity demand in the summer and winter. In contrast, industrial demand is fairly constant throughout the year.



Although, electricity demand has grown in the United States for decades, the rate at which electricity demand has grown has decreased over time—from an average of 7% in the 1960s to less than one percent over the last 10 years. Since 2005, many states have experienced no growth or even decreases in electricity consumption.



Nuclear generation is relatively constant with the exception of regular shutdowns for maintenance, but renewable generation facilities depend on the presence of their respective resources. Coal and natural gas tend to make up the difference between electricity demand and electricity generated by renewables, nuclear, and hydroelectric generation. The United States has natural gas simple cycle turbines as well as combined cycle units, which are flexible and can be quickly ramped up during periods of peak electricity demand.



United States electricity demand is highest during the hotter summer, though there is a smaller increase in demand during colder winter months. Whereas summer heat can only be met with air conditioning, winter heating requirements can be remedied with a variety of non-electric fuels such as natural gas, wood, propane, and diesel fuel. Industrial demand varies somewhat, with increases in the summer months.

Kentucky Generation Infrastructure

Electricity Generating Capacity

Capacity is the maximum amount of electricity that can be produced at any one moment in time and is measured in watts, or joules per second. In 2022, Kentucky had 53 operating power plants that operated 179 individual electricity generating units. In 2022, Kentucky had a total nameplate capacity of 21.1 gigawatts. Of the current operating units in Kentucky, 54% of capacity is coal-fired, 40% is natural gas, 5% is hydroelectric. Petroleum, solar, biomass, and battery storage resources make up the remaining capacity (< 1%).

Generation

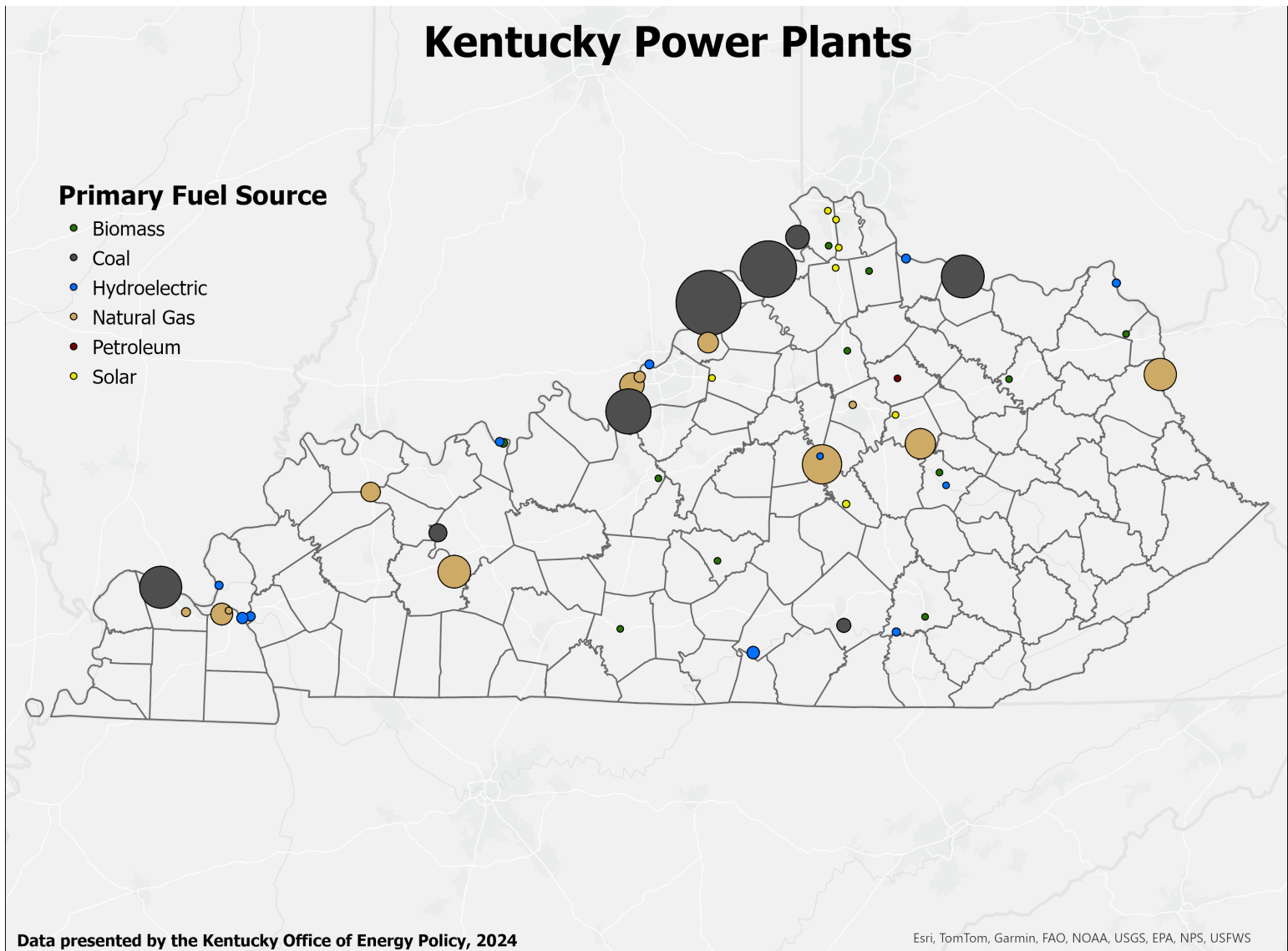
Of the electricity generated in Kentucky in 2022, 68% was derived through the combustion of coal. The amount of coal-based electricity generation decreased in 2022. Natural gas facilities were the second-largest source of electricity. Due to the presence of coal resources, and the low price of coal, Kentucky has consistently used coal to meet the vast majority of electricity demand within the Commonwealth; however, with the continued retirements of coal units and lower natural gas prices, many have been converted into natural gas units.

Capacity Factor

The capacity factor of a generating unit is a ratio 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 time (typically, hours per year). The actual output (MWh) is then divided by the maximum possible output (MWh) to determine

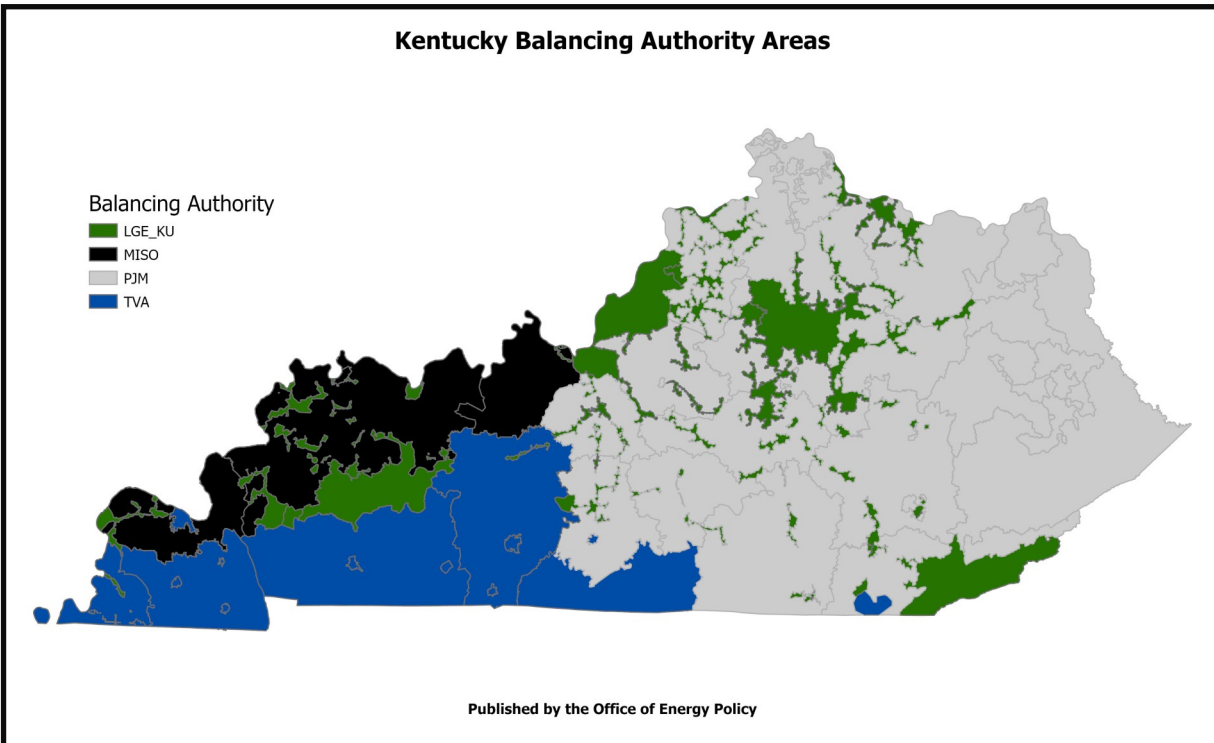
Name	Online Year	Owner	Operating Capacity (MW)	Name	Online Year	Owner	Operating Capacity (MW)
Dix Dam	1925	LG&E-KU	31.5	Marshall County Generating Station	2002	Tennessee Valley Authority	742.4
Mother Ann Lee Hydro	1927	Salt River Electric Coop	2.3	Bavarian Landfill	2003	E KY Power Coop	4.7
Ohio Falls	1928	LG&E-KU	100.8	Green Valley Landfill	2003	E KY Power Coop	2.4
Paris, KY	1934	Paris City of KY	11.9	Laurel Ridge Landfill	2003	E KY Power Coop	4
Kentucky	1944	Tennessee Valley Authority	222.5	Hardin County LFGTE	2006	E KY Power Coop	2.4
Wolf Creek Dam	1951	USCE - Nashville District	300	Pendleton County Landfill	2007	E KY Power Coop	3.2
Shawnee	1953	Tennessee Valley Authority	1,242	PPS Power Plant No 1	2010	Paducah Power System Co.	124
E.W. Brown	1957	LG&E-KU	1,431	Bowling Green Solar Project	2011	Scotty's Dev. Co. LLC	2.1
Big Sandy	1963	Kentucky Power Co.	260	Blue Ridge Generating	2013	North Amer Natural Resources	1.2
J. Sherman Cooper	1965	E KY Power Coop	341	Glasgow Regional Land-	2015	E KY Power Coop	0.9
Barkley	1966	USCE - Nashville District	148	Cane Run	2015	LG&E-KU	689
Paddy's Run	1968	LG&E-KU	203	Meldahl Hydropower Project	2016	Hamilton City of (OH)	105
Haefling	1970	LG&E-KU	28	Cannelton Dam	2016	American Mun Power Inc	87.9
Mill Creek	1972	LG&E-KU	1,477	Central KY Landfill	2016	Toyota Motor Sales U.S.A. Inc.	2
Ghent	1974	Kentucky Utilities Co.	1,943	Cooperative Solar One	2017	E KY Power Coop	8.5
R.A. Reid	1976	Big Rivers Electric Corp.	65	Crittenden Solar Facility	2017	Duke Energy Kentucky Inc.	2.7
Laurel	1977	USCE - Nashville District	61	Walton Solar Facility	2017	Duke Energy Kentucky	2
H.L. Spurlock	1977	E KY Power Coop	1,346	Paradise CC	2017	Tennessee Valley Authority	1,910
R.D. Green	1979	Big Rivers Electric Corp.	454	L'Oreal Solar - Florence	2017	L'Oreal USA Products Inc	0.9
Elmer Smith	1981	Owensboro Municipal	Retired 2020	Smithland Lock and Dam	2017	American Mun Power Inc	75.9
East Bend	1981	Duke Energy Kentucky Inc.	600	Morehead Generating Facility	2019	North American Bio-Fuels LLC	1.4
D.B. Wilson	1984	Big Rivers Electric Corp.	417	Community Solar Project	2019	LG&E-KU	2.5
Trimble County	1990	Louisville Gas & Electric Co.	2,345	LGE-KU Solar Share	2019	LG&E-KU	1.7
Cox Waste-to-Energy	1995	Cox Waste-To-Energy Inc	3.9	Ravenna Hydroelectric	2021	Soft Energy Associates	2.5
J.K. Smith	1999	E KY Power Coop	989	Turkey Creek Farm	2022	Silicon Ranch Corpora-	50
Calvert City	2000	DTE Energy Services Inc.	28.5				
Kentucky Mill	2001	Domtar Paper Co. LLC	60				
Riverside Generating Project	2001	LS Power Group	950				
Bluegrass Generation Project	2002	E KY Power Coop	567				

Power Plants in Kentucky



Coal-fired, natural gas, hydroelectric, and biomass-fired generators provide all of the baseload electricity in Kentucky because of their low operating costs. The coal fleet consists of large generators that were constructed between the mid-1950s and 2010. 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 have become more stringent. Peaking power—the additional electricity needed for short periods of high demand—is generated 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 are costlier to operate than baseload generators due to their designs, and are not optimized for baseload generation.

Kentucky Balancing Authority Areas



Local electricity grids are interconnected to form larger networks for reliability and commercial purposes. The actual operation of the electric system is managed by entities called balancing authorities. A balancing authority ensures, in real time, that power system demand and supply are finely balanced. Balancing authorities are responsible for maintaining operating conditions under mandatory reliability standards issued by the North American Electric Reliability Corporation and approved by the U.S. Federal Energy Regulatory Commission.

Retail Service:

Electricity in Kentucky is provided to customers by one of the following types of entities that have the exclusive right to serve the customers within its territory:

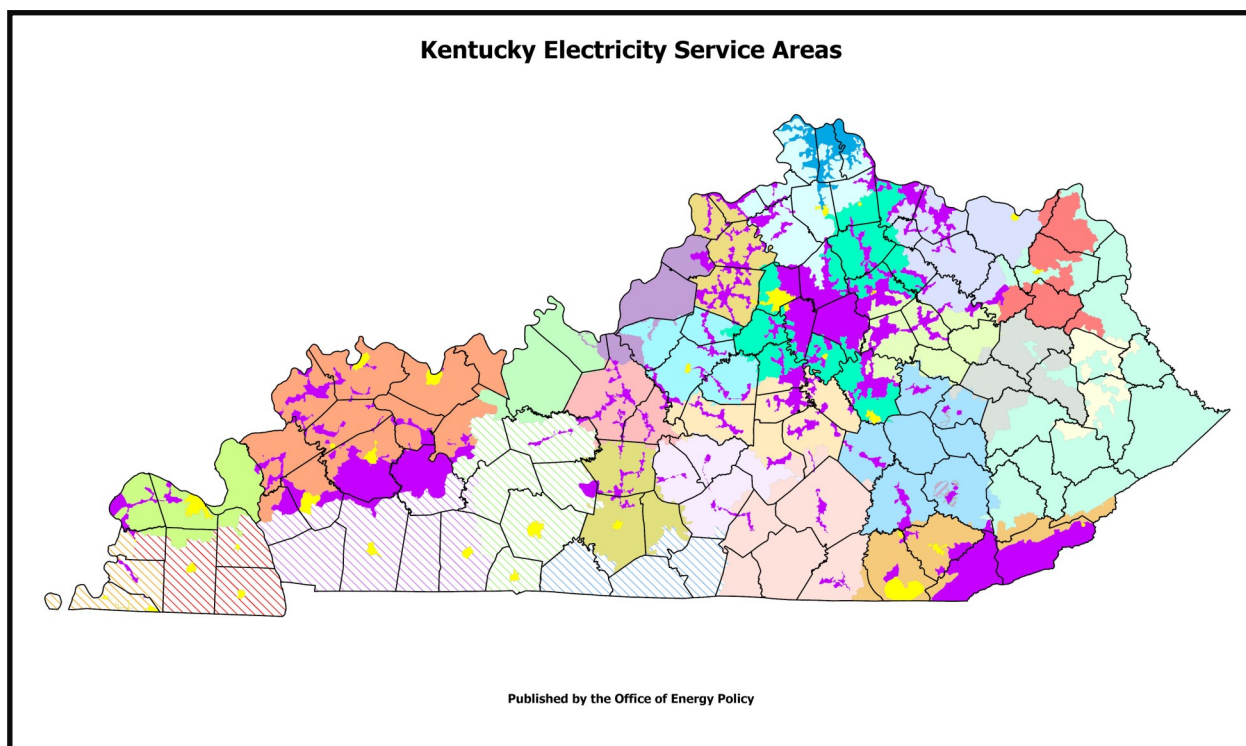
- Retail electric suppliers that are regulated by the Kentucky Public Service Commission (PSC) include: Investor-Owned Utilities (IOUs) and Rural Electric Cooperative Companies (RECCs)
- Municipal Utilities (33)
- The Tennessee Valley Authority (TVA) and its associated distributors within the state

Electric suppliers fall into two categories: IOUs and RECCs. There are four investor-owned companies in Kentucky: Duke Energy Kentucky, Kentucky Power Company (aka. American Electric Power), Kentucky Utilities (KU), and Louisville Gas and Electric (LG&E). Each of these companies generates or purchases the power required to meet its respective customers' electricity demands. RECCs are owned by their individual ratepayers and are non-profit entities that reinvest profits into energy infrastructure or return profits to ratepayers.

There are 24 RECCs in the state, 19 RECCs that are regulated by the PSC. A distribution cooperative typically receives power from its respective generation and transmission cooperative at a substation in the distributor's service territory. Five RECCs and ten municipal utilities purchase electricity from TVA. These RECCs and municipalities then resell and distribute electricity to customers within their service territories. TVA also directly serves several large industrial customers within Kentucky.

Municipal electric suppliers purchase power from various sources or self-generate electricity by owning and/or operating generating facilities.

Kentucky Electricity 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†		Pennyriple RECC§	
Fleming-Mason ECC†		Salt River ECC†	
Grayson RECC†		Shelby ECC†	
Gibson Electric Members Corp 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 Utilities, Electric Cooperative Corporations (ECC), or Rural Electric Cooperative Corporations (RECC). Municipal Utilities and TVA Distributors are not subject to Kentucky Public Service Commission regulation.

*Investor-Owned Utilities

†EKPC Owner-Member Cooperative

‡BREC Member Cooperative

§TVA Distributor

Kentucky Utility Prices — 2022

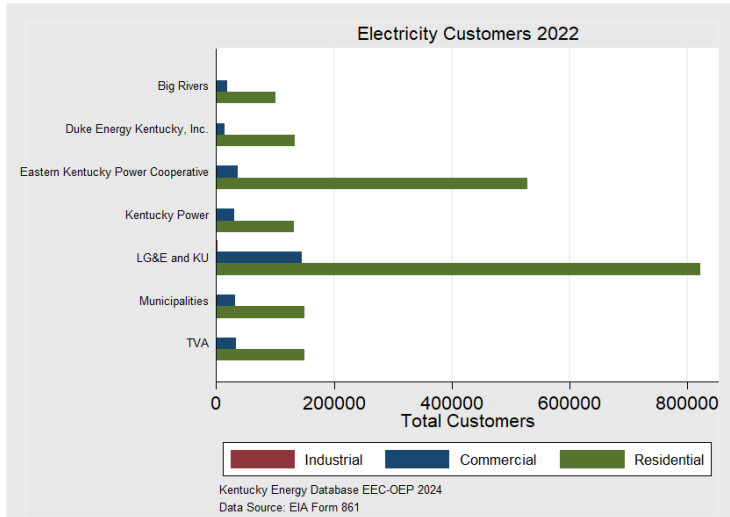
Entity	Average (cents/kWh)	Industrial (cents/kWh)	Commercial (cents/kWh)	Residential (cents/kWh)
Big Sandy Rural Elec Coop Corp	13.19	9.58	12.61	13.69
Blue Grass Energy Coop Corp	11.47	7.97	12.56	12.49
City of Bardstown - (KY)	9.68	9.02	10.11	10.49
City of Benton - (KY)	12.48	9.12	12.91	13.63
City of Berea Municipal Utility	8.32	7.19	8.67	8.98
City of Bowling Green - (KY)	10.81	7.55	11.04	11.86
City of Frankfort - (KY)	9.75	9.07	10.22	10.52
City of Franklin - (KY)	10.90	7.16	13.21	13.25
City of Fulton - (KY)	11.85	8.89	12.70	13.40
City of Glasgow - (KY)	12.32	8.85	11.98	13.77
City of Hickman	16.76		17.98	15.91
City of Hopkinsville	11.40	7.42	12.89	12.26
City of Jellico	12.65		14.14	12.31
City of Mayfield Plant Board	12.83	11.03	12.71	13.34
City of Murray - (KY)	11.22	7.27	11.18	13.54
City of Owensboro - (KY)	10.10	9.22	8.80	12.91
City of Paducah - (KY)	14.96	12.44	14.62	15.71
City of Russellville - (KY)	11.05	8.60	12.49	11.99
Clark Energy Coop Inc - (KY)	13.36	10.39	13.16	13.51
Cumberland Valley Electric, Inc.	11.36	9.69	8.68	12.81
Duke Energy Kentucky	11.55	9.66	10.92	13.18
Farmers Rural Electric Coop Corp - (KY)	12.01	9.46	12.24	12.73
Fleming-Mason Energy Coop Inc	9.38	7.39	10.52	12.65

Kentucky Utility Prices — 2022

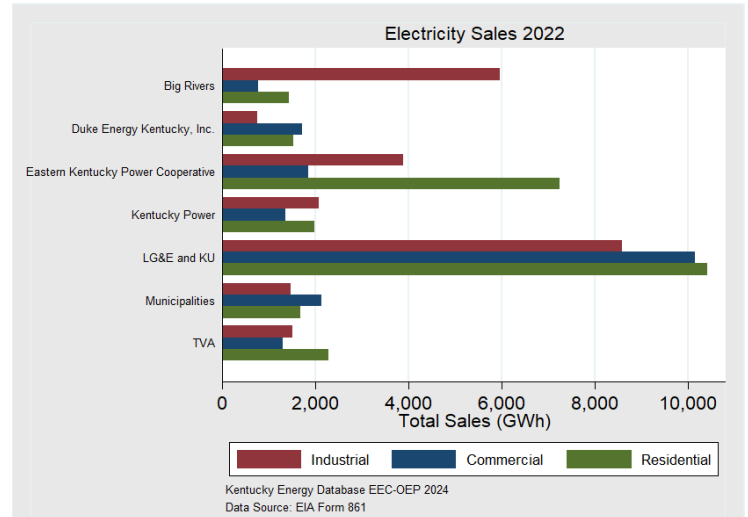
Entity	Average (cents/kWh)	Industrial (cents/kWh)	Commercial (cents/kWh)	Residential (cents/kWh)
Gibson Electric Members Corp	11.83	6.64	12.71	13.16
Grayson Rural Electric Coop Corp	13.69	7.69	10.83	16.32
Henderson City Utility Comm	6.80	5.77	7.92	8.45
Inter County Energy Coop Corp	11.99	7.37	12.27	14.26
Jackson Energy Coop Corp - (KY)	13.16	8.85	12.37	13.91
Jackson Purchase Energy Corporation	12.67	10.82	10.26	15.24
Kenergy Corp	8.99	8.09	13.53	14.57
Kentucky Power Co	12.95	8.89	14.64	16.05
Kentucky Utilities Co	10.50	7.38	12.08	12.19
Licking Valley Rural E C C	14.02	10.01	13.10	14.47
Louisville Gas & Electric Co	10.83	7.51	11.20	12.34
Madisonville Municipal Utils	10.12		9.13	12.88
Meade County Rural E C C	14.24		14.07	14.30
Nolin Rural Electric Coop Corp	11.90	7.25	11.55	13.13
Owen Electric Coop Inc	8.87	6.26	11.12	12.86
Pennyriple Rural Electric Coop	11.57	7.53	13.38	12.96
Salt River Electric Coop Corp	10.61	8.41	10.96	11.18
Shelby Energy Co-op, Inc	11.27	8.56	10.48	13.05
South Kentucky Rural E C C	12.22	10.19	15.03	12.87
Taylor County Rural E C C	10.68	7.26	11.00	11.84
Tennessee Valley Authority	5.11	4.92	7.97	
Tri-County Elec Member Corp (TN)	10.93	7.27	10.42	12.45
Warren Rural Elec Coop Corp	10.39	7.43	12.98	11.98
West Kentucky Rural E C C	11.66	4.93	14.97	13.30

Source : EIA Form 861 Monthly (Formerly EIA Form 826), Utility Sales and Revenue Tables.

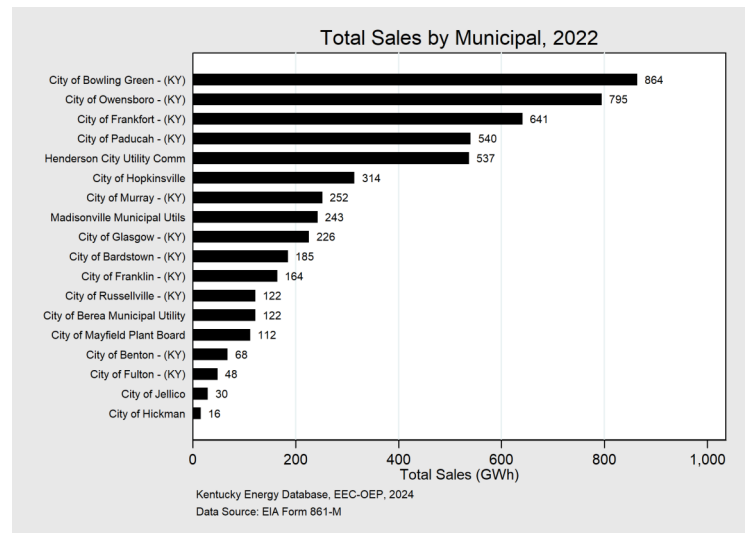
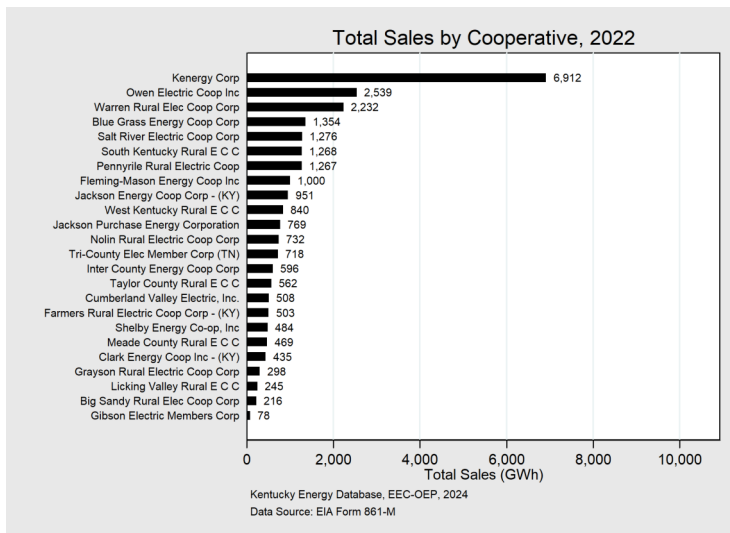
Electricity Utilities in Kentucky



Entity	Customers	Percentage
Total	2,335,129	100%
LG&E and KU	969,531	41.5%
EKPC	565,738	24.2%
Municipalities	182,544	7.8%
TVA	183,734	7.9%
Kentucky Power	164,184	7.0%
Duke Energy	148,900	6.4%
Big Rivers	120,498	5.2%



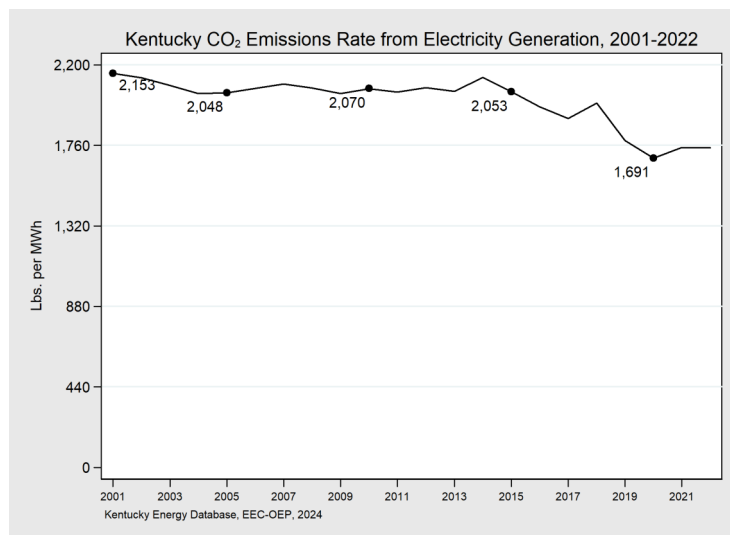
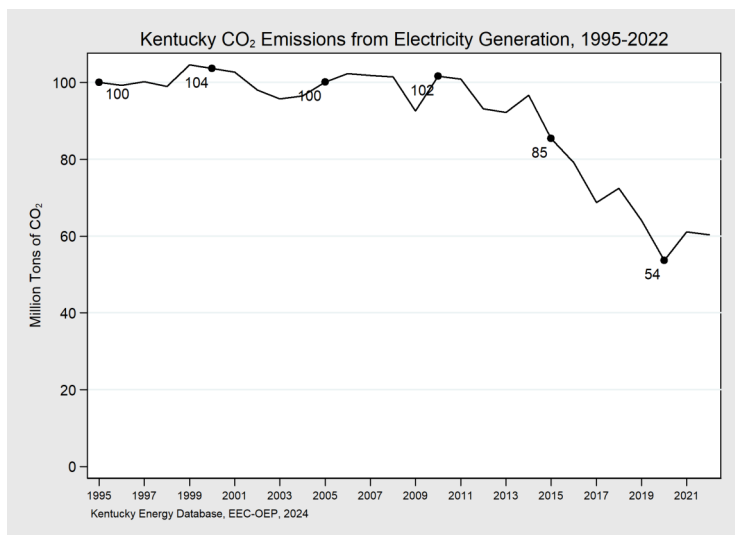
Entity	Sales (GWh)	Percentage
Total	69,943	100%
LG&E and KU	29,123	41.6%
EKPC	12,966	18.5%
Big Rivers	8,150	11.7%
TVA	5,057	7.2%
Municipalities	5,279	7.5%
Kentucky Power	5,391	7.7%
Duke Energy	3,977	5.7%



Utilities in Kentucky sold 70 TWh to 2.3 million consumers in 2022. LG&E and KU sell to 41.5% of consumers in the Commonwealth, while East Kentucky Power Cooperative sells to 24%, and the rest 34.5%.

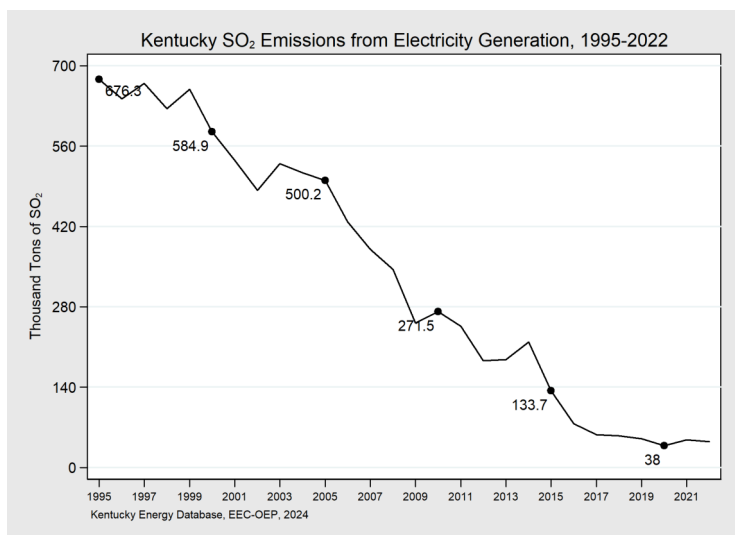
All of the sales from the Big Rivers Electric Corporation, East Kentucky Power Cooperative, and the majority from the Tennessee Valley Authority, are to RECCs and municipalities. Together, cooperatives consume more than all investor-owned corporations except LG&E and KU. Kenergy Corporation, a cooperative, sells 9.9% of Kentucky's total—more electricity than Kentucky Power, all municipalities, and Duke Energy.

Kentucky Electric Power Emissions

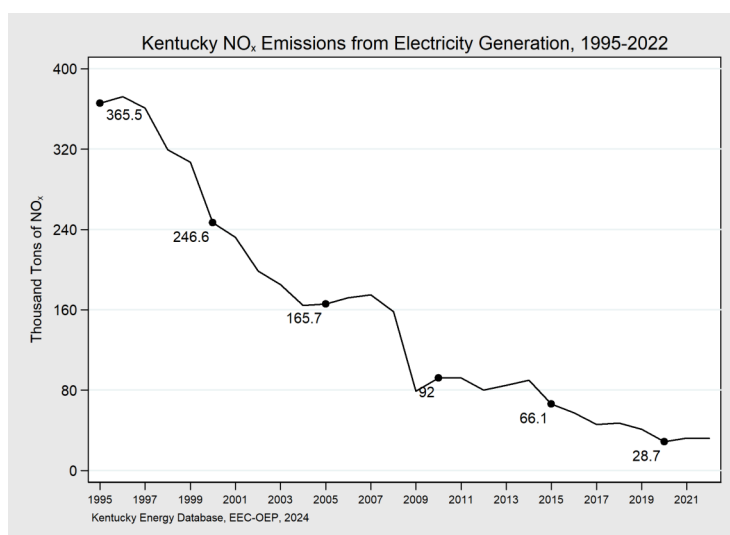


Emission	Tons	Since 2000
Carbon Dioxide	60,352,643	-41.8%
Sulfur Dioxide	45,320	-92.3%
Nitrogen Oxides	32,061	-87.0%

In 2022, the electric power sector in Kentucky emitted 60.4 million tons of carbon dioxide, a decrease of 42% compared with 2000. In terms of emissions rate, power plants emit 19% less carbon dioxide as they did in 2000.



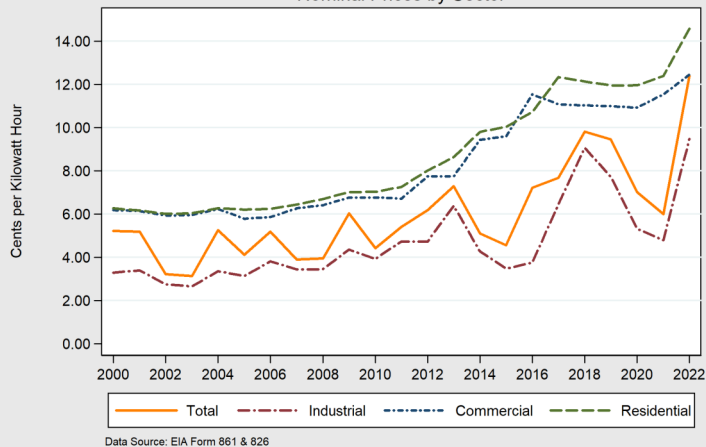
Sulfur dioxide (SO₂) is a highly reactive gas and major pollutant that is monitored and regulated by the state and federal government due to its connection to acid rain, incidence of asthma, and other respiratory problems. In 2022, the electric power sector of Kentucky emitted 45,320 tons of sulfur dioxide, a 92.3% decrease from 2000 and a 19% increase from 2020.



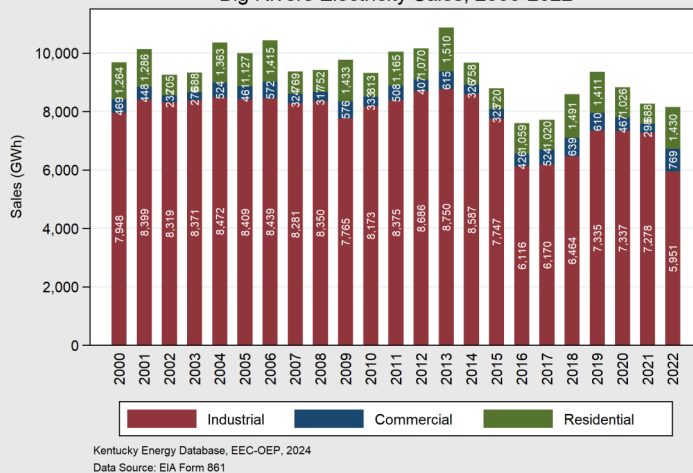
Nitrogen oxides (NO_x) are a group of highly reactive regulated pollutants: Nitric oxide (NO), Nitrogen dioxide (NO₂), and Nitrous oxide (N₂O). Nitrogen oxide, which is displayed here, has been shown to cause acid rain and exacerbate respiratory disease, while nitrous oxide, or laughing gas, is a greenhouse gas 312 times more potent than carbon dioxide. In 2022, the electric power sector of Kentucky emitted 32,061 tons of nitrogen oxides, a decrease of 87% from 2000 and a 12% increase from 2020.

Big Rivers

Big Rivers Average Electricity Price, 2000-2022
Nominal Prices by Sector



Big Rivers Electricity Sales, 2000-2022

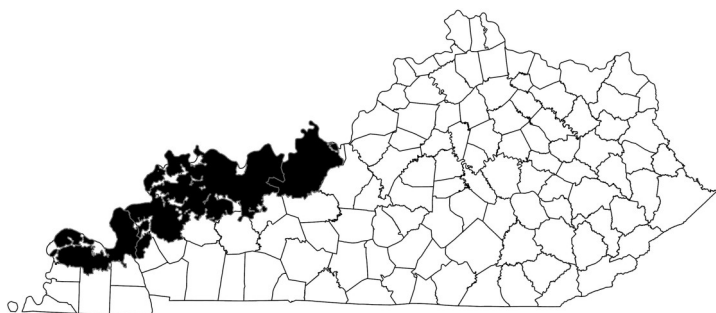


Sector	Price (Cents/kWh)	Since 2012
Total†	12.38	+100%
Residential	14.58	+82.3%
Commercial	12.45	+60.6%
Industrial	9.47	+100%

Sector	Sales (GWh)	Percentage
Total†	8,150	100%
Industrial	5,951	73.0%
Residential	1,430	17.5%
Commercial	769	9.5%

†Includes direct sales and sales to rural electric cooperatives

Big Rivers
Service Territory

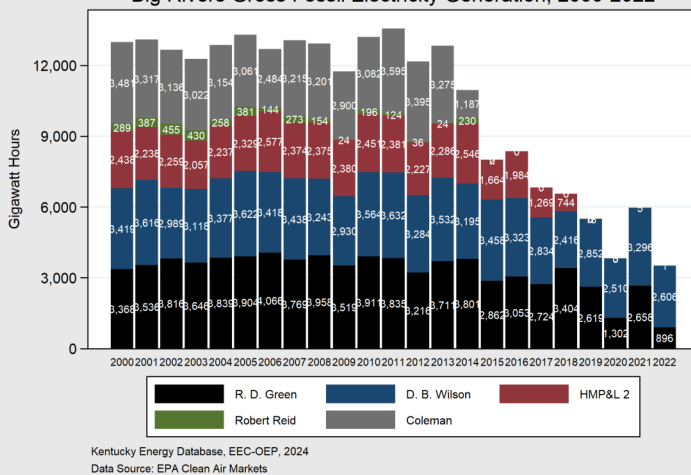


Data sourced from the Kentucky Division of Geographic Information

Data published by the Kentucky Office of Energy Policy

Big Rivers Electric Corporation generates and sells electricity in northwestern Kentucky. Total electricity prices in 2022 were 12.38 cents per kWh and have increased by 100% since 2012. Big Rivers serves three RECCs: Kenergy Corporation, Meade County RECC, and Jackson Purchase Energy Corporation. Big Rivers operates two coal-fired generating stations.

Big Rivers Gross Fossil Electricity Generation, 2000-2022

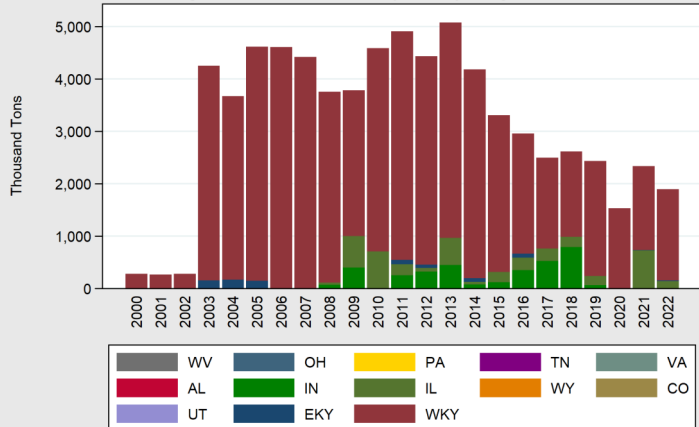


Electricity Generation	2022	Since 2012
Gigawatt Hours	3,502	-71.2%

Big Rivers generated 3.5 TWh and sold 8.2 TWh of electricity in 2022. Since the retirements of Henderson, Coleman and Reid power plants, fossil fuel generation has continued to decrease since 2013. When electricity sales are greater than generation, it means that the utility purchased power from another source. In many cases this includes a Regional Transmission Organization which serves as a market for generated power among its members.

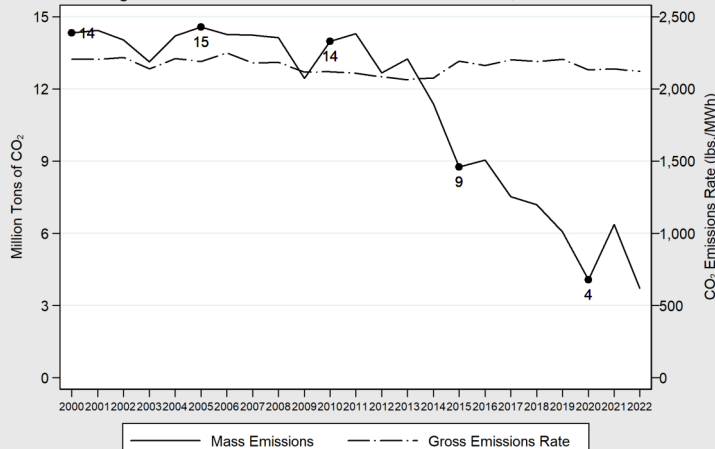
Big Rivers

Big Rivers Coal Consumption by Origin, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: FERC-423 & EIA-923

Big Rivers CO₂ Emissions from Fossil Generation, 2000-2022



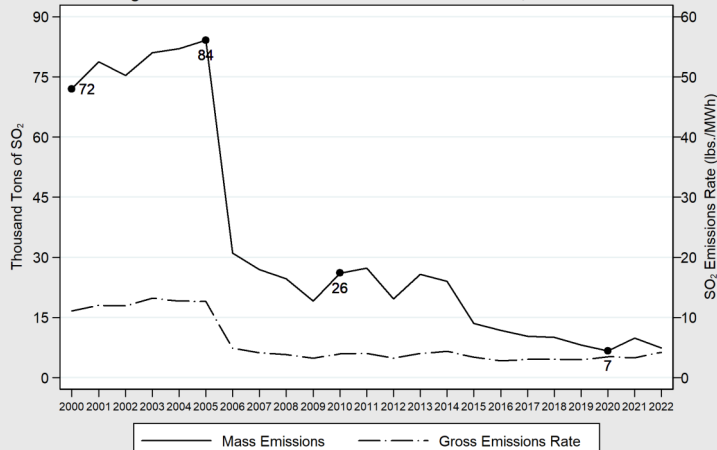
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

State	2022 Tons	Percentage
Total	1,893,388	100%
Western Kentucky	1,740,092	91.9%
Illinois	142,252	7.5%
Eastern Kentucky	11,044	0.6%

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	3,716,126	-70.7%
Rate (lbs./MWh)	2,121	+1.8%

Big Rivers Electric Corporation emitted 3.7 million tons of CO₂ in 2020, a decrease of 71% since 2012. The rate of CO₂ emissions has increased by 1.8% during that period.

Big Rivers SO₂ Emissions from Fossil Generation, 2000-2022

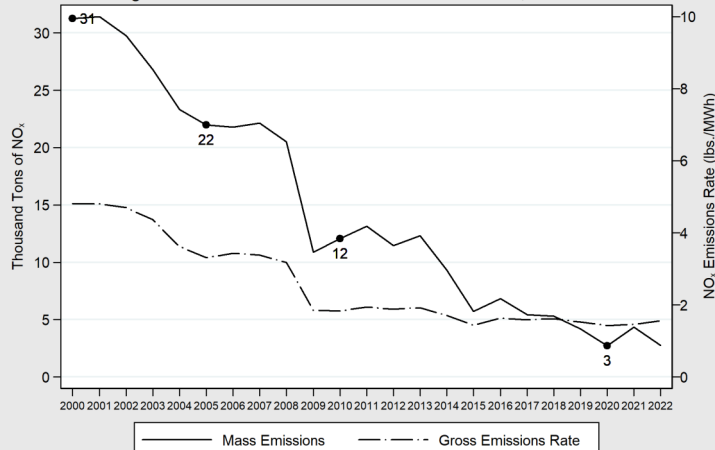


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	7,380	-62.4%
Rate (lbs./MWh)	4.22	+30.7%

Big Rivers Electric Corporation emitted 7,380 tons of SO₂ in 2022, a decrease of 62.4% since 2012. The rate of SO₂ emissions increased by 31% during that period.

Big Rivers NO_x Emissions from Fossil Generation, 2000-2022



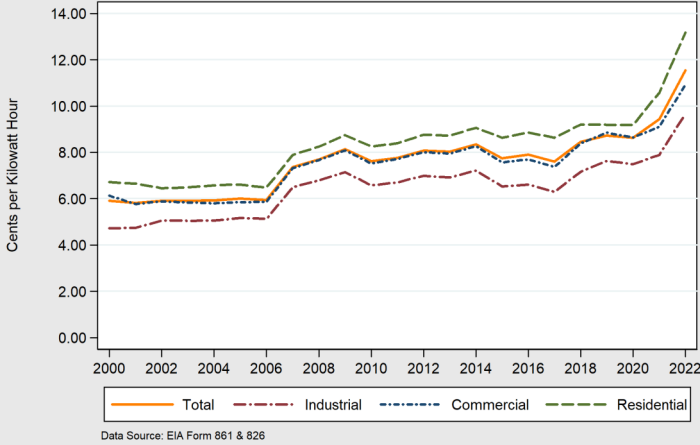
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2020	Since 2010
Emissions (Tonnage)	2,740	-76.0%
Rate (lbs./MWh)	1.56	-17.0%

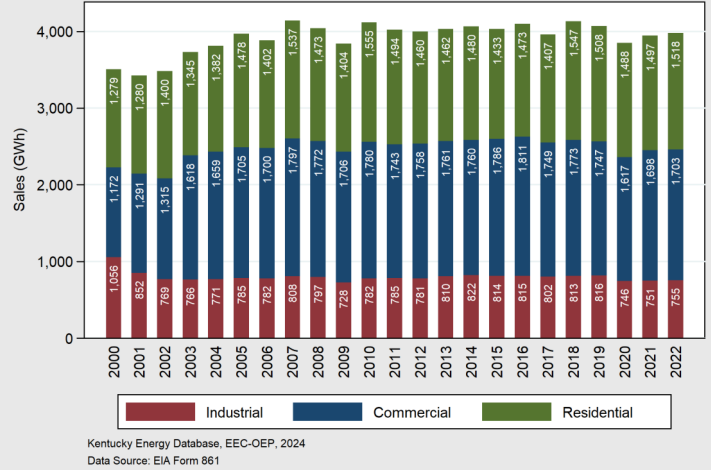
Big Rivers Electric Corporation emitted 2,740 tons of NO_x in 2022, a reduction of 76% since 2012. The rate of NO_x emissions decreased by 17% during that period.

Duke Energy Kentucky

Duke Energy Kentucky Average Electricity Price, Inc., 2000-2022
Nominal Prices by Sector



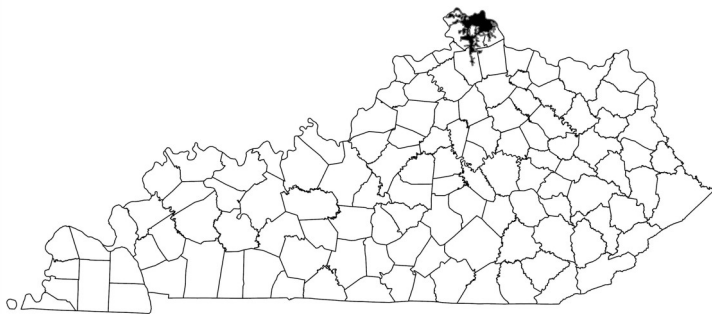
Duke Energy Kentucky Electricity Sales, 2000-2022



Sector	Price (Cents/kWh)	Since 2012
Total†	11.55	+42.9%
Residential	13.18	+50.5%
Commercial	10.92	+36.3%
Industrial	9.66	+38.2%

Sector	Sales (GWh)	Percentage
Total†	3,977	100%
Commercial	1,703	42.8%
Residential	1,518	38.2%
Industrial	755	19.0%

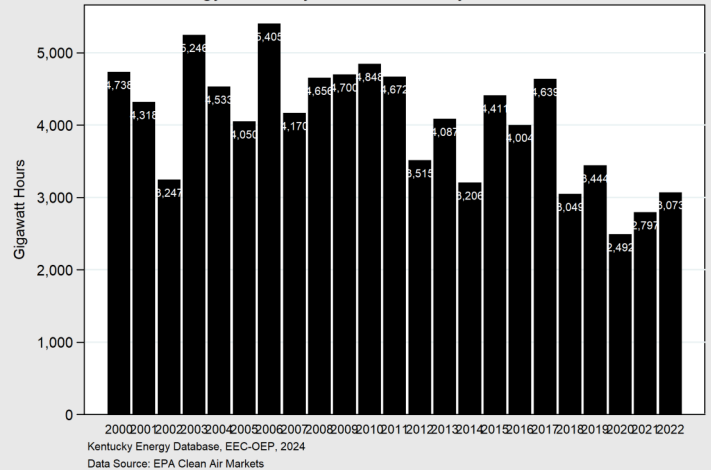
Duke Energy Kentucky
Service Territory



Data sourced from the Kentucky Division of Geographic Information
Data published by the Kentucky Office of Energy Policy

Duke Energy Kentucky generates and sells electricity in northern Kentucky and is owned and operated by Duke Energy. Total electricity prices in 2022 were 11.55 cents per kWh and has increased by 42.9% since 2012. Duke Energy owns and operates the East Bend coal-fired power plant in Boone County. Duke Energy also sells electricity throughout North and South Carolina, Indiana, and southwest Ohio.

Duke Energy Kentucky Gross Electricity Generation, 2000-2022

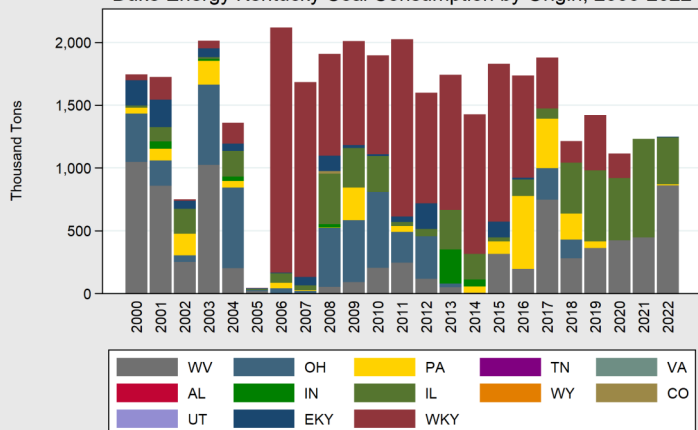


Electricity Generation	2022	Since 2012
Gigawatt Hours	3,073	-12.6%

Duke Energy Kentucky generated 3 TWh of electricity in 2022, a decrease of 12.6% from 2012.

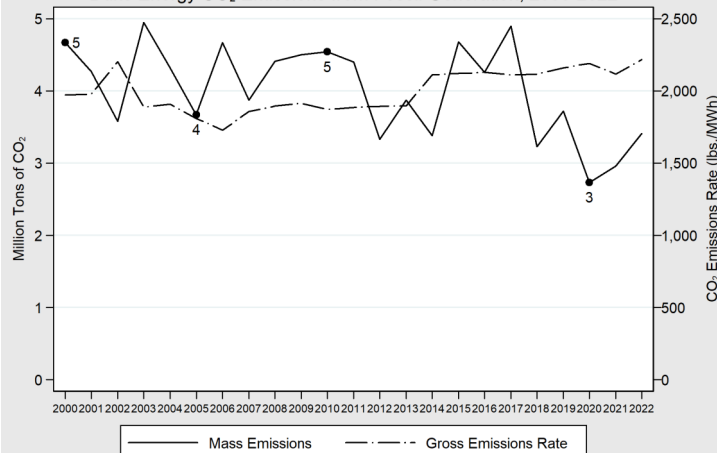
Duke Energy Kentucky

Duke Energy Kentucky Coal Consumption by Origin, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: FERC-423 & EIA-923

Duke Energy CO₂ Emissions from Fossil Generation, 2000-2022



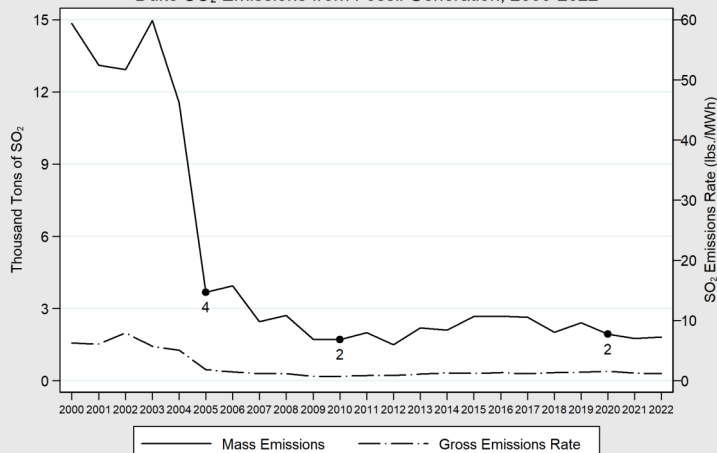
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

State	2022 Tons	Percentage
Total	1,243,518	100%
Pennsylvania	9,751	0.8%
Illinois	373,460	30.0%
West Virginia	860,307	69.2%

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	3,405,481	+2.3%
Rate (lbs./MWh)	2,217	+17.1%

Duke Energy Kentucky emitted 3.4 million tons of CO₂ in 2022, an increase of 2.3% since 2012. The rate of CO₂ emissions has increased by 17% during that period.

Duke SO₂ Emissions from Fossil Generation, 2000-2022

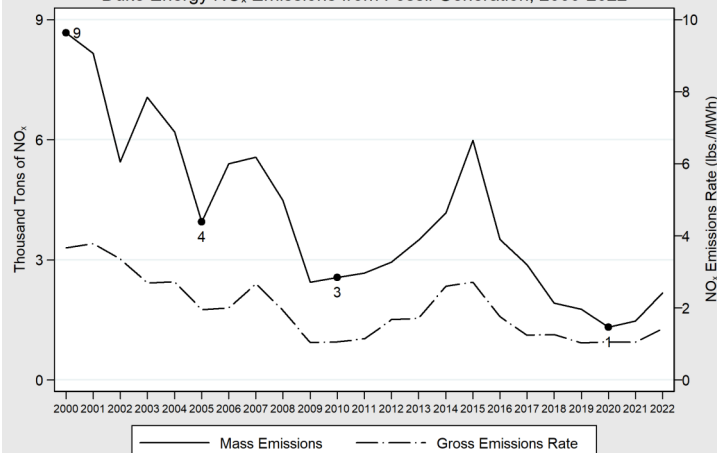


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2010
Emissions (Tonnage)	1,820	+21.3%
Rate (lbs./MWh)	1.19	+40.0%

Duke Energy Kentucky emitted 1,820 tons of SO₂ in 2022, an increase of 21% since 2012. The rate of SO₂ emissions increased by 40% during that period.

Duke Energy NO_x Emissions from Fossil Generation, 2000-2022

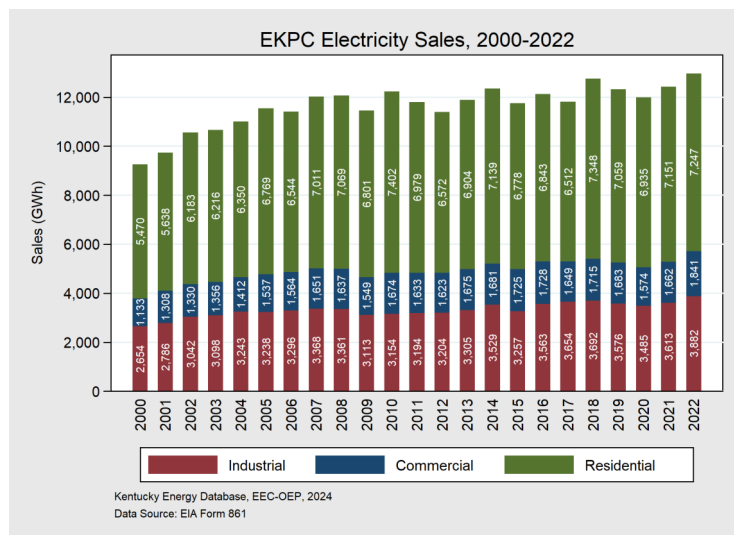
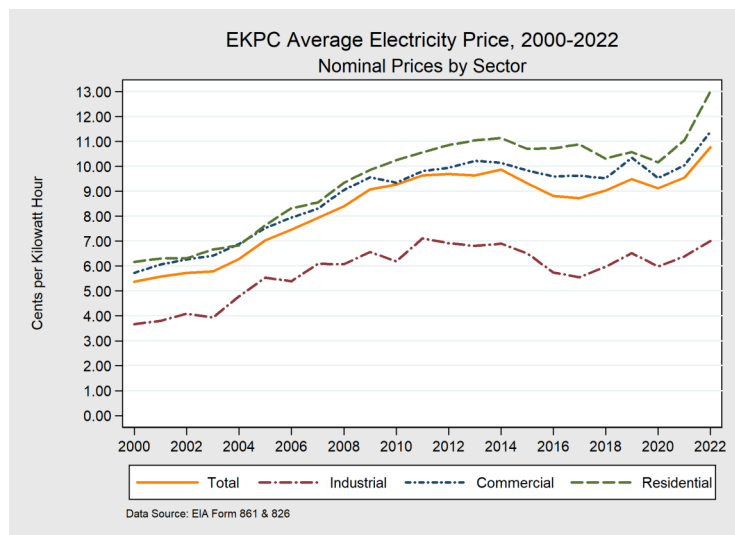


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	2,180	-25.9%
Rate (lbs./MWh)	1.42	-15.0%

Duke Energy Kentucky emitted 2,180 tons of NO_x in 2022, a reduction of 25.9% since 2012. The rate of NO_x emissions decreased 15% during that period.

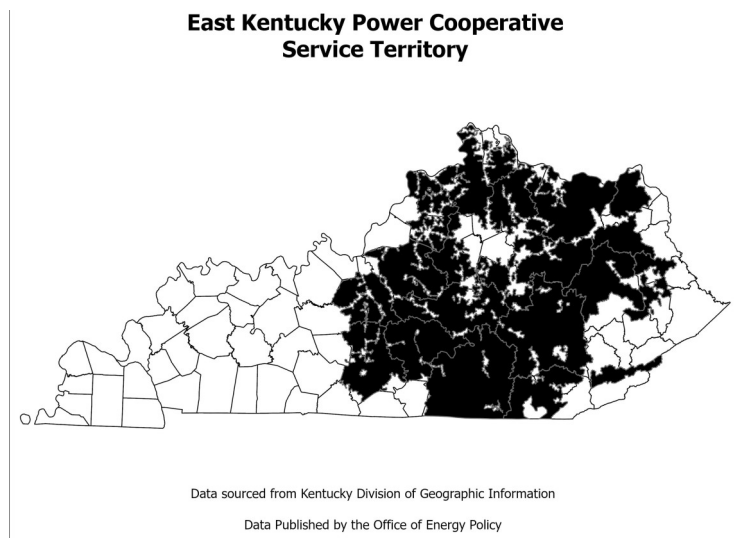
East Kentucky Power Cooperative



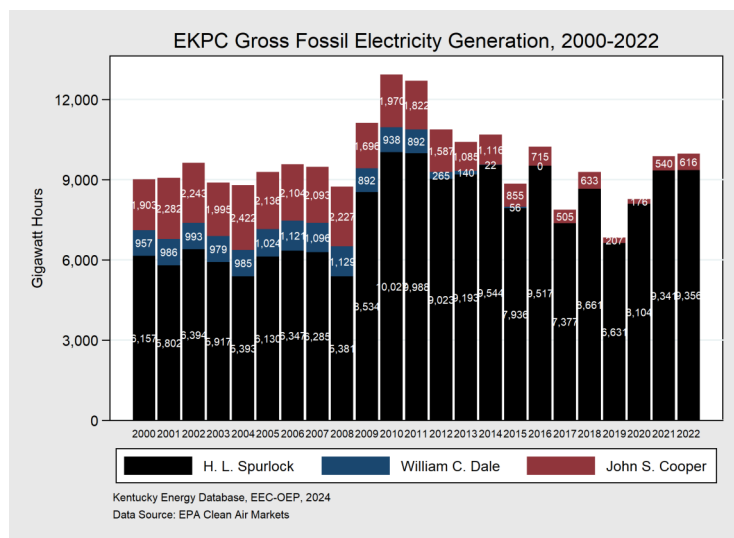
Sector	Price (Cents/kWh)	Since 2012
Total	10.77	+11.0%
Residential	13.01	+19.8%
Commercial	11.39	+14.6%
Industrial	7.01	+1.3%

Sector	Sales (GWh)	Percentage
Total	12,969	100%
Residential	7,247	55.9%
Industrial	3,882	29.9%
Commercial	1,841	14.2%

†Includes direct sales and sales to rural electric cooperatives



East Kentucky Power Cooperative serves central and eastern Kentucky where 16 RECCs jointly own and purchase electricity from EKPC. Total electricity prices in 2022 were 10.77 cents per kWh and have increased by 11% since 2012. EKPC owns and operates two coal-fired power plants, two natural gas electricity generating stations, and six landfill gas generating stations.

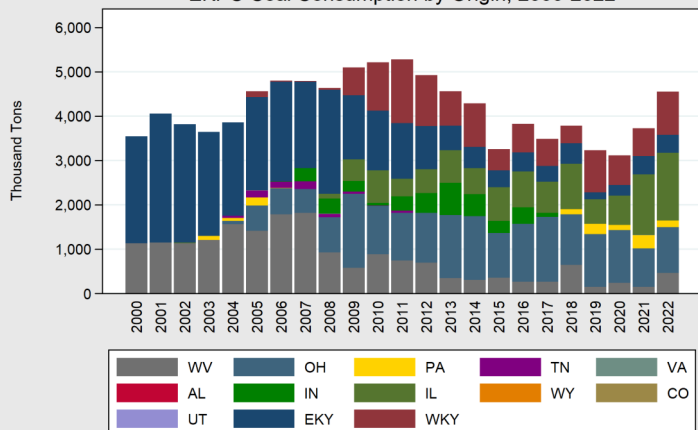


Electricity Generation	2022	Since 2012
Gigawatt Hours	9,972	-8.3%

East Kentucky Power Cooperative generated 10 TWh but sold 13 TWh of electricity in 2022. When electricity sales are greater than generation, it means that the utility purchased power from another source. In many cases this includes a Regional Transmission Organization which serves as a market for generated power among its members.

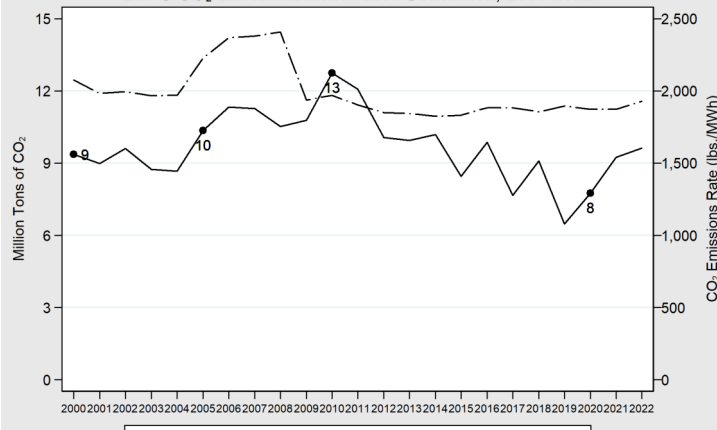
East Kentucky Power Cooperative

EKPC Coal Consumption by Origin, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: FERC-423 & EIA-923

EKPC CO₂ Emissions from Fossil Generation, 2000-2022



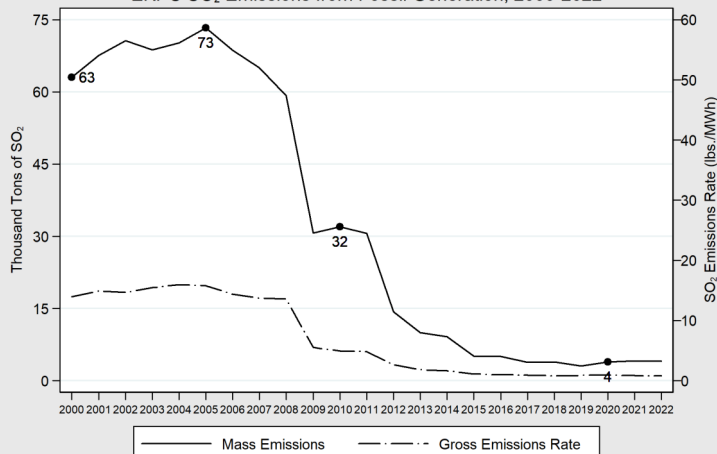
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

State	2022 Tons	Percentage
Total	4,550,710	100%
Ohio	1,028,421	22.6%
Western Kentucky	971,783	21.4%
Illinois	1,526,510	33.5%
Eastern Kentucky	407,495	9.0%
West Virginia	463,453	10.2%
Pennsylvania	153,048	3.3%

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	9,615,208	-4.5%
Rate (lbs./MWh)	1,928	+4.2%

East Kentucky Power Cooperative emitted 9.6 million tons of CO₂ in 2022, a decrease of 4.5% since 2012. The rate of CO₂ emissions has increased by 4.2% during that period.

EKPC SO₂ Emissions from Fossil Generation, 2000-2022

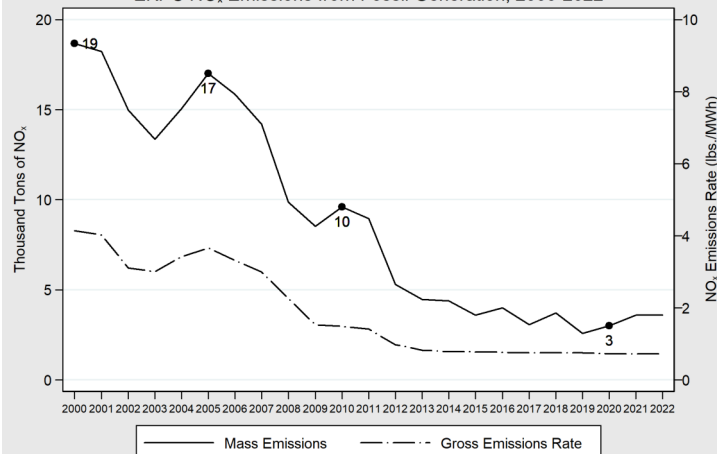


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	4,010	-72.0%
Rate (lbs./MWh)	0.80	-69.6%

East Kentucky Power Cooperative emitted 4,010 tons of SO₂ in 2022, a decrease of 72% since 2012. The rate of SO₂ emissions decreased by 69.6% during that period.

EKPC NO_x Emissions from Fossil Generation, 2000-2022



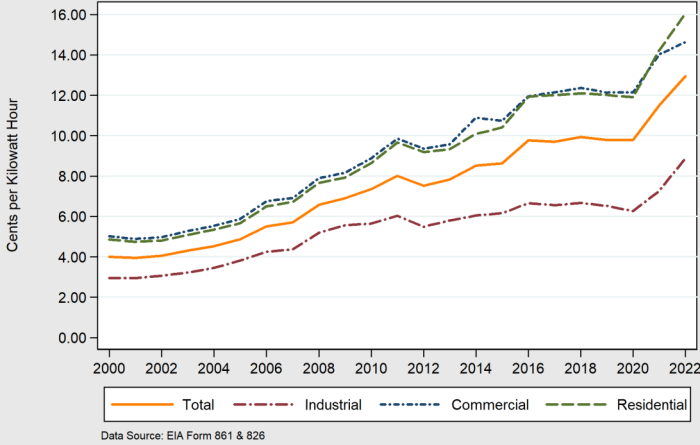
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	3,600	-32.2%
Rate (lbs./MWh)	0.72	-26.5%

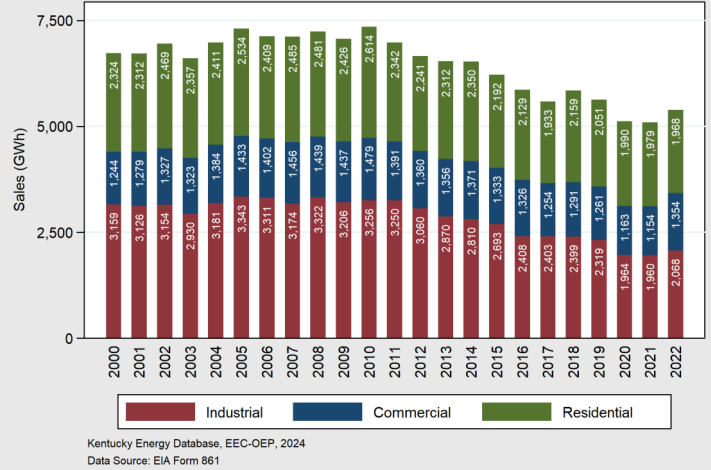
East Kentucky Power Cooperative emitted 3,600 tons of NO_x in 2022, a reduction of 32.2% since 2012. The rate of NO_x emissions decreased by 26.5% during that period.

Kentucky Power

Kentucky Power Average Electricity Price, 2000-2022
Nominal Prices by Sector



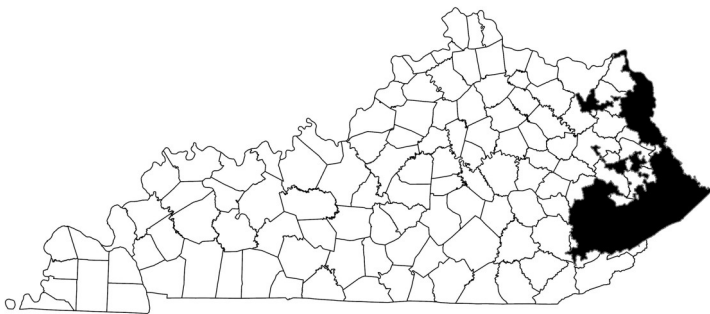
Kentucky Power Electricity Sales, 2000-2022



Sector	Price (Cents/kWh)	Since 2012
Total	12.95	+72.7%
Residential	16.05	+74.8%
Commercial	14.64	+56.4%
Industrial	8.89	+61.9%

Sector	Sales (GWh)	Percentage
Total†	5,391	100%
Industrial	2,068	38.4%
Residential	1,968	36.5%
Commercial	1,354	25.1%

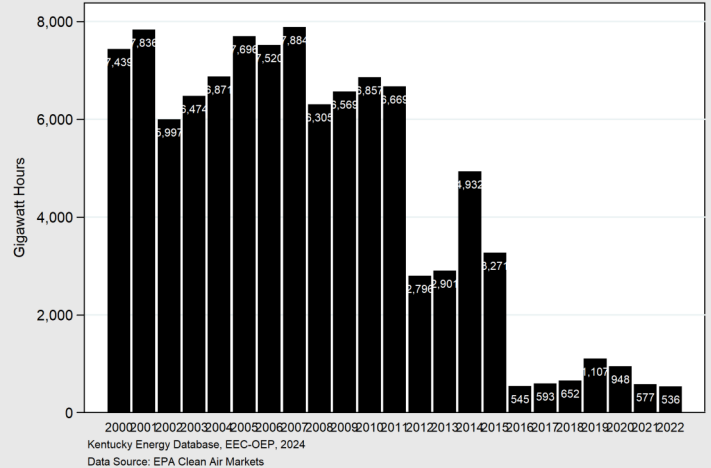
Kentucky Power
Service Territory



Data sourced from the Kentucky Division of Geographic Information
Data published by the Kentucky Office of Energy Policy

Kentucky Power, a subsidiary of American Electric Power, generates and distributes electricity in eastern Kentucky. Total electricity prices in 2022 were 12.95 cents per kWh and have increased by 72.7% since 2012. Kentucky Power operates the Big Sandy power plant in Louisa Kentucky.

Kentucky Power Gross Electricity Generation, 2000-2022

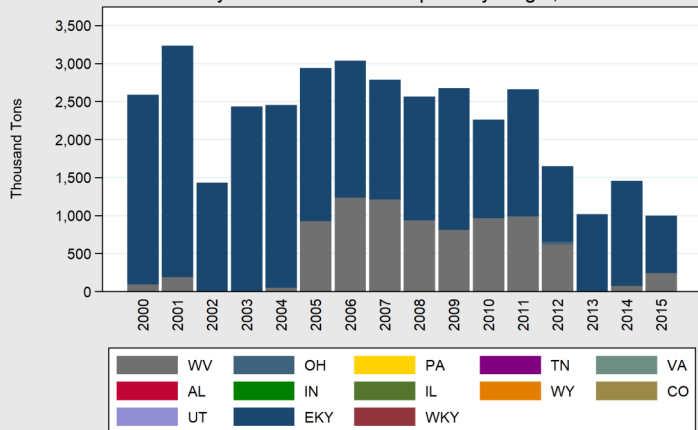


Electricity Generation	2022	Since 2012
Gigawatt Hours	536	-80.8%

Kentucky Power generated 536 GWh and sold 5.4 TWh of electricity in 2022. Since 2012 generation has decreased by 81%.

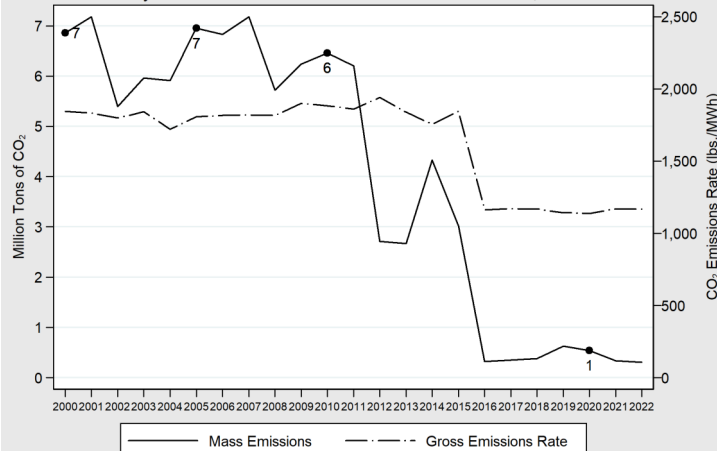
Kentucky Power

Kentucky Power Coal Consumption by Origin, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: FERC-423 & EIA-923

Kentucky Power CO₂ Emissions from Fossil Generation, 2000-2022



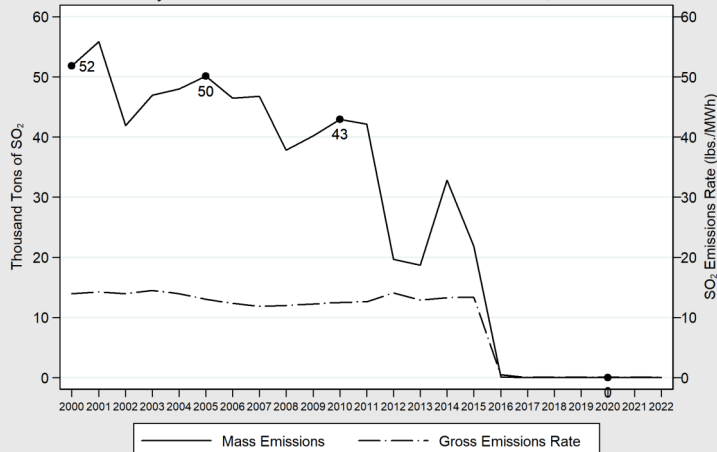
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

All units for the Big Sandy were retired in May of 2015 except unit 1, which was converted to natural gas.

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	313,359	-88.5%
Rate (lbs./MWh)	1,168	-39.8%

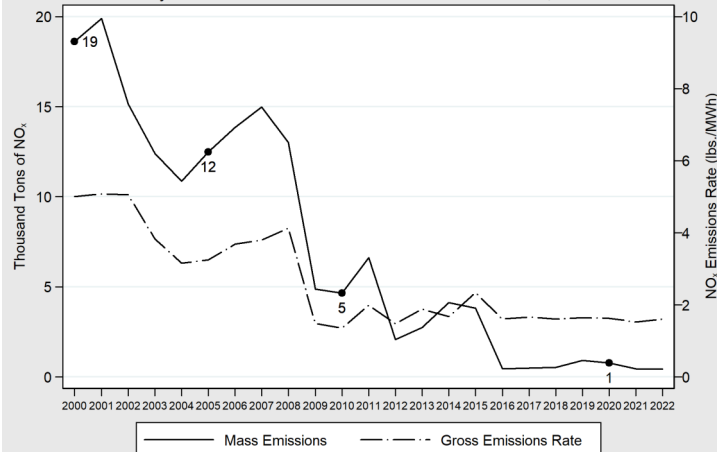
Kentucky Power emitted 313 thousand tons of CO₂ in 2022, a decrease of 88.5% since 2012. The rate of CO₂ emissions has decreased by 39.8% in that period of time.

Kentucky Power SO₂ Emissions from Fossil Generation, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Kentucky Power NO_x Emissions from Fossil Generation, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2020	Since 2010
Emissions (Tonnage)	10	-99.9%
Rate (lbs./MWh)	0.05	-99.6%

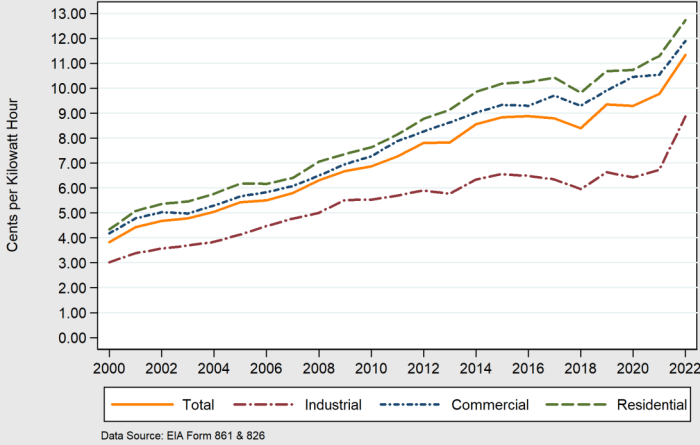
Kentucky Power emitted 10 tons of SO₂ in 2022, a decrease of 99.9% since 2012. The rate of SO₂ emissions reduced by 99.7% during that period.

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	430	-79.2%
Rate (lbs./MWh)	1.60	+8.1%

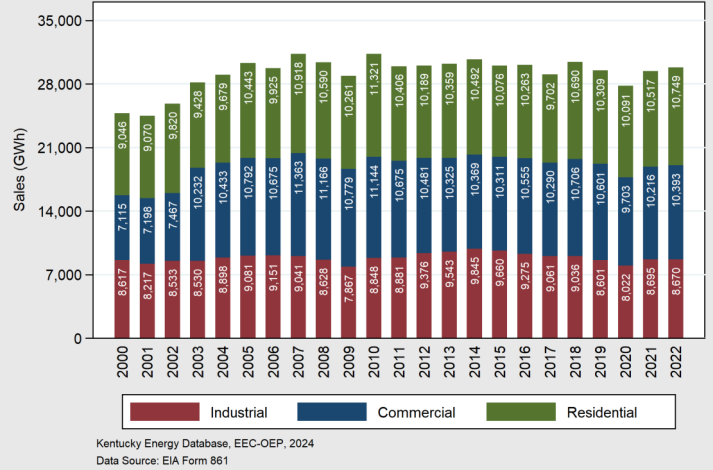
Kentucky Power emitted 430 tons of NO_x in 2022, a reduction of 79.2% since 2012. The rate of NO_x emissions increased by 8.1% during that period.

LG&E and KU

LG&E and KU Average Electricity Price, 2000-2022
Nominal Prices by Sector



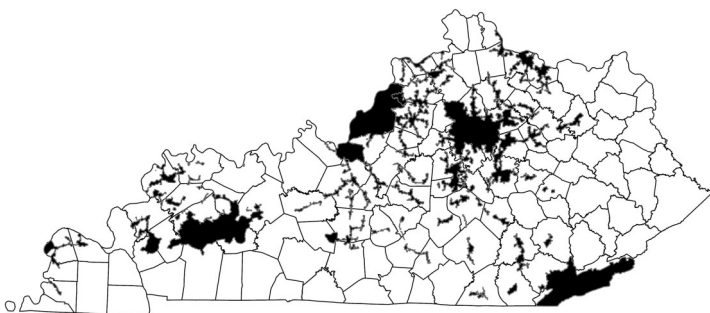
LG&E and KU Electricity Sales, 2000-2022



Sector	Price (Cents/kWh)	Since 2012
Total	11.34	+45.4%
Residential	12.73	+45.2%
Commercial	11.90	+43.9%
Industrial	8.86	+50.2%

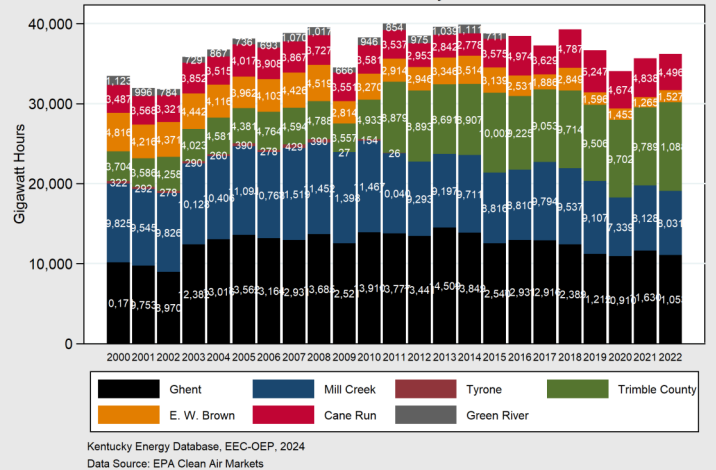
Sector	Sales (GWh)	Percentage
Total	29,812	100%
Residential	10,749	36.1%
Commercial	10,393	34.9%
Industrial	8,670	29.0%

Louisville Gas and Electric & Kentucky Utilities
Service Territory



Data sourced from the Kentucky Division of Geographic Information
Data published by the Kentucky Office of Energy Policy

LG&E & KU Gross Fossil Electricity Generation, 2000-2022



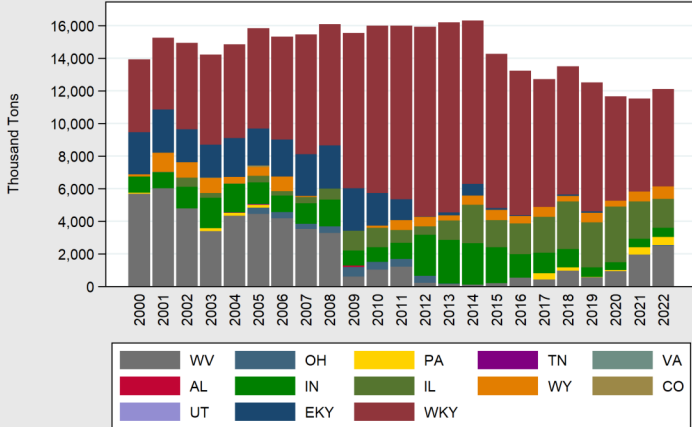
LG&E and KU is the single largest utility by sales in Kentucky and sells electricity throughout the state, primarily in densely populated areas. Total electricity prices in 2022 were 11.34 cents per kWh and have increased by 45.4% since 2012. LG&E and KU operate numerous electricity generation facilities throughout the state including four coal-fired power plants, two hydroelectric dams, five natural gas facilities and four solar operations.

Electricity Generation	2022	Since 2012
Gigawatt Hours	36,190	-6.4%

LG&E and KU generated over 36 TWh and sold almost 29 TWh of electricity in 2022. Since 2012, generation has decreased by 6.4%.

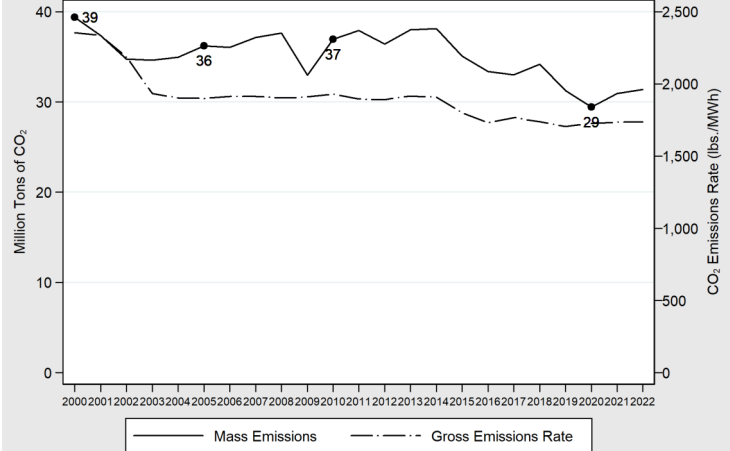
LG&E and KU

LG&E and KU Coal Consumption by Origin, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: FERC-423 & EIA-923

LG&E & KU CO₂ Emissions from Fossil Generation, 2000-2022



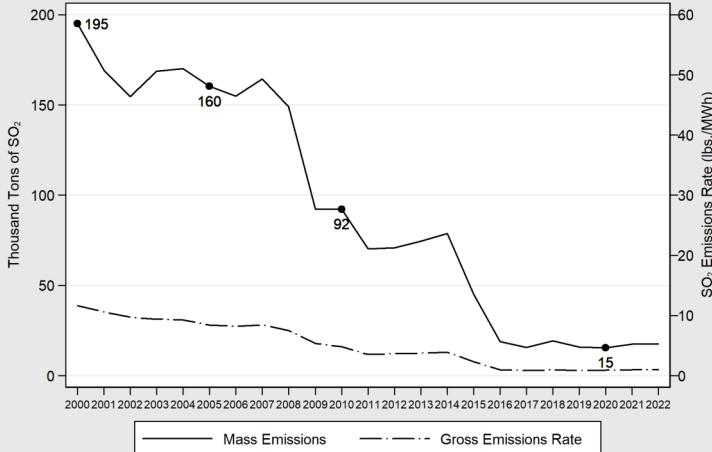
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

State	2022 Tons	Percentage
Total	12,058,344	100%
Western Kentucky	5,989,002	49.7%
Illinois	1,771,632	14.7%
Wyoming	758,233	6.3%
Indiana	556,458	4.6%
Pennsylvania	493,341	4.1%
West Virginia	2,489,678	20.6%

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	31,403,725	-13.8%
Rate (lbs./MWh)	1,735	-8.3%

LG&E and KU emitted 31.4 million tons of CO₂ in 2022, a decrease of 13.8% since 2012. The rate of CO₂ emissions decreased by 8.3% during that period.

LG&E & KU SO₂ Emissions from Fossil Generation, 2000-2022

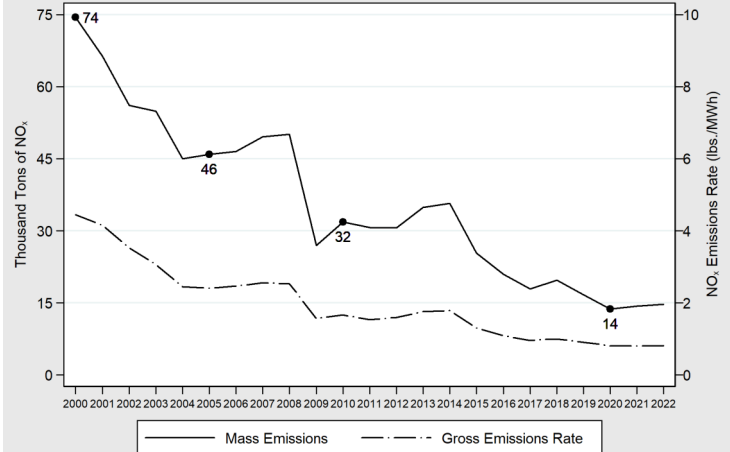


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	17,739	-75.0%
Rate (lbs./MWh)	0.98	-73.4%

LG&E and KU emitted 17,739 tons of SO₂ in 2022, a decrease of 75% since 2012. The rate of SO₂ emissions reduced by 73.4% during that period.

LG&E & KU NO_x Emissions from Fossil Generation, 2000-2022



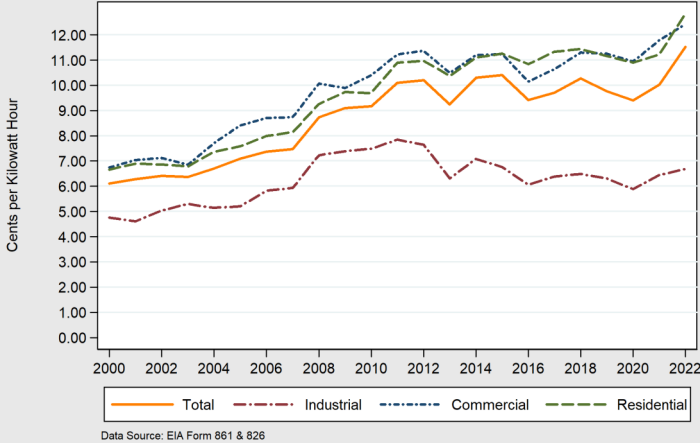
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	14,670	-52.1%
Rate (lbs./MWh)	0.81	-49.1%

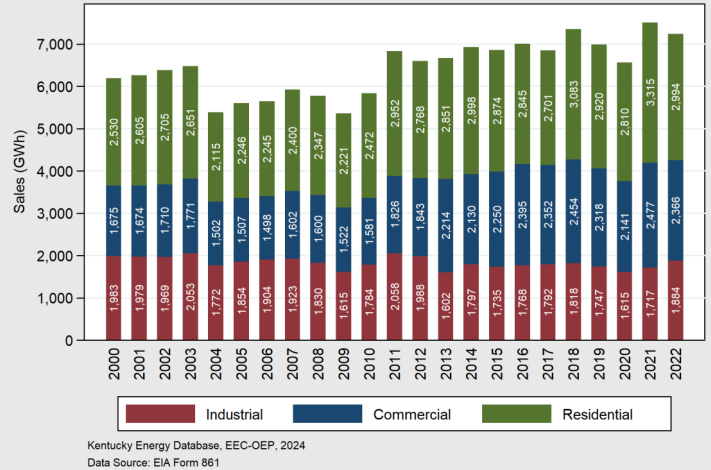
LG&E and KU emitted 14,670 tons of NO_x in 2022, a reduction of 52.1% since 2012. The rate of NO_x emissions decreased by 49.1% during that period.

Tennessee Valley Authority

TVA Average Electricity Price, 2000-2022
Nominal Prices by Sector



TVA Electricity Sales, 2000-2022

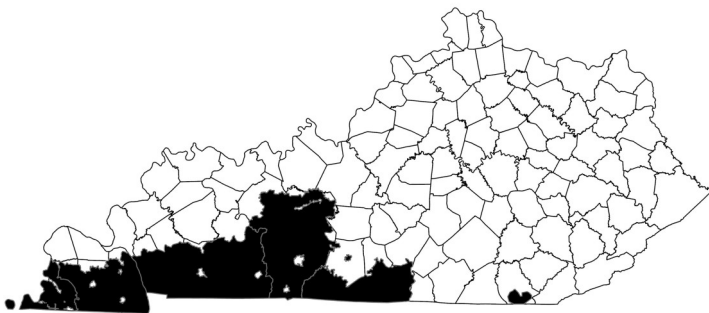


Sector	Price (Cents/kWh)	Since 2012
Total†	11.52	+12.9%
Residential	12.85	+17.0%
Commercial	12.42	+9.2%
Industrial	6.68	-12.6%

Sector	Sales (GWh)	Percentage
Total†	7,243	100%
Industrial	1,884	26.0%
Residential	2,994	41.3%
Commercial	2,365	32.7%

†Includes direct sales and sales to rural electric cooperatives and municipalities

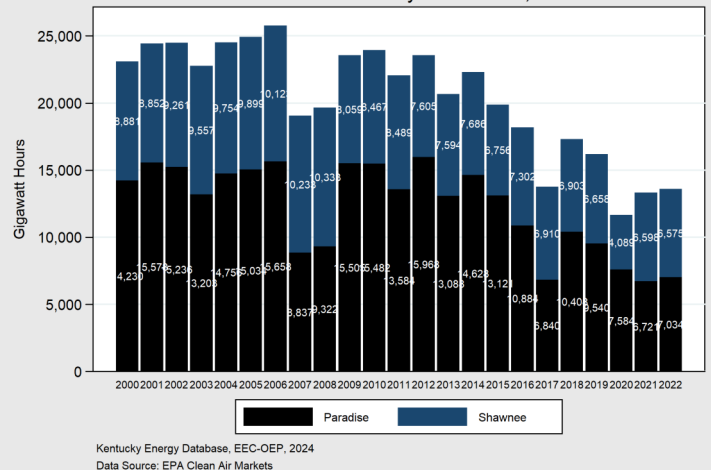
Tennessee Valley Authority
Service Territory



Data sourced from the Kentucky Division of Geographic Information
Data published by the Kentucky Office of Energy Policy

The Tennessee Valley Authority generates and sells electricity to five RECCs, 10 municipalities, and several industrial consumers in southwest Kentucky. Total electricity prices in 2022 were 11.52 cents per kWh and have increased by 12.9% since 2012. In Kentucky, TVA operates the Marshall Combustion Turbine Plant near Calvert City as well as the coal-fired power plants of Paradise and Shawnee.

TVA Gross Fossil Electricity Generation, 2000-2022

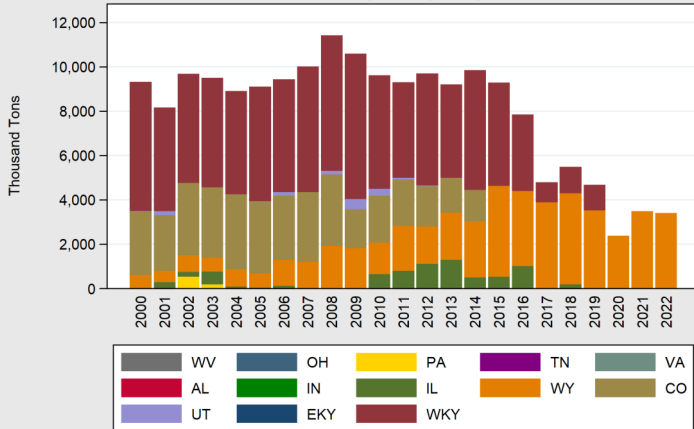


Electricity Generation	2022	Since 2012
Gigawatt Hours	13,609	-42.3%

TVA generated 13.6 TWh and sold 7.2 TWh of electricity in 2022. Since 2012, generation has decreased by 42.3%. TVA directly sells electricity to a number of industrial manufacturers and five RECCs. The 10 municipalities TVA supplies are not shown in the figures above.

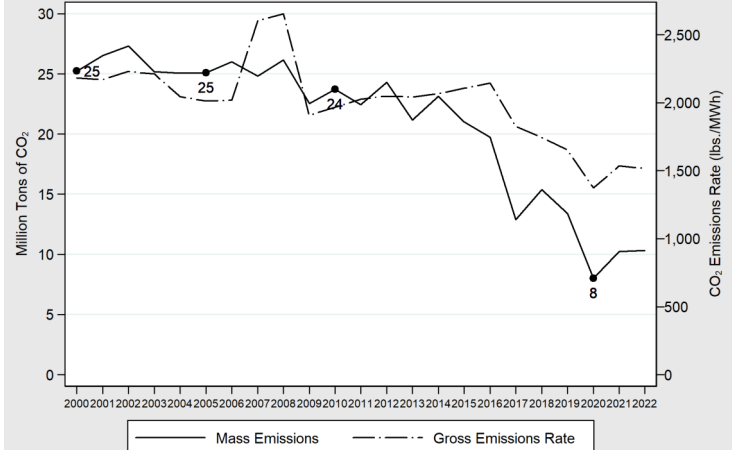
Tennessee Valley Authority

TVA Coal Consumption by Origin, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: FERC-423 & EIA-923

TVA CO₂ Emissions from Fossil Generation, 2000-2022



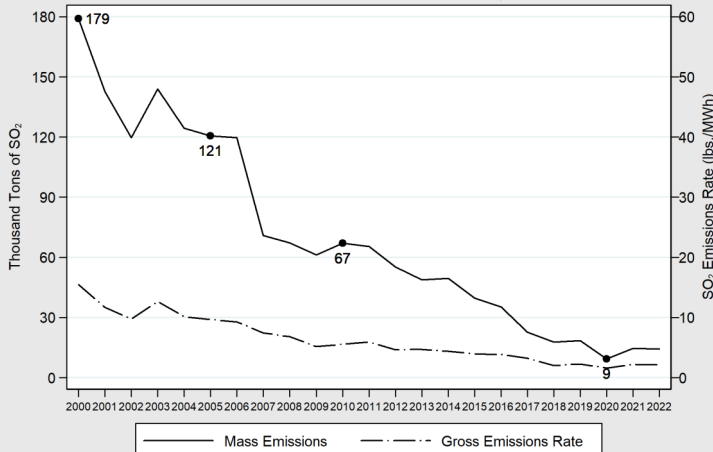
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

State	2020 Tons	Percentage
Total	3,400,873	100%
Wyoming	3,400,873	100%

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	10,322,948	-57.5%
Rate (lbs./MWh)	1,517	-26.0%

The Tennessee Valley Authority emitted 10.3 million tons of CO₂ in Kentucky in 2022, a decrease of 57.5% since 2012. The rate of CO₂ emissions has decreased by 26% during that period.

TVA SO₂ Emissions from Fossil Generation, 2000-2022

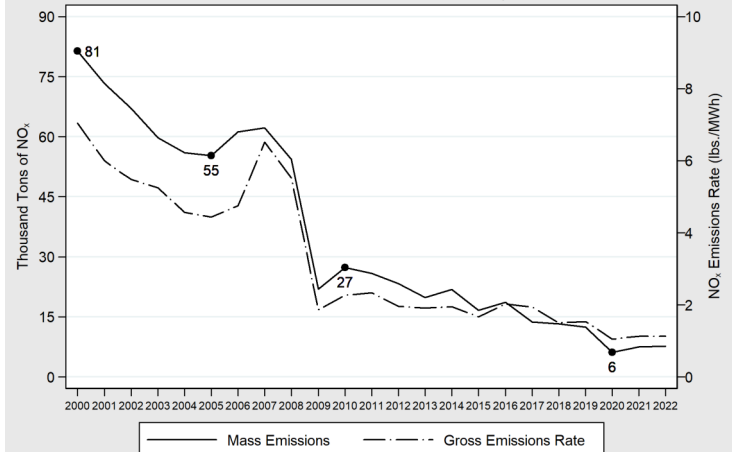


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	14,340	-74.0%
Rate (lbs./MWh)	2.11	-54.6%

The Tennessee Valley Authority emitted 14,340 tons of SO₂ in 2022, a decrease of 74% since 2012. The rate of SO₂ emissions reduced by 55% during that period.

TVA NO_x Emissions from Fossil Generation, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	7,690	-67.0%
Rate (lbs./MWh)	1.13	-42.3%

The Tennessee Valley Authority emitted 7,690 tons of NO_x in 2022, a reduction of 67% since 2012. The rate of NO_x emissions decreased by 42.3% during that period.

Distributed Renewable Generation

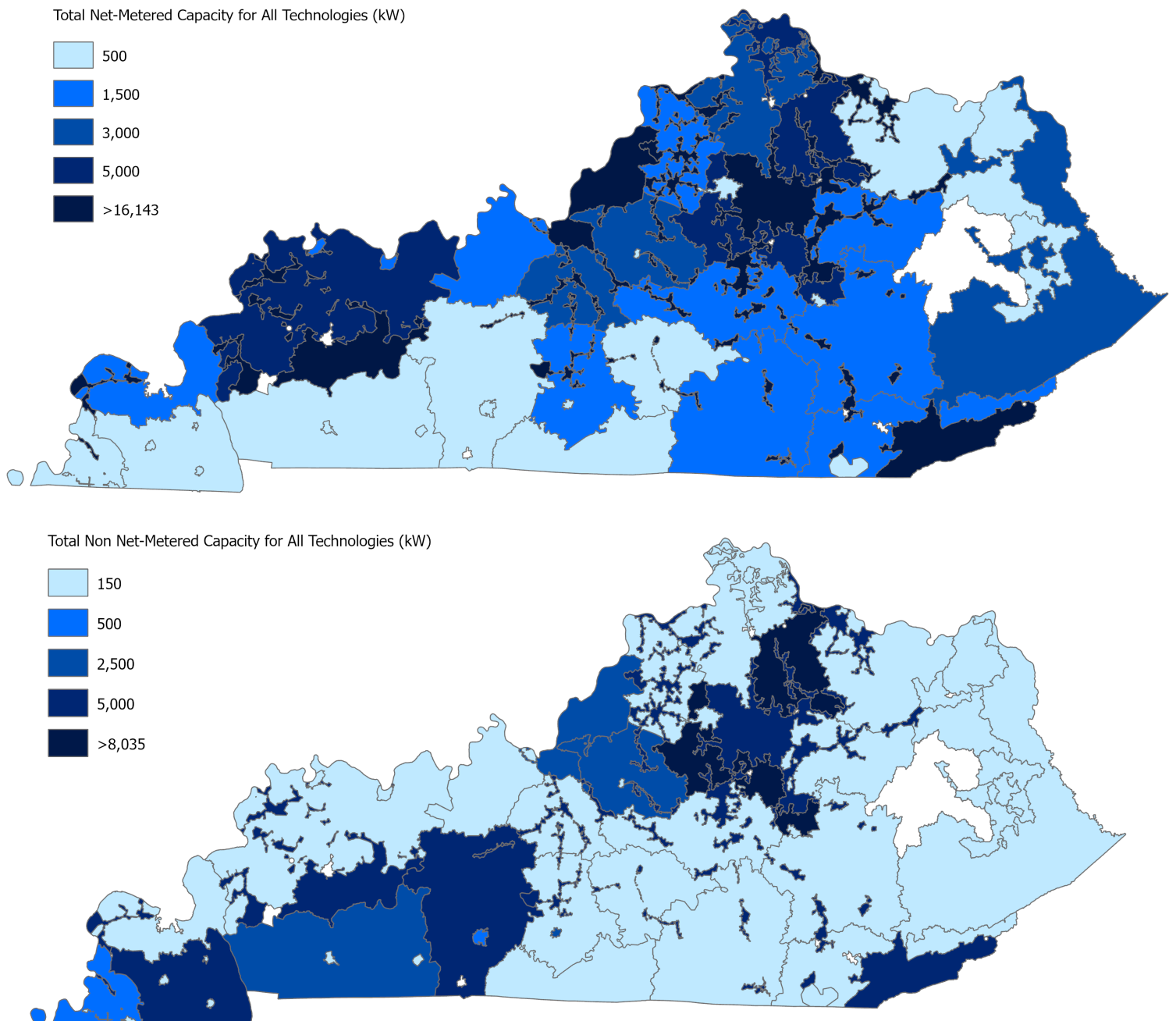
Distributed Renewable Generation (DG) refers to those distributed renewable energy systems that generate or store electricity for delivery to the electrical grid and includes the eligible electric generating facilities under KRS 278.465 and those connected under utility tariffs filed under the regulation for Small Power Production and Cogeneration.

Net Energy Metering or Net Metering refers to a compensation mechanism established in KRS 278.465-468 which allows small renewable generation systems to interconnect to the electric distribution grid.

Distributed renewable generation systems located in areas of Kentucky served by TVA local power companies do not interconnect via net metering.

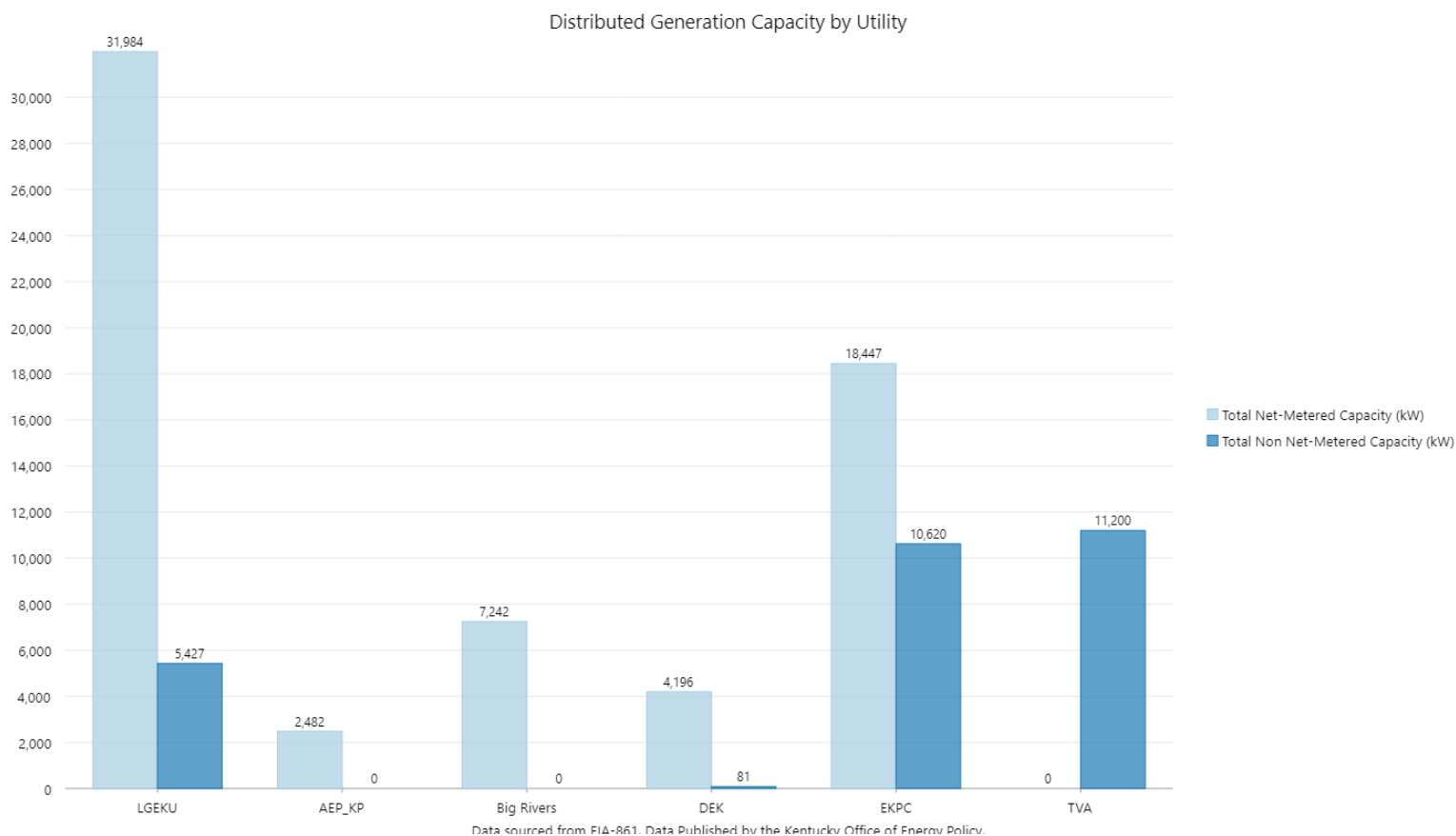
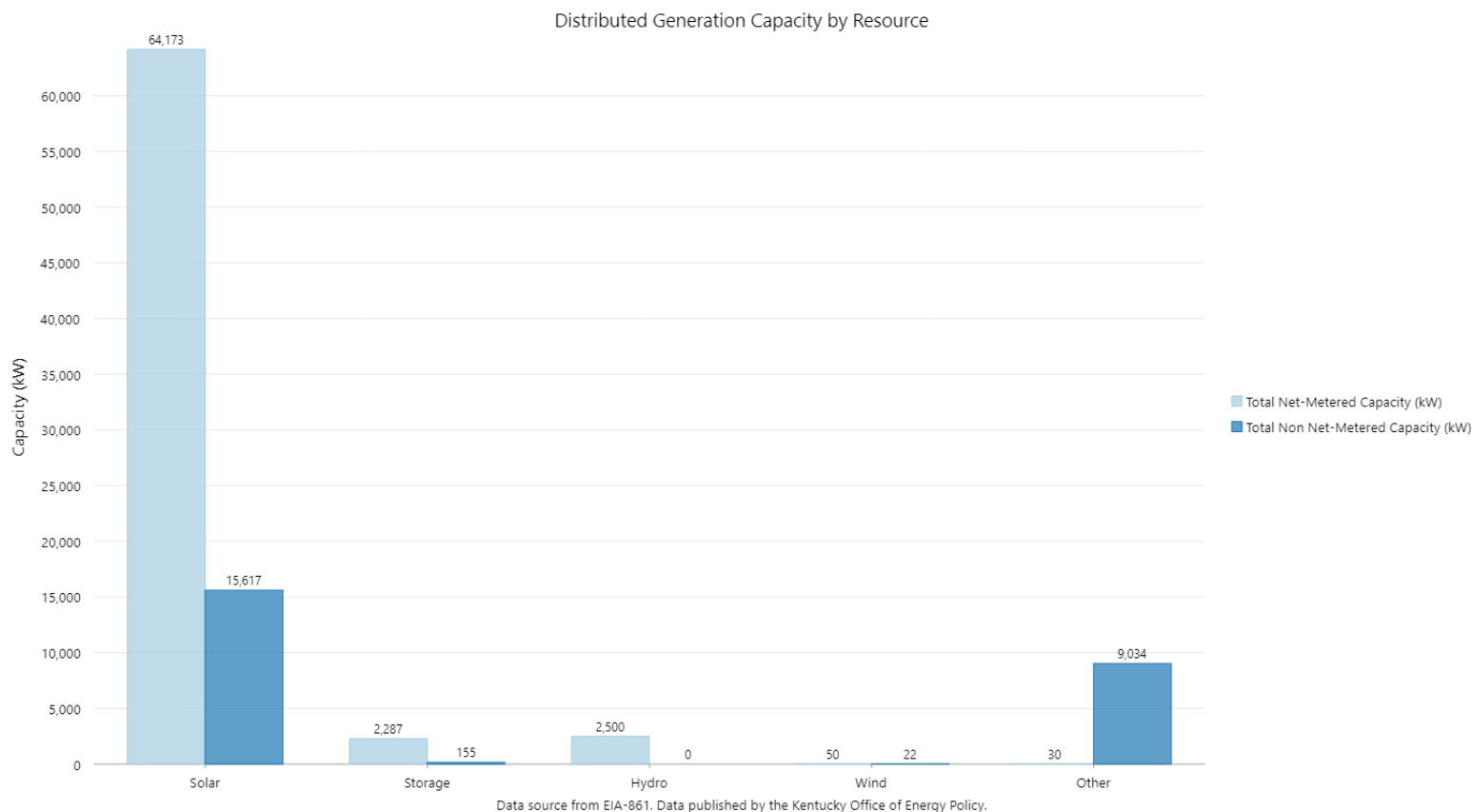
In addition to Net Metering, larger power generation systems interconnect to the electric grid via tariffs established by utilities under the Public Utility Regulatory Policies Act.

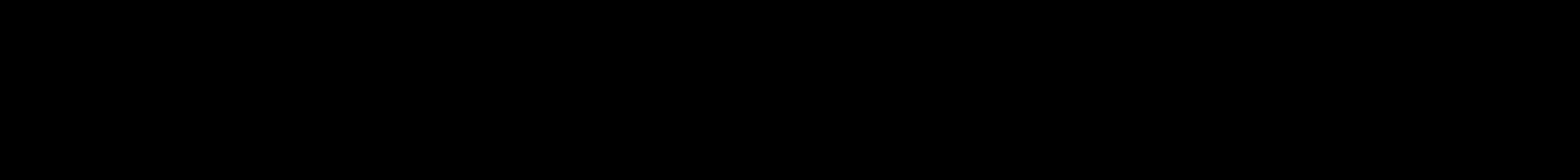
For more information on accessing alternative energy in Kentucky, visit the Consumer Energy Management and Access Guide located at eec.ky.gov/energy.



Data published by the Kentucky Office of Energy Policy, 2024

Distributed Renewable Generation — 2022



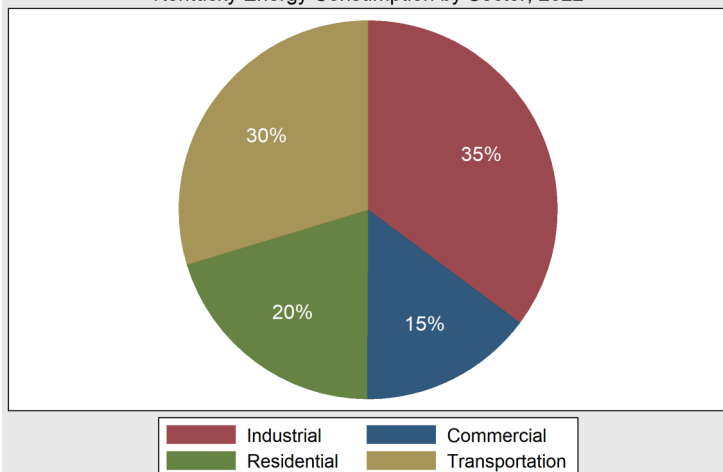


Kentucky Sector Profiles



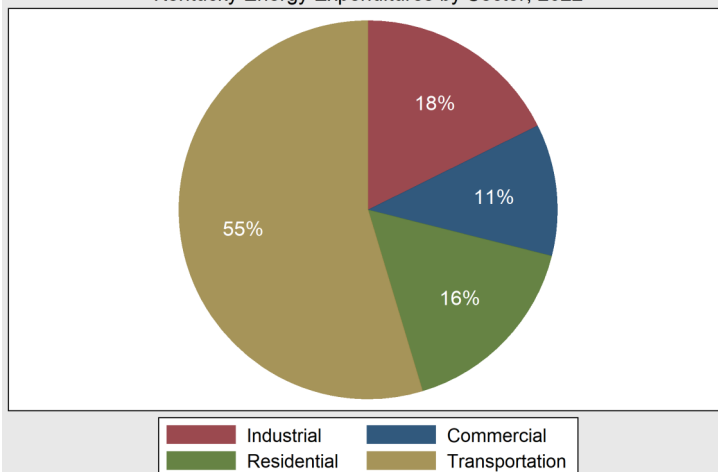
Kentucky Energy Consumption

Kentucky Energy Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Energy Expenditures by Sector, 2022

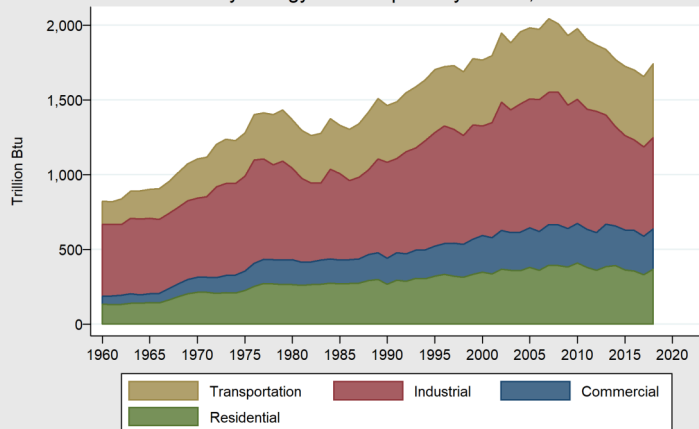


Kentucky Energy Database, EEC-OEP, 2024

Sector	Billion Btu	1 Year Change
Total	1,673,214	+1.5%
Industrial	589,194	-0.4%
Transportation	497,157	+0.4%
Residential	338,374	+3.5%
Commercial	249,363	+6.0%

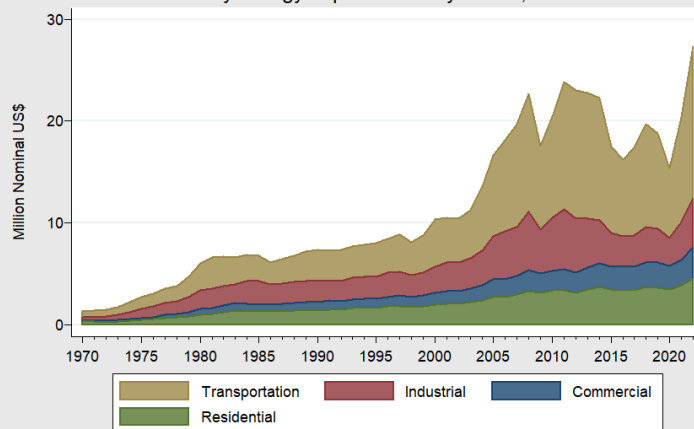
Sector	Million Dollars	1 Year Change
Total	27,349	+34.1%
Transportation	14,945	+44.6%
Industrial	4,827	+31.3%
Residential	4,494	+17.3%
Commercial	3,083	+20.7%

Kentucky Energy Consumption by Sector, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky Energy Expenditures by Sector, 1970-2022



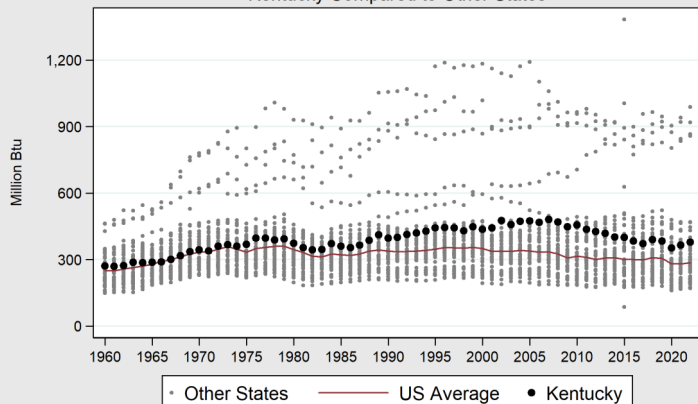
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

During 2022, manufacturing operations in Kentucky consumed 35% of all energy consumed within the Commonwealth. Kentucky's industrial energy use was slightly larger than the national average of 33% in 2022. After manufacturing, transportation was the second largest use of energy, with 30% of total energy demand, followed by residential energy use at 20%. The commercial sector accounted for 15% of energy consumption.

The Kentucky transportation energy use was the majority of energy expenditures in the state during the year. A total of nearly \$15 billion was spent in 2022 on transportation fuels—primarily on gasoline and diesel. Manufacturers spent \$4.8 billion on various energy commodities, while the residential and commercial sectors spent \$4.5 billion and \$3.1 billion, respectively.

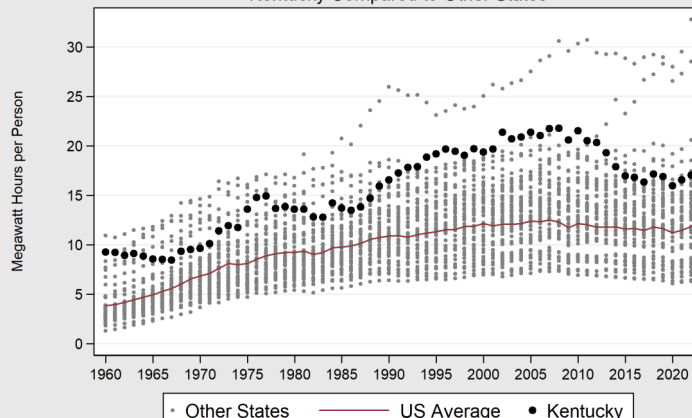
Kentucky Energy Intensity

Kentucky Annual Energy Consumption per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

Electricity Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

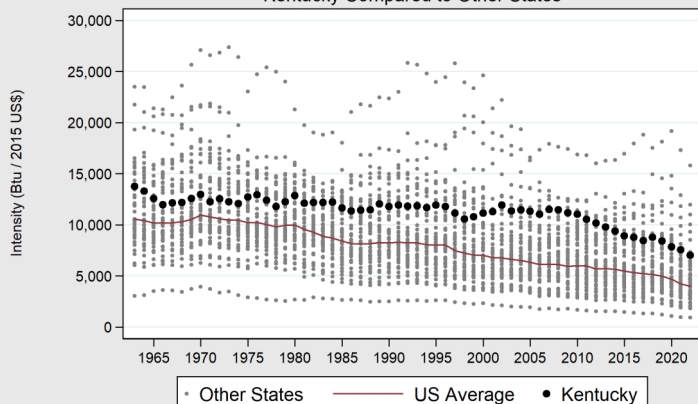
State	MMBtu per Capita	Rank
Arkansas	988.2	1st
Kentucky	378.4	12th
U.S. Average	285.6	-
Rhode Island	170.4	50th

Kentucky's total energy consumption per capita increased by 3.6% compared to 2021, which is 12th highest of all states.

State	MWh per Capita	Rank
North Dakota	32.8	1st
Kentucky	17.0	8th
U.S. Average	11.8	-
Hawaii	6.3	50th

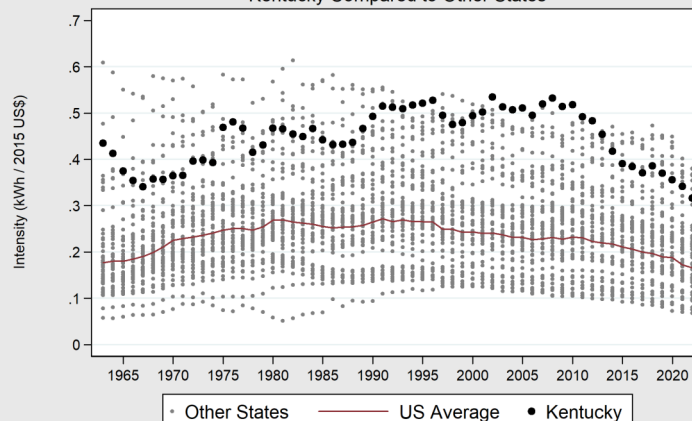
In 2022, Kentucky ranked 8th in terms of total electricity consumption per capita. Total electricity consumption per capita increase by 3% compared with 2021.

Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

Electricity Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

State	Btu/\$U.S. GDP	Rank
Louisiana	15,803	1st
Kentucky	7,020	8th
U.S. Average	4,000	-
New York	1,832	50th

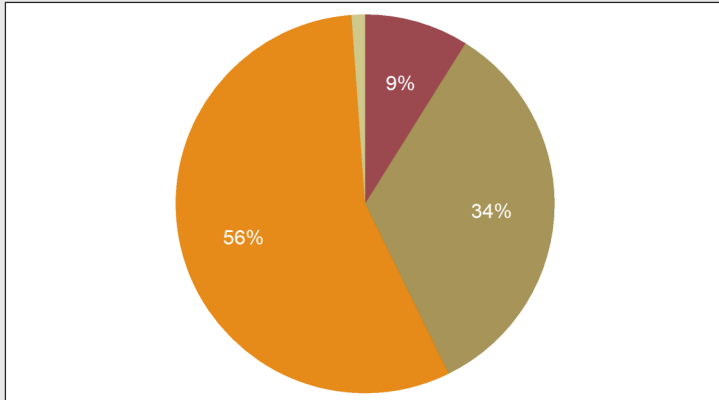
Kentucky ranked 8th in terms of total energy consumption per dollar of state GDP in 2022. Total energy intensity decreased by 7% compared with 2021.

State	kWh/\$U.S. GDP	Rank
Mississippi	0.38	1st
Kentucky	0.32	8th
U.S. Average	0.17	-
California	0.07	50th

In 2022, Kentucky had the 8th most electricity-intensive economy in the United States, and total electricity intensity decreased by 5.9% compared with 2021.

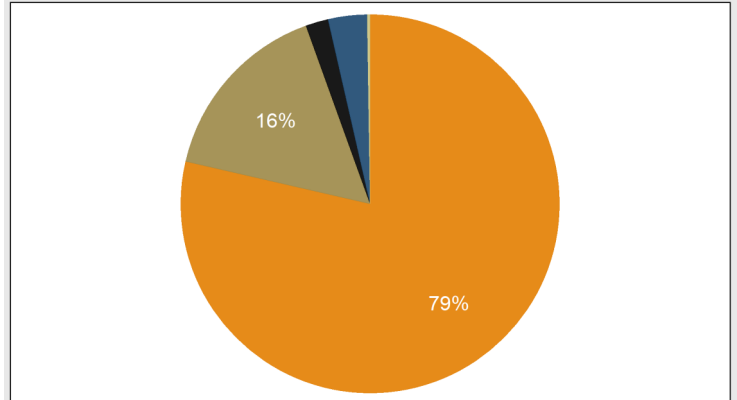
Commercial Energy Consumption

Kentucky Commercial Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Commercial Energy Expenditures by Fuel, 2022

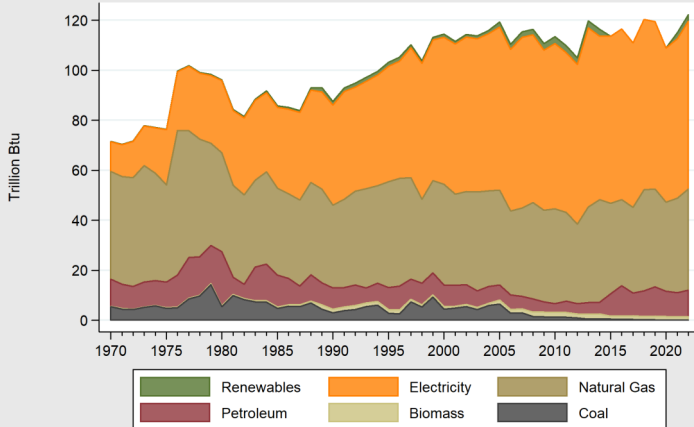


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total Net	249,363	+6.1%
Electricity	67,128	+5.3%
Natural Gas	40,478	+7.1%
Petroleum	10,644	+10.4%
Wood	1,364	+6.0%

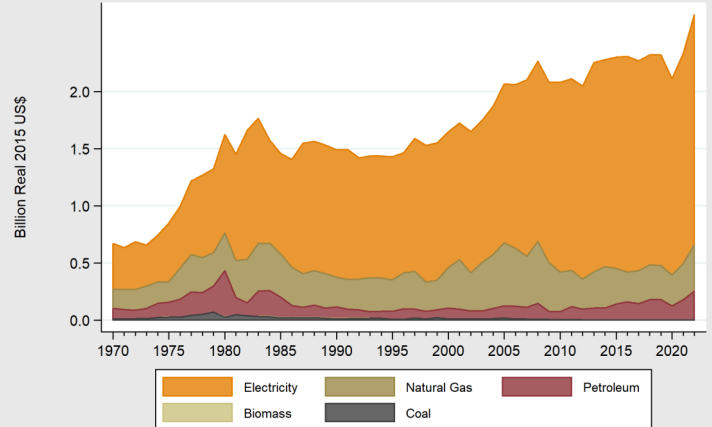
Fuel Type	Million Dollars	1 Year Change
Total	3,083	+20.7%
Electricity	2,318	+15.4%
Natural Gas	468	+35.7%
Diesel	98	+71.9%
Propane	58	+48.7%

Kentucky Commercial Energy Consumption by Fuel, 1970-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky Commercial Energy Expenditures by Fuel, 1970-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

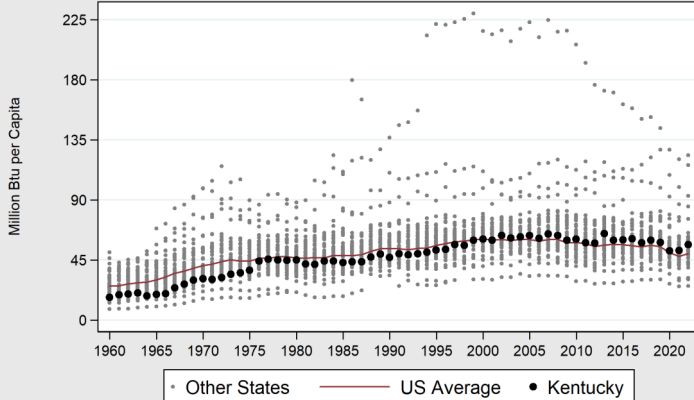
In 2022, non-manufacturing businesses in Kentucky consumed 249.4 trillion Btu of energy, a 6.1% increase in net commercial energy consumption compared with 2021. Electricity constituted 56% of commercial energy consumption, followed by natural gas at 34%. Other commodities such as petroleum products, wood, coal, and ethanol accounted for approximately 10% of commercial energy consumption in 2022.

In 2022, non-manufacturing businesses in Kentucky spent nearly \$3.1 billion on energy consumption—a 20.7% increase in commercial energy expenditures compared with 2021. Electricity was the largest energy expenditure, at 79%. Natural gas was 16% of commercial energy expenditures.

*Fuels with lower contributions to residential consumption are not shown in figures.

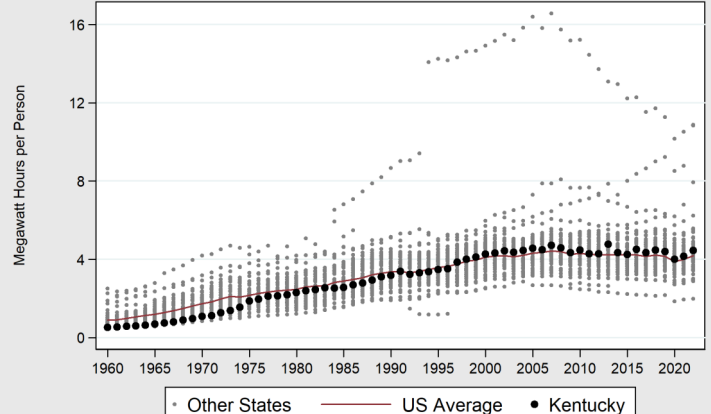
Commercial Energy Intensity

Annual Commercial Energy Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

Commercial Electricity Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

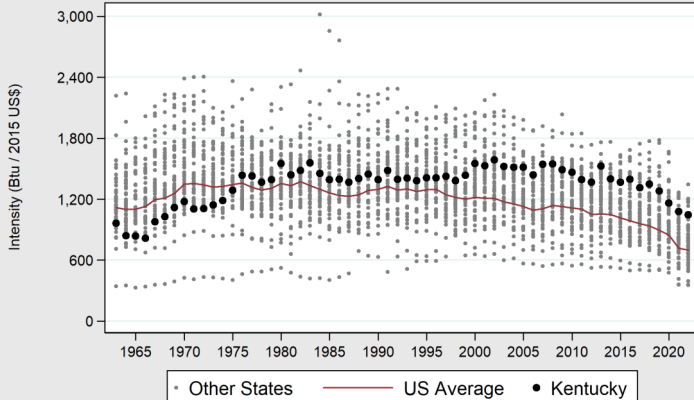
State	MMBtu per Capita	Rank
North Dakota	116.1	1st
Kentucky	56.4	34th
U.S. Average	49.9	-
Hawaii	25.4	50th

Kentucky's commercial energy consumption per capita increased by 8.1% compared with 2021, and ranks 34th of all states.

State	MWh per Capita	Rank
North Dakota	10.83	1st
Kentucky	4.45	18th
U.S. Average	4.19	-
Hawaii	1.97	50th

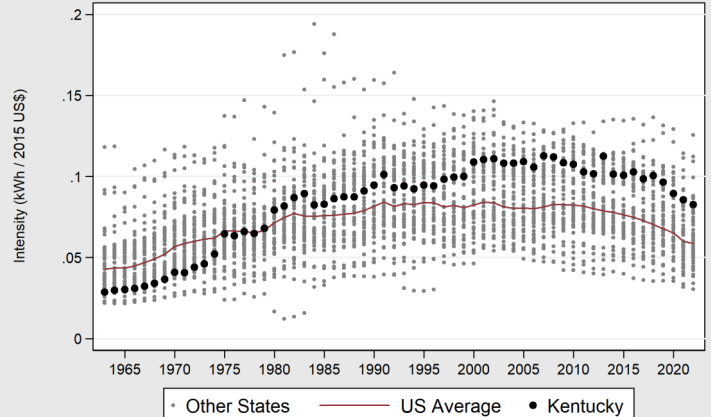
Kentucky ranked 18th in terms of commercial electricity consumption per capita in 2022, an increase of 7.5% compared with 2021.

Commercial Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

Commercial Electricity Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

State	Btu/\$U.S. GDP	Rank
North Dakota	1,346	1st
Kentucky	1,046	10th
U.S. Average	698	-
Washington	354	52nd

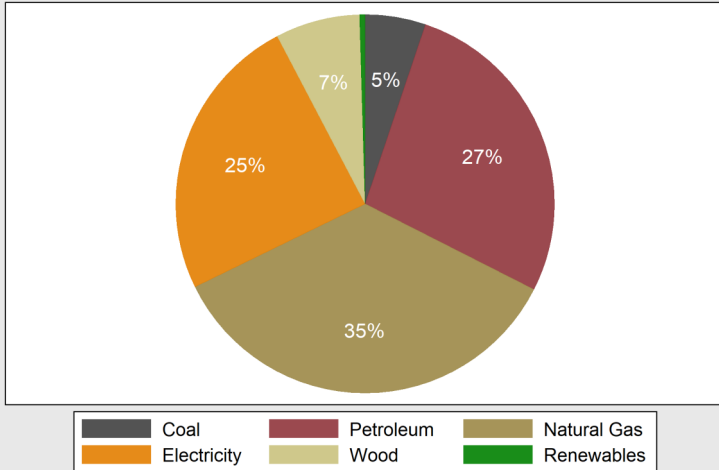
Kentucky ranked 10th highest in terms of commercial energy consumption per dollar of state GDP in 2022. Commercial energy intensity decreased by 2.9% compared with 2021.

State	kWh/\$U.S. GDP	Rank
North Dakota	0.13	1st
Kentucky	0.08	8th
U.S. Average	0.06	-
Hawaii	0.03	50th

In 2022, Kentucky ranked 8th in terms of commercial electricity use per dollar of state GDP.

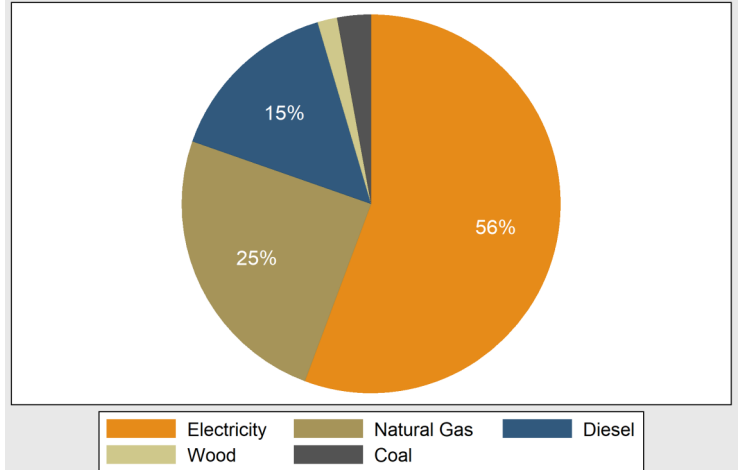
Industrial Energy Consumption

Kentucky Industrial Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Industrial Energy Expenditures by Fuel, 2022

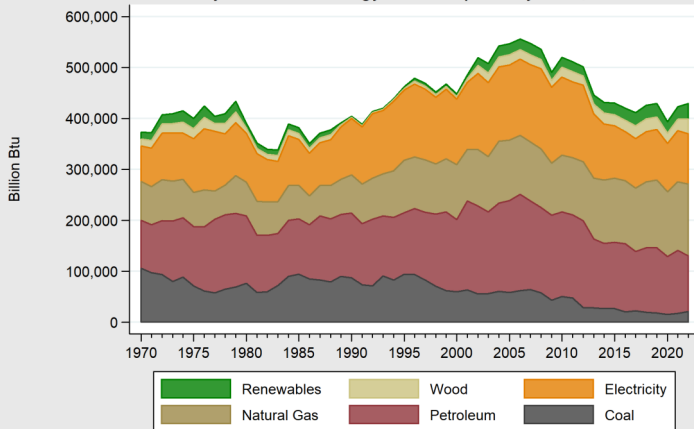


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total Net	589,194	-0.4%
Petroleum	109,402	-11.6%
Electricity	98,349	-1.9%
Natural Gas	141,297	+5.0%
Coal	20,728	+19.2%
Wood	26,863	+33.1%

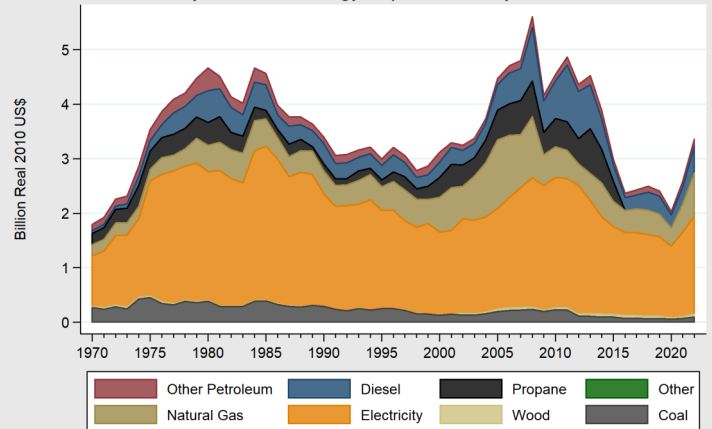
Fuel Type	Million Dollars	1 Year Change
Total	4,827	+31.3%
Electricity	2,068	+22.1%
Diesel	559	+65.4%
Kerosene	2	+31.3%
Natural Gas	916	+62.1%
Coal	107	-50.7%

Kentucky Industrial Energy Consumption by Fuel, 1970-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky Industrial Energy Expenditures by Fuel, 1970-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

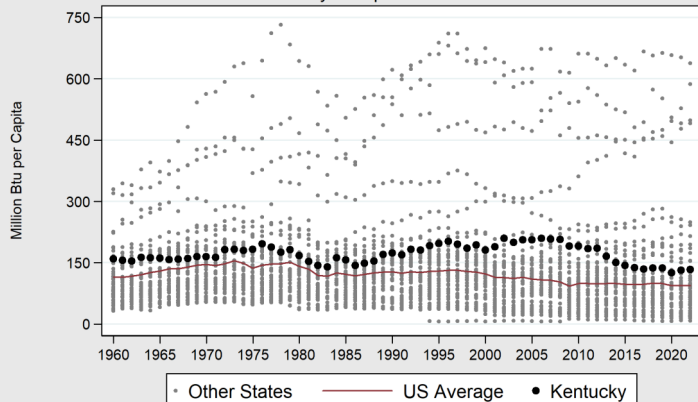
Kentucky-based manufacturing operations and farms consumed 589 trillion Btu of energy in 2022, a decrease of 0.4% from 2021. Natural gas was the largest component of industrial energy use in 2022, attributing to 35% of total industrial energy consumption. Electricity and petroleum accounted for 25% and 27% of industrial energy consumption, respectively.

*Fuels with lower contributions to industrial consumption are not reflected in figures.

Kentucky spent more than \$4.8 billion to fuel factories and farms within the Commonwealth, which was a 31% increase in industrial energy spending compared with 2021. Electricity was the largest expenditure—56% of industrial energy spending. Diesel and natural gas accounted for 15% and 25% of industrial expenditures, respectively. Coal, wood, and ethanol accounted for the remainder of industrial energy expenditures in 2022.

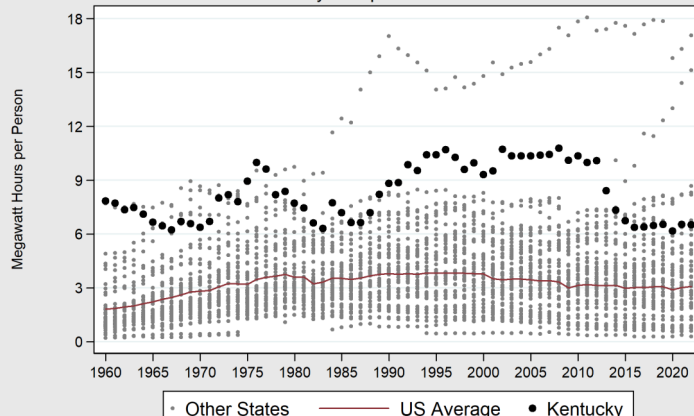
Industrial Energy Intensity

Annual Industrial Energy Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

Industrial Electricity Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

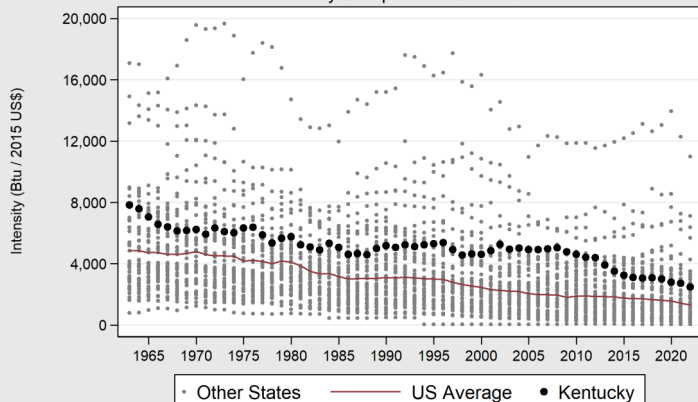
State	MMBtu per Capita	Rank
Louisiana	638.1	1st
Kentucky	133.2	14th
U.S. Average	93.6	-
Maryland	14.2	50th

Kentucky's industrial energy consumption per capita increased by 1.5% in 2022, but remains above average due to energy-intensive manufacturing.

State	MWh per Capita	Rank
Wyoming	17.1	1st
Kentucky	6.5	7th
U.S. Average	3.1	-
Rhode Island	0.6	50th

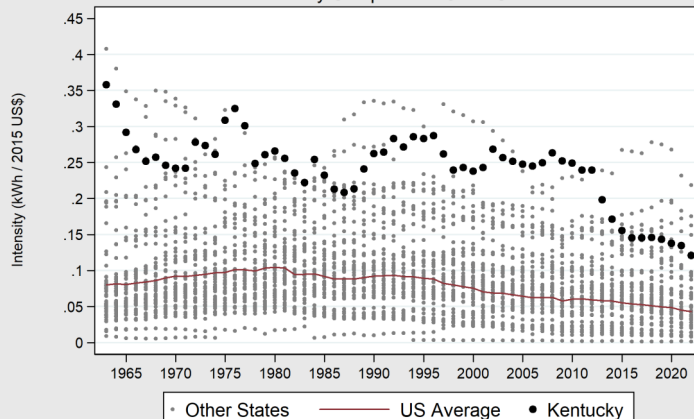
Industrial electricity consumption per capita increased 5.7% compared to 2020, but remains above average due to the presence of energy-intensive manufacturing.

Industrial Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

Industrial Electricity Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

State	Btu/\$U.S. GDP	Rank
Louisiana	10,981	1st
Kentucky	2,417	17th
U.S. Average	1,311	-
New York	174	50th

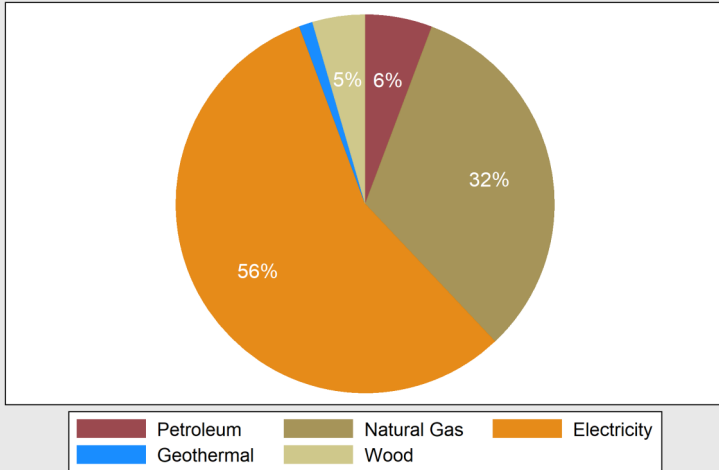
Kentucky industrial energy intensity decreased by 8.8% compared with 2021, and is decreasing significantly faster than the national average.

State	kWh/\$U.S. GDP	Rank
Wyoming	0.219	1st
Kentucky	0.121	8th
U.S. Average	0.043	-
DC	0.008	50th

In 2022, Kentucky was 8th in terms of industrial electricity use per dollar of GDP. There was a 10.4% decrease compared to 2021.

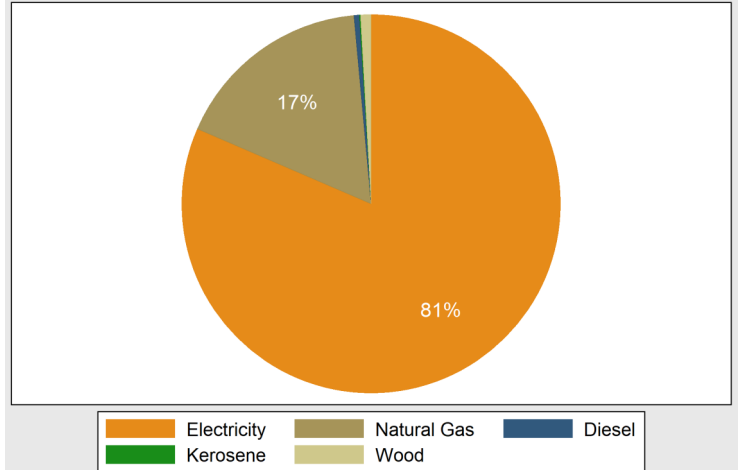
Residential Energy Consumption

Kentucky Residential Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Residential Energy Expenditures by Fuel, 2022

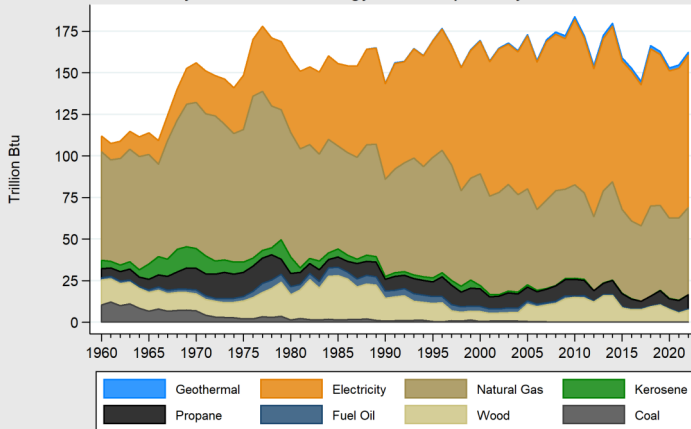


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total Net	338,374	+3.5
Electricity	91,579	+1.5%
Natural Gas	52,392	+6.3%
Wood	7,320	+30.2%
Petroleum	9,276	+21.5%
Geothermal	1,860	+0.0%

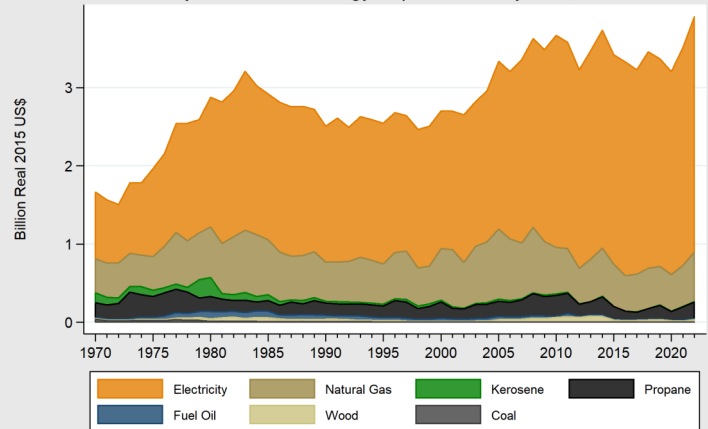
Fuel Type	Million Dollars	1 Year Change
Total	4,494	+17.3%
Electricity	3,466	+14.0%
Natural Gas	726	+26.7%
Wood	37	+94.7%
Diesel	20	+55.6%

Kentucky Residential Energy Consumption by Fuel, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky Residential Energy Expenditures by Fuel, 1970-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

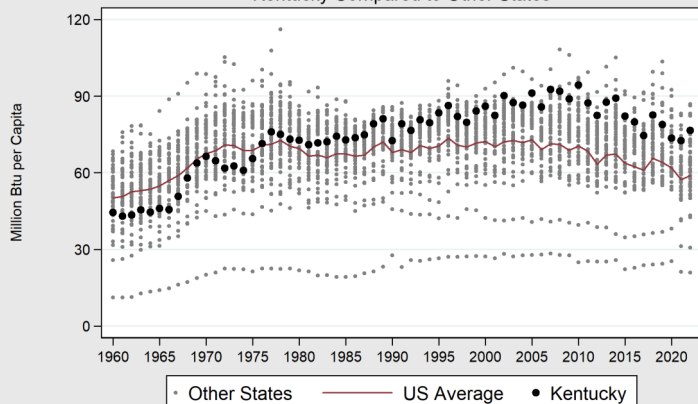
Households in Kentucky consumed 338 trillion Btu of energy in 2022, a 3.5% increase in net residential energy consumption compared with 2021. The largest portion of energy used in the residential sector—56%—was through electricity and the second largest was natural gas. Over time, electricity has increased its share of domestic energy consumption while natural gas, primarily used for home heating, has decreased.

Kentucky households spent nearly \$4.5 billion on energy commodities and energy consumption in 2022, a 17.3% increase in residential energy expenditures compared with 2021. Electricity expenditures comprised 81% of spending, which totaled almost \$3.5 billion during the year.

*Fuels with lower contributions to residential consumption are not reflected in figures.

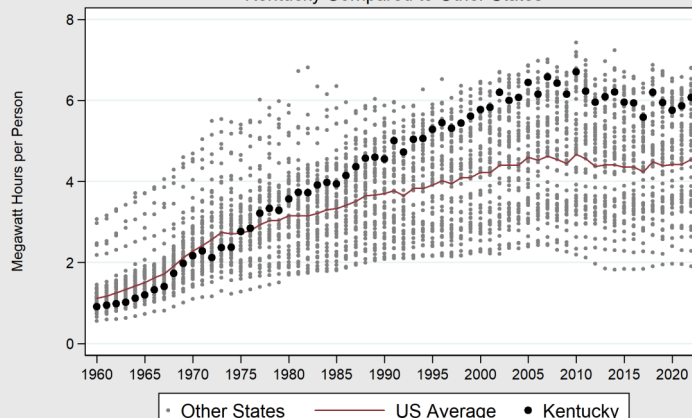
Residential Energy Intensity

Annual Residential Energy Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

Residential Electricity Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

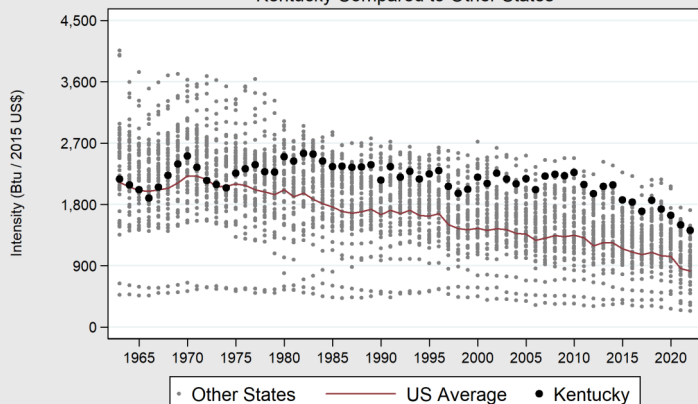
State	MMBtu per Capita	Rank
Wyoming	86.9	1st
Kentucky	76.5	6th
U.S. Average	58.9	-
Hawaii	20.9	50th

Kentucky's residential energy consumption per capita increased in 2022 by 5.5%, and is 6th highest of all states.

State	MWh per Capita	Rank
North Dakota	6.8	1st
Kentucky	6.07	11th
U.S. Average	4.55	-
Hawaii	1.91	50th

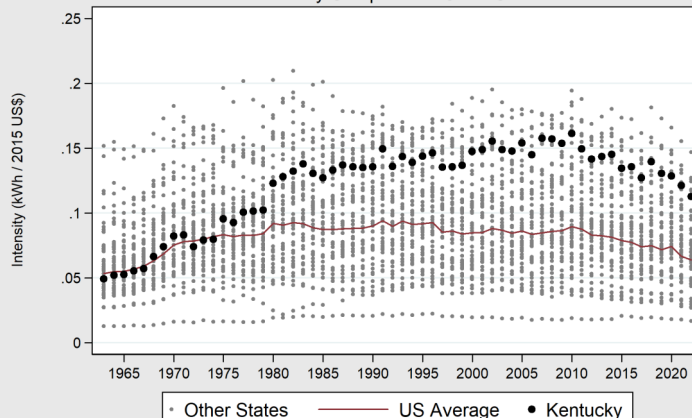
In 2022, Kentucky ranked 11th nationally in terms of residential electricity use per capita, an increase of 3.6% compared with 2021.

Residential Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

Residential Electricity Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024

State	Btu/\$U.S. GDP	Rank
West Virginia	1,715	1st
Kentucky	1,420	5th
U.S. Average	825	-
Hawaii	323	50th

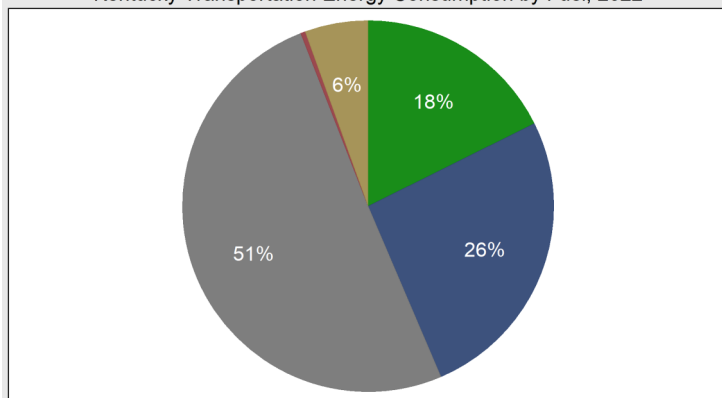
Kentucky ranked 5th in terms of residential energy consumption relative to one dollar of state GDP. Residential energy intensity decreased by 5.2% compared with 2021.

State	kWh/\$U.S. GDP	Rank
Mississippi	0.15	1st
Kentucky	0.11	8th
U.S. Average	0.06	-
California	0.02	50th

In 2022, Kentucky ranked 8th in terms of residential electricity use relative to one dollar of state GDP. There was 7% decrease compared to 2021.

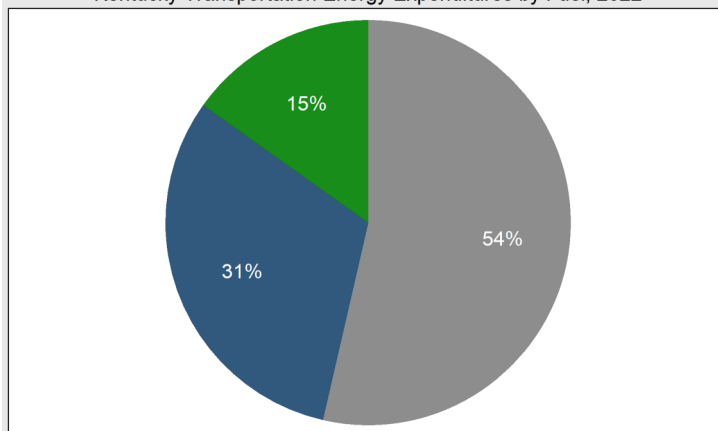
Transportation Energy Consumption

Kentucky Transportation Energy Consumption by Fuel, 2022



DEDI Energy Database, 2017

Kentucky Transportation Energy Expenditures by Fuel, 2022

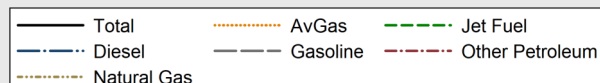
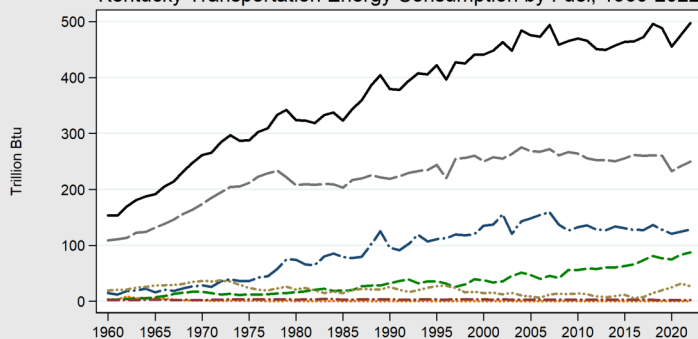


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	497,157	+0.4%
Gasoline	249,804	-0.3%
Diesel	128,268	+2.5%
Jet Fuel	87,255	+4.9%
Natural Gas	27,247	-14.3%

Fuel Type	Million Dollars	1 Year Change
Total	6,836	-30.8%
Gasoline	3,954	-30.7%
Diesel	2,111	-25.6%
Jet Fuel	771	-47.2%

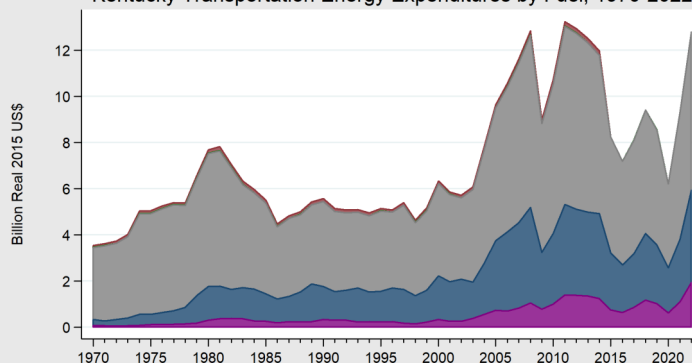
Kentucky Transportation Energy Consumption by Fuel, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Transportation sector energy consumption in Kentucky was 497 trillion Btu in 2022, a 0.4% increase compared with 2021. Gasoline was 51% of transportation energy consumption in 2022, followed by diesel at 26%. The other 23% of transportation energy consumption came from jet fuel, natural gas and propane.

Kentucky Transportation Energy Expenditures by Fuel, 1970-2022

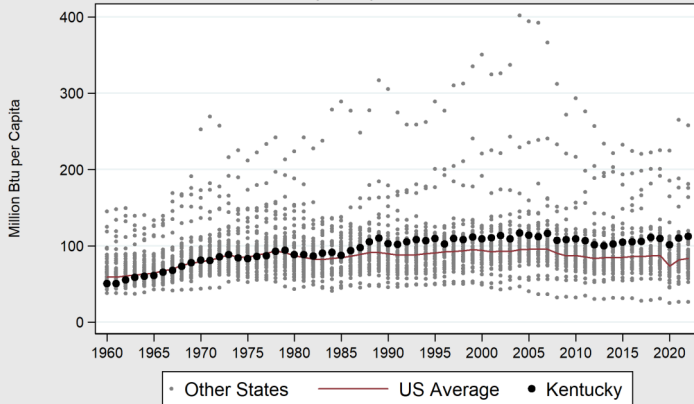


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Transportation energy expenditures were approximately \$6.8 billion in Kentucky in 2022. Compared with 2021, transportation energy expenditures decreased by 31%. Gasoline was the largest component of transportation energy expenditures with 54% of spending in 2022. Diesel expenditures were 31% of transportation energy costs in Kentucky in 2022. (Consumption of natural gas by way of transmission pipelines is not tabulated in terms of transportation sector energy expenditures).

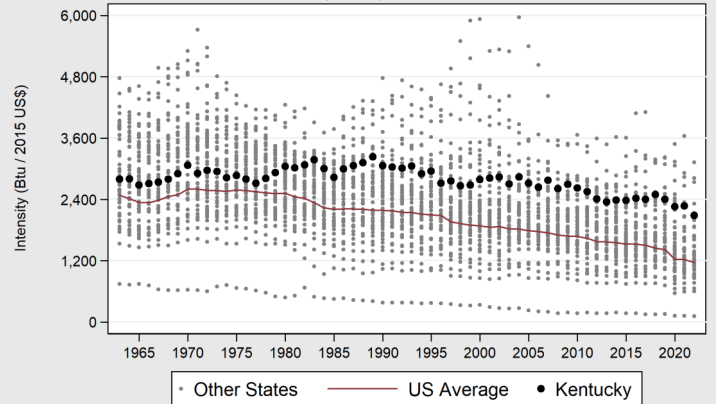
Transportation Energy Intensity

Annual Transportation Energy Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

Transportation Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

State	MMBtu per Capita	Rank
Alaska	258.0	1st
Kentucky	112.4	8th
U.S. Average	83.3	-
Rhode Island	52.3	50th

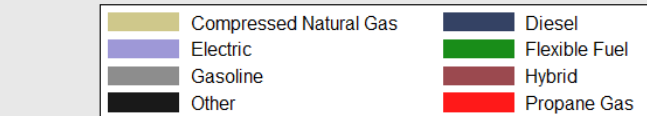
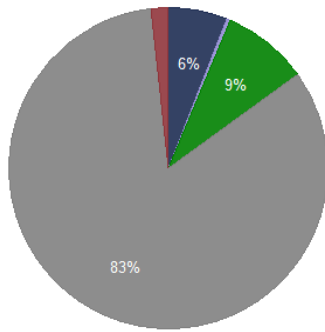
In 2022, Kentucky transportation energy consumption per capita increase by 2.4% compared with 2021, which is 8th highest of all states.

State	Btu/\$U.S. GDP	Rank
Alaska	3,126	1st
Kentucky	2,086	7th
U.S. Average	1,116	-
New York	598	50th

In 2022, Kentucky ranked 7th in terms of transportation energy consumption per dollar of state GDP. Transportation energy intensity decreased by 8% compared with 2021.

Kentucky Electric Vehicles

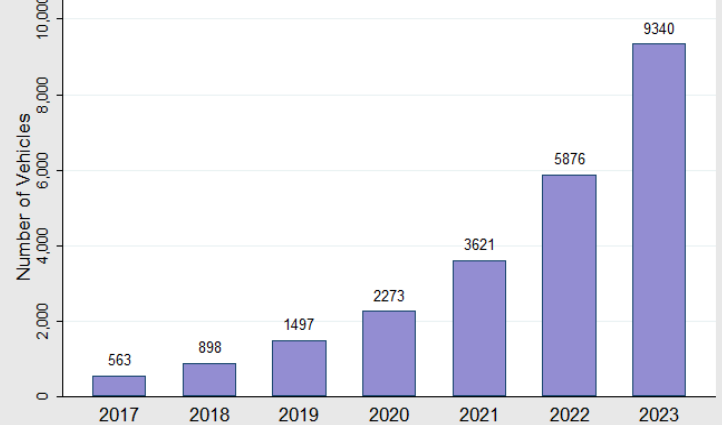
Kentucky Registered Vehicles by Fuel, 2023



Data Source: KTC Datamart
EEC-OEP, 2023

Fuel	Number of Vehicles	Percent of Total
Total	3,506,044	100%
Gasoline	2,916,806	83%
Flex Fuel	307,418	8.8%
Diesel	209,993	6.0%
Hybrid	61,685	1.8%
Electric	9,340	0.3%
CNG	615	>0.1%
Propane Gas	70	>0.1%
Other	117	>0.1%

Kentucky Electric Vehicles
Fully Electric and Hybrid Vehicles



EEC-OEP
Data Source: KTC Datamart

Year	Number of EVs	1 Year Change (%)
2017	563	NA
2018	898	59.5%
2019	1,497	66.7%
2020	2,273	51.9%
2021	3,621	59.3%
2022	5,876	62.3%
2023	9,340	58.9%

The Infrastructure Investment and Jobs Act (IIJA) established the [NEVI Formula Program](#). The NEVI Formula Program provides \$5 billion to states to strategically deploy a total of 500,000 EV chargers by 2030, through an interconnected network to facilitate data collection, access, and reliability. The Commonwealth will receive \$69.5 million in NEVI Formula Program funding between Fiscal Years 2022-2026. With the required 20% non-Federal match, which will be covered by private sector participation, the total funding available for the Commonwealth's EV network build-out is approximately \$87 million.

The Kentucky Transportation Cabinet (KYTC) and the Energy and Environment Cabinet (EEC) worked in close coordination with the Public Service Commission, the Kentucky Cabinet for Economic Development, the Federal Highway Administration, the Cabinet for Finance and Administration, the Cabinet for Arts and Heritage, the Cabinet for Education and Labor, and the public to develop [The Electric Vehicle Infrastructure Deployment Plan](#). Approved by the Joint Office of Energy and Transportation on September 14th of 2022, The Plan envisions a phased approach to create a reliable, accessible, convenient, and affordable EV charging network that supports transportation choices, energy diversification, economic development, and environmental sustainability for all Kentuckians.

The Federal Highway Administration's (FHWA) Fact Sheet for the NEVI Formula Program can be found here: [NEVI Fact Sheet](#).

Kentucky Fuel Profiles



Kentucky Fuel Profiles

Kentucky's energy profile is dominated by fossil fuels, reflecting the state's abundant natural resources and longstanding ties to the coal industry. However, economic pressures, environmental regulations, and technological advancements are driving a shift toward a more diverse energy mix. Coal, petroleum, and natural gas are the backbone of Kentucky's electricity generation, but the growth of renewable energy sources like solar, biofuels, and hydroelectric power is reshaping the state's approach to meeting its energy needs.

Coal has been the cornerstone of Kentucky's energy production for over a century, making the state one of the nation's top coal producers. In the mid-20th century, coal accounted for nearly 90% of the state's electricity generation. However, in recent years, coal usage has sharply declined due to economic competition from cheaper natural gas, stricter environmental regulations, and the growing availability of renewables. By 2022, coal production in the state had declined to 28 million tons. Despite its decline, coal still plays a significant role in Kentucky's energy landscape, though its future viability remains uncertain as the state seeks to comply with federal emissions standards.

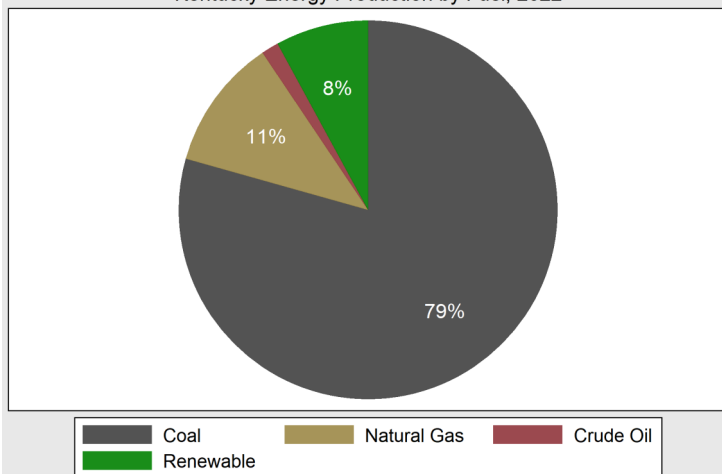
Petroleum products have traditionally been used in Kentucky primarily for transportation and industrial purposes rather than electricity generation. In the past, the state relied heavily on petroleum for heating, diesel fuel, and gasoline, especially in the rural and agricultural sectors. With advancements in fuel efficiency and the introduction of electric vehicles, petroleum demand has stabilized in recent years. However, Kentucky's energy infrastructure still supports a significant level of petroleum imports and refining. The use of petroleum for electricity generation remains minimal, but the state continues to use it for backup power in peak demand situations and for off-grid rural communities.

Natural gas has become an increasingly important part of Kentucky's energy mix, especially in the last two decades. Historically, natural gas played a minor role in electricity generation, but the shale gas boom and the subsequent drop in prices made it a more attractive option. In the early 2000s, natural gas accounted for less than 5% of the state's electricity generation; by 2022, this figure had risen to nearly 30%. The growth of natural gas is driven by its lower emissions profile compared to coal and its ability to serve as a flexible, reliable power source. New pipeline infrastructure and expanded storage capabilities have further cemented natural gas as a key element of Kentucky's transition towards a lower-carbon energy system.

Renewable energy sources are gaining traction in Kentucky as the state looks to diversify its energy mix and reduce greenhouse gas emissions. Hydroelectric power has been a consistent contributor, especially from the Ohio River dams, but accounts for a relatively small portion of total electricity generation. Solar energy is seeing rapid growth, driven by federal incentives as well as both utility-scale projects and distributed installations on agricultural land. Biomass, sourced from the state's rich forestry and agricultural waste, is also contributing to the renewable energy portfolio. In the early 2000s, renewables made up less than 2% of Kentucky's electricity generation, but by 2022, this figure had risen to approximately 10%, signaling a significant shift towards cleaner energy sources. The state's continued investment in solar, hydroelectric, and biofuel projects highlights its commitment to expanding renewable capacity in the coming years.

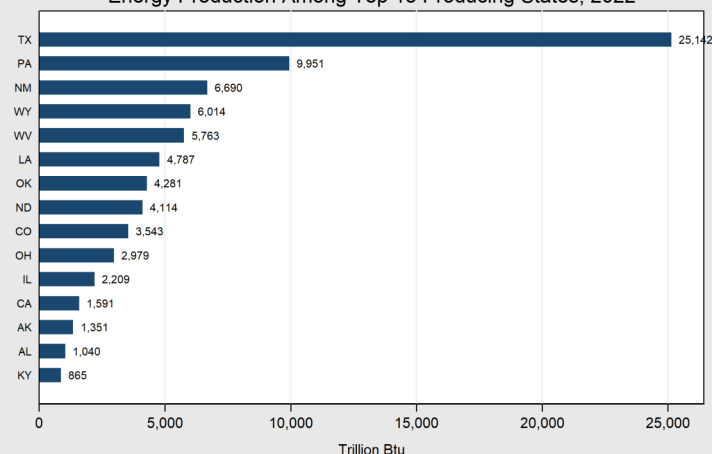
Kentucky Energy Production

Kentucky Energy Production by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Energy Production Among Top 15 Producing States, 2022



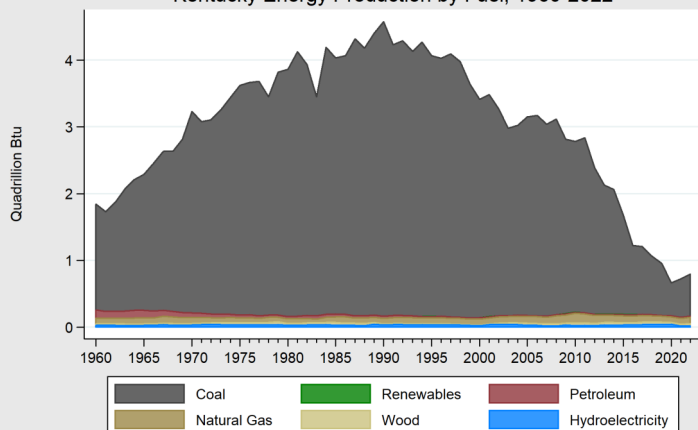
Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	865,410	+10.1%
Coal	686,921	+10.2%
Natural Gas	97,151	+12.5%
Renewable	68,537	+10.7%
Crude Oil	12,800	-8.7%

State	Quadrillion Btu	Rank
Texas	25.1	1st
Kentucky	.9	15th

Kentucky was the 15th largest producer of energy in 2022. As recently as 2009, Kentucky ranked 4th among all states; however, the increased adoption of horizontal hydraulic fracturing has increased production in other states and the decline of coal mining has decreased production in Kentucky.

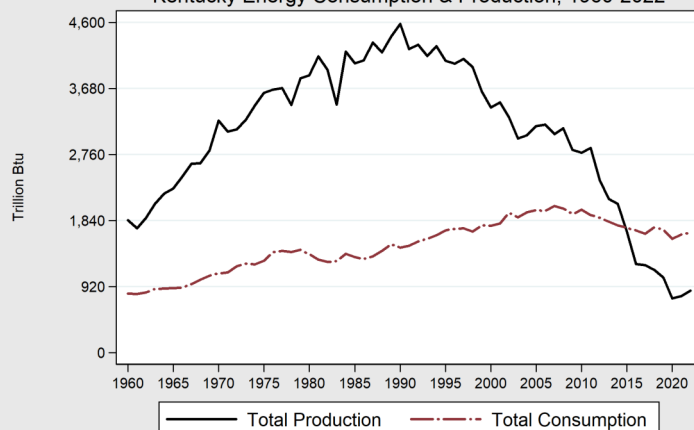
Kentucky Energy Production by Fuel, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky produced 865 Trillion Btu of energy in 2022. Despite declining production since 1990, coal supplies the vast majority of energy production in Kentucky at 687 Trillion Btu, or 79% of all energy produced. Natural gas, renewable resources, and crude oil—despite significant growth in recent years—combined to only account for 21% of energy production.

Kentucky Energy Consumption & Production, 1960-2022

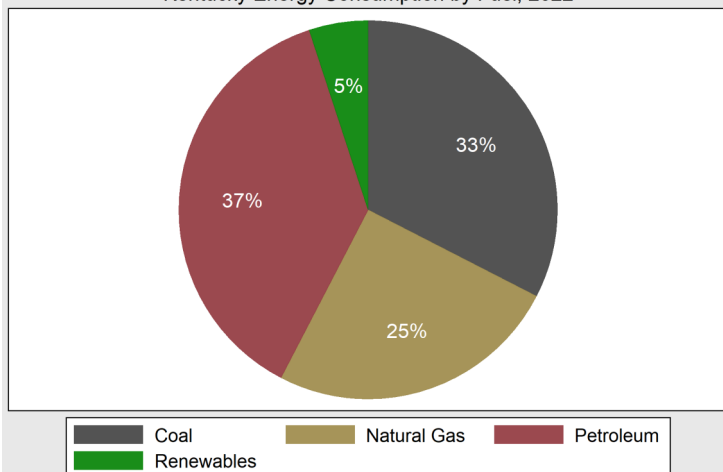


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Due to abundant coal resources, Kentucky has historically been a net exporter of energy. The trend in coal production in Kentucky has always driven the trend in overall energy production. However, with decreasing coal production and stable demand, Kentucky's net exports of energy have declined since 1990.

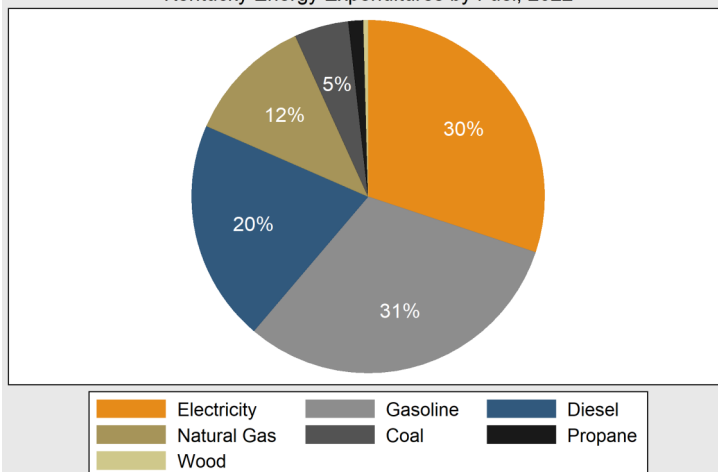
Kentucky Energy Consumption

Kentucky Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Energy Expenditures by Fuel, 2022



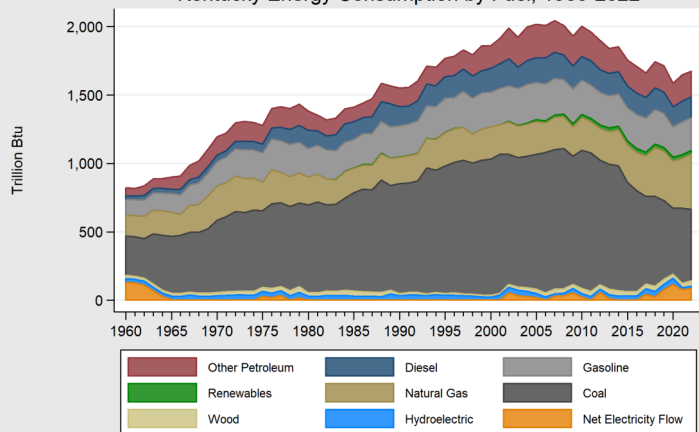
Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	1,673,214	+1.5%
Coal	523,276	-4.6%
Petroleum	600,664	-0.8%
Natural Gas	402,659	+10.0%
Renewables	80,976	+9.7%

Fuel Type*	Million (\$ US)	1 Year Change
Total	27,346	+34.1%
Gasoline	8,112	+31.4%
Electricity	7,852	+16.4%
Diesel	5,308	+57.6%
Coal	1,301	+21.2%
Natural Gas	3,045	+56.1%

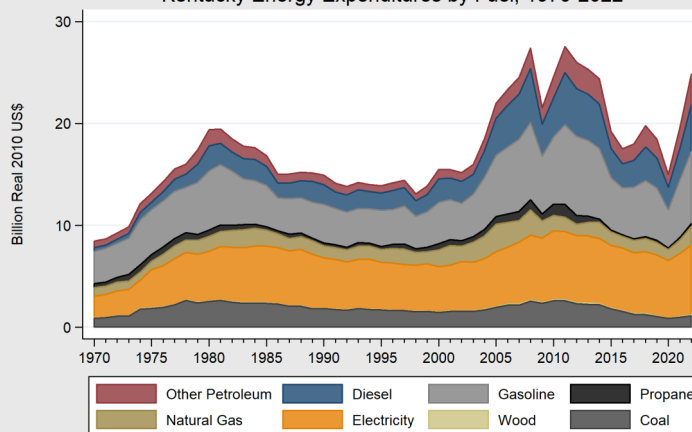
*Only top five sources listed

Kentucky Energy Consumption by Fuel, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky Energy Expenditures by Fuel, 1970-2022

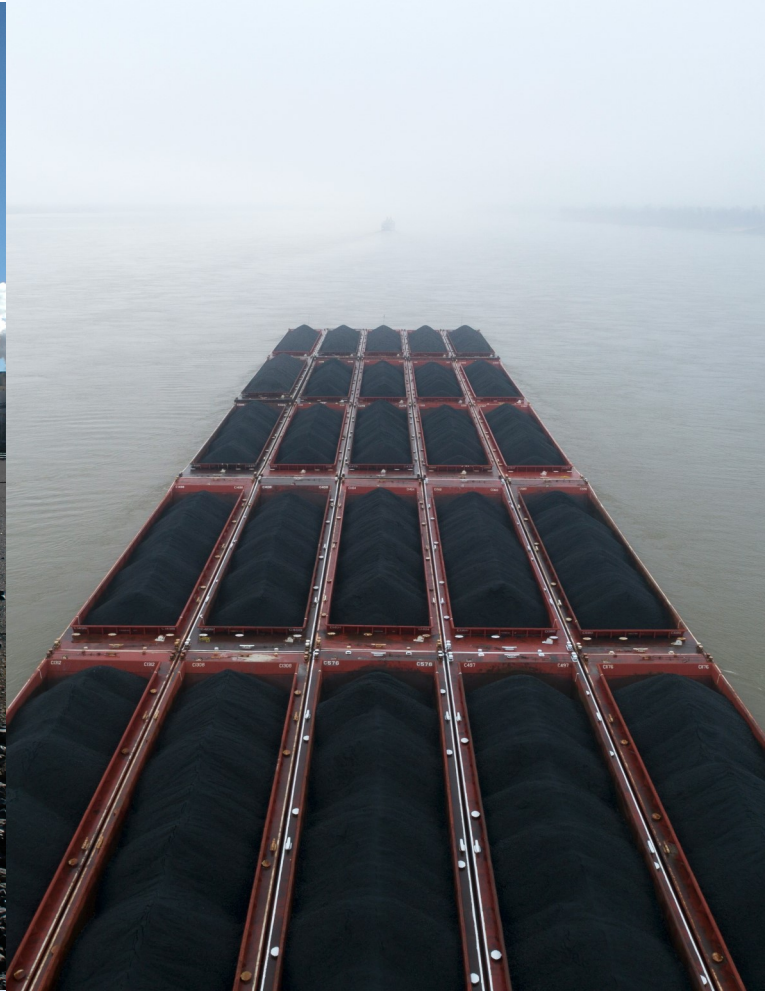


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

During 2022, Kentucky consumed 1.67 quadrillion Btu of energy, an increase of 1.5% compared with 2021. Petroleum was Kentucky's primary energy source, providing 37% of the state's energy requirements. Coal was the second largest source of energy at 33%. The remainder of energy consumption was supplied by natural gas, at 25%, and renewable energy sources at 5%.

More than \$27 billion was spent on energy in Kentucky in 2022, an increase of 34% in energy expenditures compared with 2021. During the year, electricity was 30% of energy expenditures and gasoline was 31%. Diesel fuel accounted for 20% of energy expenditures. Coal and natural gas consumption, other than electricity, together accounted for approximately 17% of energy expenditures.

Kentucky Coal Profile



Kentucky Coal Production

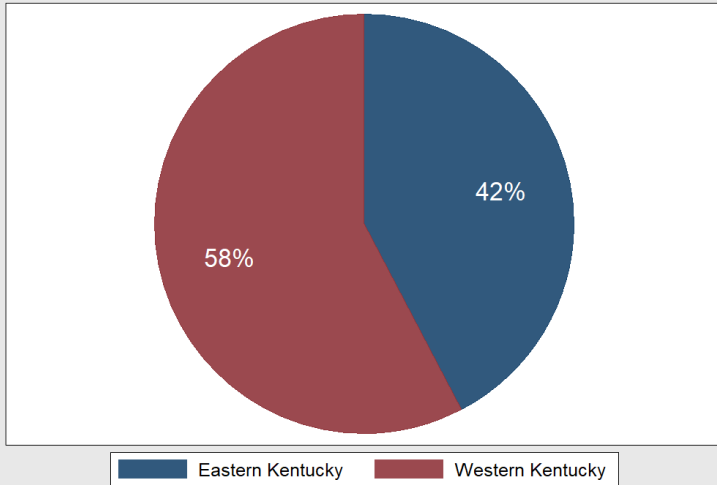
County	2022 Tonnage	Percentage
Total	28,479,713	100%
Union	10,158,148	35.67%
Hopkins	4,115,682	14.45%
Pike	3,576,072	12.56%
Muhlenberg	2,156,026	7.57%
Harlan	2,131,407	7.48%
Perry	2,081,843	7.31%
Letcher	1,222,488	4.29%
Bell	669,802	2.35%
Johnson	513,435	1.80%
Knott	418,735	1.47%
Leslie	384,394	1.35%
Floyd	239,324	0.84%
Martin	208,933	0.73%
Knox	190,488	0.67%
Whitley	167,261	0.59%
Morgan	126,642	0.44%
Breathitt	102,016	0.36%
Elliott	10,737	0.04%

During 2022, coal production in the Commonwealth increased to 28.5 million tons. Union County remained the top producer of coal in Kentucky throughout the entire year. Pike County, the largest producer from 1978 to 2011, mined the most in eastern Kentucky.

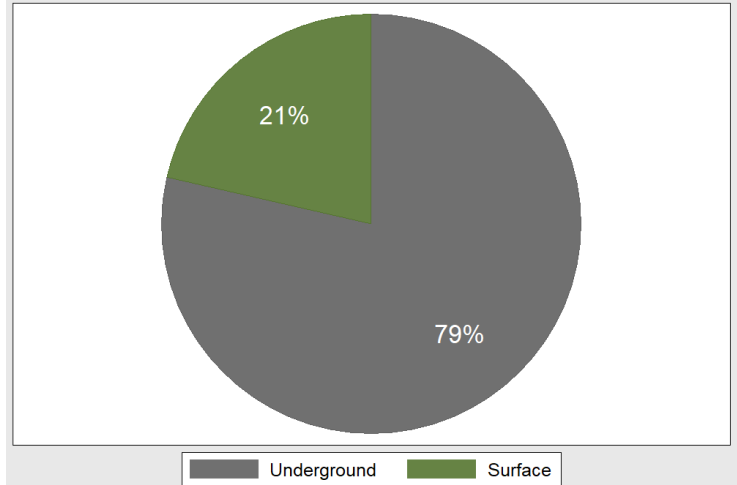
In Kentucky, coal mining is divided between two different geologic basins—the Central Appalachian Basin of eastern Kentucky and the Illinois Basin of western Kentucky. Kentucky is the only major coal exporting state to span two geologic basins, and the chemical composition and accessibility of the coal from each is distinct. Eastern Kentucky has recorded coal mining since as early as 1790 and western Kentucky is known to have had mining operations in 1820. The coalfield of eastern Kentucky has coal with a relatively higher heat content and lower sulfur content than western Kentucky. Eastern Kentucky coal is also more difficult to mine. As a result of differences regarding the extractability and quality of the coal, eastern Kentucky is overall more expensive than western Kentucky coal. The difference in the delivered price of coal between the two coalfields is a result of numerous factors that affect both the supply of and demand for coal, including transportation costs, the ease of accessing coal and the subsequent mining techniques employed, and the chemical properties and heat content of the coal.

Kentucky Coal Production

Kentucky Total Coal Production, 2022



Kentucky Total Coal Production, 2022



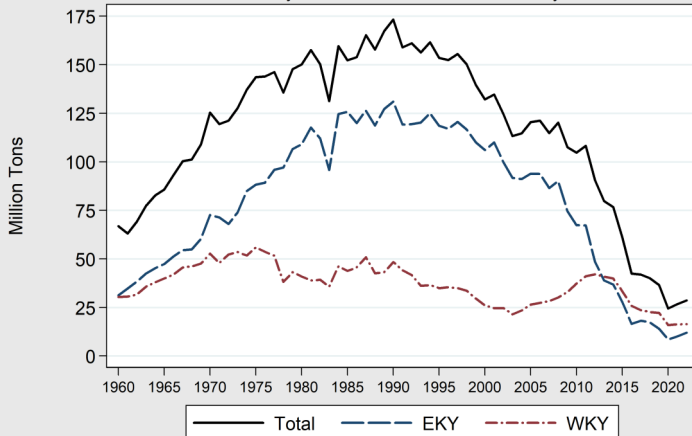
Region	2022 Tonnage	Annual Change
Total	28,479,713	+7.7%
Western Kentucky	16,429,856	+0.8%
Eastern Kentucky	12,049,857	+18.6%

Kentucky coal mines produced 28.5 million tons in 2022, an increase of 7.7% from 2021. Production increased in both the eastern and western coalfields in 2022.

Mine Type	2022 Tonnage	Annual Change
Total	28,479,713	+7.7%
Underground	22,504,852	+4.7%
Surface	6,127,875	+17.6%

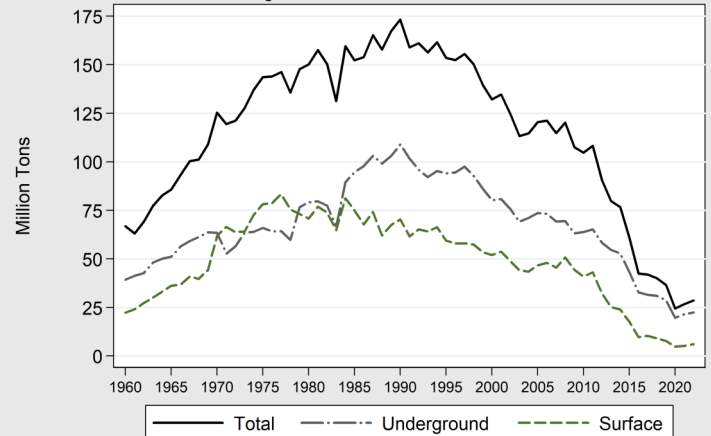
The majority of Kentucky coal production has been from underground operations since 1979, following the passage of the Surface Mine Control and Reclamation Act of 1977.

Kentucky Coal Production, 1960-2022
Eastern Kentucky Production & Western Kentucky Production



Eastern Kentucky was the top-producing region in Kentucky between 1912 and 2013. Western Kentucky coal mines have produced the majority of coal in the Commonwealth since the third quarter of 2013.

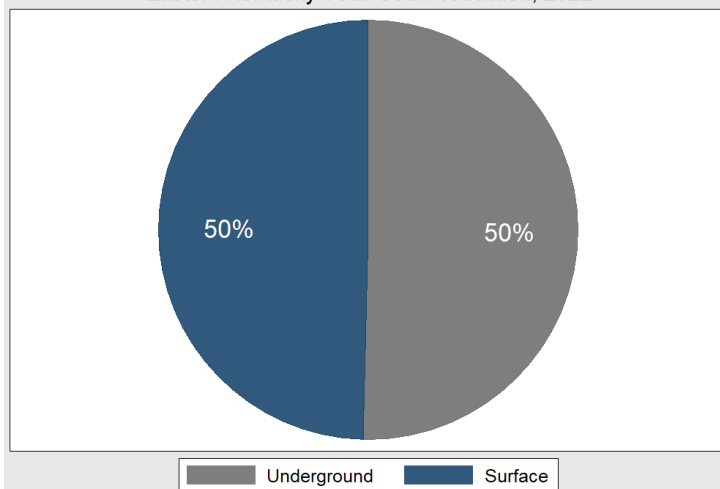
Kentucky Total Coal Production, 1960-2022
Underground Production vs. Surface Production



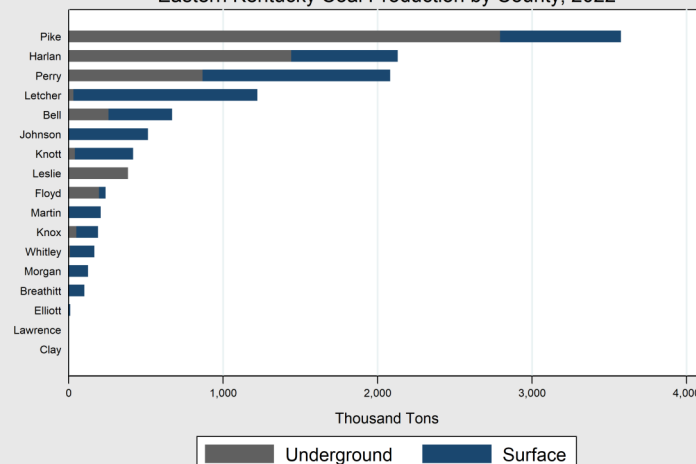
Underground coal mines produced 22.5 million tons of coal, or 79% of total Kentucky production in 2022, an increase of 4.7% from 2021. Surface mining operations, which mined 6.1 million tons of coal, increased production by 17.6% since 2021. Production has trended down in both surface and underground mining since 1990; however, Kentucky experienced its first increase in production since 2011.

Eastern Kentucky Coal Production

Eastern Kentucky Total Coal Production, 2022



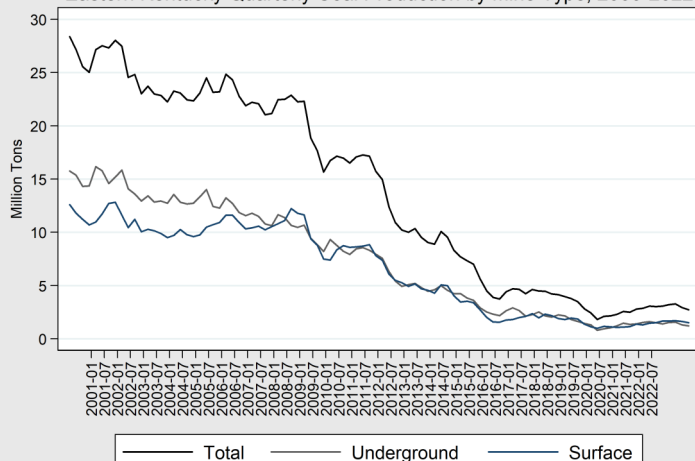
Eastern Kentucky Coal Production by County, 2022



Mine Type	2022 Tonnage	Annual Change
Total	12,049,857	+18.6%
Surface	5,974,860	+26.7%
Underground	6,074,997	+11.6%

Eastern Kentucky coal production increased in 2022 by 18.6% to 12.1 million tons of coal, split evenly between surface and underground mines.

Eastern Kentucky Quarterly Coal Production by Mine Type, 2000-2022



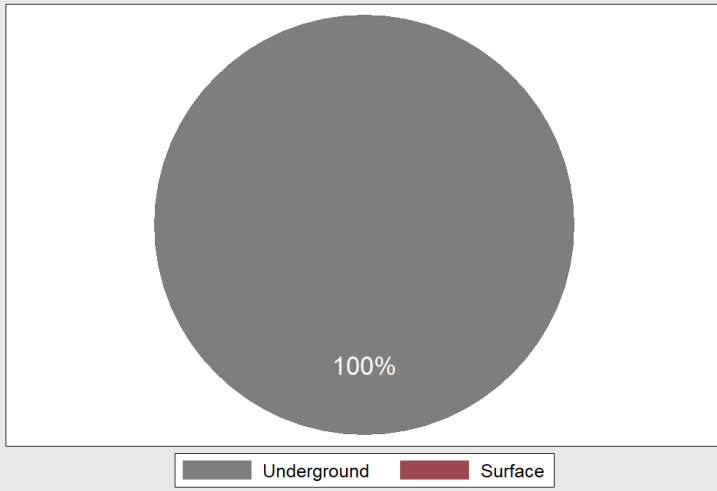
Annual production increased at both underground and surface mining operations in eastern Kentucky in 2022, by 11.6% and 26.7% respectively.

Eastern County	2022 Tonnage	Annual Change
Pike	3,576,072	+13.5%
Harlan	2,131,407	+19.8%
Perry	2,081,843	+10.1%
Letcher	1,222,488	+82.9%
Bell	669,802	+21.8%
Johnson	513,435	-9.9%
Knott	418,735	-15.3%
Leslie	384,394	+12.9%
Floyd	239,324	+70.3%
Martin	208,933	+52.0%
Knox	190,488	-17.0%
Whitley	167,261	+1.0%
Morgan	126,642	+681.3%
Breathitt	102,016	+434.5%
Elliott	10,737	+>100%

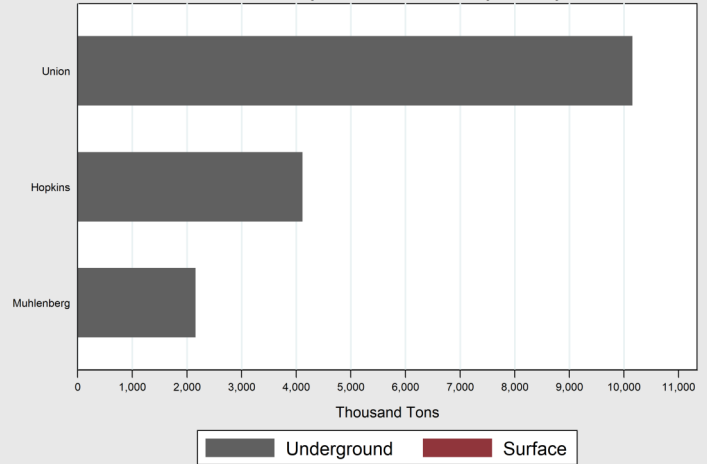
Pike County, the largest coal producing county in the East, increased coal production by 13.5%. Harlan and Perry counties also increased production, producing over 1 million tons of coal in 2022.

Western Kentucky Coal Production

Western Kentucky Total Coal Production, 2022



Western Kentucky Coal Production by County, 2022



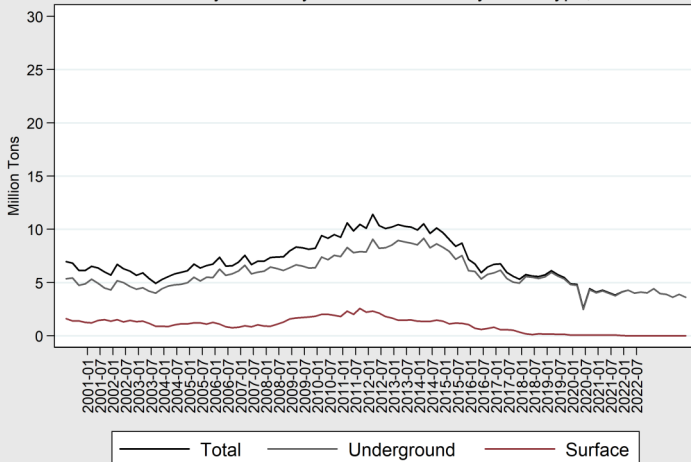
Mine Type	2022 Tonnage	Annual Change
Total	16,429,856	+0.8%
Underground	16,429,856	+2.3%
Surface	0	>100%

Western Kentucky mined 16.4 million tons of coal in 2022, an increase of 0.8% from 2021. Underground mines accounted for 100% of regional production in 2022.

Western County	2022 Tonnage	Annual Change
Union	10,158,148	3.2%
Hopkins	4,115,682	-0.6%
Muhlenberg	2,156,026	4.2%

Union County remained Kentucky's leading coal producing county, mining 10.2 million tons during 2022. Production in the county increased by 3.2% from the year prior.

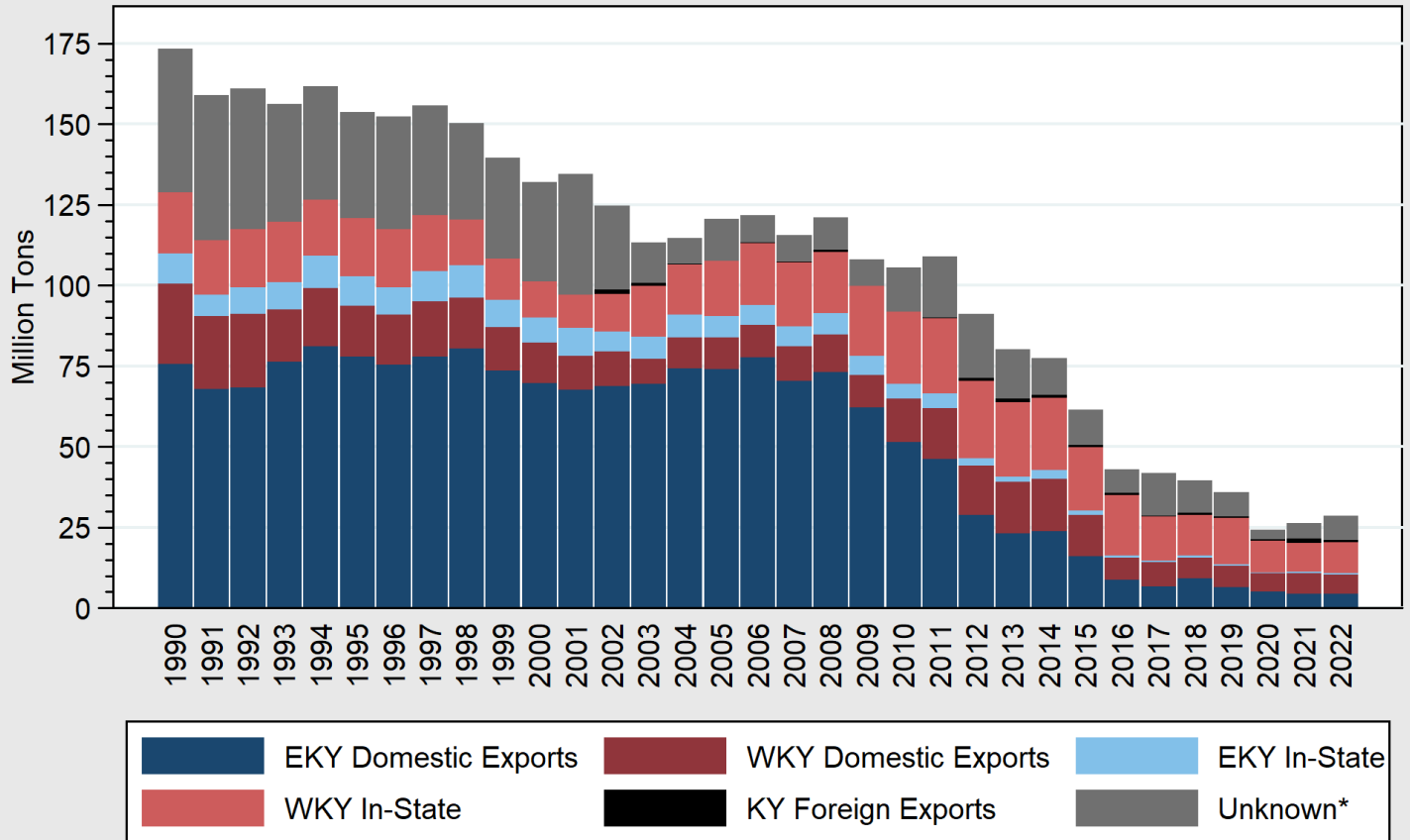
Western Kentucky Quarterly Coal Production by Mine Type, 2000-2022



Most western Kentucky mining since 1985 has been underground. As a result of the topography and basinal structure of the Illinois Basin, surface coal production is relatively more accessible on the edges of the coalfield, further from the Ohio River, where much of the economically viable coal has been extracted in years past. The topography, in part, explains the relative increase in underground mining in the region since 1983 and the relative decrease in surface mining since peak regional surface production in 1972.

Kentucky Coal Distribution, 2022

Kentucky Coal Distribution by Destination, 1990-2022



Kentucky Energy Database, EEC-OEP, 2024
 Data Source: EIA-923 & U.S. Census Bureau-Foreign Trade Division
 *Combination of Industrial, Institutional, & Unknown

Coal Distribution by Destination, 2022

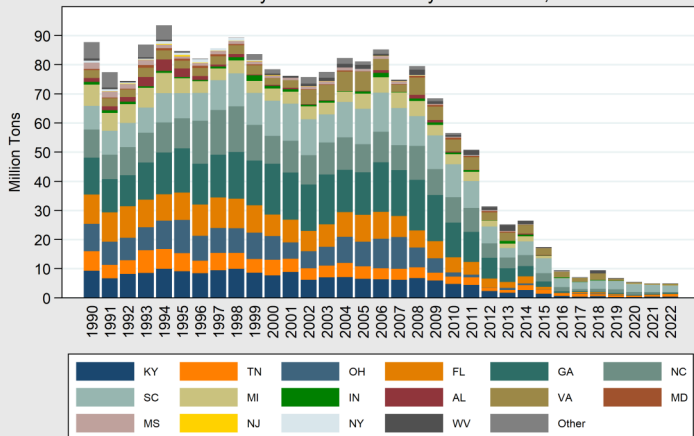
Coal and Destination	Thousand Tons	Percentage
Total Production	28,480	100%
WKY In-State	9,584	33.6%
WKY Out-of-State	5,980	21.0%
EKY Out-of-State	4,459	15.7%
EKY In-State	425	1.5%
Foreign Exports	679	2.4%
Unknown*	7,353	25.8%

The annual distribution of coal mined in Kentucky is a combination of in-state consumers, out-of-state power plants, factories, and foreign exports.

Eastern Kentucky coal has predominantly been sold to states in the southeastern United States. Conversely, western Kentucky coal has mostly been mined for in-state consumption. Kentucky remains the single-largest consumer of Kentucky coal, increasing its consumption as other states have decreased their consumption of coal from Kentucky. The Cooper, H.L. Spurlock, and Mill Creek were the only power plants that consumed eastern Kentucky coal in Kentucky.

Kentucky Coal Deliveries

Eastern Kentucky Coal Deliveries by Destination, 1990-2022



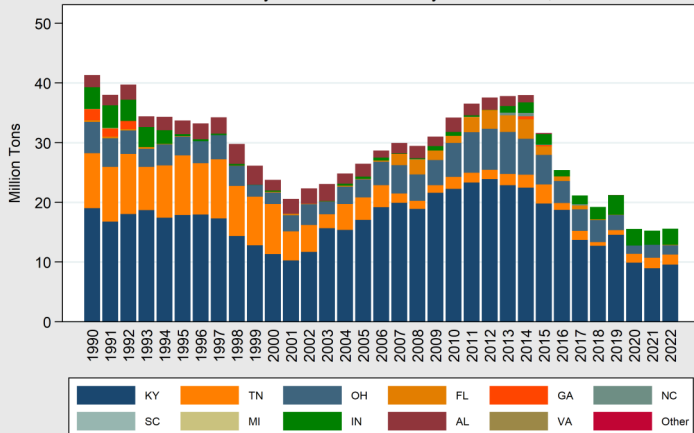
Kentucky Energy Database, EEC-OEP, 2024
Data Source: Form EIA 923

Known shipments of steam coal from eastern Kentucky to power plants within the United States remained around 4.8 million tons in 2022. The largest markets for eastern Kentucky coal are traditionally located in the southeast, and were led by South Carolina and Virginia. Overall, coal mined in the region was shipped to 10 different states in 2022.

Eastern Kentucky Coal Deliveries, 2022

Destination	Thousand Tons	Percentage
Total	4,810	100%
South Carolina	2,169	45.1%
Virginia	318	6.6%
North Carolina	396	8.2%
Tennessee	696	14.5%
Florida	174	3.6%
Kentucky	425	8.8%
West Virginia	254	5.3%
Ohio	10	0.2%
Georgia	303	6.3%
Michigan	65	1.4%

Western Kentucky Coal Deliveries by Destination, 1990-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: Form EIA 923

Known shipments of steam coal from western Kentucky to power plants within the United States rose to 15.6 million tons in 2022. The largest market for western Kentucky coal is consistently Kentucky, which represented 61.5% of western Kentucky coal deliveries during the year. Overall, coal mined in western Kentucky was shipped to 5 different states in 2022.

Western Kentucky Coal Deliveries, 2022

Destination	Thousand Tons	Percentage
Total	15,564	100%
Kentucky	9,584	61.5%
Florida	1,559	10.0%
Indiana	2,688	17.3%
Tennessee	1,658	10.7%
Ohio	75	0.5%

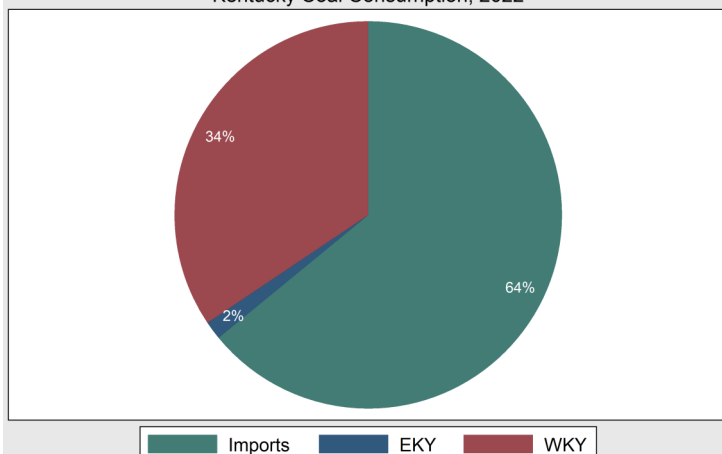
Kentucky Coal Deliveries, 2022

Origin	Thousand Tons	1 Year Change
Total	20,374	+1.2%
WKY	15,564	+2.0%
EKY	4,810	-1.4%

Total Kentucky coal deliveries have continued to decrease since 2014, primarily because of reduced shipments from eastern Kentucky. Overall, there was a 1.2% increase since 2021.

Kentucky In-State Coal Consumption

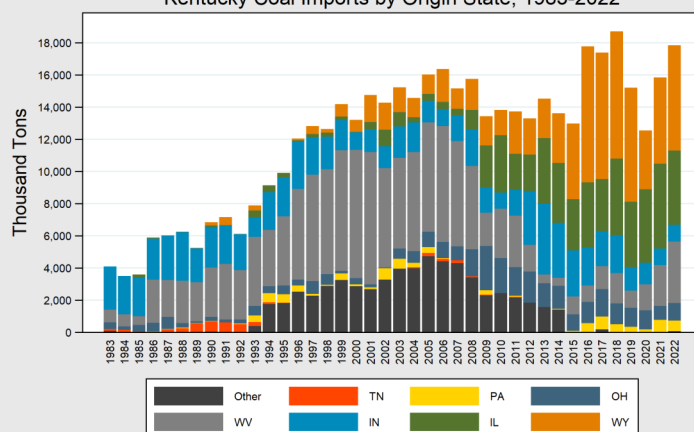
Kentucky Coal Consumption, 2022



Kentucky Energy Database, EEC-OEP, 2023

Data Source: Form EIA-923. EKY=Eastern Kentucky. WKY=Western Kentucky

Kentucky Coal Imports by Origin State, 1983-2022



Kentucky Energy Database, EEC-OEP, 2024

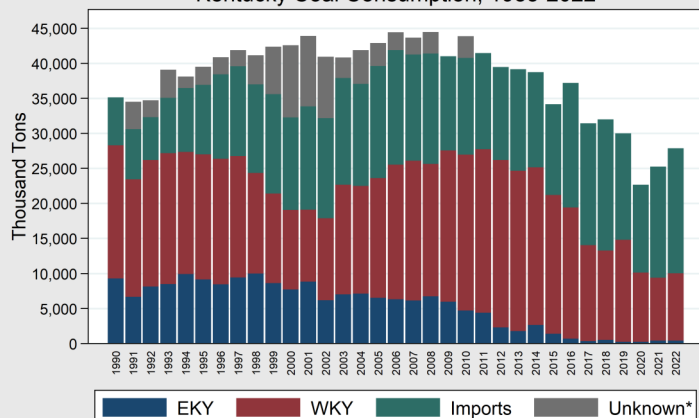
Data Source: Form EIA 923

Origin of Coal	Thousand Tons	1 Year Change
Total	27,857	+12.2%
Western Kentucky	9,584	+6.9%
Imports	17,828	+12.6%
Eastern Kentucky	425	+2.4%

Imported Coal	Thousand Tons	1 Year Change
Total Imports	17,828	+12.2%
Wyoming	6,539	+21.5%
Illinois	4,631	-12.0%
Indiana	1,048	+1.9%
Ohio	1,088	+24.3%
West Virginia	3,813	+50.2%
Pennsylvania	656	-13.3%

All values have been rounded to the nearest thousand tons.

Kentucky Coal Consumption, 1983-2022



Kentucky Energy Database, EEC-OEP, 2024

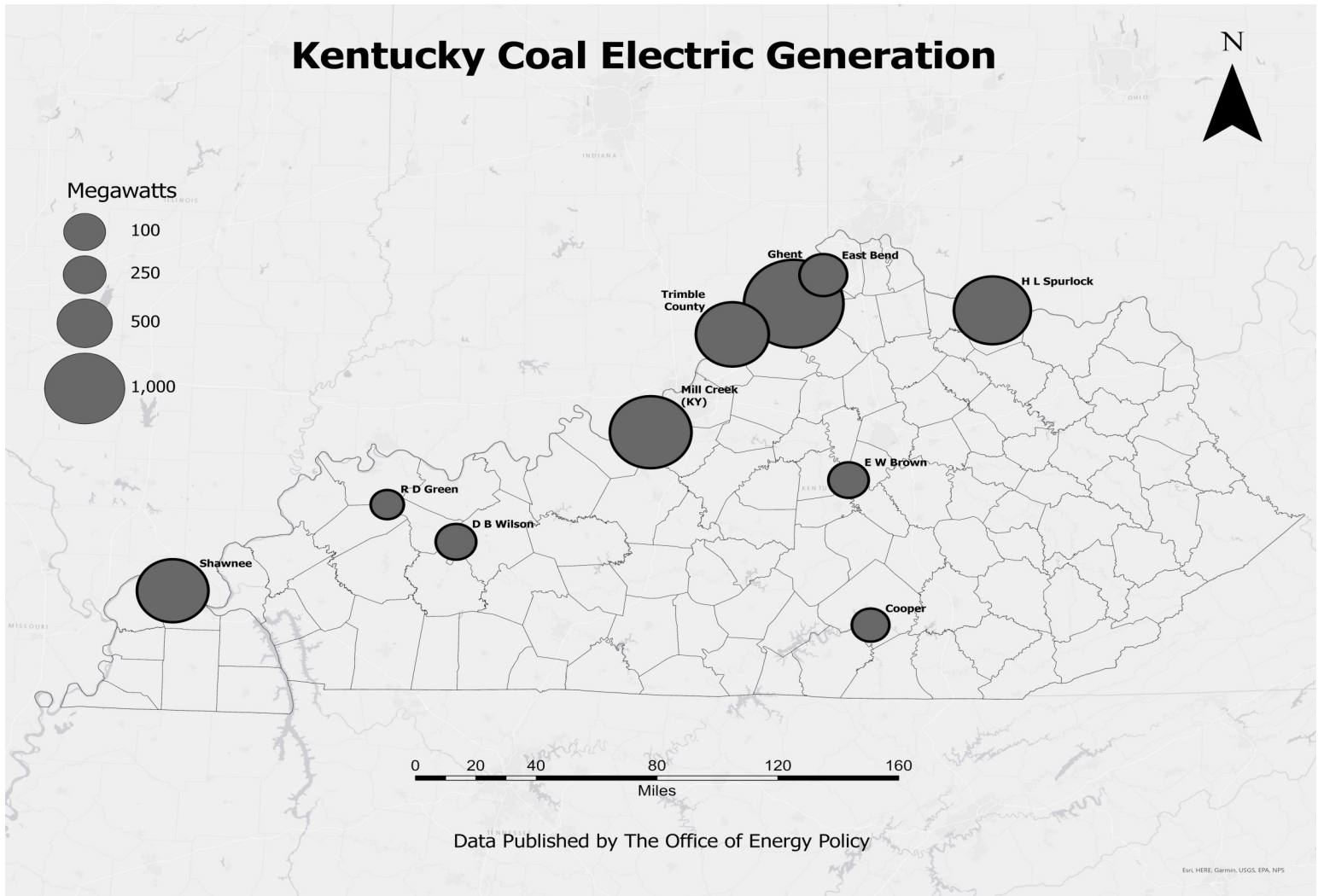
*Combination of Industrial, Institutional, & Unknown

Data Source: Form EIA-923. EKY=Eastern Kentucky. WKY=Western Kentucky

Coal consumption in Kentucky increased by 12.2% in 2022 to 27.9 million tons. Coal imports were the largest source of coal used within the Commonwealth, representing 64% of coal consumption. Conversely, coal from eastern Kentucky accounted for 2% of the coal consumed in Kentucky in 2022.

Several factors affect the use of imported coal in Kentucky including the price, delivery cost, heat content, and the sulfur content of a particular coal. For electrical power generation, utilities must balance the economic and environmental costs of these factors when purchasing coal. As a result, electric utilities, municipalities, and power producers often blend coal from a variety of sources to maintain a diversified cost-effective fuel resource while complying with environmental regulations. Since 1990, electric utilities in Kentucky have increasingly used coal containing relatively higher sulfur content, a trend accelerated through 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 recent decisions in Kentucky has meant an increasing reliance on western Kentucky coal supplies, and a diminishing demand for eastern Kentucky coal. The relatively low price of coal from several western states has also increased imports for electric power generation.

Kentucky Coal Electric Generation

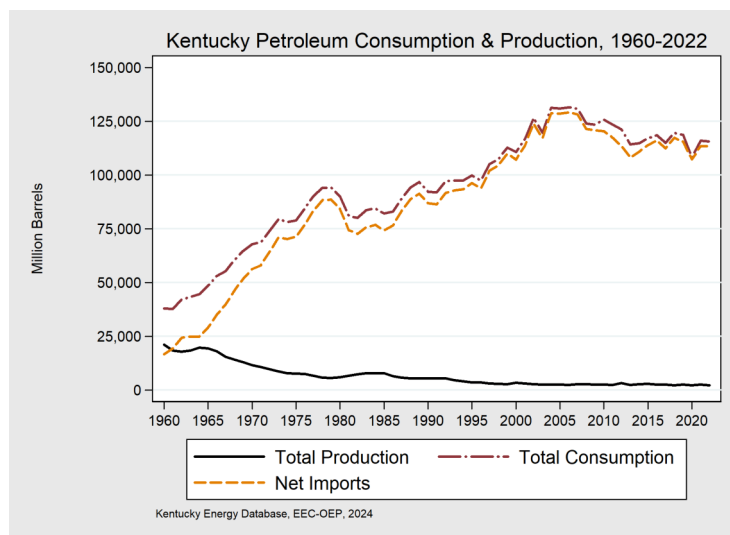
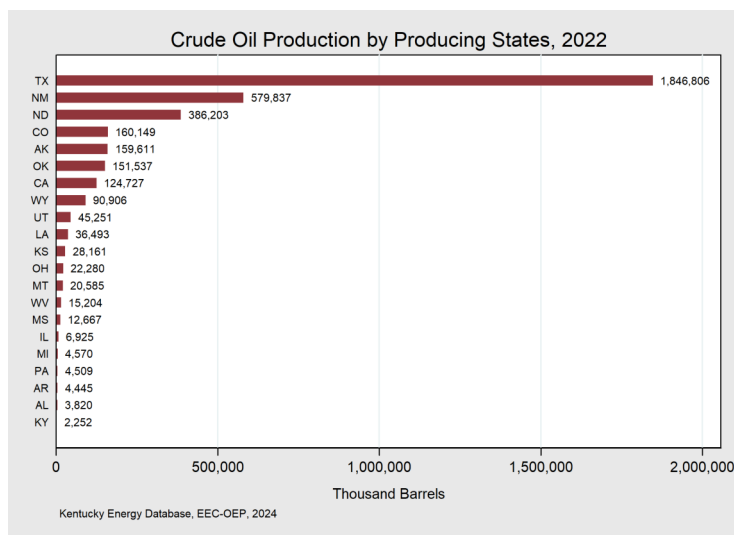


Name	Capacity (MW)
Cooper	341
DB Wilson	417
EW Brown	412
East Bend	600
Ghent	1919
HL Spurlock	1346
Mill Creek	1465
RD Green	231
Shawnee	1206
Trimble	1243

Kentucky Petroleum Profile



Kentucky Crude Oil Production



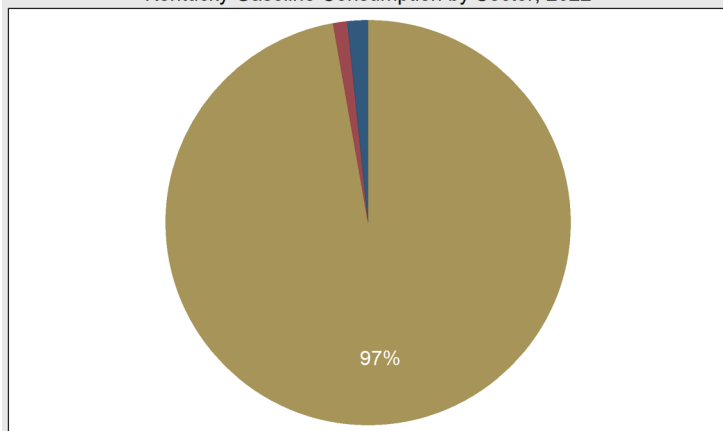
Production	2022 Million Barrels	Rank
Texas	1,847	1st
Kentucky	2	22nd

Crude oil production in Kentucky decreased by 8.6% in 2022 to produce 2.3 million barrels. Annual crude oil production in Kentucky had remained between 2.3 and 2.9 million barrels since the year 2000, but has recently increased with more widespread application of horizontal wells and nitrogen foam and hydraulic fracture stimulations. Despite this increase, in-state crude oil production contributes to less than 1% of total U.S. production.

Though Kentucky is a producer of petroleum, statewide consumption has increasingly surpassed production. As a result, Kentucky's petroleum imports have increased from 44% to 98% between 1960 and 2022.

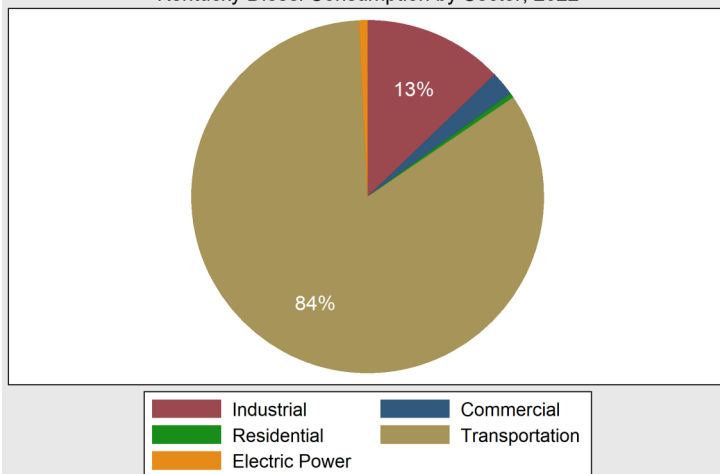
Kentucky Liquid Fuel Consumption

Kentucky Gasoline Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Diesel Consumption by Sector, 2022

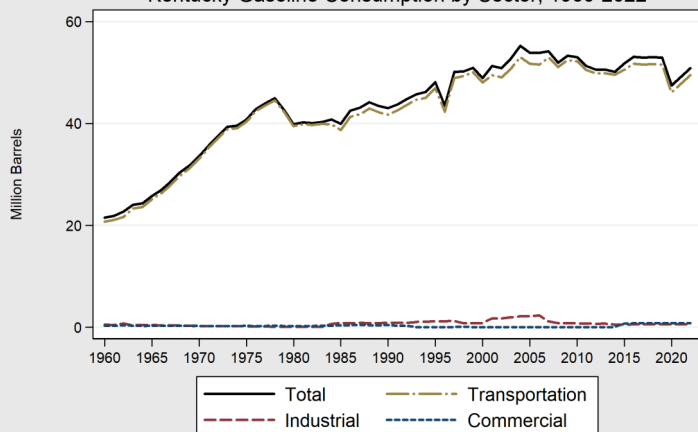


Kentucky Energy Database, EEC-OEP, 2024

Sector	Thousand Barrels	1 Year Change
Total	50,891	-0.2%
Transportation	49,476	-0.3%
Industrial	580	+2.8%
Commercial	835	+2.7%

Sector	Thousand Barrels	1 Year Change
Total	26,576	+2.4%
Transportation	22,249	+2.4%
Industrial	3,407	+1.1%
Commercial	598	+1.4%
Electric Power	212	+34.2%
Residential	111	+2.8%

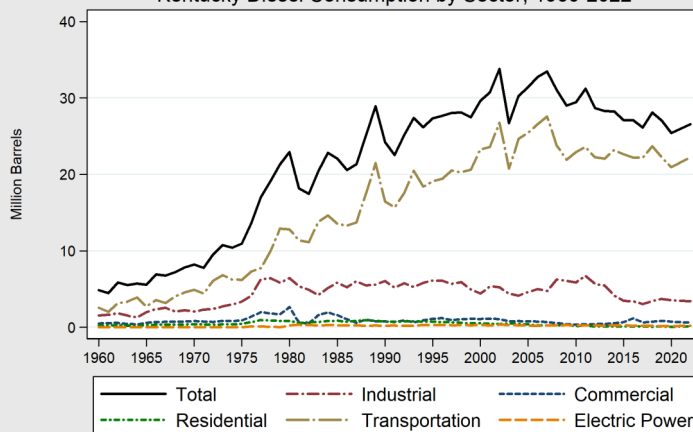
Kentucky Gasoline Consumption by Sector, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

In 2022, Kentucky consumed 50.9 million barrels of gasoline, with 97% used for transportation. Compared with 2021, total gasoline consumption in Kentucky decreased by 0.2%.

Kentucky Diesel Consumption by Sector, 1960-2022

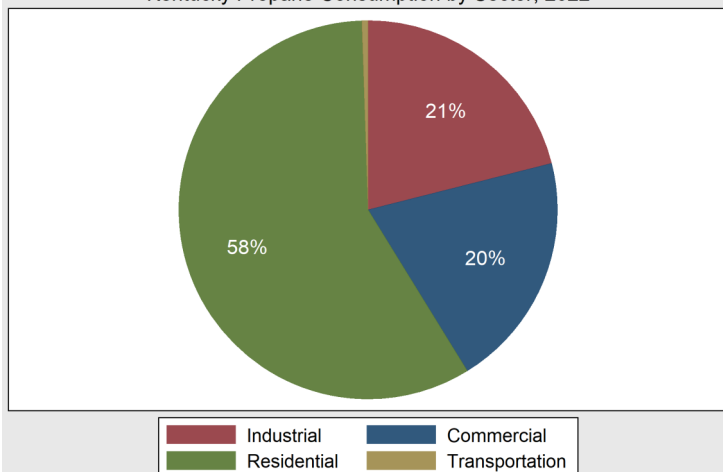


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

In 2022, Kentucky consumed 26.6 million barrels of diesel fuel, a 2.4% increase in overall consumption from 2021. The vast majority of diesel consumption—84%—was consumed by the transport sector, mostly for trucking on highways, marine vessels, and railroad consumers. Industrial users, predominately manufacturing facilities and farms, consumed 13%. The commercial, residential, and electric power sectors made up the remaining 3% in 2022.

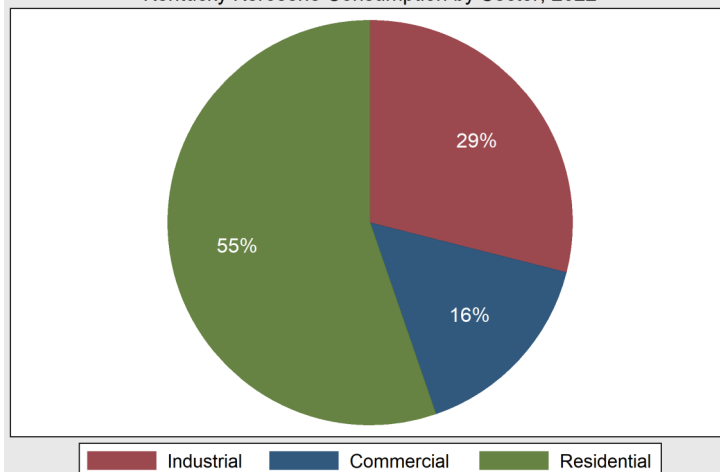
Kentucky Liquid Fuel Consumption

Kentucky Propane Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Kerosene Consumption by Sector, 2022

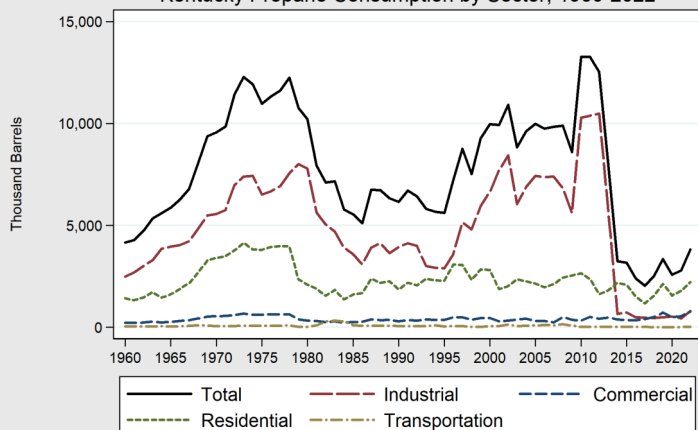


Kentucky Energy Database, EEC-OEP, 2024

Sector	Thousand Barrels	1 Year Change
Total	3,806	+36.2%
Industrial	801	+80.8%
Residential	2,218	+23.7%
Commercial	768	+40.0%
Transportation	20	+81.8%

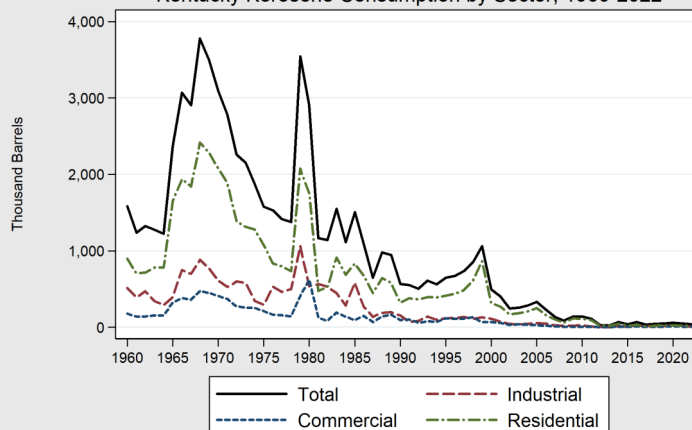
Sector	Thousand Barrels	1 Year Change
Total	37	-14.0%
Residential	21	-8.7%
Industrial	11	-21.4%
Commercial	6	-14.3%

Kentucky Propane Consumption by Sector, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

Kentucky Kerosene Consumption by Sector, 1960-2022



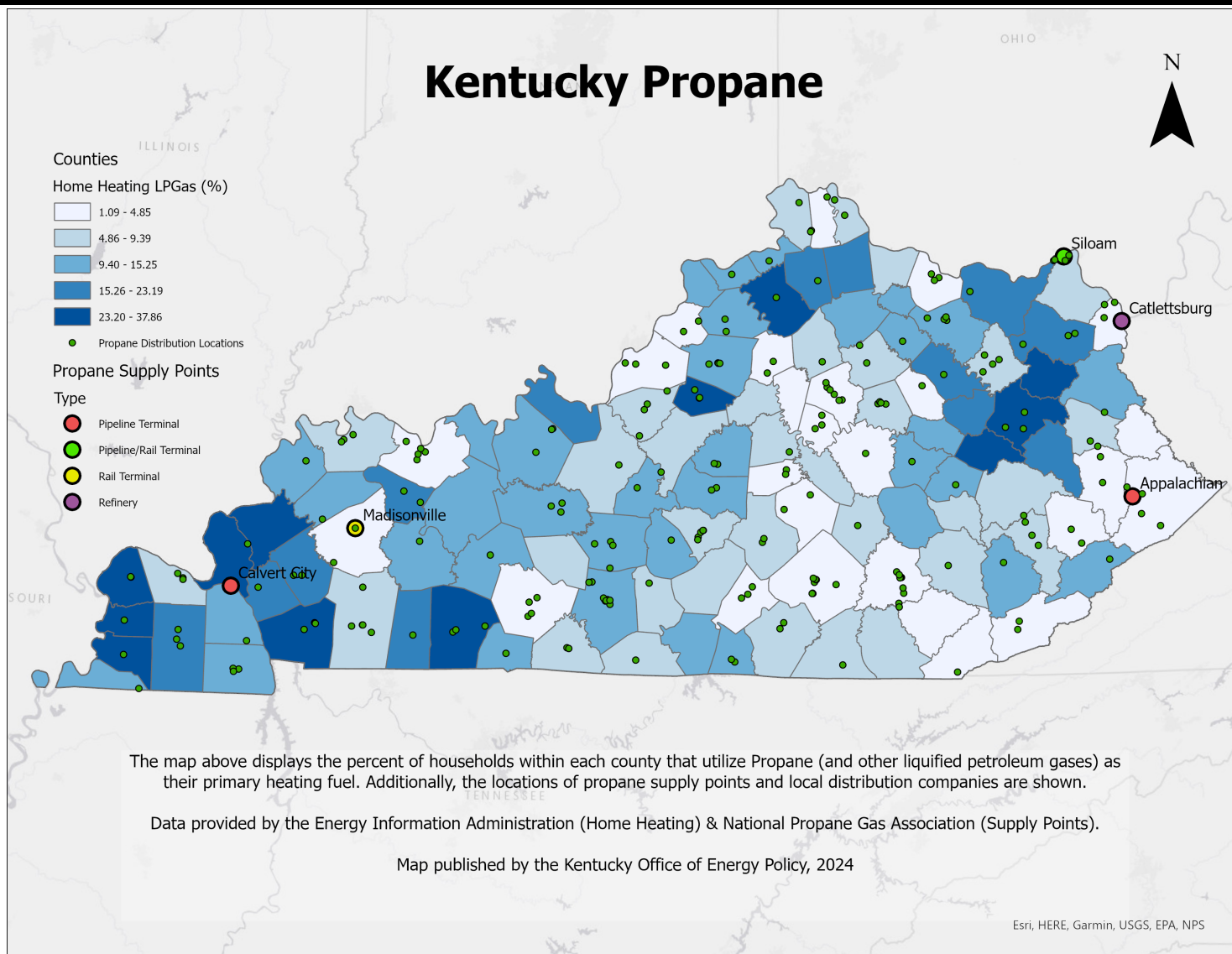
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

In 2022, more than 3.8 million barrels of liquid petroleum gas (LPG), which is mostly propane (technically, a hydrocarbon gas liquid), but also includes ethane and butane, was consumed in Kentucky. Since 2021, consumption increased by 36%. With 58% of total consumption, the residential sector was the largest end-user of LPG, followed by the industrial sector with 21%. The commercial and transportation sectors comprised the remaining 21% of LPG consumption in 2022.

In 2022, Kentucky consumed 37 thousand barrels of kerosene. The industrial and residential sectors were the largest consumers of kerosene, consuming 29% and 55%, respectively, of the total for home heating. The commercial sector was the smallest consumer with 16% of consumption. Compared with 2021, Kentucky kerosene consumption decreased by 14 percent.

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

Kentucky Propane Profile



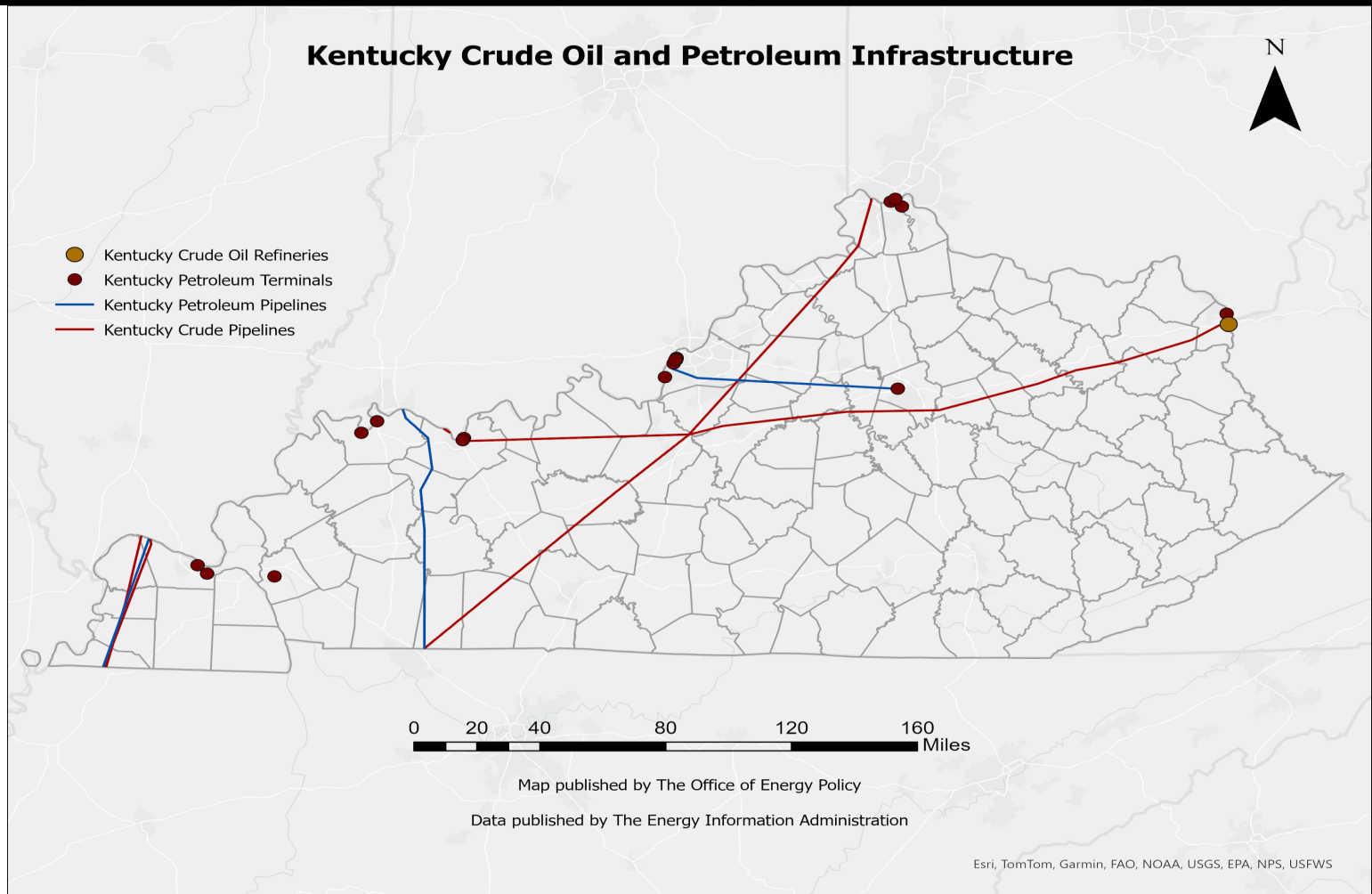
Propane is used in approximately 10 percent of Kentucky homes. It is also used in home appliances such as air conditioning units, cook stoves, water heaters, fireplaces, generators, clothes dryers, and gas grills. Numerous industries use propane as a catalyst to heat industrial processes. Propane is the third-largest source of motor fuel in the U.S. and an approved clean fuel source used to power cars, trucks, buses, forklifts, lawnmowers, and other vehicles used in both on- and off-road applications. Propane is a major source of fuel for agricultural applications including heat for livestock buildings and greenhouses, irrigation pumps, crop drying, and weed control.

Pipelines and petroleum refineries provide propane supply. Distribution from these supply sources is by truck transport (approximately 9,000 gallons) or by rail car (approximately 30,000 gallons) to retail marketers. Marketers maintain storage facilities that support a regional customer base usually within a 50-75 air-mile radius. Marketers deliver propane to their customers using a delivery vehicle called a bobtail. These bobtails hold approximately 2,800 gallons of fuel and deliver to stationary customer storage tanks. Propane can also be transported in smaller (typically 20-, 33-, or 100-pound) cylinders. In 2021, Kentucky employed an estimated 537 employees directly related to propane industries (2021 Propane Industry's Economic Impact Report, PERC 2023).

Propane in Kentucky exhibits regionality within our agriculture, residential, and transportation sectors. In terms of agriculture, there are ~850 large-scale poultry farms in 44 counties. This represents critical local industries that maintain lifeline services for the food sectors. The dependence of this sector on propane for heating is a critical energy dependency in the state.

Propane motor fuel markets are expanding rapidly whether it be school buses, government fleets, industrial use, or off-road applications. Propane provides reduced emissions, fuel flexibility and diversity.

Kentucky Petroleum Infrastructure



Kentucky has one operating crude oil refinery in the state located in Catlettsburg, KY which has a operating capacity of 291,000 barrels per calendar day. Additional information on the location of oil fields and wells is available from the Kentucky Geological Survey Geologic Map Information Service at: <http://kgs.uky.edu/kgsmmap/kgsgeoserver/viewer.asp>

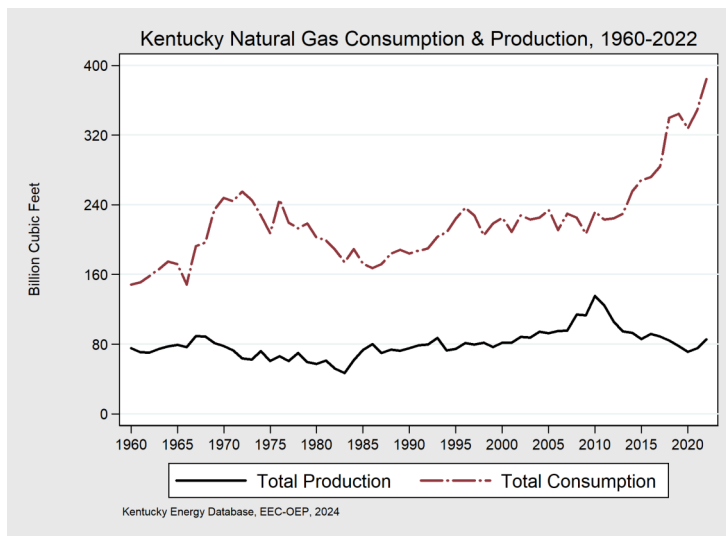
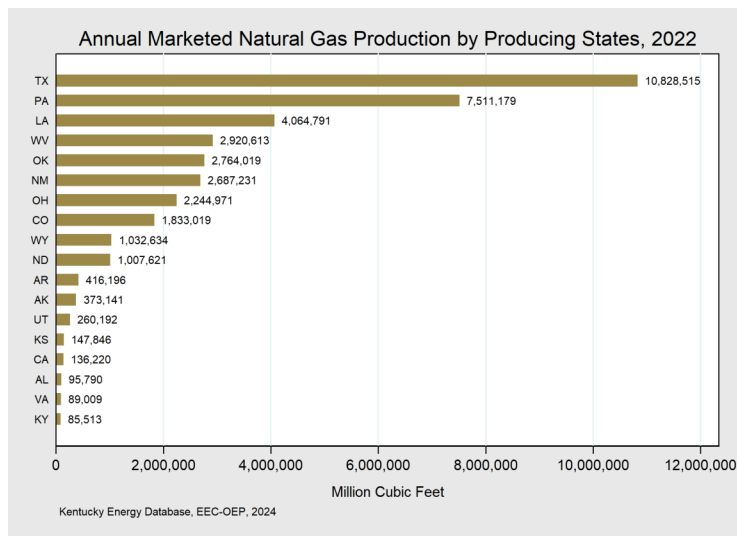
Kentucky has 22 petroleum product terminals throughout the state, with the majority being within close proximity to the Ohio River.

Kentucky has over 220 miles of petroleum product pipelines and 580 miles crude oil pipelines within the state.

Kentucky Natural Gas Profile



Kentucky Natural Gas Production



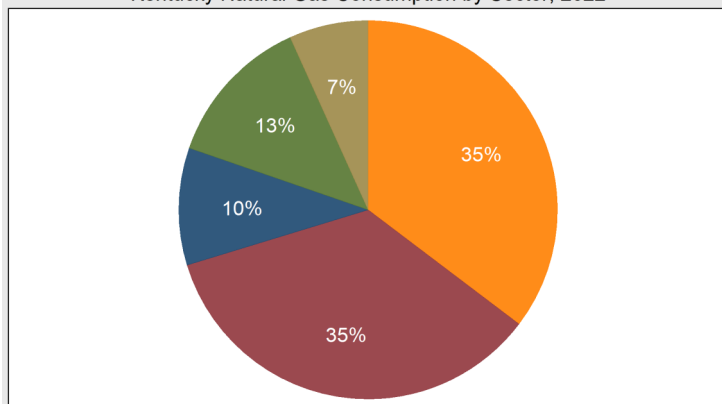
State	BCF Production	Rank
Texas	10,829	1st
Kentucky	86	18th

Kentucky produced 86 billion cubic feet (Bcf) of natural gas in 2022, a 13.5% increase in natural gas production from 2021. Given a favorable price of natural gas, statewide production has the capacity to increase substantially, but production is expected to remain less than other states.

Kentucky has 2 natural gas processing plants located in eastern Kentucky and 22 underground storage locations, mostly located in western Kentucky. Additional information on the location of natural gas fields and wells is available from the Kentucky Geological Survey Geologic Map Information Service at: <http://kgs.uky.edu/kgsmmap/kgsgeoserver/viewer.asp>

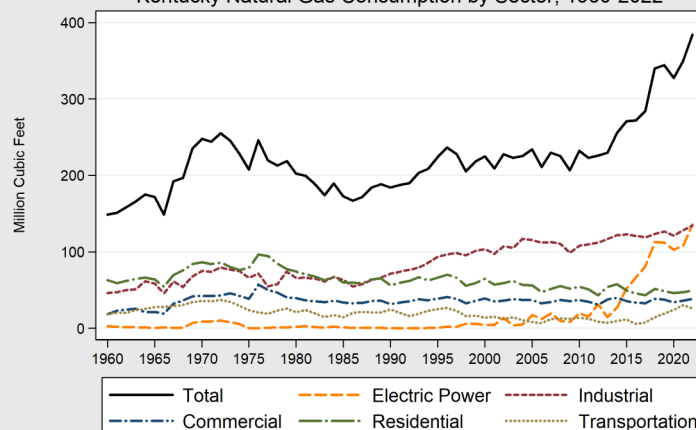
Kentucky Natural Gas Consumption

Kentucky Natural Gas Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Natural Gas Consumption by Sector, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

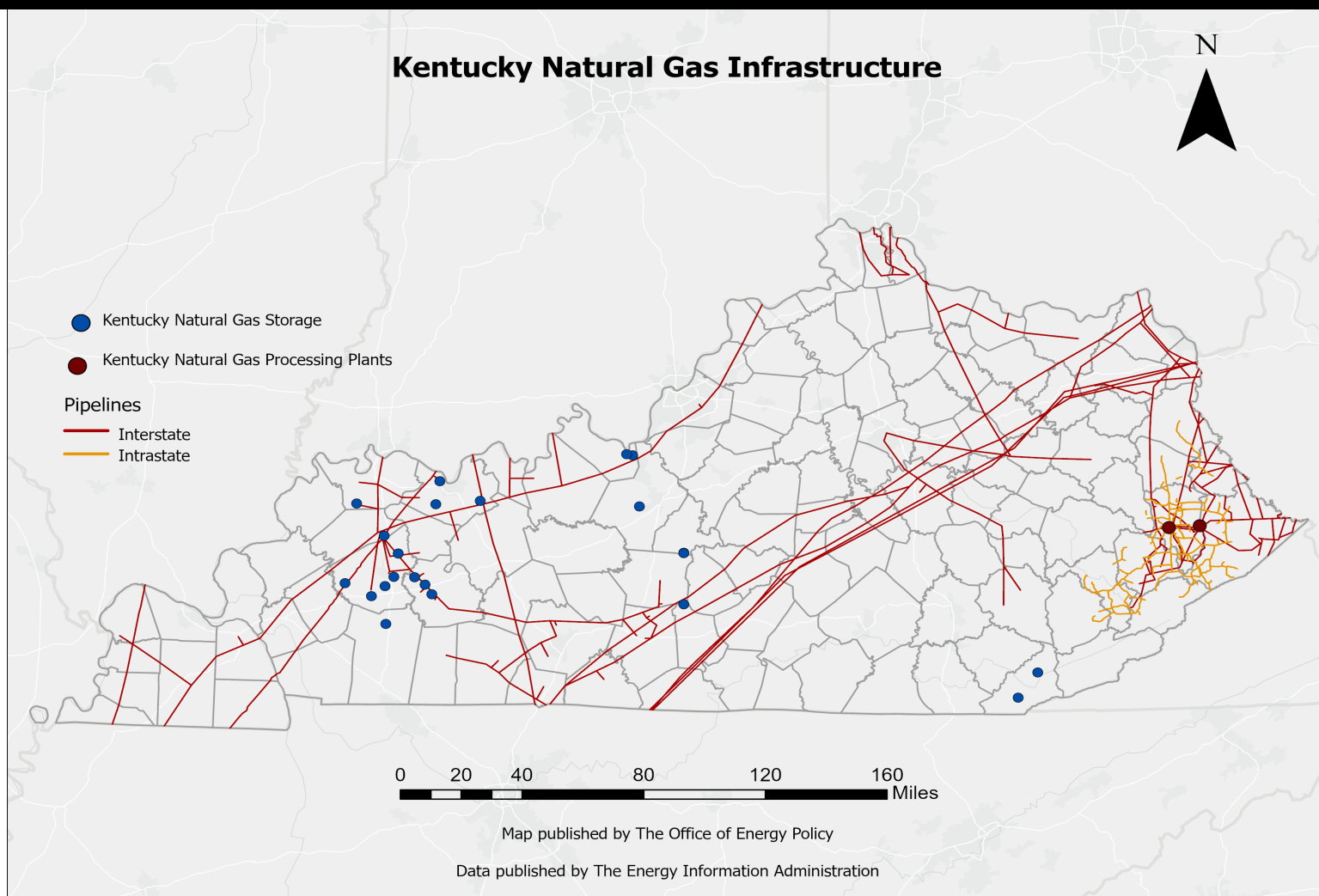
Sector	Million Cubic Feet	1 Year Change
Total	384,217	+10.0%
Industrial	134,364	+4.9%
Residential	49,821	+6.2%
Commercial	38,492	+7.0%
Electric Power	135,630	+25.6%
Transportation	25,910	-14.4%

*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.

Kentucky's consumption of natural gas rose by 10% in 2022 to consume a total of 384,217 million cubic feet, approximately 1% of United States total consumption. The industrial and electric sector were the largest consumer of natural gas, each using 35% of the state total. The residential sector accounted for 13% of consumption. Natural gas combined cycle (NGCC) plants have replaced coal-fired boilers at the Cane Run, Big Sandy, Paradise, and Robert Reid power plants. Both, the commercial and transportation sectors, consumed 17% of statewide consumption.

The commercial and residential sectors consume natural gas to generate heat while industrial consumers, which include agriculture, primarily use natural gas as a process feedstock in manufacturing operations. As a result, residential and commercial consumption follows a seasonal pattern, with notable fluctuation due to weather while industrial consumption is more consistent throughout the year. The sizeable consumption by the industrial sector is reflective of the large presence of industrial firms within Kentucky.

Kentucky Natural Gas Infrastructure



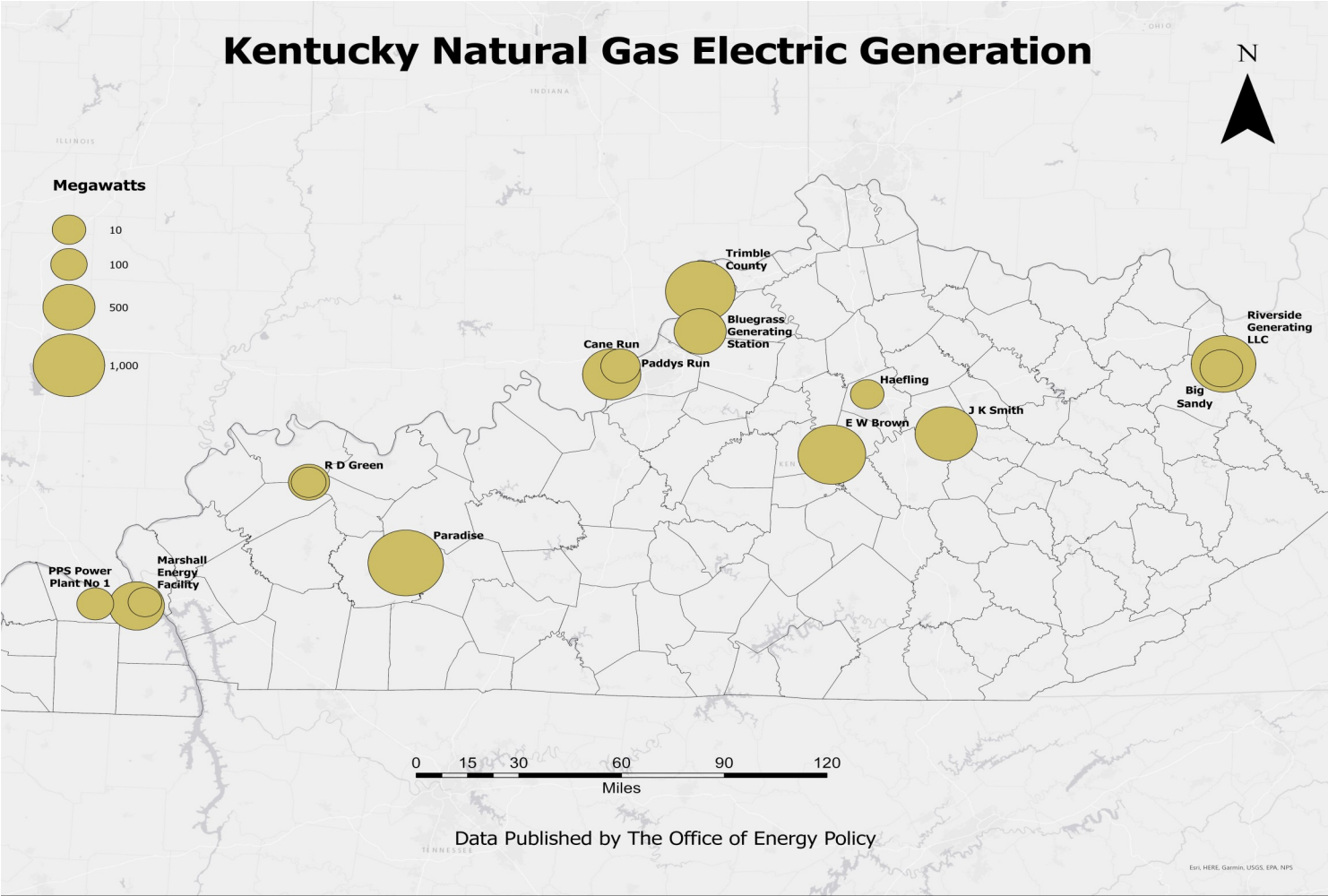
Kentucky has 32,741 miles of natural gas, hazardous liquids, and hydrocarbon gas liquids pipelines, 20 active natural gas storage areas, and two processing plants.

Kentucky has 22 natural gas underground storage areas. In 2022, Kentucky had a storage capacity of 1,084 billion cubic feet of working natural gas. The majority of the storage areas are in the western part of the state with eastern Kentucky has 2 storage areas, one active and one inactive, with a working capacity of 2.6 million cubic feet of capacity.

Kentucky has two natural gas processing plants located in Pike and Floyd counties. In 2022, Kentucky natural gas processing plants produced 67.2 metric million cubic feet.

Kentucky has an extensive natural gas pipeline infrastructure with over 32,000 miles of interstate and intrastate pipelines. Intrastate pipelines are concentrated in the in the eastern part of the state, mostly due to the presence of the processing plants.

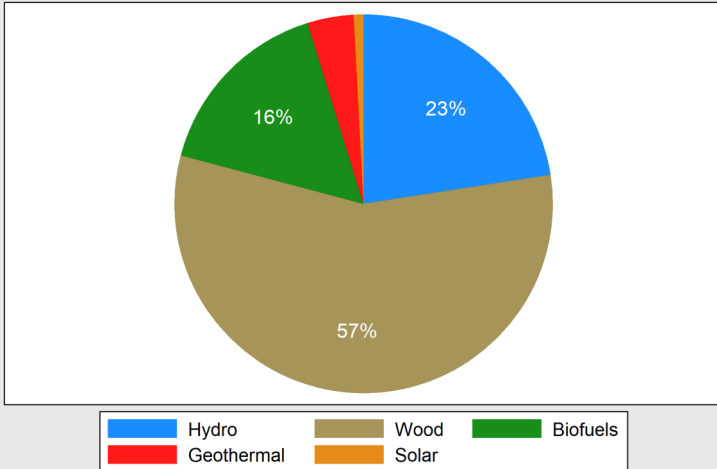
Kentucky Natural Gas Electric Generation



Name		Capacity (MW)	Name		Capacity (MW)
Big Sandy		260	Paddy's Run		170
Bluegrass Generation Station		501	Paradise		1100
Calvert City		23	PPS Power Plant No 1		110
Cane Run		663	RD Green		223
EW Brown		906	Riverside Generating LLC		825
Haefling		24	Robert A Reid		58
JK Smith		753	Trimble County		954
Marshall Energy Facility		582			

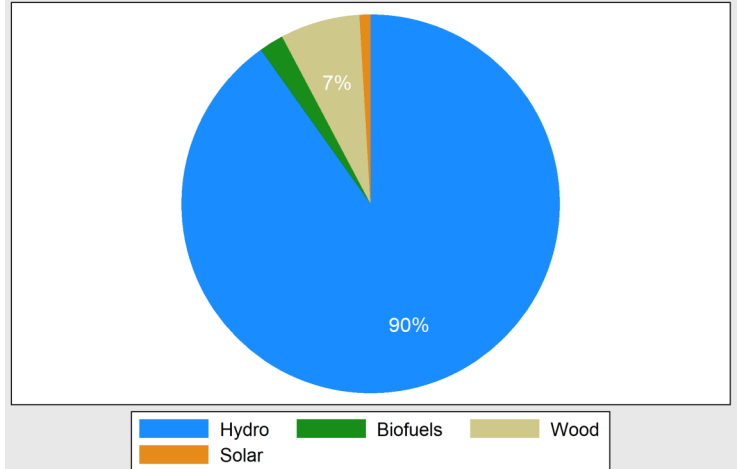
Kentucky Renewable Energy

Kentucky Renewable Energy Production by Fuel Type, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Renewable Electricity Generation by Fuel Type, 2022

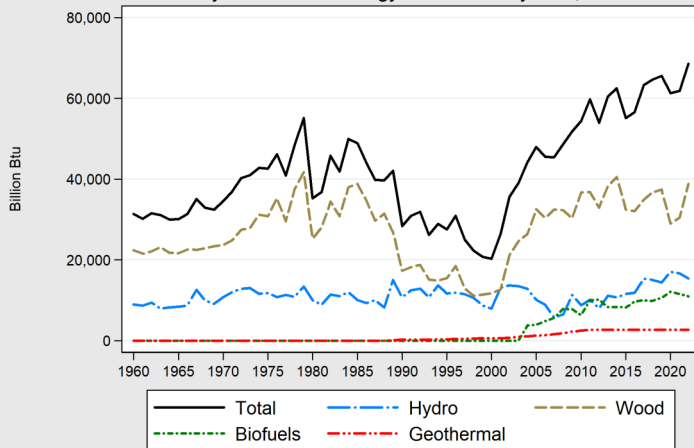


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	68,537	+10.7%
Wood & Biomass	38,787	+27.2%
Hydroelectric	15,456	-7.1%
Biofuels	11,007	-5.0%
Geothermal	2,712	+0.0%
Solar	575	+23.7%

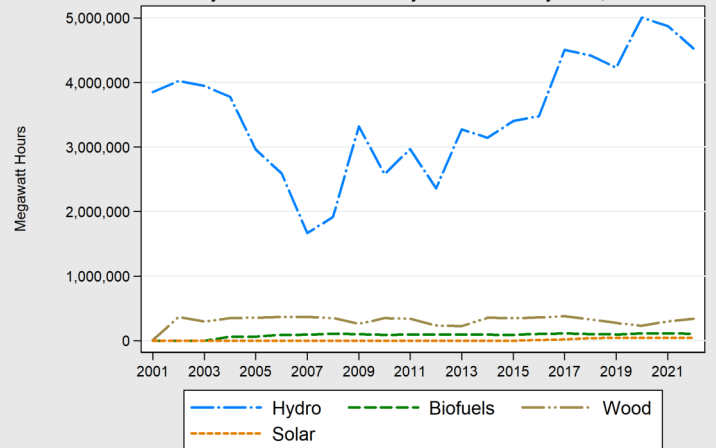
Fuel Type	Gigawatt Hours	1 Year Change
Total	5,024	-5.9%
Hydroelectric	4,530	-7.1%
Wood & Biomass	343	+14.3%
Biofuels	105	-8.8%
Solar	47	+1.9%

Kentucky Renewable Energy Production by Fuel, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Renewable Electricity Generation by Fuel, 2001-2022



Kentucky Energy Database, EEC-OEP, 2024

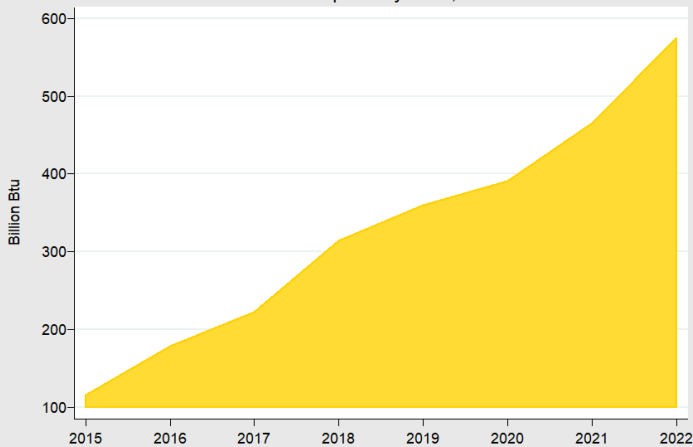
In 2022, Kentucky produced 68.5 trillion Btu of energy from renewable resources, a 10.7% increase compared with 2021. Year-to-year fluctuations are mostly due to variations in hydroelectric power, which itself is a reflection of rainfall. Hydroelectric, Wood and Biofuels were 90% of all renewable energy produced in Kentucky in 2022.

Hydroelectric power generated 90% of renewable electricity in Kentucky in 2022. Total renewable electricity generation decreased by 5.9% compared with 2021.

Kentucky Solar Profile

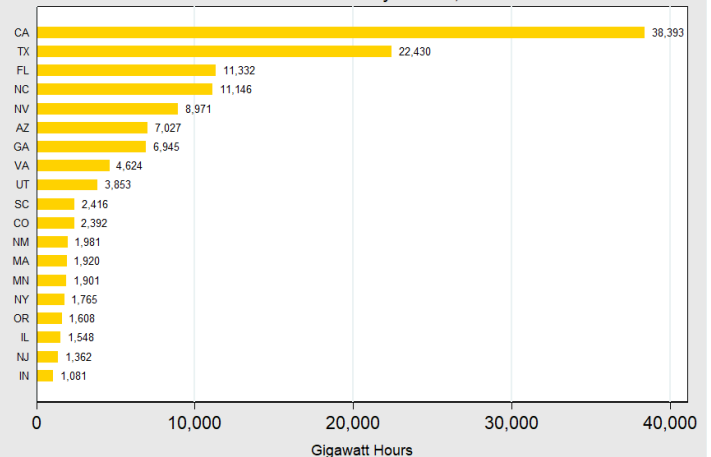


Solar Consumption by Year, 1960-2022



Data Source: EIA-SEDS

Solar Generation by States, 2022



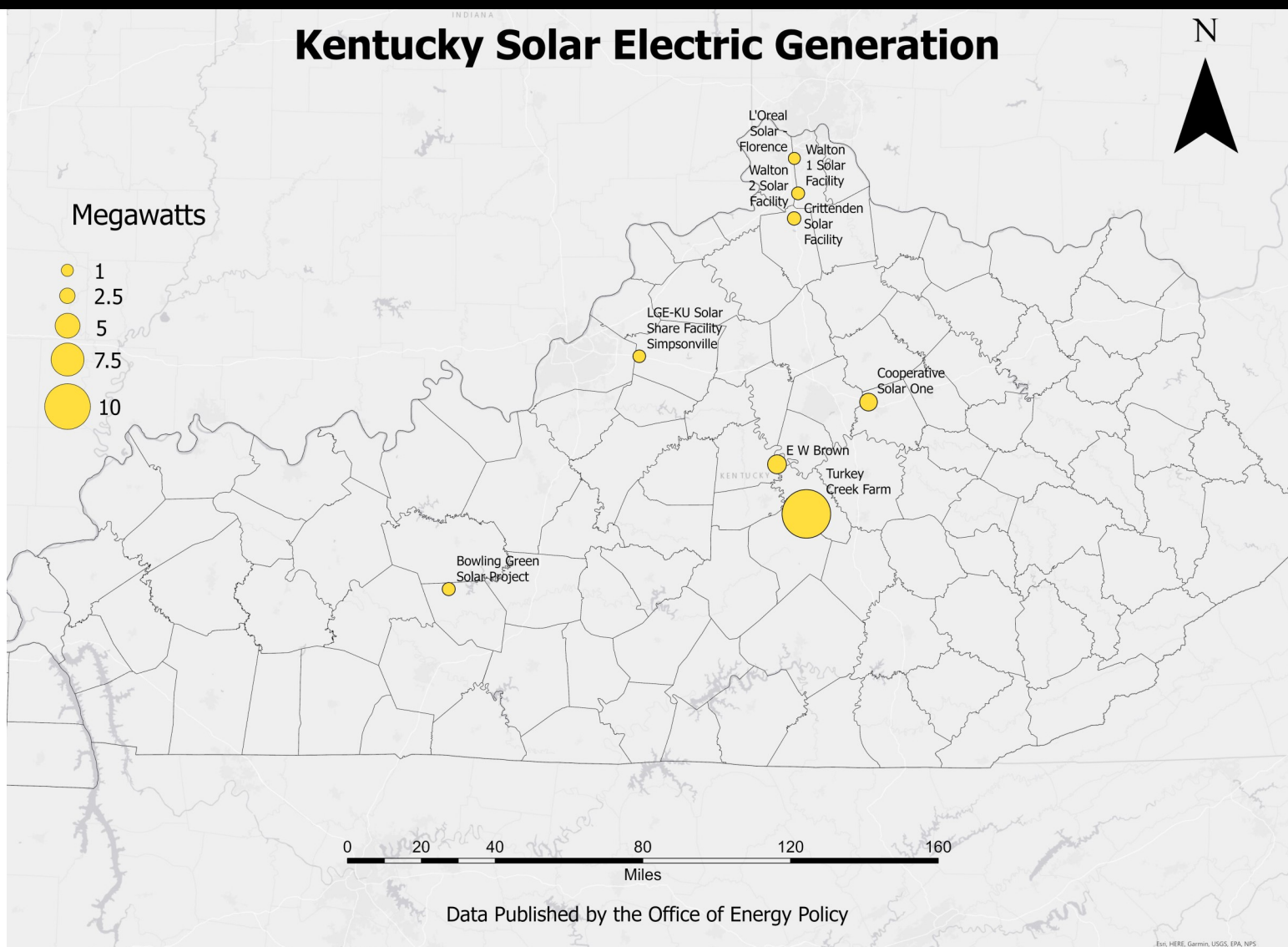
Year	Billion Btu	1 Year Change
2022	575	+23.7%

State	Gigawatt Hours	Rank
California	38,393	1st
Kentucky	44	43rd

Over the past five years, Kentucky has witnessed a notable growth in utility-scale solar energy consumption, marking a significant shift towards renewable energy sources. The state has embraced solar power as a key component of its energy portfolio, with an increasing number of utility-scale solar projects contributing to the overall energy mix. In 2022, Kentucky consumed 575 BBtu electric generation, a 23.7% increase from 2021 consumption levels.

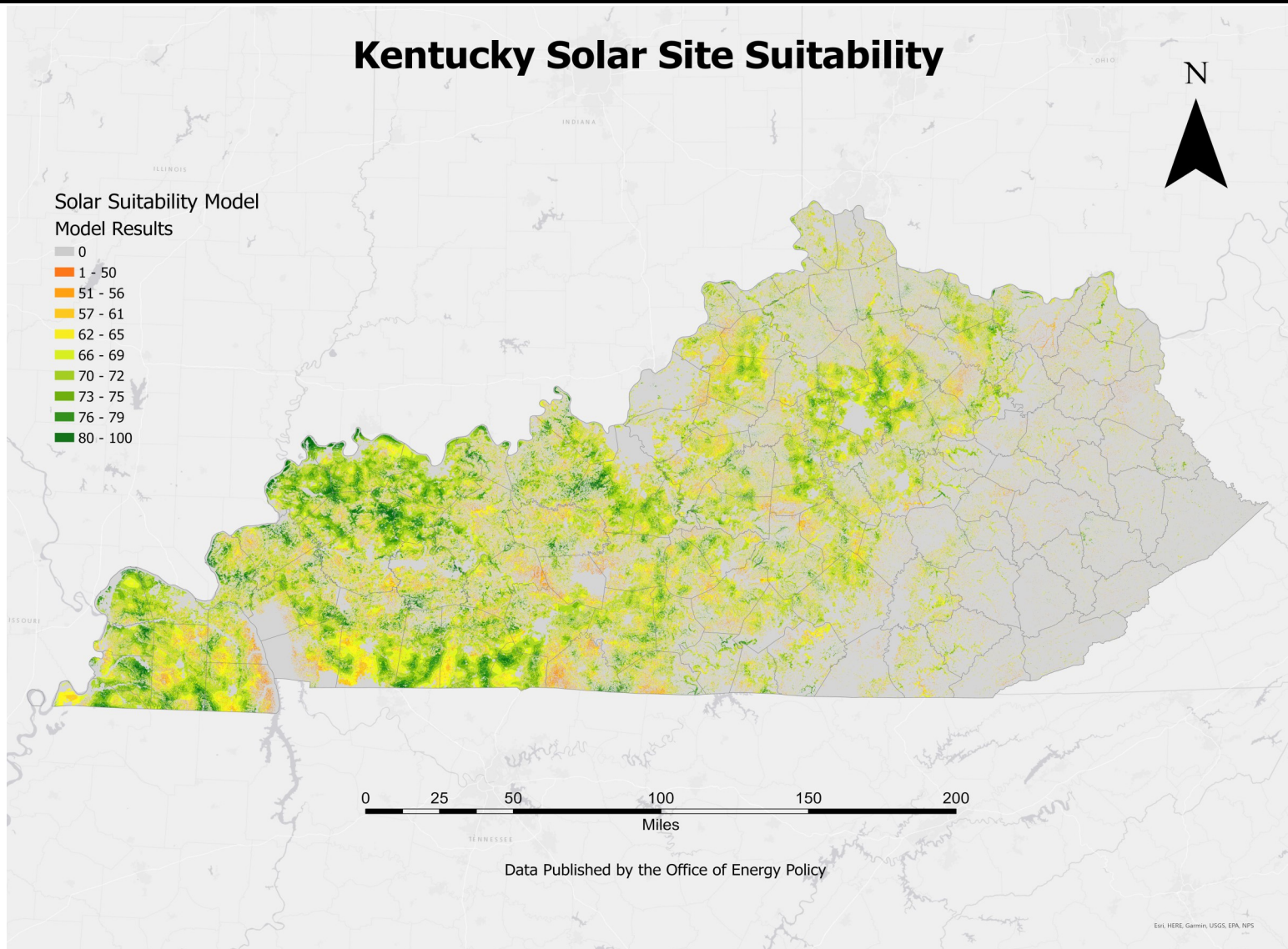
Kentucky ranks 43rd in the nation in solar utility electric generation. The surge in solar energy can be attributed to both environmental awareness and economic incentives, as Kentucky seeks to diversify its energy sources. As the state continues to invest in solar infrastructure and technology, the trajectory of utility-scale solar energy consumption in Kentucky appears promising, aligning with broader national and global trends in sustainable energy development.

Kentucky Solar Generation



Name	Capacity (MW)
Turkey Creek Farm	50
Bowling Green Solar Project	2.1
LGE-KU Solar Share Facility	1.7
Cooperative Solar One (Clark County Solar)	8.5
Crittenden Solar Facility	2.7
E.W. Brown Solar Project (Universal Solar Facility)	10
L'Oreal Solar - Florence	1.1
Walton 1 Solar Facility	2
Walton 2 Solar Facility	2

Kentucky Solar Site Suitability

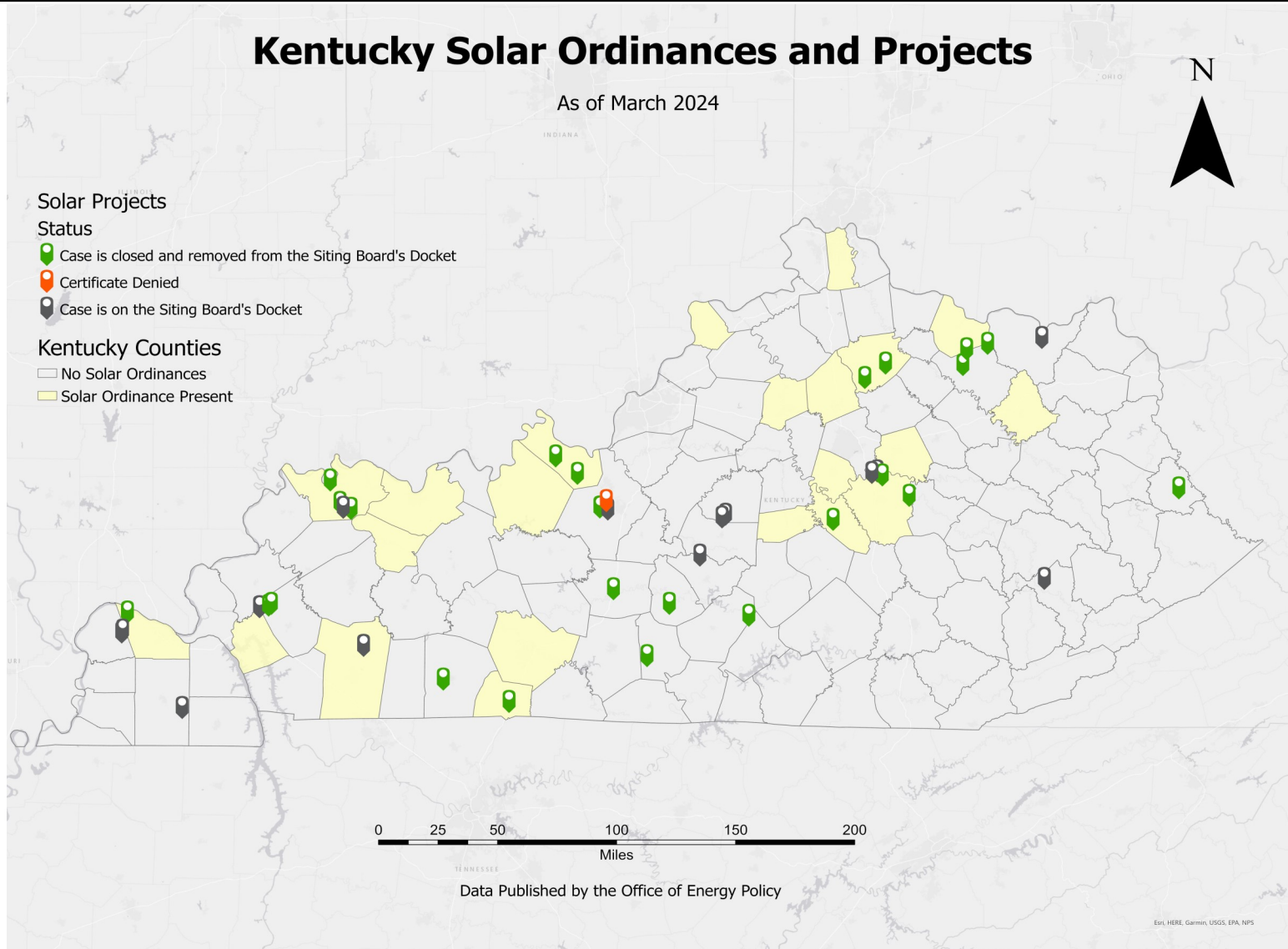


Finding a suitable site for solar development comes with many challenges. The Office of Energy Policy's Solar Suitability Toolkit is designed to help relevant entities explore the feasibility of developing utility-scale solar projects across the Commonwealth of Kentucky, particularly in areas that were previously used for mining. By modeling topography, federally protected land, population, necessary infrastructure, and other characteristics that may limit development, the solar suitability tool can be used by solar developers pinpoint a location for their project. Moreover, the platform provides many resources, such as information on mine permitting and reclamation, additional data required for site analysis, and the OEP's Community Energy Management Access Guide - a guide for utility customers seeking pathways to access alternative energy through onsite or offsite electricity generation in Kentucky.

Kentucky Solar Projects

Kentucky Solar Ordinances and Projects

As of March 2024



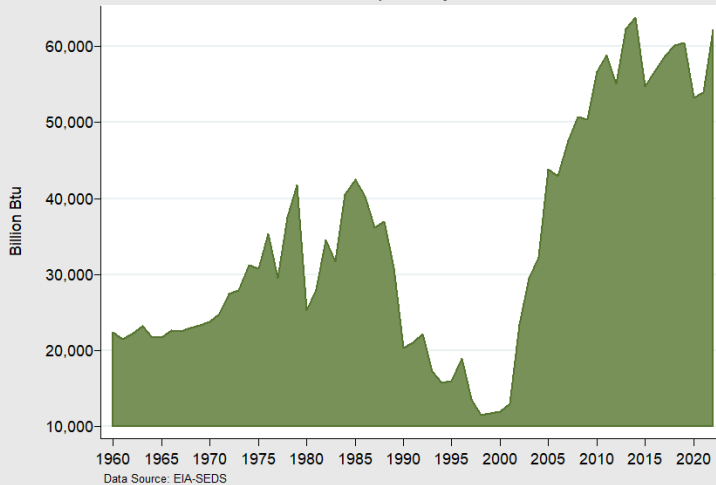
The Kentucky Solar Ordinance and Projects Dashboard provides users with a comprehensive view of solar projects that have applied for a certificate of construction to the Siting Board, and the county/local regulations that govern these projects. In the past several years, the nation has seen an exponential increase in utility-scale solar development, leading local and county officials to propose regulations for solar development in their jurisdictions. The Siting Board then ensures that all of the county and local regulations are adhered to when making their decision to approve or deny their certificate for construction. As of December 2024, there have been 47 case filings with the Siting Board. 32 of these cases have been approved for construction and 1 had been denied a certificate for construction. At least 35 counties and 8 municipalities have adopted regulations surrounding utility-scale solar development.

These regulations are proposed for a variety of reasons. In Kentucky, there has been great public concern about the potential loss of farmland to solar development, the unsightliness of solar panels, and their potential impact on property values. In response to these concerns, several jurisdictions have adjusted their zoning regulations to designate certain zones as suitable for solar development, such as industrial or commercial areas, and restrict installations in residential or agricultural zones. Height, setback, and landscaping requirements are frequently designed to minimize visual impact. These provisions can help address concerns about the appearance and placement of solar arrays but may increase the complexity and cost of the project and reduce the space for development.

Kentucky Biomass Profile



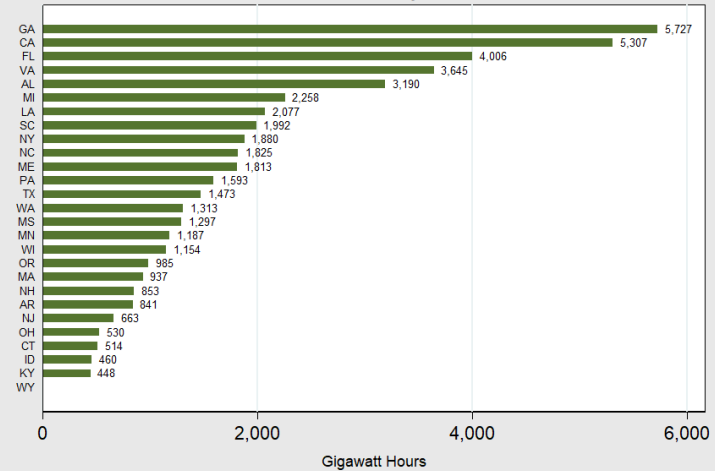
Biomass Consumption by Year, 1960-2022



Year	Billion BTU	1 Year Change
2022	62,233	+15.3%

Kentucky's biomass energy consumption has witnessed dynamic changes since the 1960s, reflecting evolving energy trends and environmental considerations. Initially relying on traditional biomass sources like wood and agricultural residues, the state gradually transitioned towards modern biomass technologies, including bioenergy and biopower systems. These advancements have enabled Kentucky to diversify its energy portfolio, reduce greenhouse gas emissions, and contribute to sustainable energy practices.

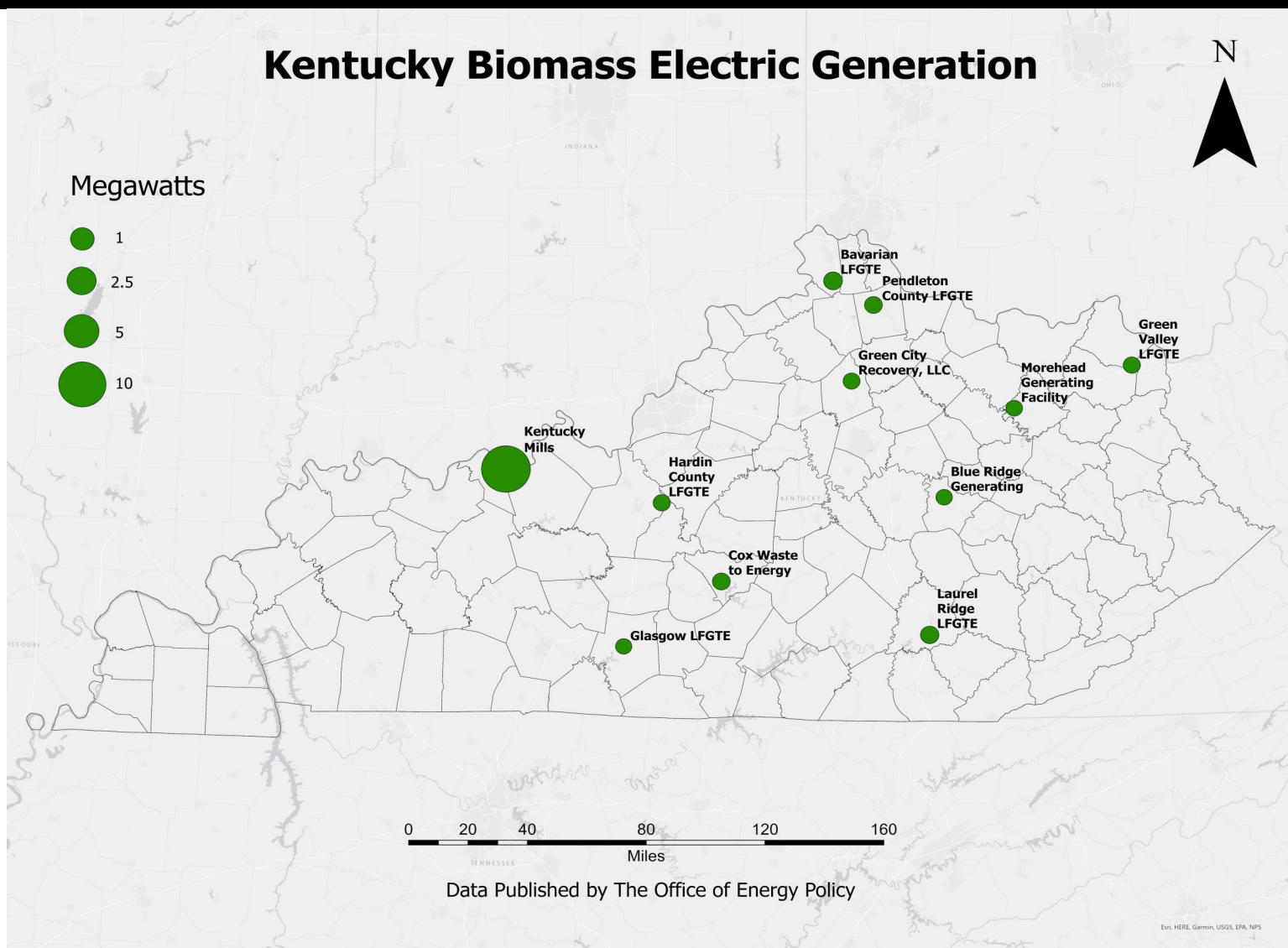
Biomass Generation by States, 2022



State	Gigawatt Hours	Rank
Georgia	5,727	1st
Kentucky	448	26th

In 2022, Kentucky consumed 62,233 billion BTU of biomass energy, a 15.3% increase from 2021 consumption levels. Georgia leads the nation in biomass generation while Kentucky ranks 26th.

Kentucky Biomass Generation

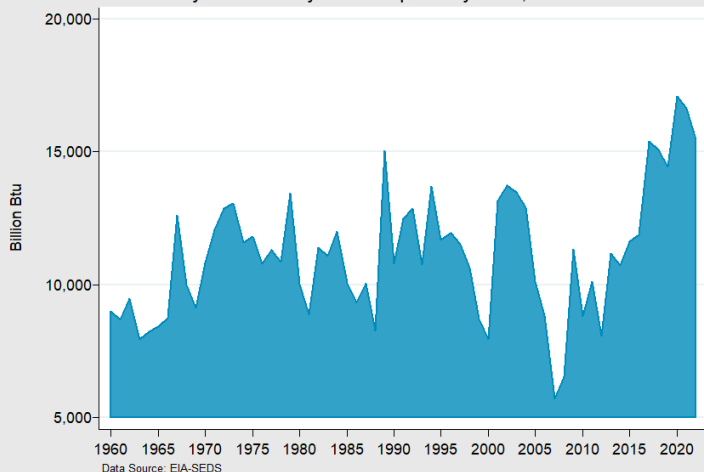


Name	Capacity (MW)
Bavarian Landfill	4.7
Blue Ridge Generating	1.2
Central KY Landfill	2
Cox Waste-to-Energy	3.9
Glasgow Regional Landfill	1
Green Valley Landfill	2.4
Kentucky Mills	60
Laurel Ridge Landfill	4
Hardin County LFGTE	2.4
Pendleton County Landfill	3.2
Morehead Generating Facility	1.4

Kentucky Hydroelectric Profile



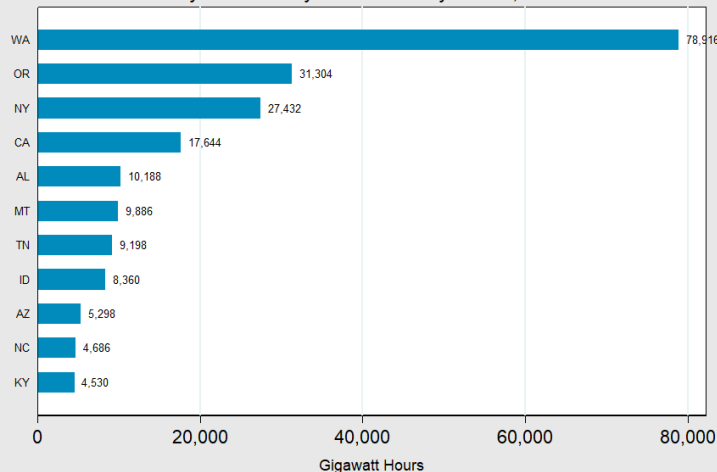
Hydroelectricity Consumption by Year, 1960-2022



Year	Billion BTU	1 Year Change
2022	15,456	-7.1%

Kentucky's hydroelectricity production has undergone significant developments since the 1960s, reflecting the state's evolving energy landscape. Initially characterized by limited reliance on hydroelectric power, Kentucky has gradually increased its utilization of this renewable energy source. The construction of hydroelectric facilities and the harnessing of water resources for power generation have contributed to a diversified energy portfolio. While hydroelectricity remains a relatively modest component compared to other sources, the state's commitment to renewable energy and environmental sustainability is evident.

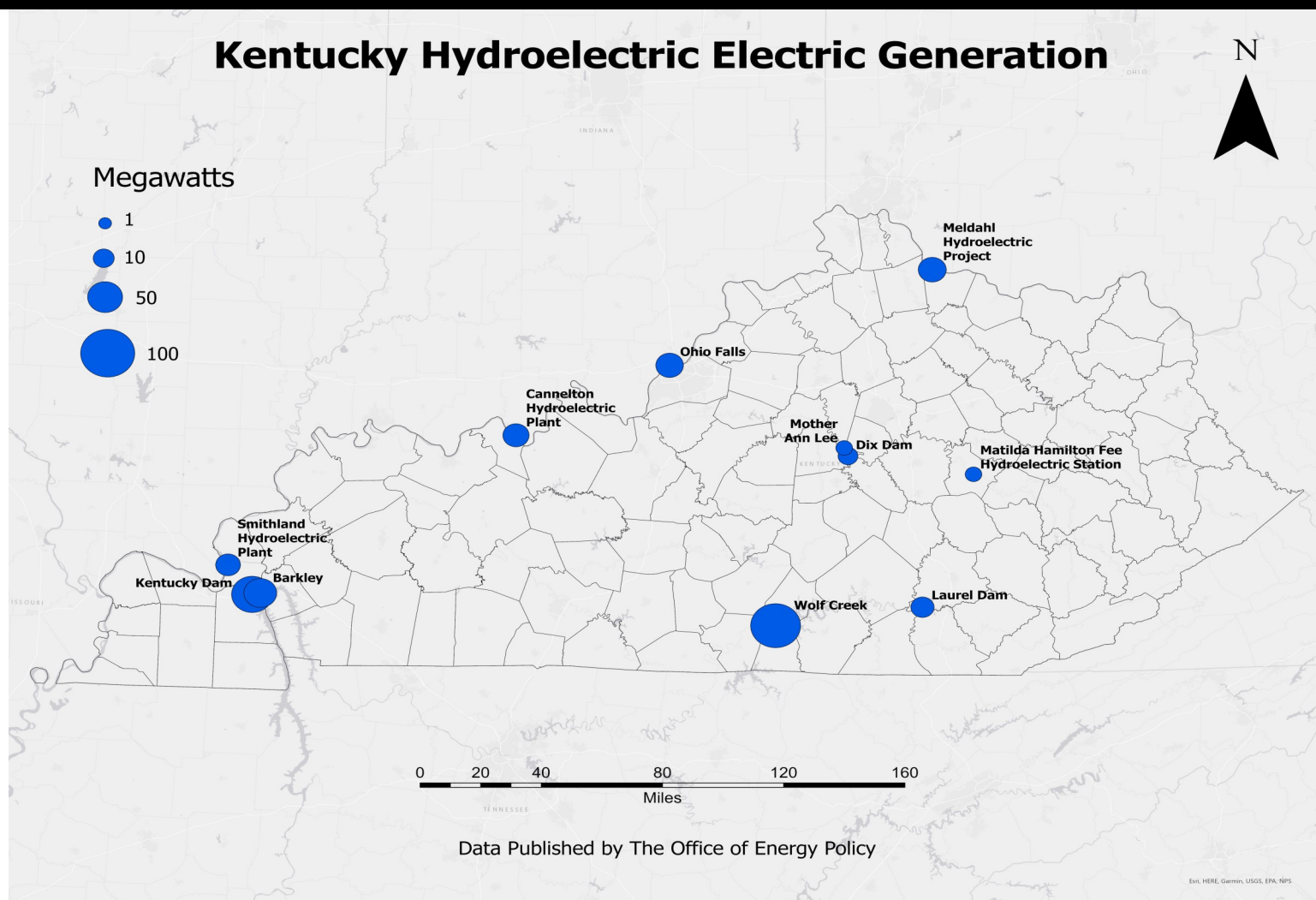
Hydroelectricity Generation by States, 2022



State	Gigawatt Hours	Rank
Washington	78,916	1st
Kentucky	4,530	11th

In 2022, Kentucky consumed 15,456 Billion BTU of hydroelectricity, a 7.1% decrease from 2021 consumption levels. Washington leads the nation in hydroelectricity generation while Kentucky ranks 11th.

Kentucky Hydroelectricity Generation



Name	Capacity (MW)
Barkley	148
Cannelton Dam	87.9
Dix Dam	31.5
Kentucky	222.5
Laurel	61
Meldahl Hydropower Project	105
Mother Ann Lee Hydro	2.3
Ohio Falls	100.8
Smithland Lock and Dam	75.9
Wolf Creek Dam	312

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