

TEAM
KENTUCKY[®]

ENERGY AND
ENVIRONMENT CABINET

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 proxy price (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.

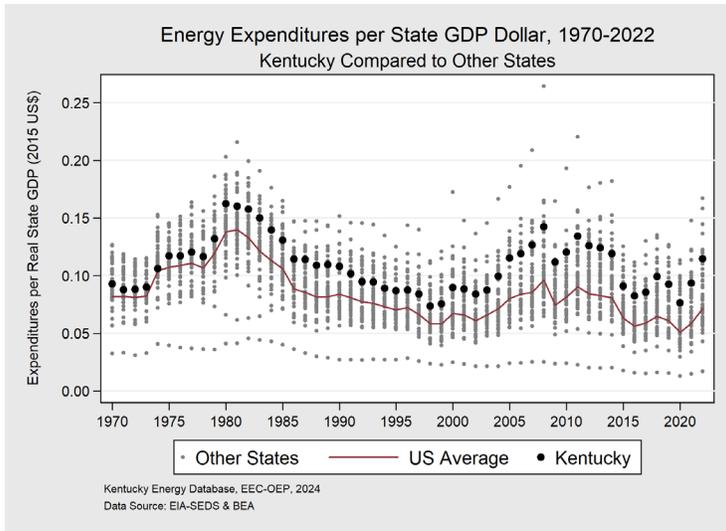
This edition of the Kentucky Energy Profile does not include the power plant profiles that have been available in previous editions. The Office of Energy Policy has created a public dashboard that provides the information in an interactive format. The [Power Plant Profiles Dashboard](#) includes data up to 2024.

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>

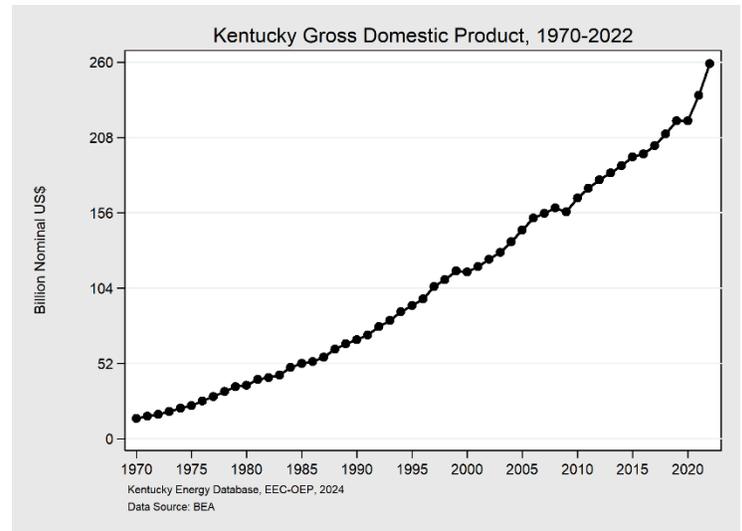
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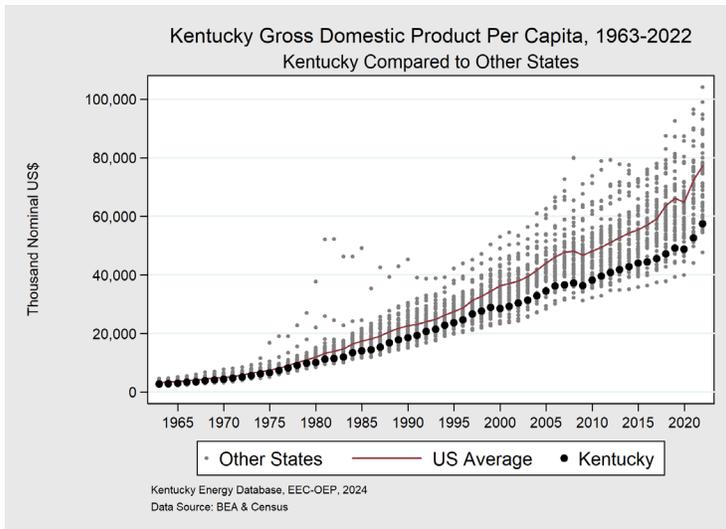
General Statistics



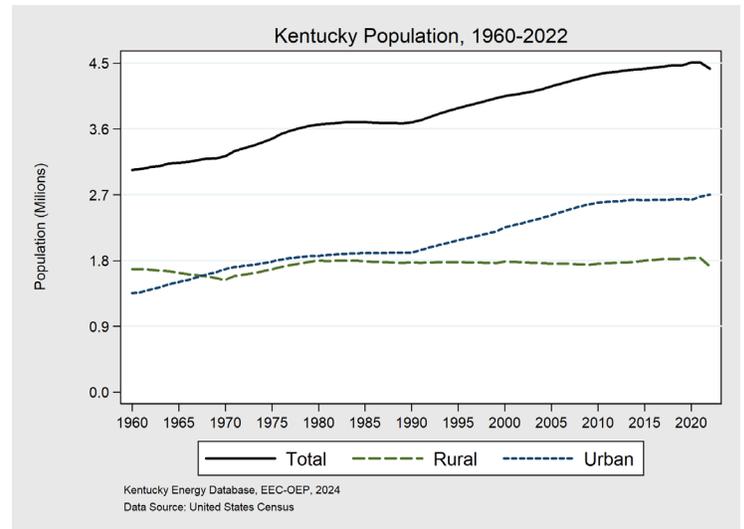
In 2022, on average \$0.11 was spent in Kentucky on energy to produce one dollar of state Gross Domestic Product (GDP). Kentucky ranked 9th in energy intensity of GDP in 2022 and increased its intensity by 22.8% from 2021. Kentucky is home to large, energy-intensive, manufacturing operations which cause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

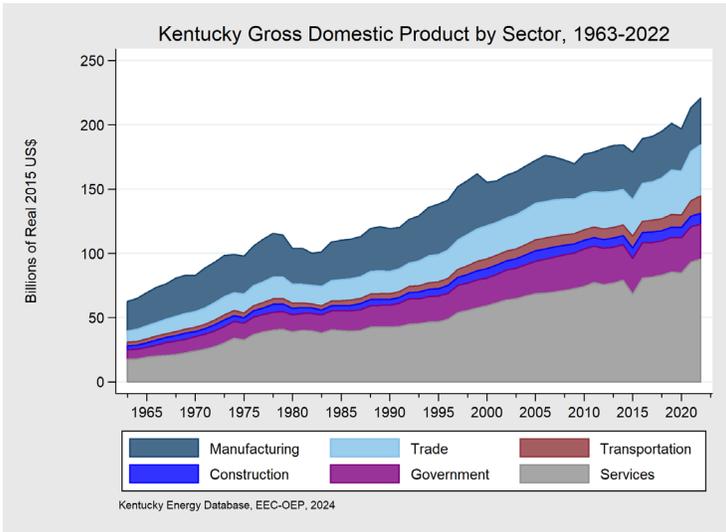


In 2022, Kentucky's GDP per capita was \$57,394, an increase of 17.8% from 2020. Kentucky ranked 44th in the nation in terms of GDP per capita and below the national average of \$77,243 in 2022.

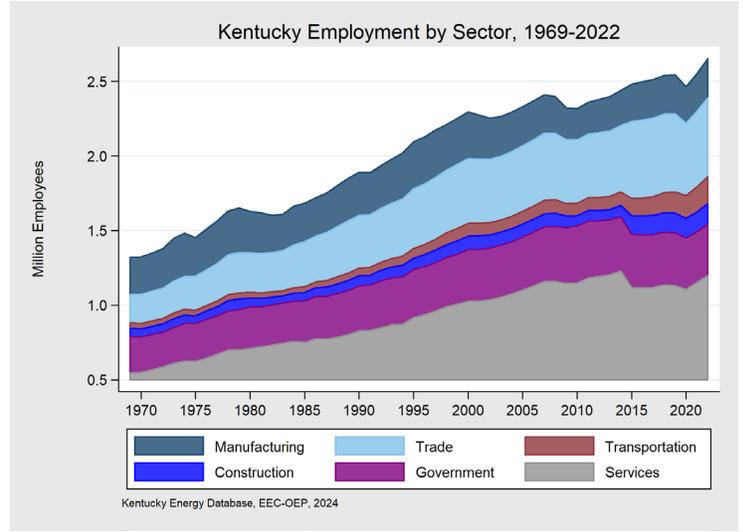


In 2022, Kentucky's population was approximately 4.4 million people, a decrease of 1.9% since 2020. Between 1960 and 2022, Kentucky's urban population has doubled while the rural population has stayed consistent.

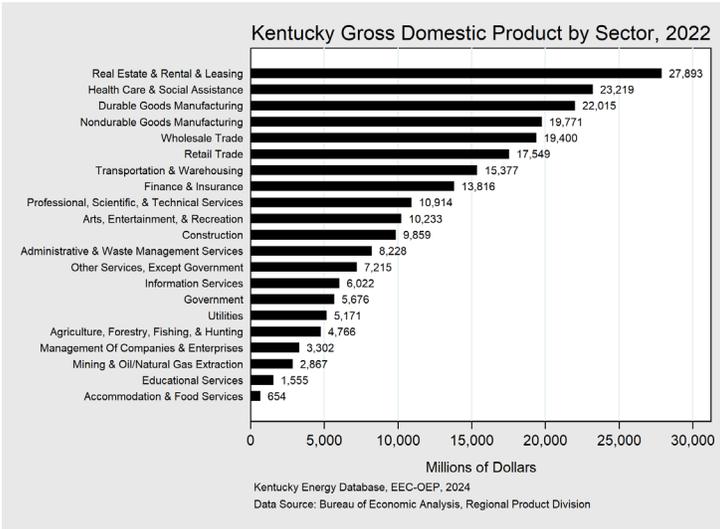
Kentucky's Economy



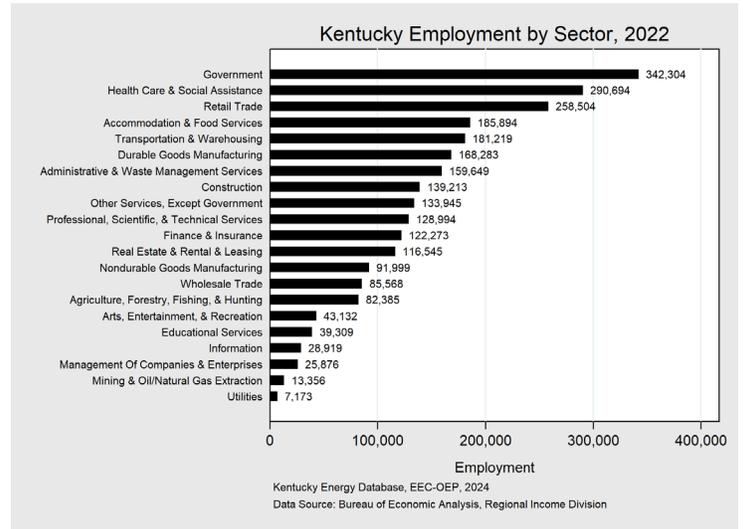
GDP from most sectors has risen gradually in the last 50 years, with output from the service sector rising the most. Manufacturing GDP has been relatively more volatile than that from other sectors. Output in 2022 appears to be another peak in GDP; however, data from 2023 and 2024 will be required to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



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.

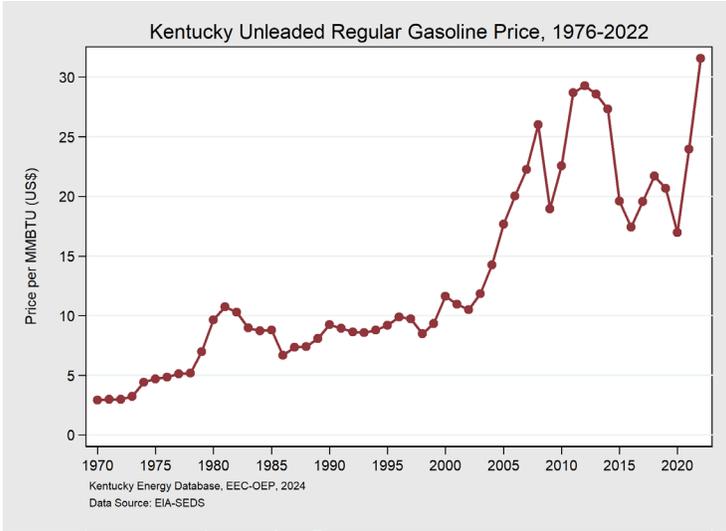


The Real Estate & Rental Leasing industry had the largest portion of state GDP with 11.8%, followed by Health Care & Social Assistance with approximately 9.9% of the total GDP in 2022. Goods manufacturing (Durable and Non-Durable) combined account for 17.7% of the total GDP.



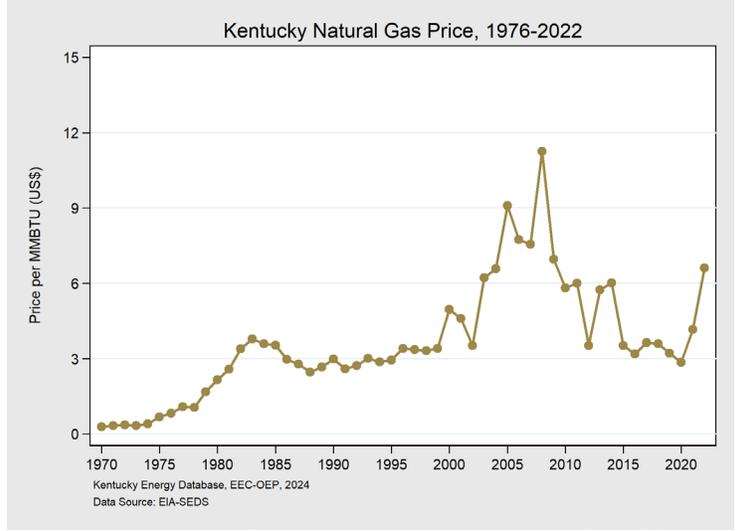
In 2022, the government sector was the single largest employer in Kentucky. Government employment was approximately 12.8% of total employment, healthcare was 10.9%, and retail trade 9.7%. Employment is defined as the average number of full-time and part-time jobs where wages or salaries are paid.

Commodity Prices



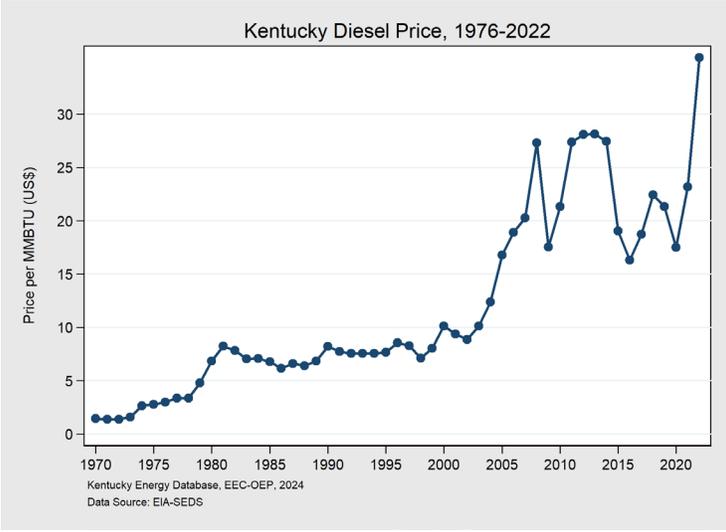
Fuel Type	U.S./MMBtu	% Change
Gasoline	31.57	+31.7%

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



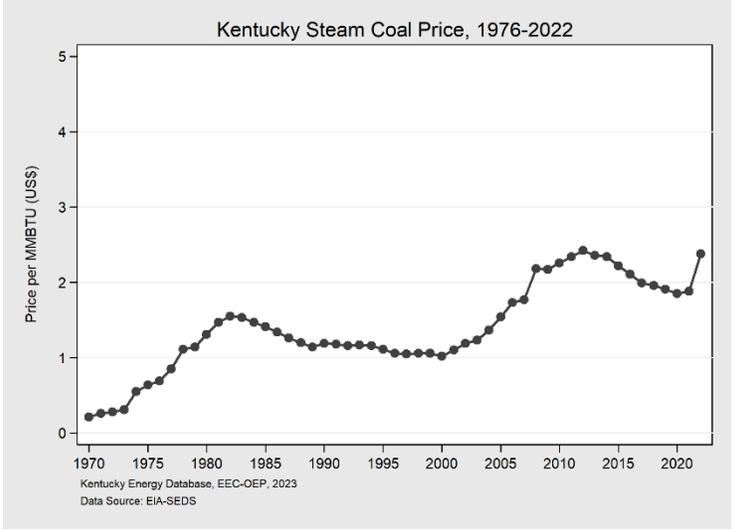
Fuel Type	(U.S./MMBtu)	% Change
Natural Gas	6.61	+58.9%

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.



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.

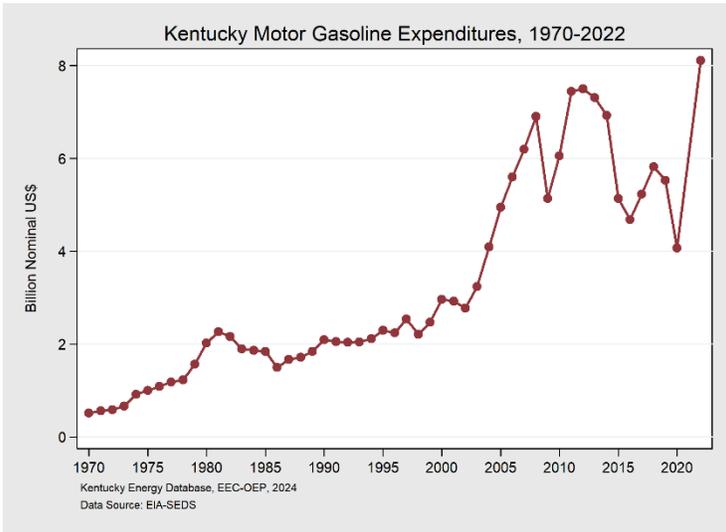


Fuel Type	U.S./MMBtu	% Change
Coal	2.38	+26.6%

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.

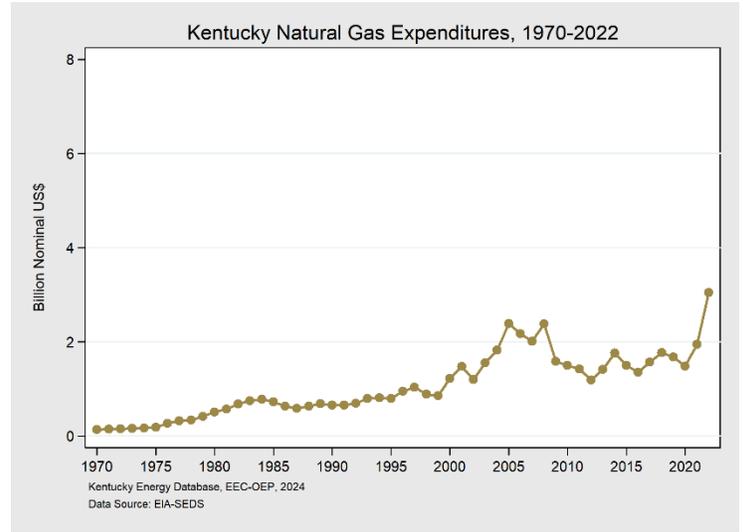
*Citygate prices are defined as "A point or measuring station at which a distributing gas utility receives gas from a natural gas pipeline company or transmission system."

Commodity Expenditures



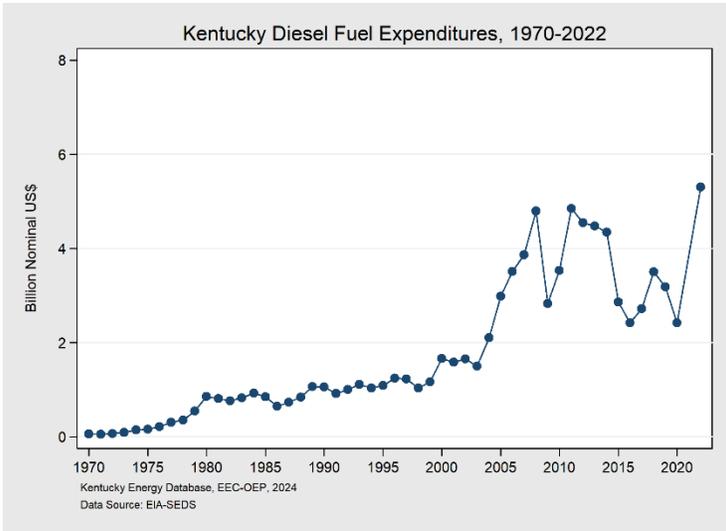
Fuel Type	Million U.S.\$	% of Total
Gasoline	8,112	29.7%

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.



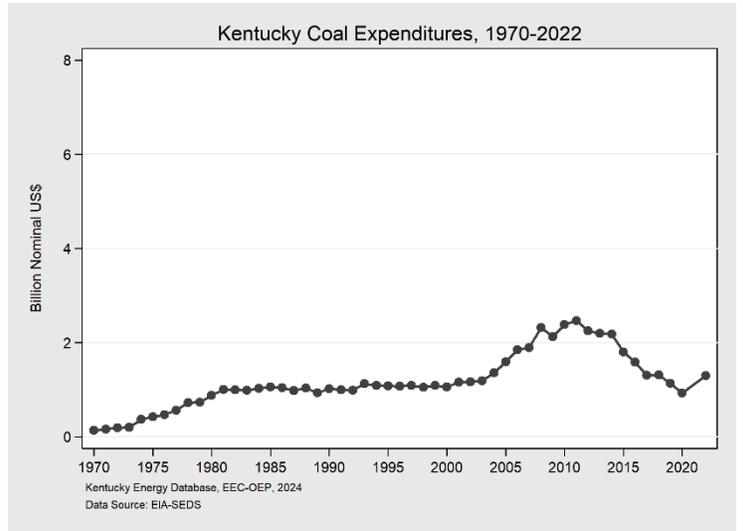
Fuel Type	Million U.S.\$	% of Total
Natural Gas	3,044	11.1%

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.



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.



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

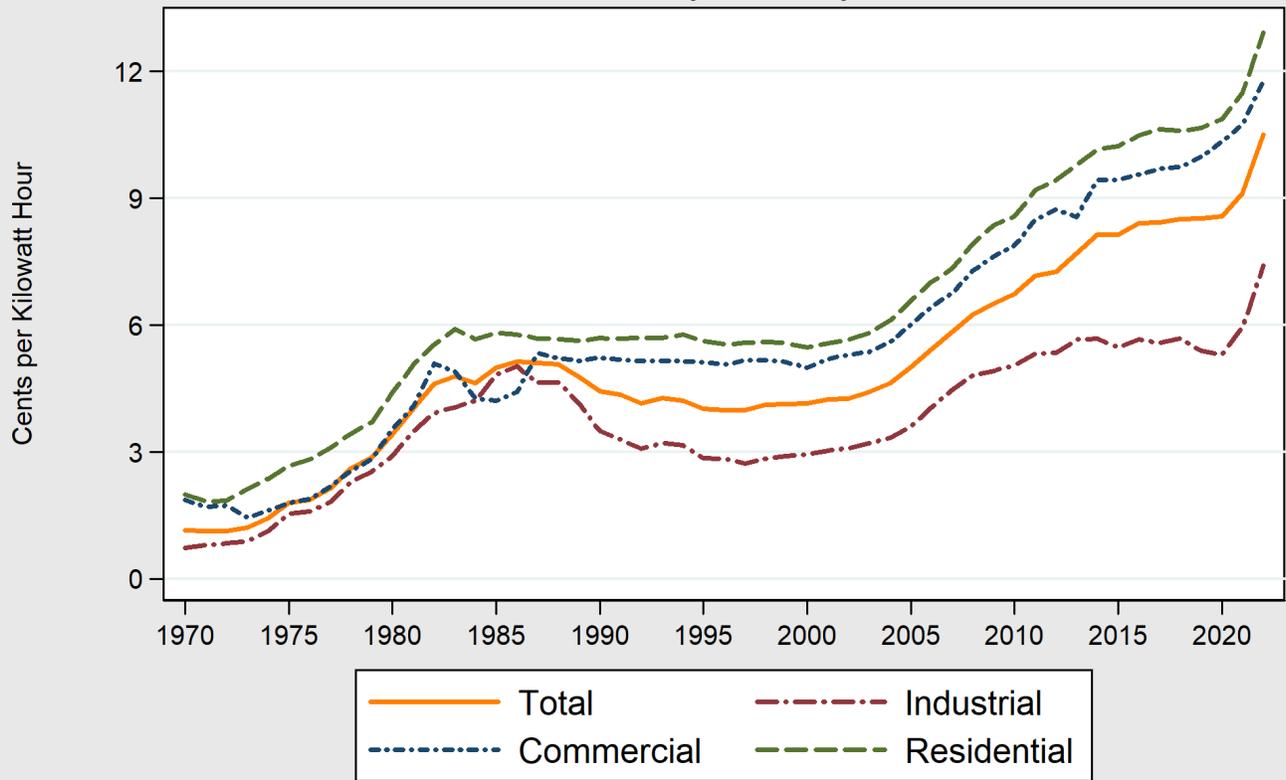


Electricity Proxy Prices by State

Rank	State	Primary Generation Fuel	2022 Proxy Price			
			Average	Industrial	YOY	5-Year
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

Kentucky Average Revenue per Kilowatt-hour, 1970-2022
Nominal Proxy Prices by Sector



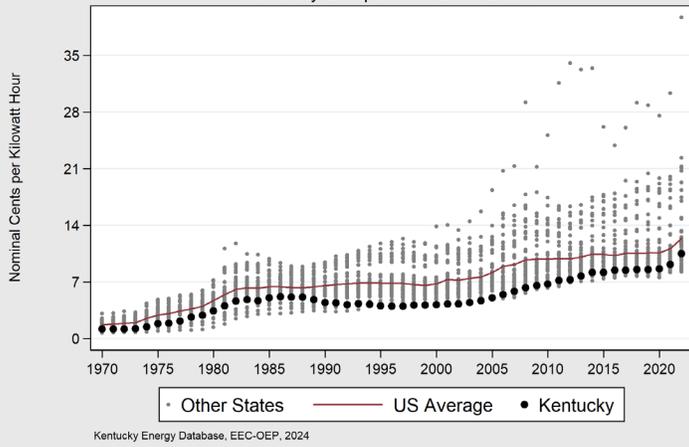
Kentucky Energy Database, EEC-OEP, 2024

Sector	2022 Average Revenue per kWh	U.S. Rank*
Average	10.51	20th
Residential	12.91	16th
Commercial	11.78	30th
Industrial	7.41	18th

*U.S. Rank is from lowest revenue per kWh (1st) to highest (50th).

The Energy Information Administration (EIA) calculates these proxy 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 Average Revenue per Kilowatt-hour, 1970-2022
Kentucky Compared to Other States

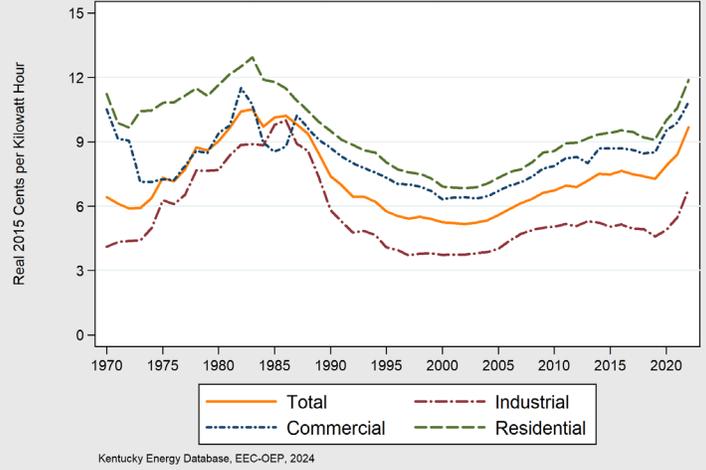


State	Nominal Cents/kWh	Rank
Wyoming	8.24	1st
Kentucky	10.51	20th
U.S. Average	12.36	-
Hawaii	39.72	50th

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.

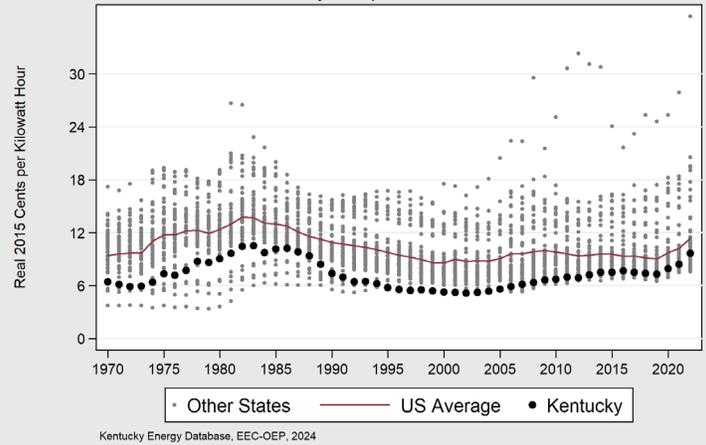
In 2022, the average proxy price of electricity across economic sectors in Kentucky was 10.51¢ per kilowatt-hour. This average proxy price ranked Kentucky electricity prices 20th in the country. The residential sector paid the highest proxy price for electricity at 12.91¢ per kilowatt-hour, followed 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.

Kentucky Average Real Proxy Prices, 1970-2022



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%

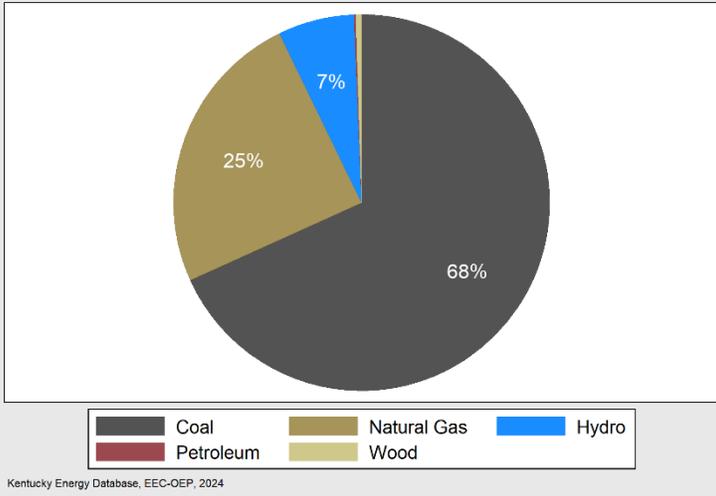
Kentucky Average Real Proxy Prices, 1970-2022
Kentucky Compared to Other States



In inflation-adjusted dollars, the price of electricity in Kentucky 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 proxy prices have increased nearly 23% across the sectors. The industrial sector in Kentucky saw the largest change since 2020 at nearly 40% increase.

Annual Electricity Profiles

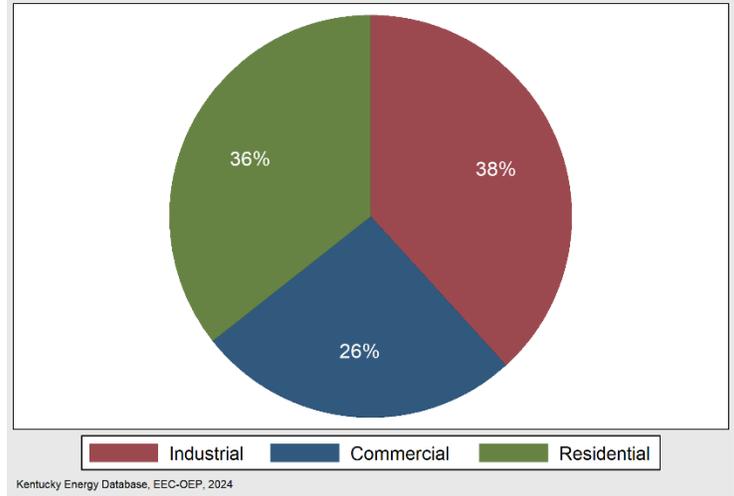
Kentucky Electricity Generation by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Gigawatt Hours	1 Year Change
Total	69,147	-1.10%
Coal	47,053	-5.60%
Natural Gas	16,918	16.10%
Hydro	4,530	-7.10%

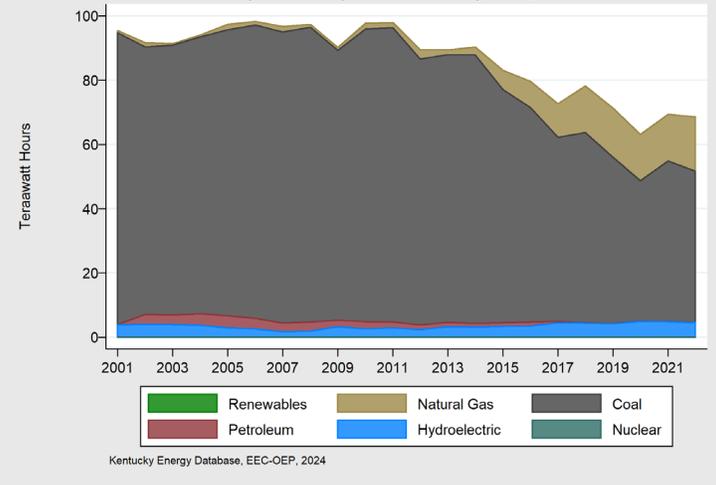
Kentucky Electricity Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

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

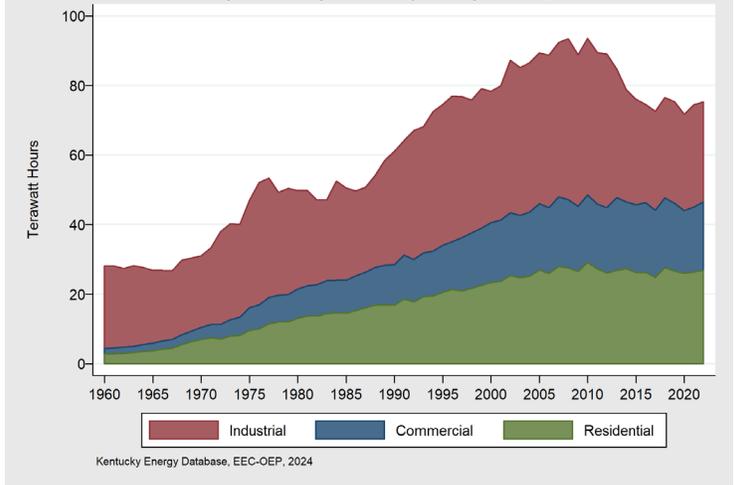


Kentucky Energy Database, EEC-OEP, 2024

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.*

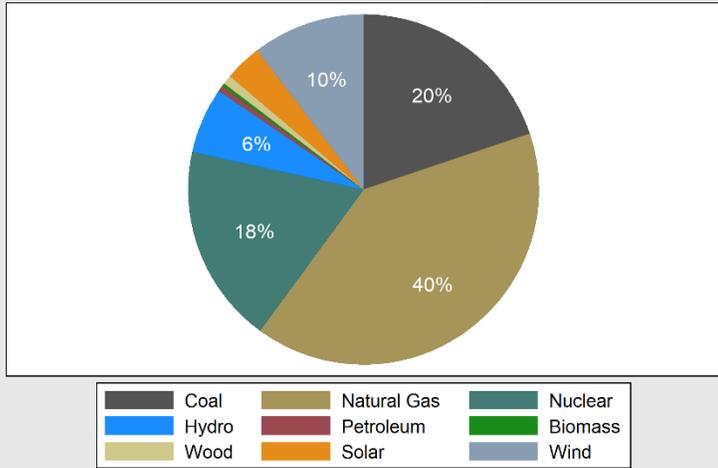
Kentucky Electricity Consumption by Sector, 1960-2022



Kentucky Energy Database, EEC-OEP, 2024

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%.

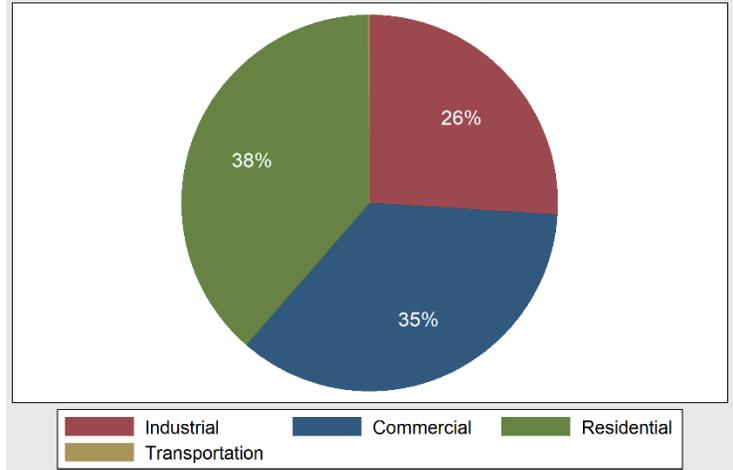
United States Electricity Generation by Fuel, 2022



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%

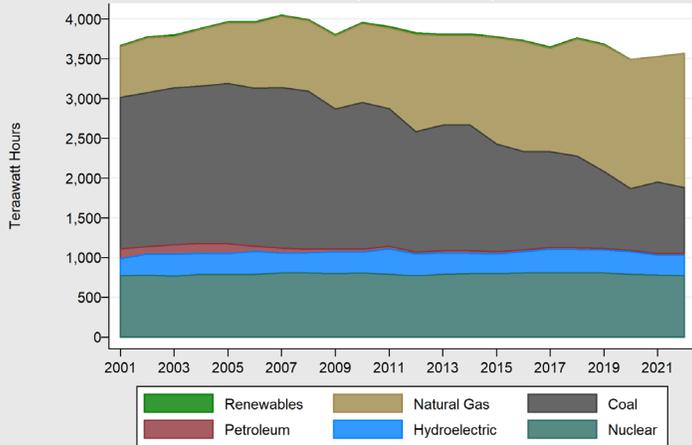
United States Electricity Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

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%

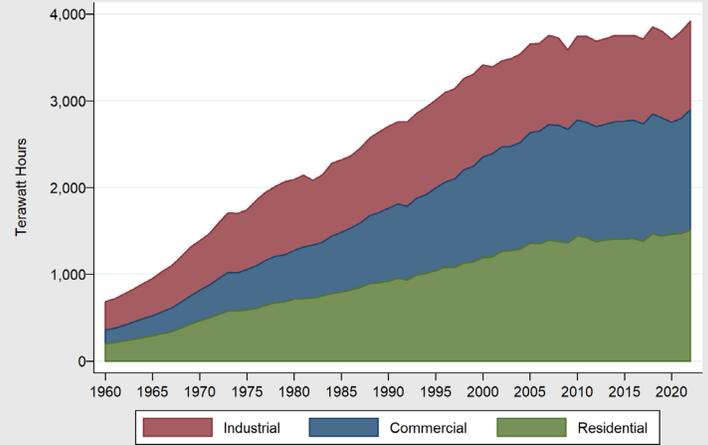
United States Electricity Generation by Fuel, 2001-2022



Kentucky Energy Database, EEC-OEP, 2024

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.

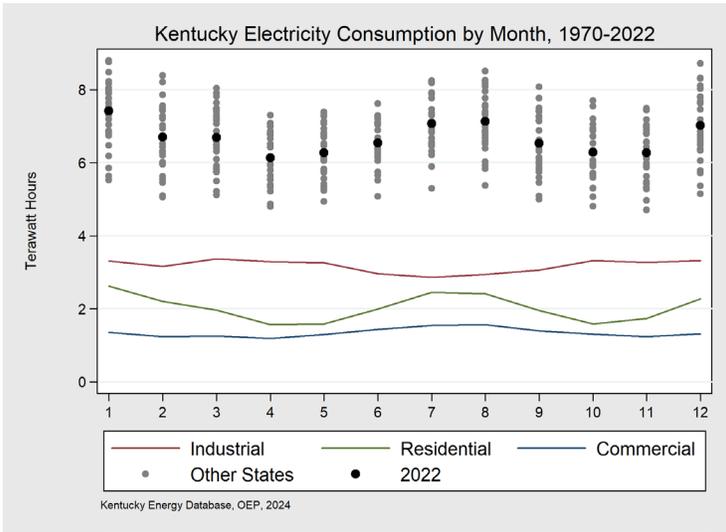
United States Electricity Consumption by Sector, 1960-2022



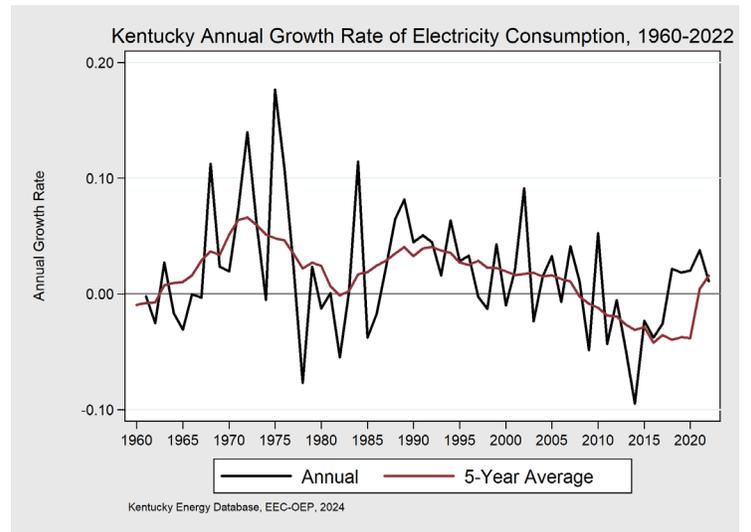
Kentucky Energy Database, EEC-OEP, 2024

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%.

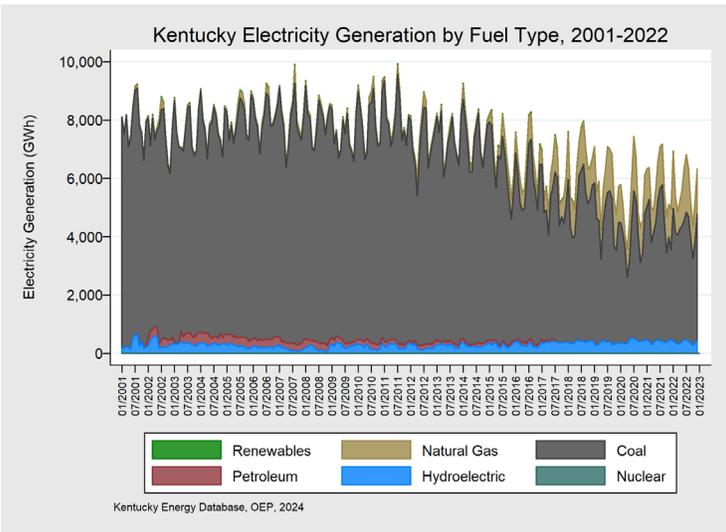
Monthly Electricity Profiles



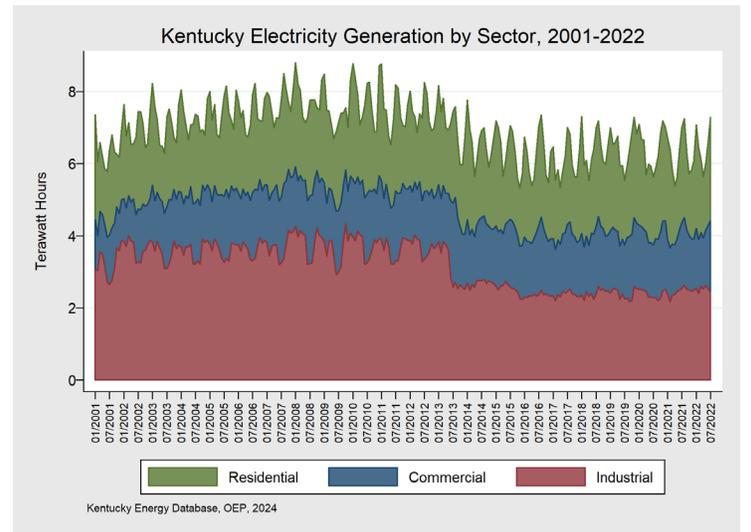
Seasonal fluctuations in Kentucky’s electricity consumption are largely the result of the residential sector, which utilizes electricity for air conditioning in the summer and heating in the winter. On average, the highest demand for electricity in Kentucky occurs in summer and winter.



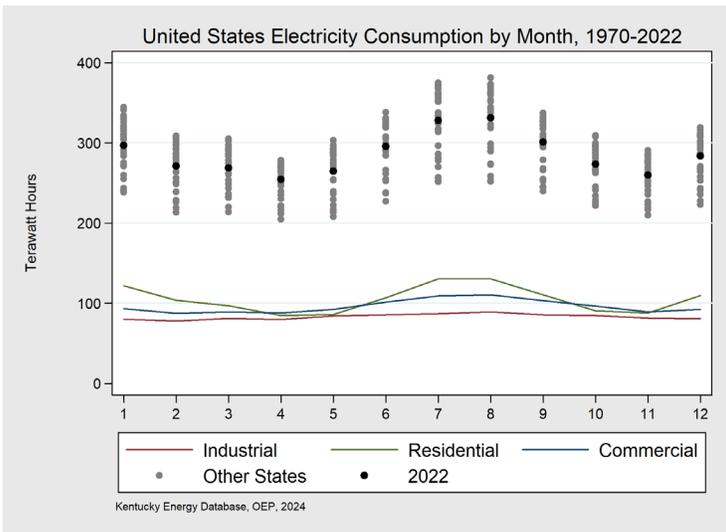
Kentucky electricity demand grew rapidly in the late 1960s to the early 1970s and again from the late 1980s to the early 1990s but has decreased overall since 2008.



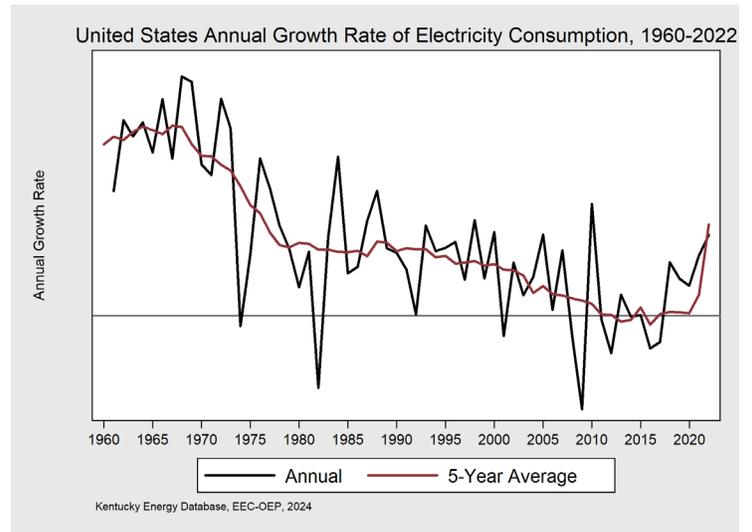
Coal-fired generation supplies most of the electricity in Kentucky. During the spring and fall, electricity demand is lower, and some coal plants go offline for maintenance. In the past five years, natural gas has become a bigger contributor to Kentucky’s electricity generation as well as an increase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



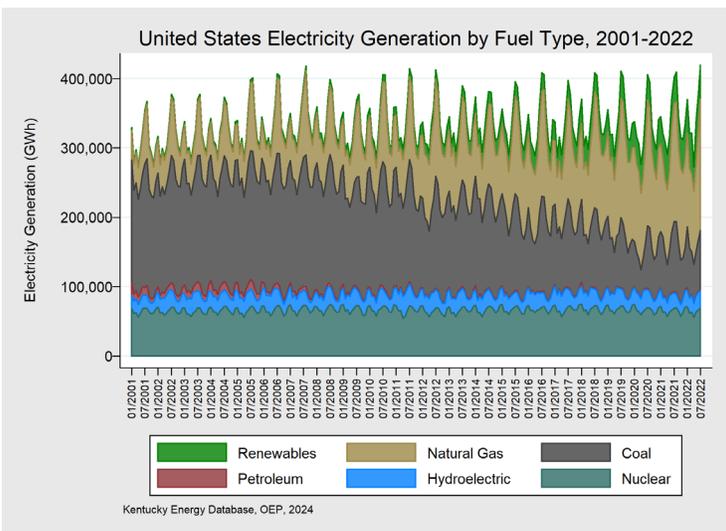
Industrial electricity demand in Kentucky tends to vary little relative to the residential sector. Industrial electricity demand had decreased in 2013, when the United States Enrichment Corporation in Paducah—approximately 15% of Kentucky’s total electricity demand—shut down for annual maintenance. However,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



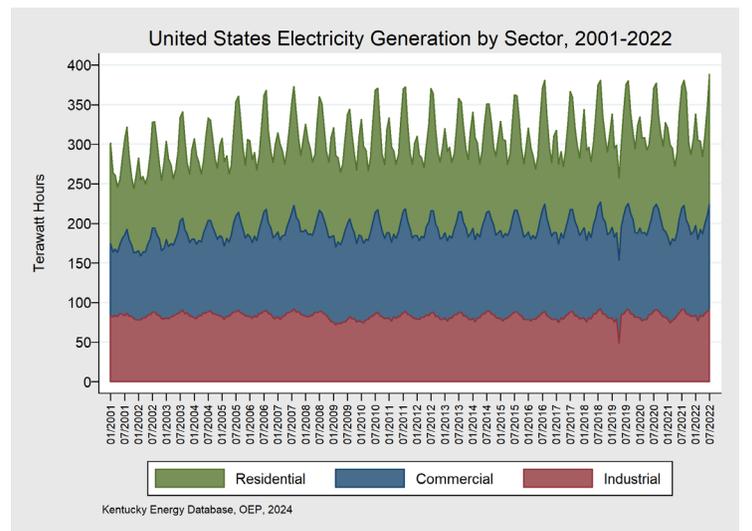
Electricity demand in the United States is approximately the same across all sectors during spring and fall, but demand for heating and air conditioning increases residential and commercial electricity demand in the summer and winter. In contrast, industrial demand is constant throughout the year.



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.

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 the capacity factor of the unit.

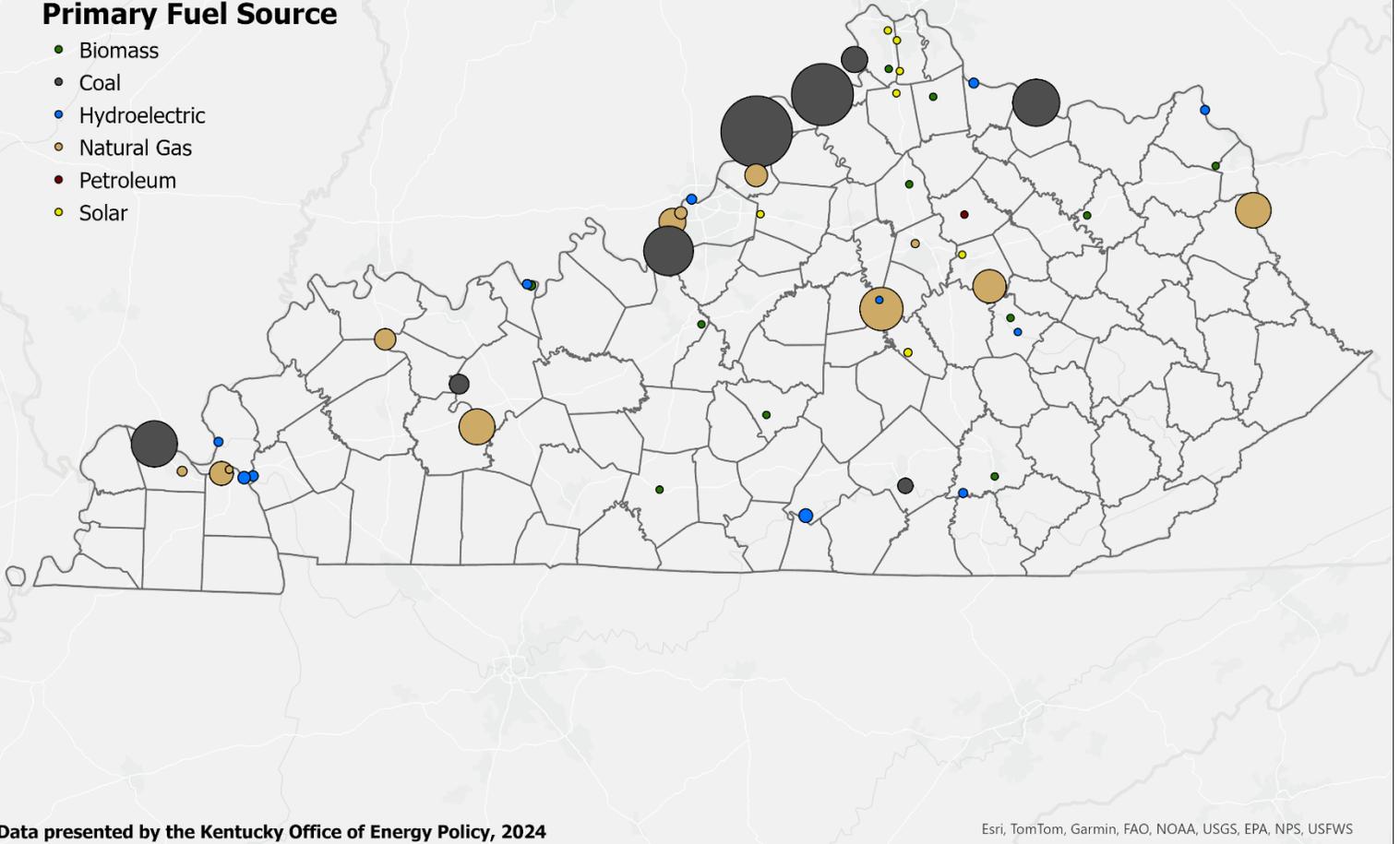
Name	Online Year	Owner	Operating Capacity (MW)
Dix Dam	1925	LG&E-KU	31.5
Mother Ann Lee Hydro	1927	Salt River Electric Coop	2.3
Ohio Falls	1928	LG&E-KU	100.8
Paris, KY	1934	Paris City of KY	11.9
Kentucky	1944	Tennessee Valley Authority	222.5
Wolf Creek Dam	1951	USCE - Nashville District	300
Shawnee	1953	Tennessee Valley Authority	1,242
E.W. Brown	1957	LG&E-KU	1,431
Big Sandy	1963	Kentucky Power Co.	260
J. Sherman Cooper	1965	E KY Power Coop	341
Barkley	1966	USCE - Nashville District	148
Paddy's Run	1968	LG&E-KU	203
Haefling	1970	LG&E-KU	28
Mill Creek	1972	LG&E-KU	1,477
Ghent	1974	Kentucky Utilities Co.	1,943
R.A. Reid	1976	Big Rivers Electric Corp.	65
Laurel	1977	USCE - Nashville District	61
H.L. Spurlock	1977	E KY Power Coop	1,346
R.D. Green	1979	Big Rivers Electric Corp.	454
Elmer Smith	1981	Owensboro Municipal	Retired 2020
East Bend	1981	Duke Energy Kentucky Inc.	600
D.B. Wilson	1984	Big Rivers Electric Corp.	417

Name	Online Year	Owner	Operating Capacity (MW)
Trimble County	1990	Louisville Gas & Electric Co.	2,345
Cox Waste-to-Energy	1995	Cox Waste-To-Energy Inc	3.9
J.K. Smith	1999	E KY Power Coop	989
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
Marshall County Generating Station	2002	Tennessee Valley Authority	742.4
Bavarian Landfill	2003	E KY Power Coop	4.7
Green Valley Landfill	2003	E KY Power Coop	2.4
Laurel Ridge Landfill	2003	E KY Power Coop	4
Hardin County LFGTE	2006	E KY Power Coop	2.4
Pendleton County Landfill	2007	E KY Power Coop	3.2
PPS Power Plant No 1	2010	Paducah Power System Co.	124
Bowling Green Solar Project	2011	Scotty's Dev. Co. LLC	2.1
Blue Ridge Generating	2013	North Amer Natural Resources	1.2
Glasgow Regional Landfill	2015	E KY Power Coop	0.9
Cane Run	2015	LG&E-KU	689
Meldahl Hydropower Project	2016	Hamilton City of (OH)	105
Cannelton Dam	2016	American Mun Power Inc	87.9
Central KY Landfill	2016	Toyota Motor Sales U.S.A. Inc.	2
Cooperative Solar One	2017	E KY Power Coop	8.5
Crittenden Solar Facility	2017	Duke Energy Kentucky Inc.	2.7
Walton Solar Facility	2017	Duke Energy Kentucky Inc.	2
Paradise CC	2017	Tennessee Valley Authority	1,910
L'Oreal Solar - Florence	2017	L'Oreal USA Products Inc	0.9
Smithland Lock and Dam	2017	American Mun Power Inc	75.9
Morehead Generating Facility	2019	North American Bio-Fuels LLC	1.4
Community Solar Project	2019	LG&E-KU	2.5
LGE-KU Solar Share Facility	2019	LG&E-KU	1.7
Ravenna Hydroelectric Project	2021	Soft Energy Associates	2.5
Turkey Creek Farm	2022	Silicon Ranch Corporation	50

Kentucky Power Plants

Primary Fuel Source

- Biomass
- Coal
- Hydroelectric
- Natural Gas
- Petroleum
- Solar

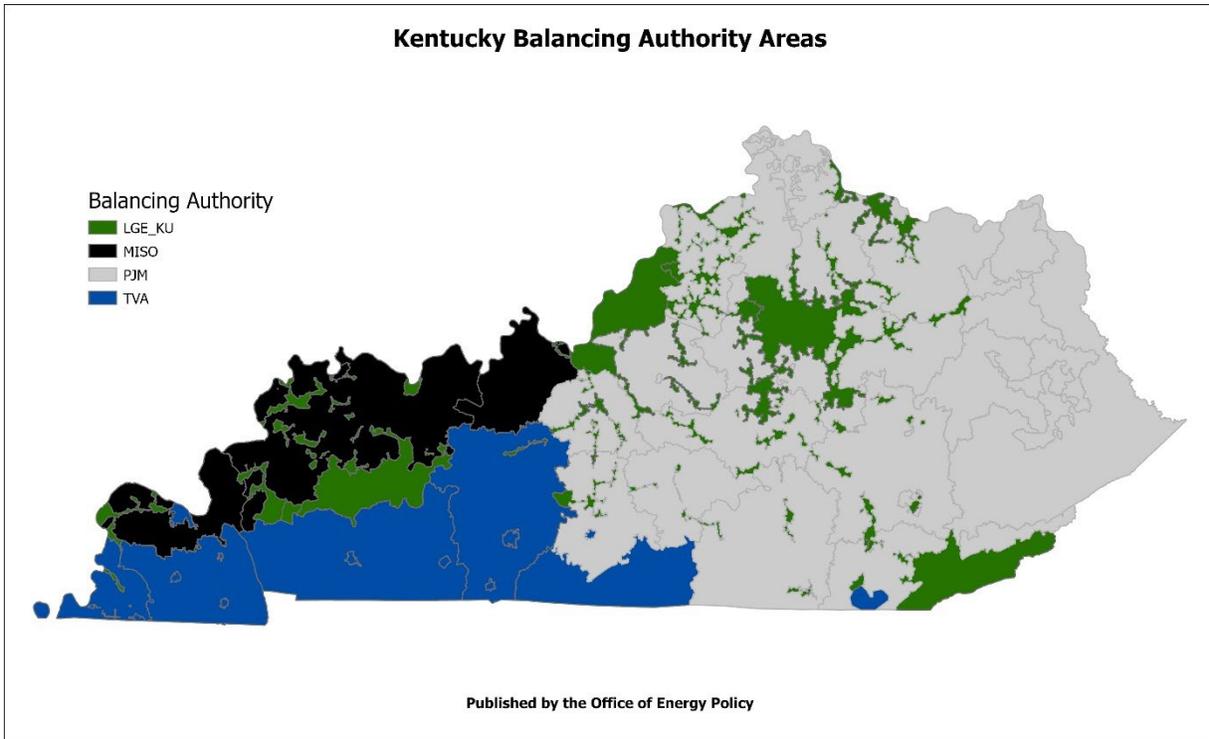


Data presented by the Kentucky Office of Energy Policy, 2024

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS

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.

Balancing Authorities



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.

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

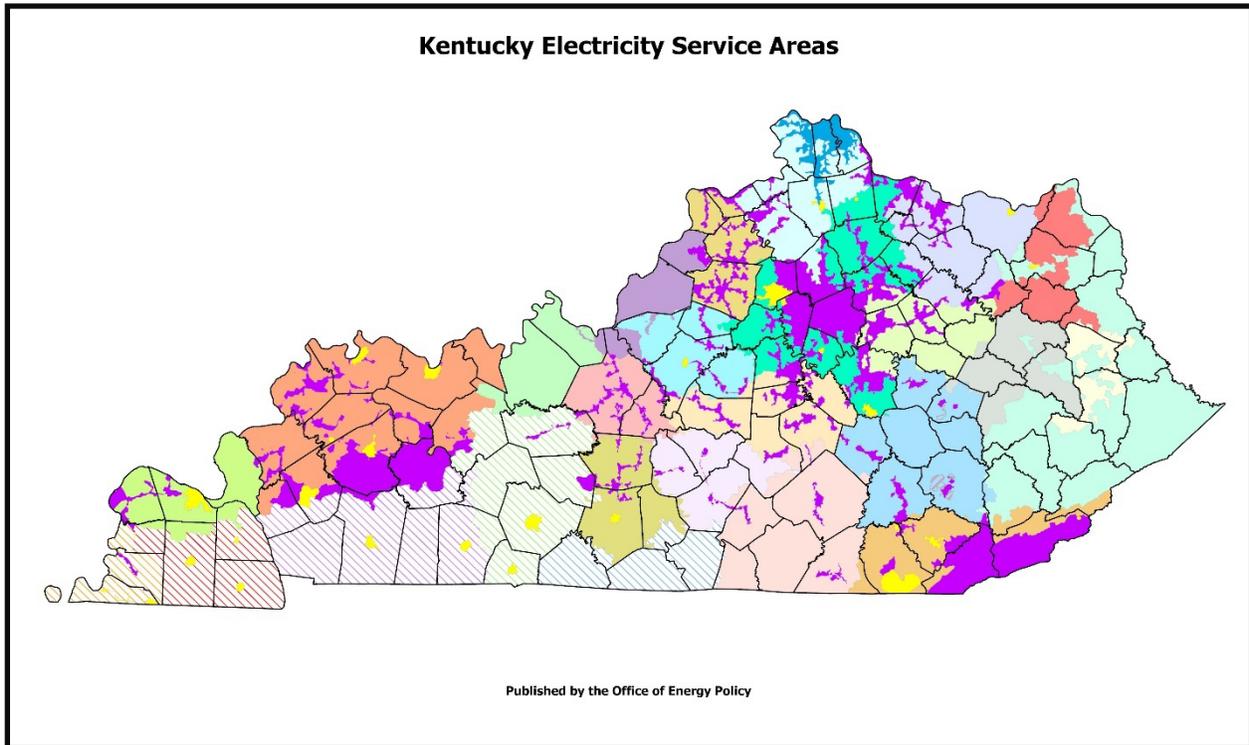
Electric suppliers fall into two categories: IOUs and RECCs. There are four investor-owned companies in Kentucky: Duke Energy Kentucky, Kentucky Power Company (aka. American Electric Power), Kentucky Utilities (KU), and Louisville Gas and Electric (LG&E). Each of these companies generates or purchases 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.

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

Electric Service Areas



All Municipal Utilities		Kentucky Utilities*	
Big Sandy RECC†		Licking Valley RECC†	
Blue Grass ECC†		Louisville Gas & Electric*	
Clark ECC†		Meade County RECC‡	
Cumberland Valley RECC†		Nolin RECC†	
Duke Energy Kentucky*		Owen ECC†	
Farmers RECC†		Pennyrile RECC§	
Fleming-Mason ECC†		Salt River ECC†	
Grayson RECC†		Shelby ECC†	
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 Utility

†EKPC Owner Member Cooperative

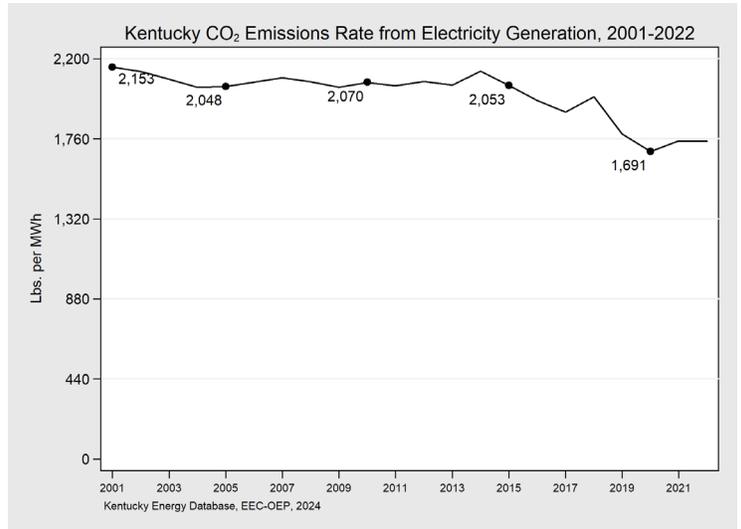
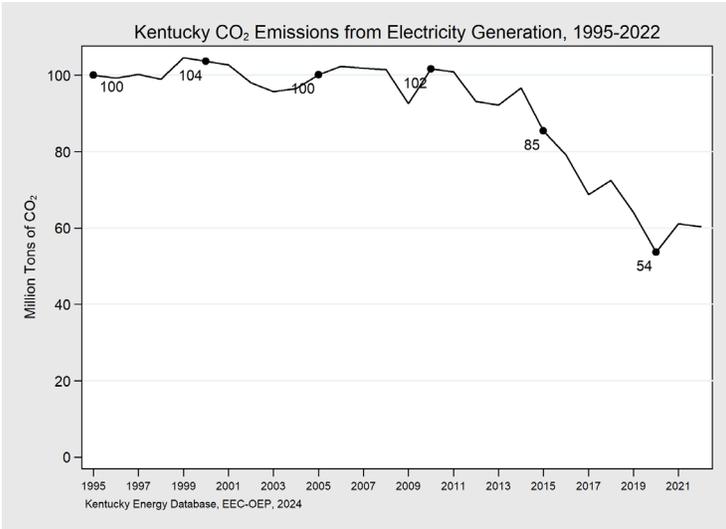
‡BREC Member Cooperative

§TVA Distributor

Electric Utility Prices

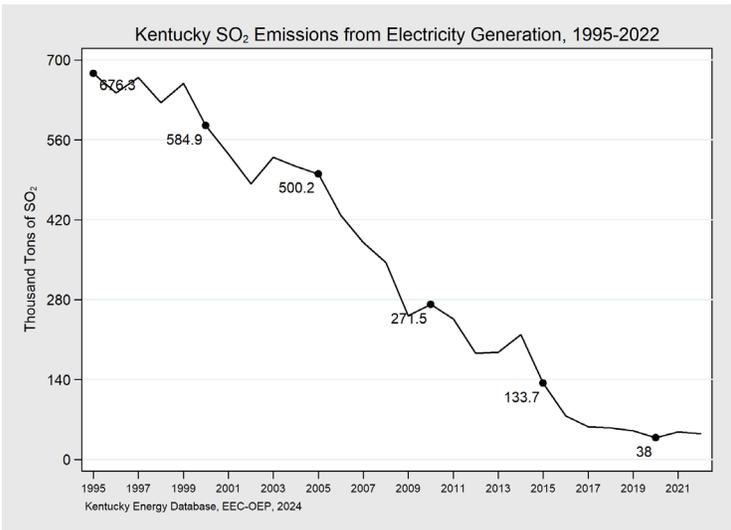
Entity	2022 Average Proxy Price (Cents per kWh)			
	Average	Industrial	Commercial	Residential
Big Sandy RECC	13.19	9.58	12.61	13.69
Blue Grass Energy Coop	11.47	7.97	12.56	12.49
City of Bardstown	9.68	9.02	10.11	10.49
City of Benton	12.48	9.12	12.91	13.63
City of Berea	8.32	7.19	8.67	8.98
City of Bowling Green	10.81	7.55	11.04	11.86
City of Frankfort	9.75	9.07	10.22	10.52
City of Franklin	10.90	7.16	13.21	13.25
City of Fulton	11.85	8.89	12.70	13.40
City of Glasgow	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	12.83	11.03	12.71	13.34
City of Murray	11.22	7.27	11.18	13.54
City of Owensboro	10.10	9.22	8.80	12.91
City of Paducah	14.96	12.44	14.62	15.71
City of Russellville	11.05	8.60	12.49	11.99
Clark Energy Coop	13.36	10.39	13.16	13.51
Cumberland Valley Electric	11.36	9.69	8.68	12.81
Duke Energy Kentucky	11.55	9.66	10.92	13.18
Farmers RECC	12.01	9.46	12.24	12.73
Fleming-Mason Energy Coop	9.38	7.39	10.52	12.65
Gibson Electric Members	11.83	6.64	12.71	13.16
Grayson Rural Electric Coop	13.69	7.69	10.83	16.32
Henderson City Utilities	6.80	5.77	7.92	8.45
Inter County Energy Coop	11.99	7.37	12.27	14.26
Jackson Energy Coop	13.16	8.85	12.37	13.91
Jackson Purchase Energy Corporation	12.67	10.82	10.26	15.24
Kenergy	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 RECC	14.02	10.01	13.10	14.47
Louisville Gas & Electric Co	10.83	7.51	11.20	12.34
Madisonville Municipal	10.12		9.13	12.88
Meade County RECC	14.24		14.07	14.30
Nolin Rural Electric Coop	11.90	7.25	11.55	13.13
Owen Electric Coop	8.87	6.26	11.12	12.86
Pennyrile Rural Electric Coop	11.57	7.53	13.38	12.96
Salt River Electric Coop	10.61	8.41	10.96	11.18
Shelby Energy Co-op	11.27	8.56	10.48	13.05
South Kentucky RECC	12.22	10.19	15.03	12.87
Taylor County RECC	10.68	7.26	11.00	11.84
Tennessee Valley Authority	5.11	4.92	7.97	
Tri-County Elec Member Corp (KY)	10.93	7.27	10.42	12.45
Warren Rural Elec Coop	10.39	7.43	12.98	11.98
West Kentucky RECC	11.66	4.93	14.97	13.30

Electric Power Emissions

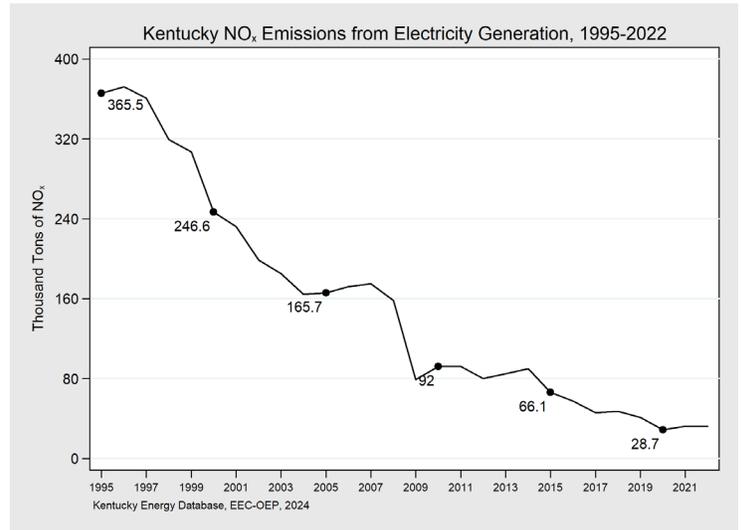


Emission	Tons	% Change
Carbon Dioxide	60,352,643	-41.8%
Sulfur Dioxide	45,320	-92.3%
Nitrogen Oxides	32,061	-87.0%

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.

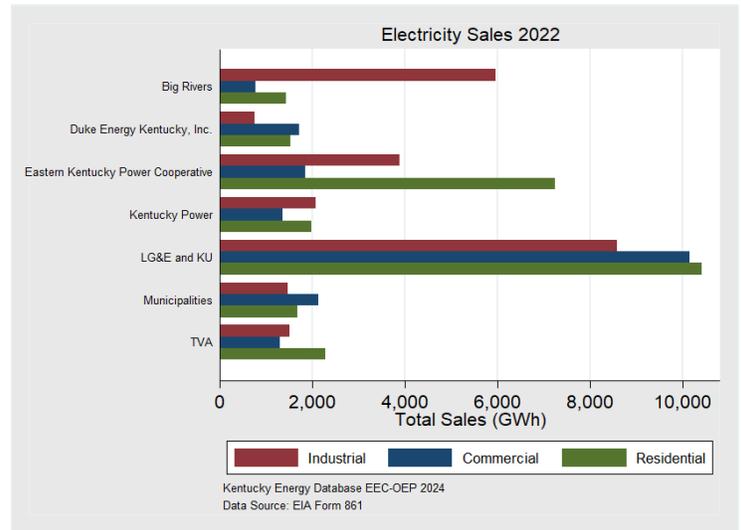
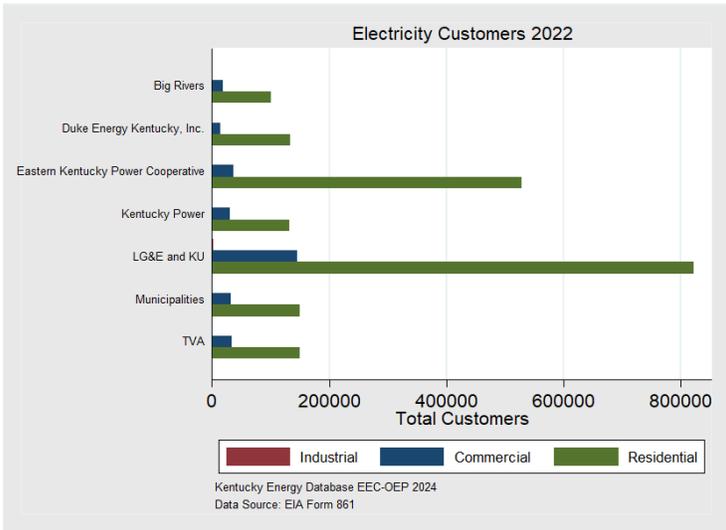


Sulfur dioxide (SO₂) is a highly reactive gas and major pollutant that is monitored and regulated by the state and federal government due to its connection to acid rain, incidence of asthma, and other respiratory problems. In 2022, the electric power sector of Kentucky emitted 45,320 tons of sulfur dioxide,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



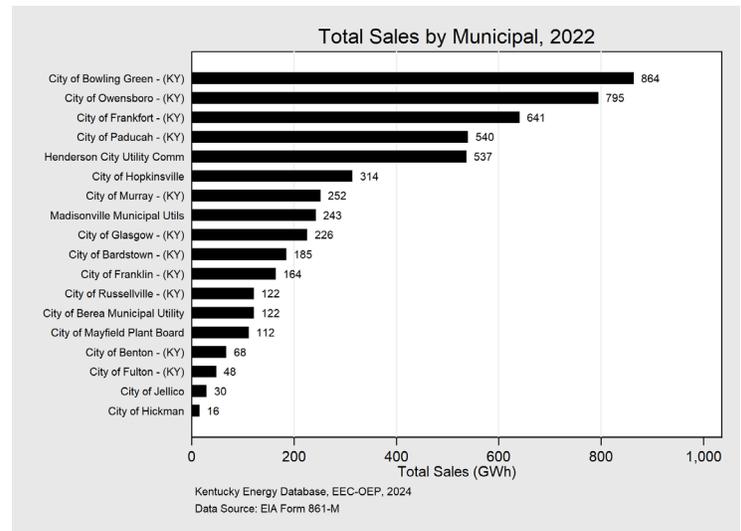
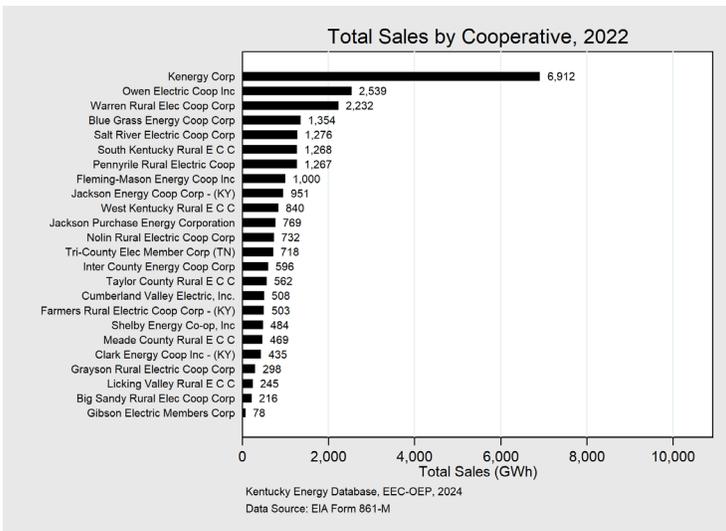
Nitrogen oxides (NO_x) are a group of highly reactive regulated pollutants: Nitric oxide (NO), Nitrogen dioxide (NO₂), and Nitrous oxide (N₂O). Nitrogen oxide, which is displayed here, has been shown to cause acid rain and exacerbate respiratory disease, while nitrous oxide, or laughing gas, is a greenhouse 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.

Electric Utility Profiles



Entity	Customers	Percentage
Total	2,335,129	100.0%
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%

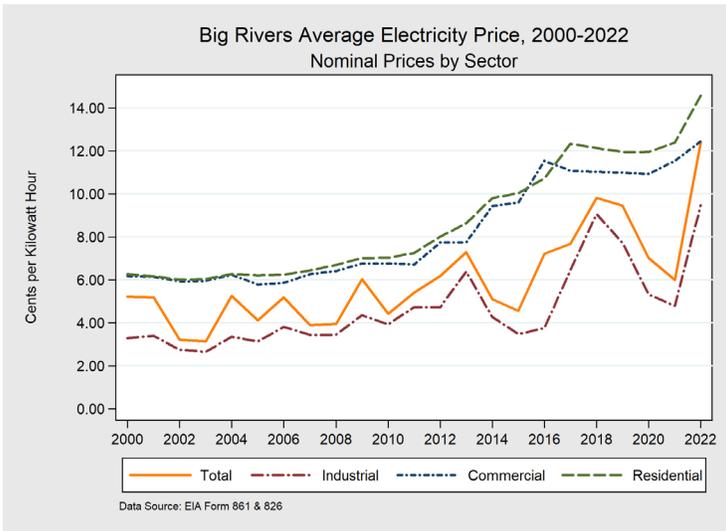
Entity	Sales (GWh)	Percentage
Total	69,943	100%
LG&E and KU	29,123	41.60%
EKPC	12,966	18.50%
Big Rivers	8,150	11.70%
TVA	5,057	7.20%
Municipalities	5,279	7.50%
Kentucky Power	5,391	7.70%



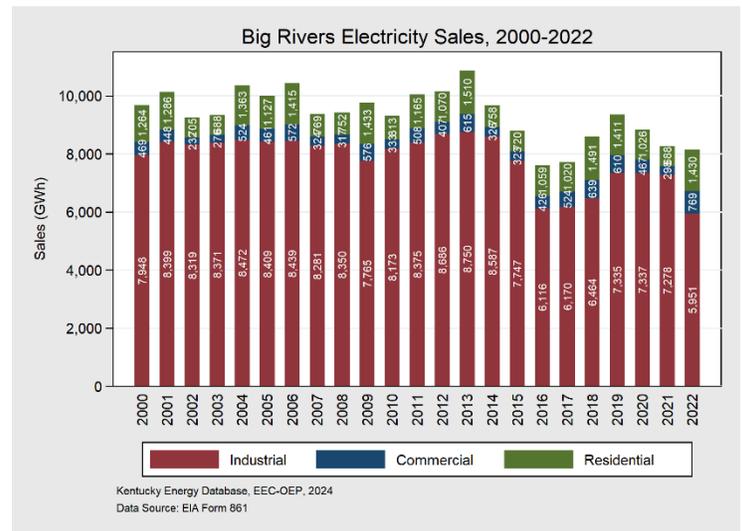
Utilities in Kentucky sold 70 TWh to 2.3 million consumers in 2022. LG&E and KU sell to 41.5% of consumers in the Commonwealth, while East Kentucky Power Cooperative sells to 24%, and the rest 34.5%.

All 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.

Big Rivers

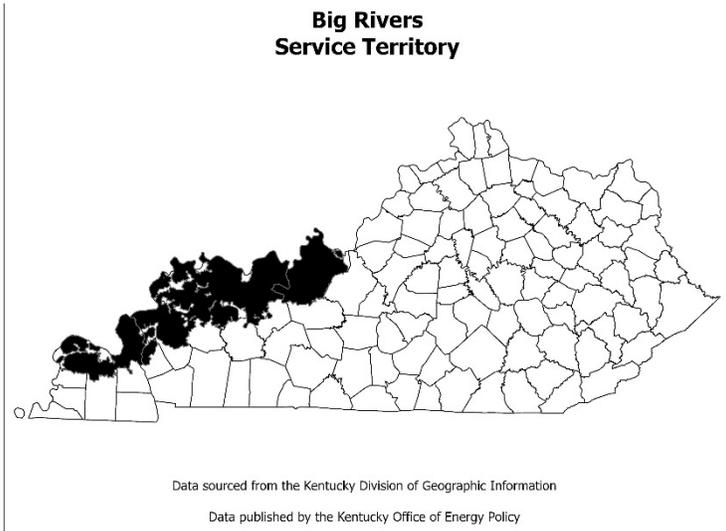


Sector	Price (Cents/kWh)	Since 2012
Total†	12.38	100%
Residential	14.58	82.30%
Commercial	12.45	60.60%
Industrial	9.47	100%

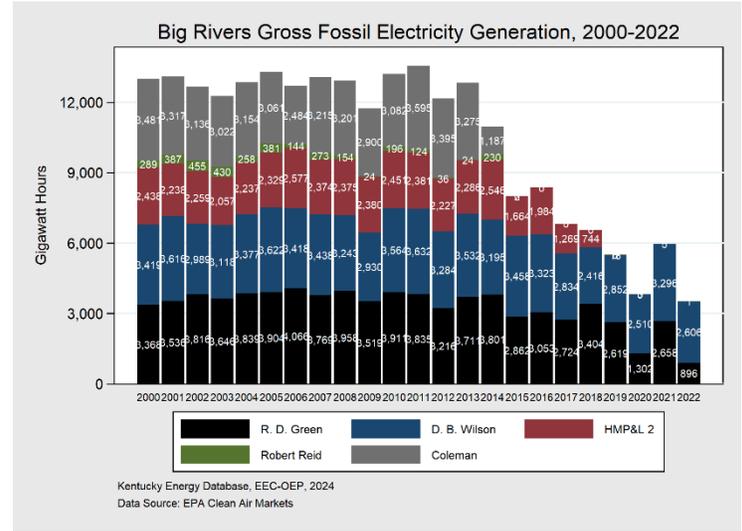


Sector	Sales (GWh)	Percentage
Total†	8,150	100%
Industrial	5,951	73.0%
Residential	1,430	17.5%
Commercial	769	9.5%

†Includes direct sales and sales to rural electric cooperatives



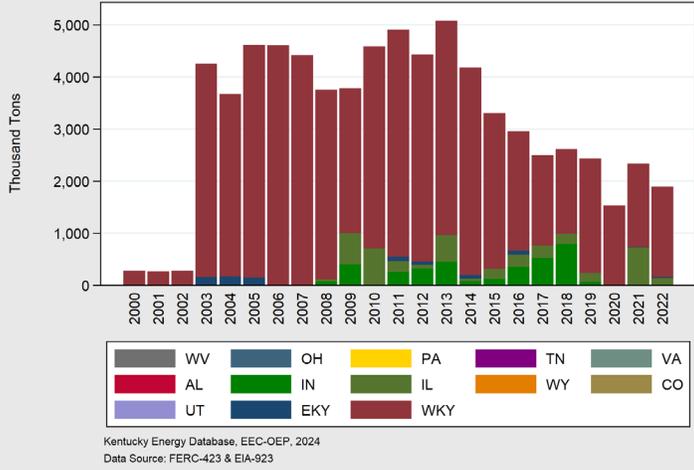
Big Rivers Electric Corporation generates and sells electricity in northwestern Kentucky. Total electricity prices in 2022 were 12.38 cents per kWh and have increased by 100% since 2012. Big Rivers serves three RECCs: Kenegy Corporation, Meade County RECC, and Jackson Purchase Energy Corporation. Big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



Electricity Generation	2022	Since 2012
Gigawatt Hours	3,502	-71.20%

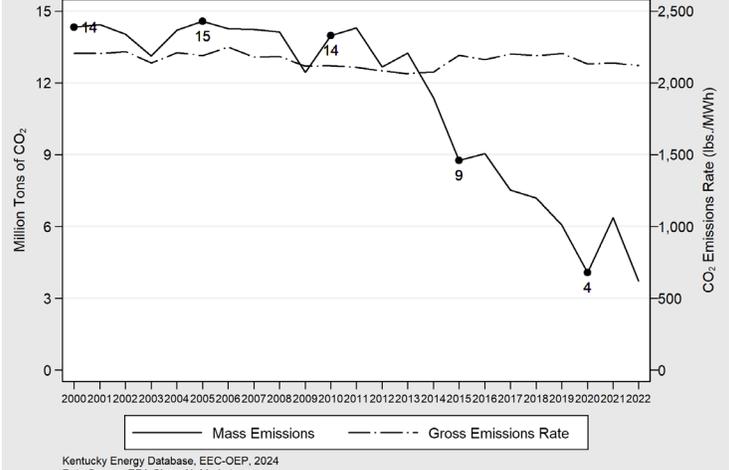
Big Rivers generated 3.5 TWh and sold 8.2 TWh of electricity in 2022. Since the retirements of Henderson, Coleman and Reid power plants, fossil fuel generation has continued to decrease since 2013. When electricity sales are greater than generation, it means that the utility purchased power from another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

Big Rivers Coal Consumption by Origin, 2000-2022



State	2022 Tons	Percentage
Total	1,893,388	100%
Western Kentucky	1,740,092	91.90%
Illinois	142,252	7.50%
Eastern Kentucky	11,044	0.60%

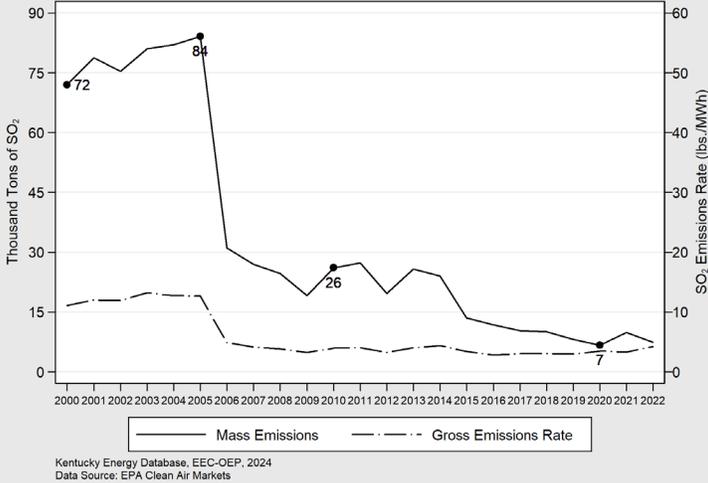
Big Rivers CO₂ Emissions from Fossil Generation, 2000-2022



Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	3,716,126	-70.70%
Rate (lbs./MWh)	2,121	1.80%

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 same span.

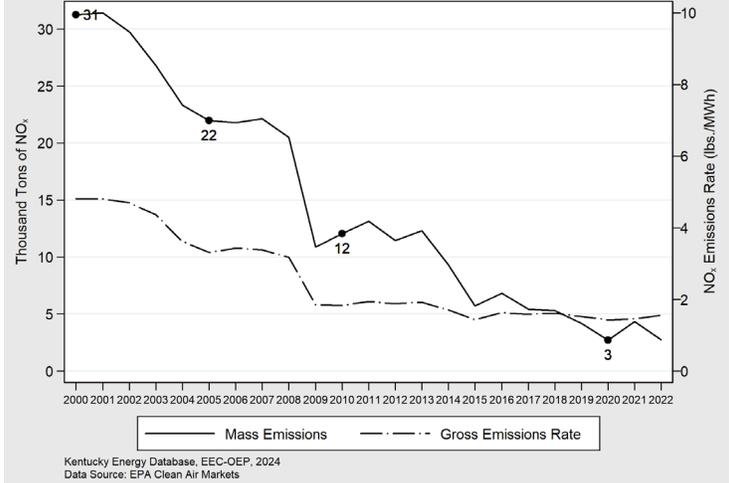
Big Rivers SO₂ Emissions from Fossil Generation, 2000-2022



Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	7,380	-62.40%
Rate (lbs./MWh)	4.22	30.70%

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.

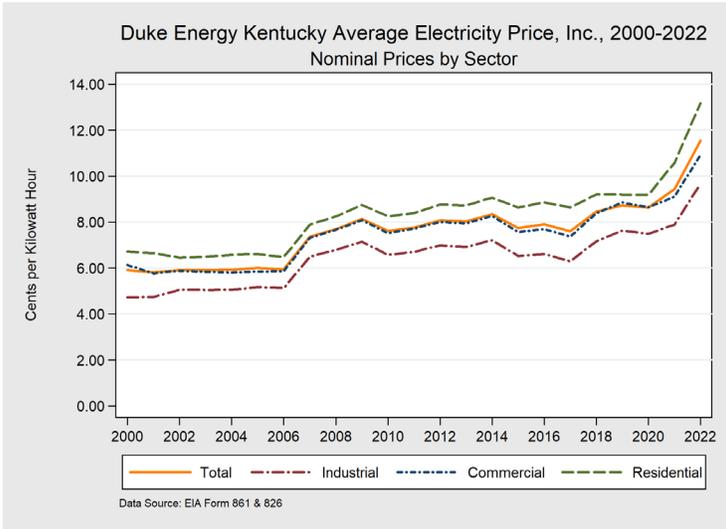
Big Rivers NO_x Emissions from Fossil Generation, 2000-2022



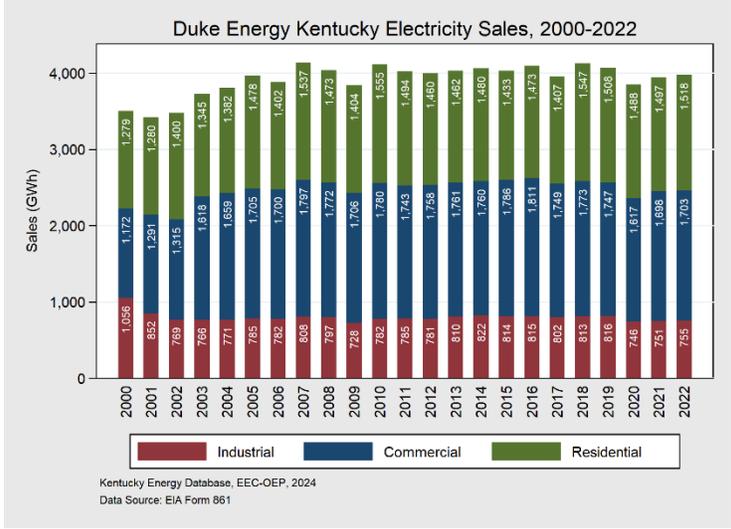
Nitrogen Dioxide	2020	Since 2010
Emissions (Tonnage)	2,740	-76.00%
Rate (lbs./MWh)	1.56	-17.00%

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

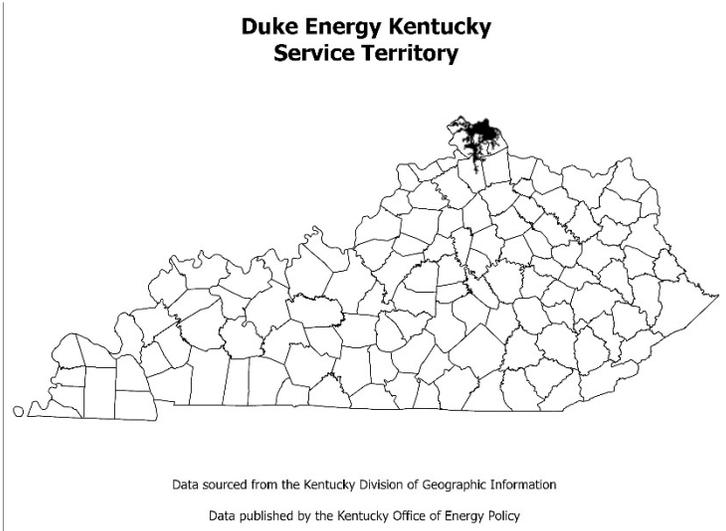


Sector	Price (Cents/kWh)	Since 2012
Total†	11.55	42.9%
Residential	13.18	50.5%
Commercial	10.92	36.3%
Industrial	9.66	38.2%

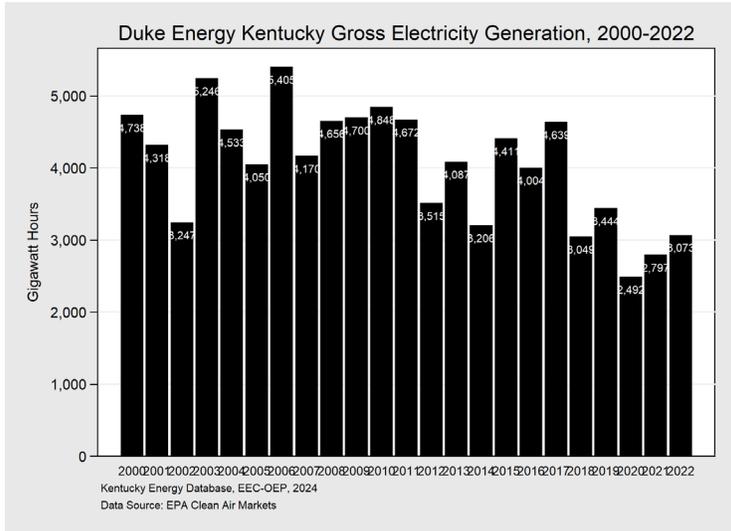


Sector	Sales (GWh)	Percentage
Total†	3,977	100%
Commercial	1,703	42.8%
Residential	1,518	38.2%
Industrial	755	19.0%

†Includes direct sales and sales to rural electric cooperatives



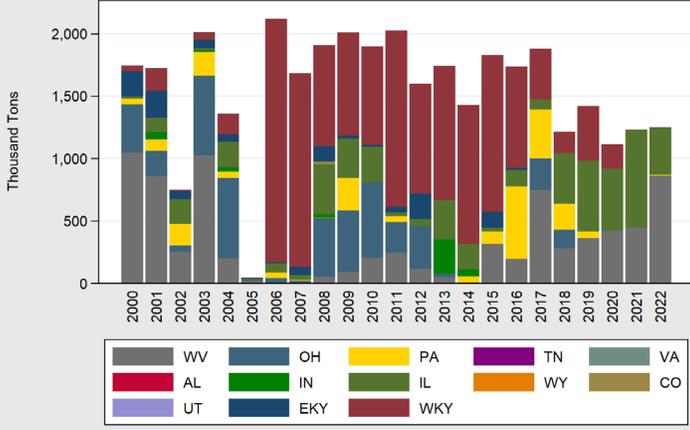
Duke Energy Kentucky generates and sells electricity in northern Kentucky and is owned and operated by Duke Energy. Total electricity prices in 2022 were 11.55 cents per kWh and has increased by 42.9% since 2012. Duke Energy owns and operates the East Bend coal-fired power plant in Boone County. Duke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



Electricity Generation	2022	Since 2012
Gigawatt Hours	3,073	-12.60%

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

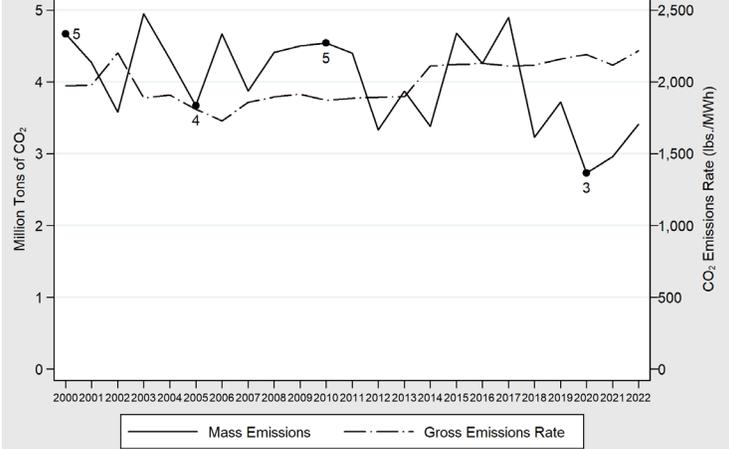
Duke Energy Kentucky Coal Consumption by Origin, 2000-2022



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

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%

Duke Energy CO₂ Emissions from Fossil Generation, 2000-2022

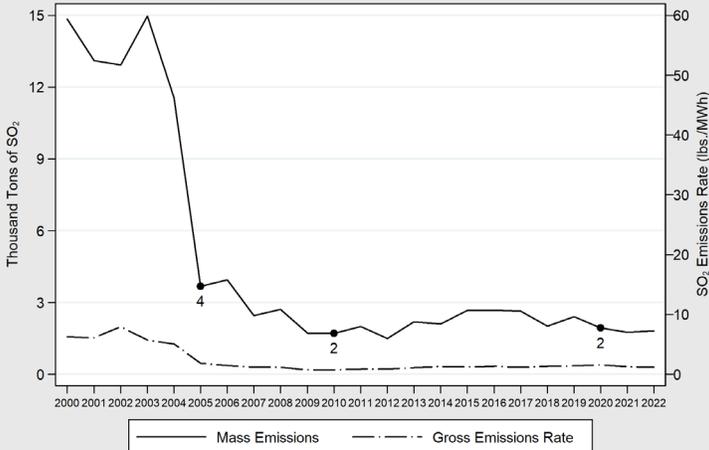


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Carbon Dioxide	2022	
Emissions (Tonnage)	3,405,481	2.30%
Rate (lbs./MWh)	2,217	17.10%

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

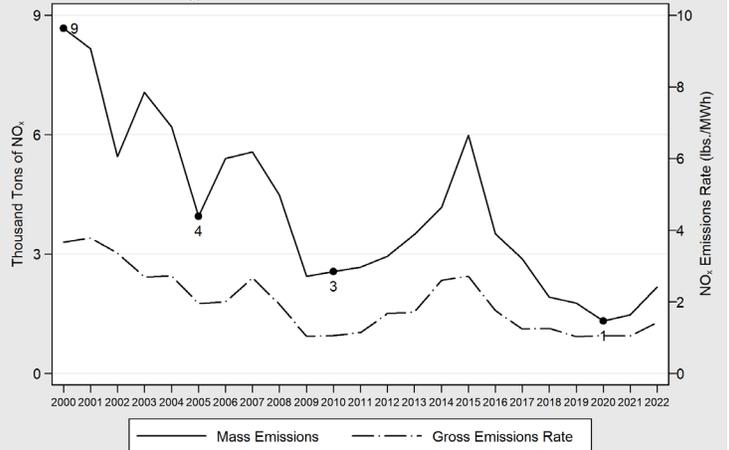


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2010
Emissions (Tonnage)	1,820	21.30%
Rate (lbs./MWh)	1.19	40.00%

Duke Energy Kentucky emitted 1,820 tons of SO₂ in 2022, an increase of 21% since 2010. The rate of SO₂ emissions increased by 40% during that period.

Duke Energy NO_x Emissions from Fossil Generation, 2000-2022

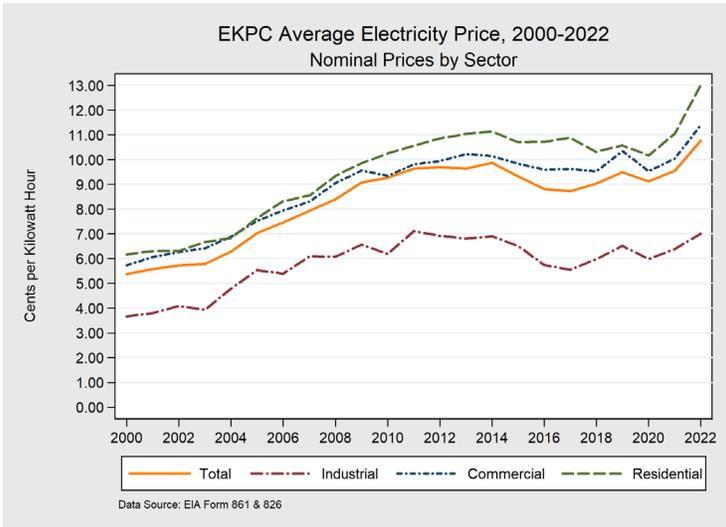


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

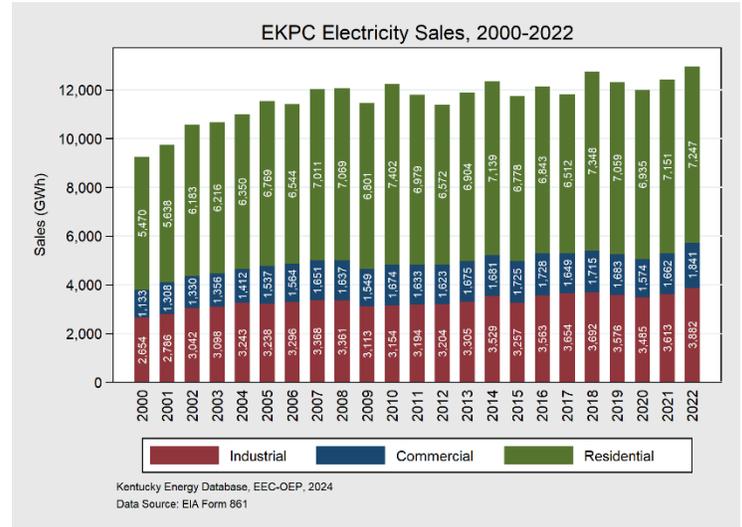
Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	2,180	-25.90%
Rate (lbs./MWh)	1.42	-15.00%

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

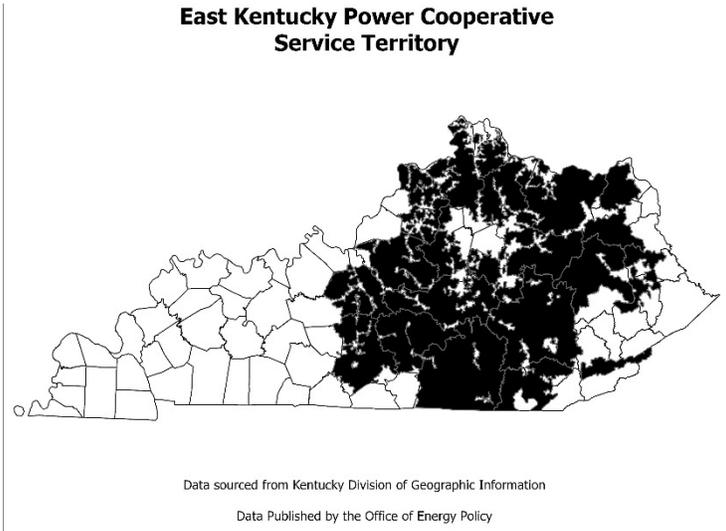


Sector	Price (Cents/kWh)	Since 2012
Total	10.77	11.00%
Residential	13.01	19.80%
Commercial	11.39	14.60%
Industrial	7.01	1.30%

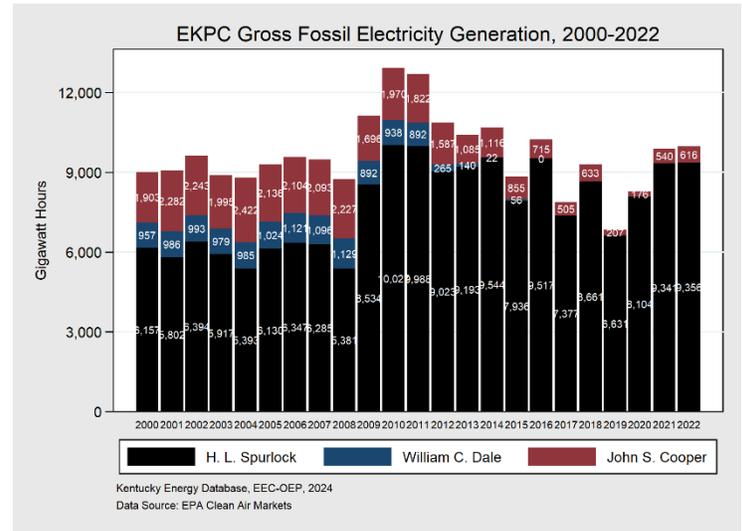


Sector	Sales (GWh)	Percentage
Total	12,969	100%
Residential	7,247	55.90%
Industrial	3,882	29.90%
Commercial	1,841	14.20%

*Includes direct sales and sales to rural electric cooperatives



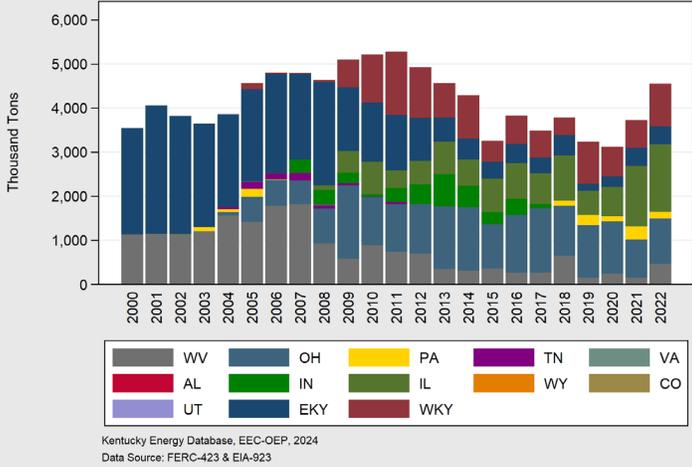
East Kentucky Power Cooperative serves central and eastern Kentucky where 16 RECCs jointly own and purchase electricity from EKPC. Total electricity prices in 2022 were 10.77 cents per kWh and have increased by 11% since 2012. EKPC owns and operates two coal-fired power plants, two natural gas electricity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



Electricity Generation	2022	Since 2012
Gigawatt Hours	9,972	-8.30%

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.

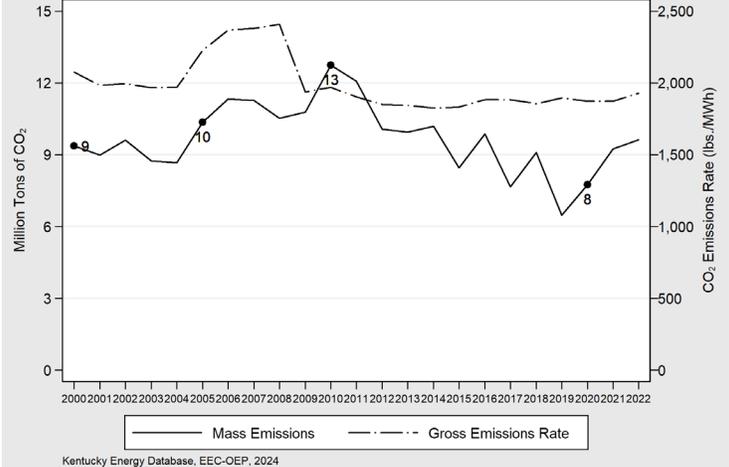
EKPC Coal Consumption by Origin, 2000-2022



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

State	2022 Tons	Percentage
Total	4,550,710	100%
Ohio	1,028,421	22.60%
Western Kentucky	971,783	21.40%
Illinois	1,526,510	33.50%
Eastern Kentucky	407,495	9.00%
West Virginia	463,453	10.20%
Pennsylvania	153,048	3.30%

EKPC CO₂ Emissions from Fossil Generation, 2000-2022

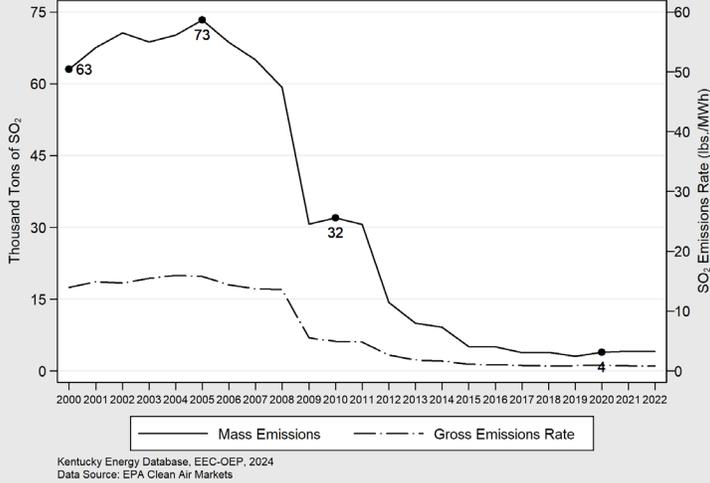


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	9,615,208	-4.50%
Rate (lbs./MWh)	1,928	4.20%

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

EKPC SO₂ Emissions from Fossil Generation, 2000-2022

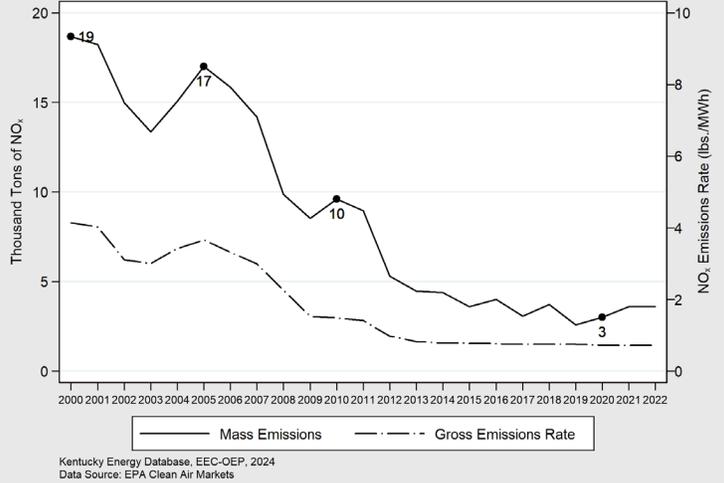


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	4,010	-72.00%
Rate (lbs./MWh)	0.8	-69.60%

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



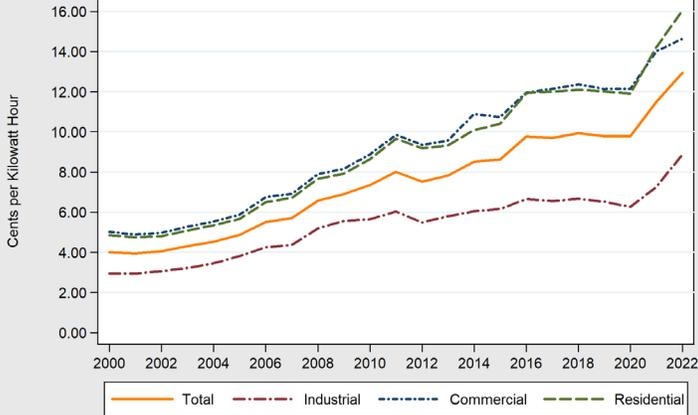
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	3,600	-32.20%
Rate (lbs./MWh)	0.72	-26.50%

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

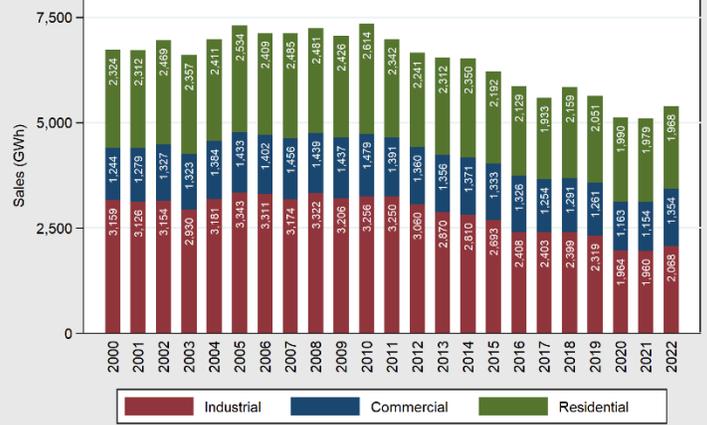
Kentucky Power Average Electricity Price, 2000-2022
Nominal Prices by Sector



Data Source: EIA Form 861 & 826

Sector	Price (Cents/kWh)	Since 2012
Total	12.95	72.70%
Residential	16.05	74.80%
Commercial	14.64	56.40%
Industrial	8.89	61.90%

Kentucky Power Electricity Sales, 2000-2022



Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA Form 861

Sector	Sales (GWh)	Percentage
Total†	5,391	100%
Industrial	2,068	38.40%
Residential	1,968	36.50%
Commercial	1,354	25.10%

†Includes direct sales and sales to rural electric cooperatives

Kentucky Power Service Territory

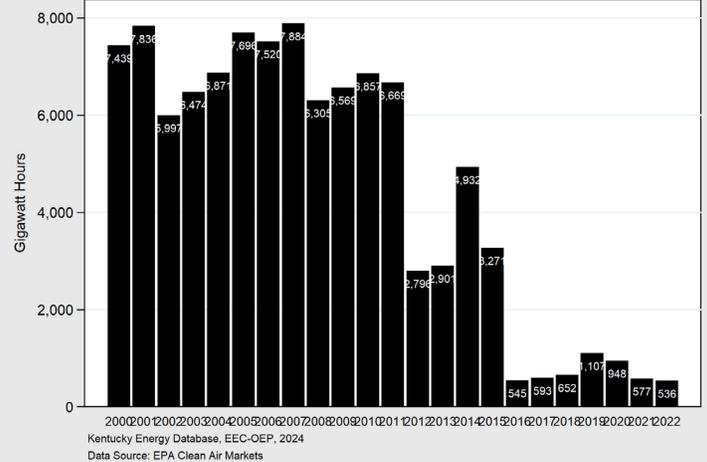


Data sourced from the Kentucky Division of Geographic Information

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

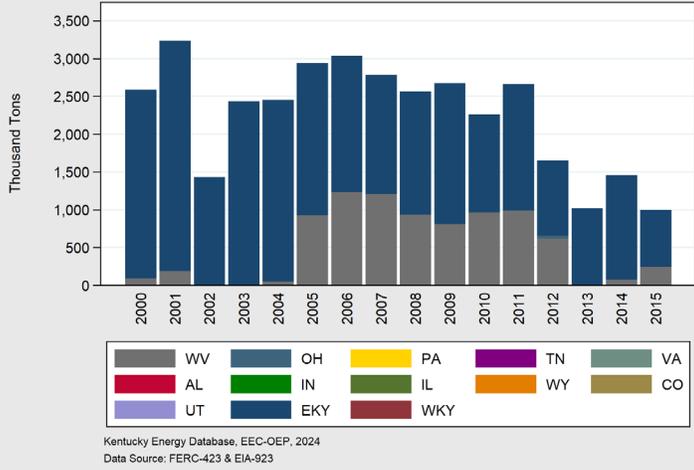


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Electricity Generation	2022	Since 2012
Gigawatt Hours	536	-80.80%

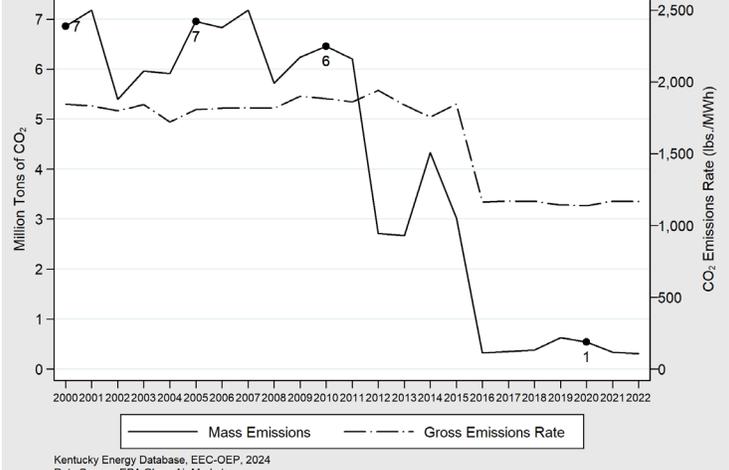
Kentucky Power generated 536 GWh and sold 5.4 TWh of electricity in 2022. Since 2012 generation has decreased by 81%.

Kentucky Power Coal Consumption by Origin, 2000-2022



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

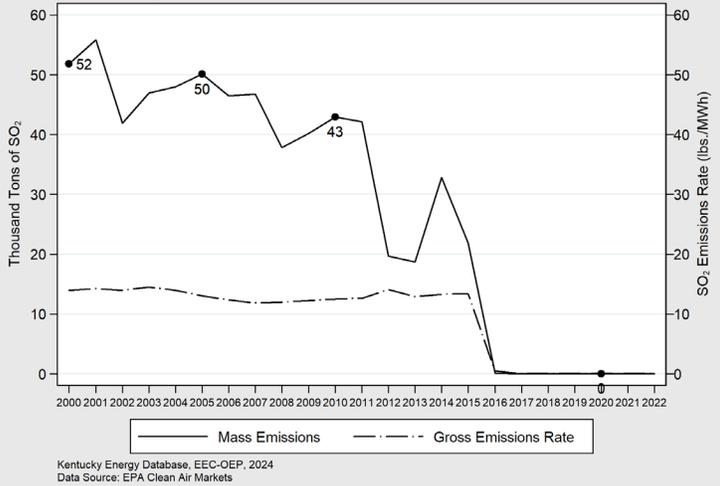
Kentucky Power CO₂ Emissions from Fossil Generation, 2000-2022



Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	313,359	-88.50%
Rate (lbs./MWh)	1,168	-39.80%

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.

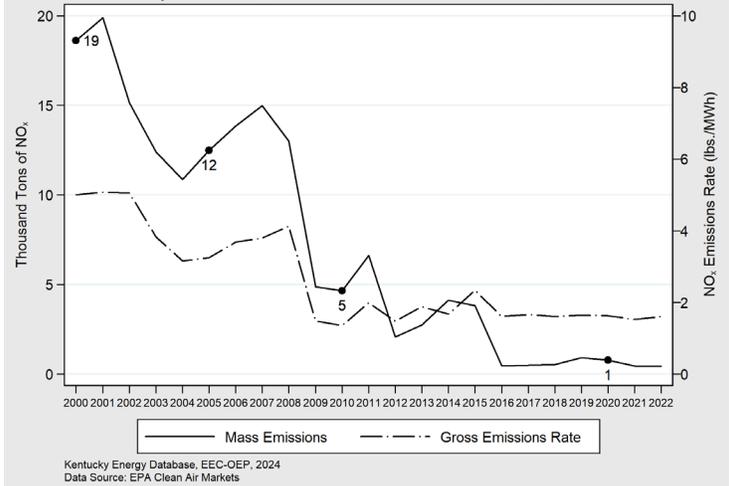
Kentucky Power SO₂ Emissions from Fossil Generation, 2000-2022



Sulfur Dioxide	2020	Since 2010
Emissions (Tonnage)	10	-99.90%
Rate (lbs./MWh)	0.05	-99.60%

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.

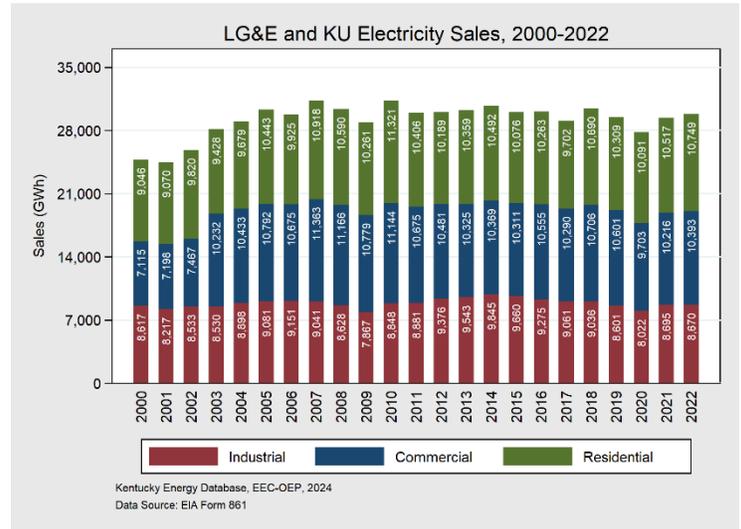
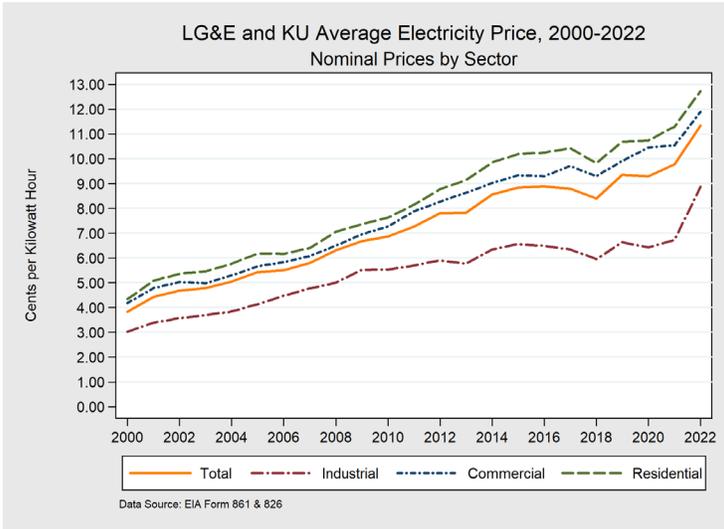
Kentucky Power NO_x Emissions from Fossil Generation, 2000-2022



Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	430	-79.20%
Rate (lbs./MWh)	1.6	8.10%

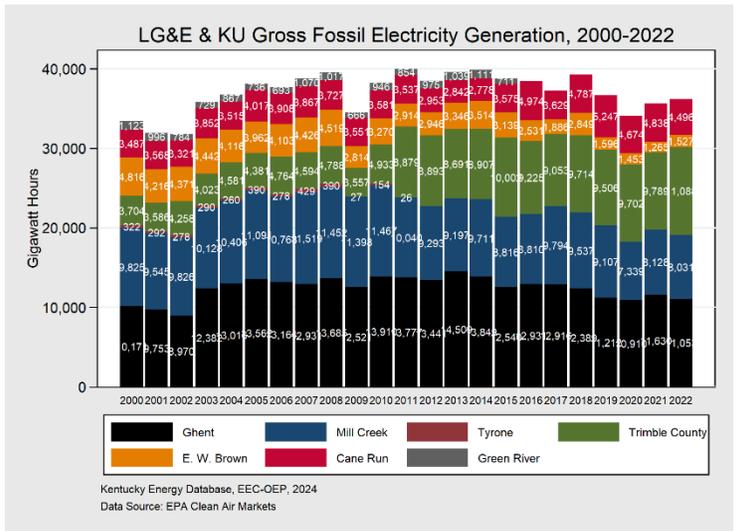
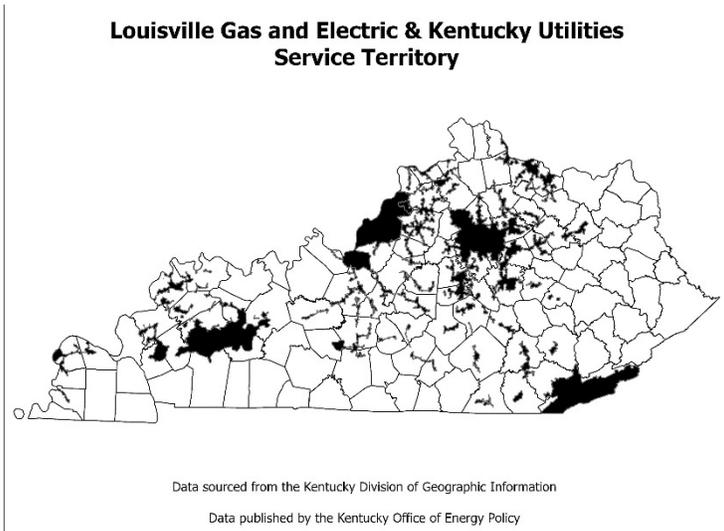
Kentucky Power emitted 430 tons of NO_x in 2022, a reduction of 79.2% since 2012. The rate of NO_x emissions increased by 8.1% during that period.

Louisville Gas and Electric & Kentucky Utilities



Sector	Price (Cents/kWh)	Since 2012
Total	11.34	45.40%
Residential	12.73	45.20%
Commercial	11.9	43.90%
Industrial	8.86	50.20%

Sector	Sales (GWh)	Percentage
Total	29,812	100%
Residential	10,749	36.10%
Commercial	10,393	34.90%
Industrial	8,670	29.00%

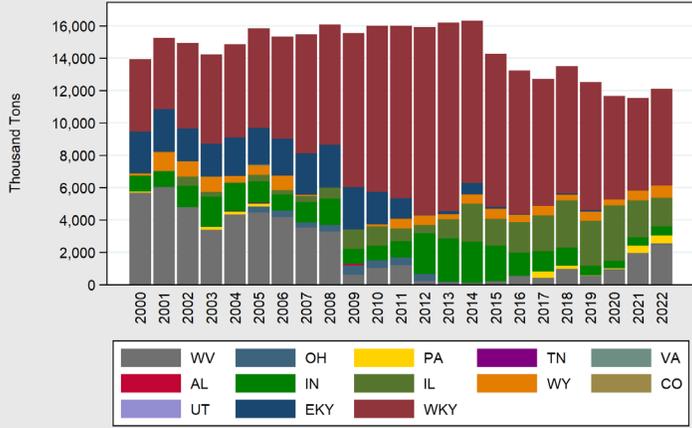


LG&E and KU is the single largest utility by sales in Kentucky and sells electricity throughout the state, primarily in densely populated areas. Total electricity prices in 2022 were 11.34 cents per kWh and have increased by 45.4% since 2012. LG&E and KU operate numerous electricity generation facilities 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	-6.40%

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%.

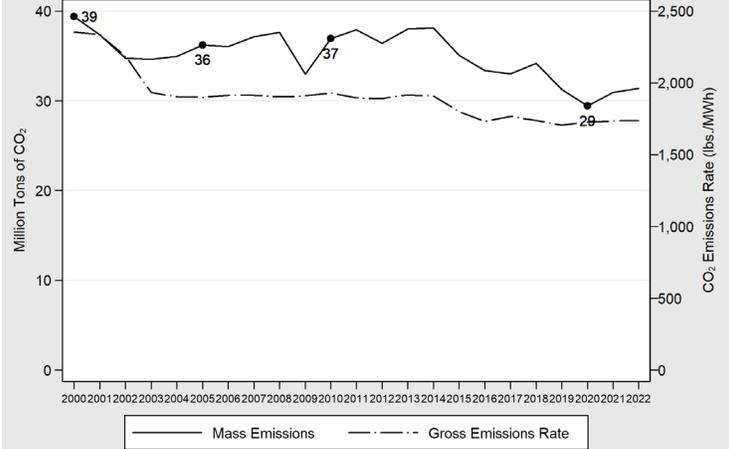
LG&E and KU Coal Consumption by Origin, 2000-2022



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

State	2022 Tons	Percentage
Total	12,058,344	100%
Western Kentucky	5,989,002	49.70%
Illinois	1,771,632	14.70%
Wyoming	758,233	6.30%
Indiana	556,458	4.60%
Pennsylvania	493,341	4.10%
West Virginia	2,489,678	20.60%

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

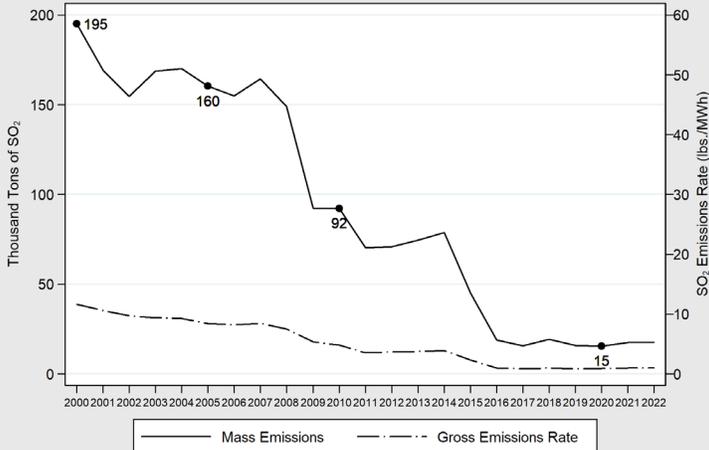


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	31,403,725	-13.80%
Rate (lbs./MWh)	1,735	-8.30%

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

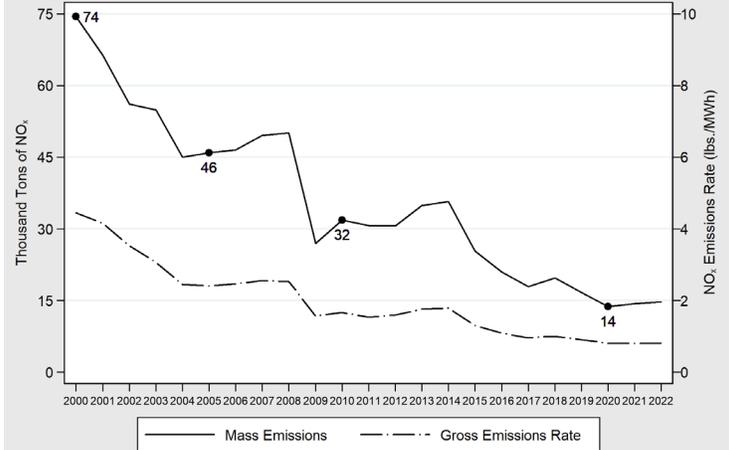


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	17,739	-75.00%
Rate (lbs./MWh)	0.98	-73.40%

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

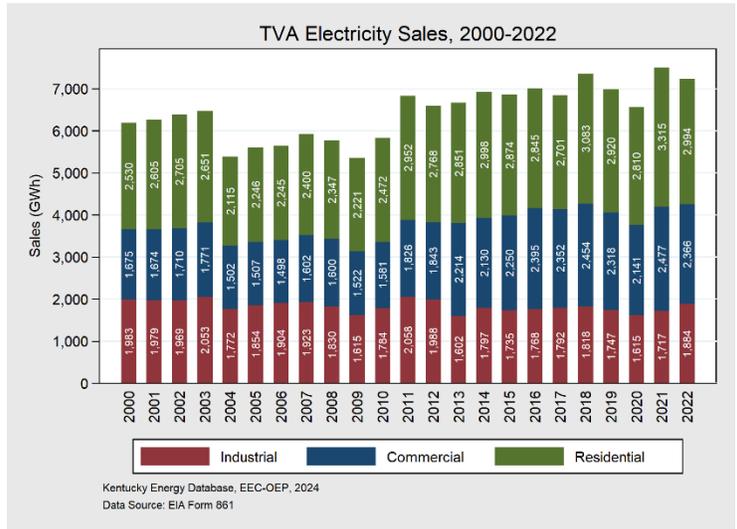
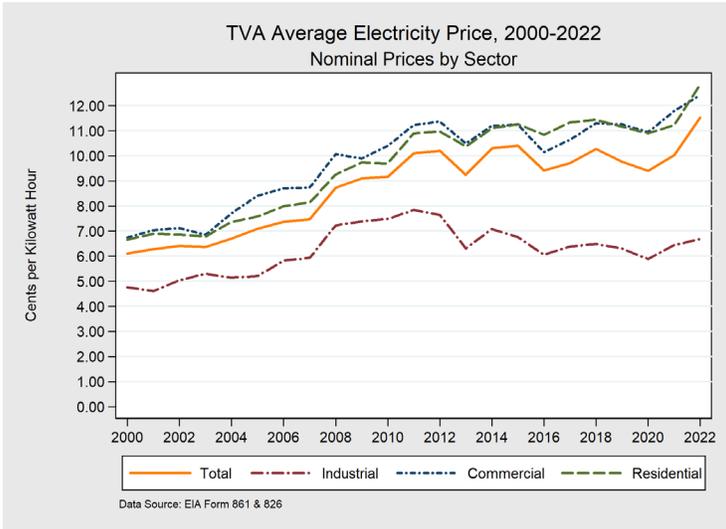


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EPA Clean Air Markets

Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	14,670	-52.10%
Rate (lbs./MWh)	0.81	-49.10%

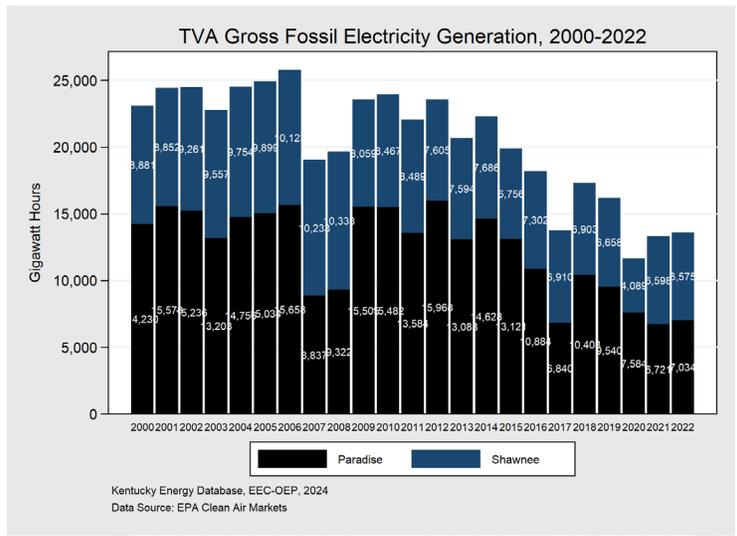
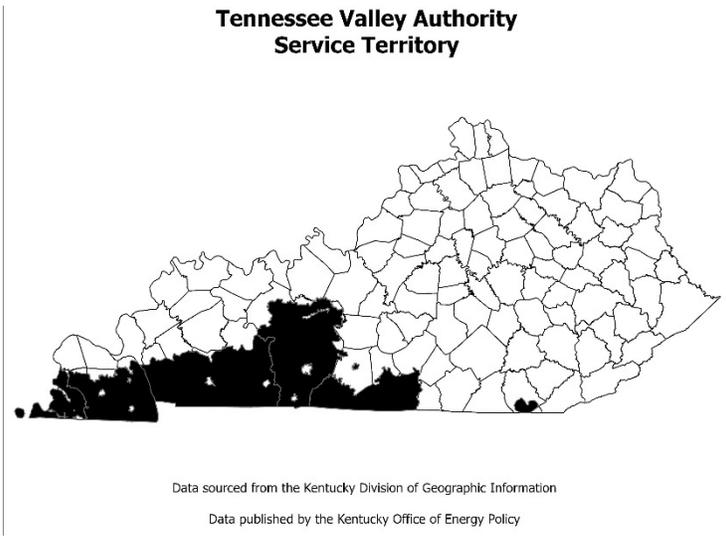
LG&E and KU emitted 14,670 tons of NO_x in 2022, a reduction of 52.1% since 2012. The rate of NO_x emissions decreased by 49.1% during that period.

Tennessee Valley Authority



	11.52	12.90%
	12.85	17.00%
	12.42	9.20%
	6.68	-12.60%

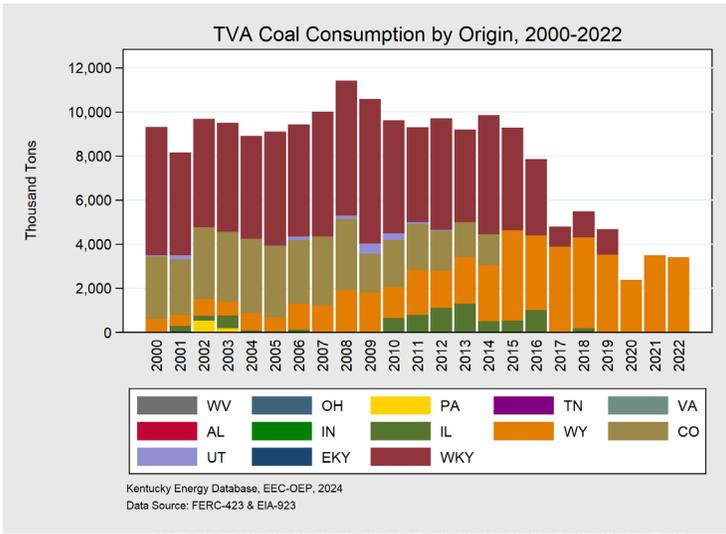
Sector	Sales (GWh)	Percentage
Total†	7,243	100%
Industrial	1,884	26.00%
Residential	2,994	41.30%
Commercial	2,365	32.70%



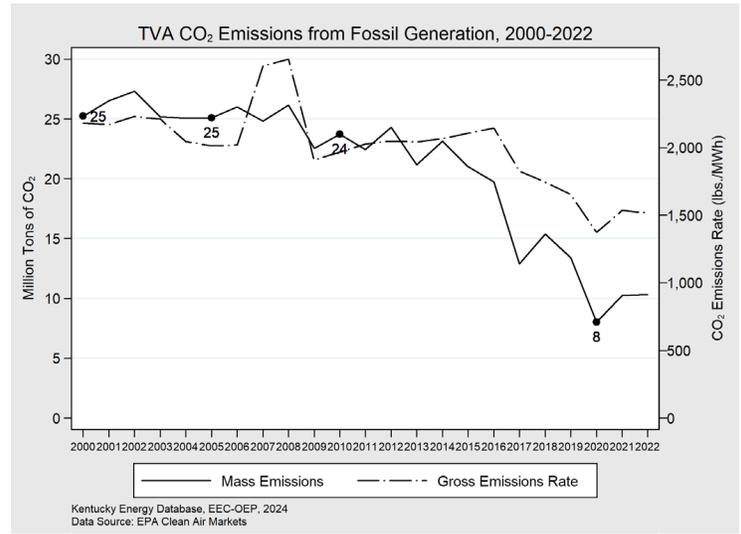
The Tennessee Valley Authority generates and sells electricity to five RECCs, 10 municipalities, and several industrial consumers in southwest Kentucky. Total electricity prices in 2022 were 11.52 cents per kWh and have increased by 12.9% since 2012. In Kentucky, TVA operates the Marshall Combustion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

Electricity Generation	2022	Since 2012
Gigawatt Hours	13,609	-42.30%

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.

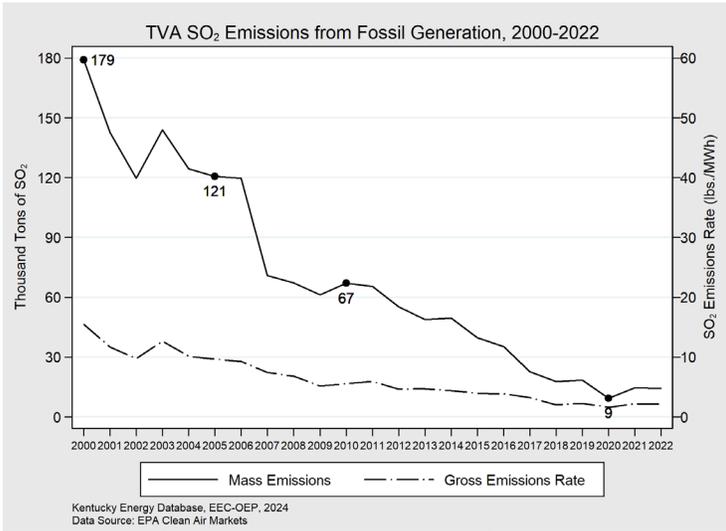


State	2020 Tons	Percentage
Total	3,400,873	100%
Wyoming	3,400,873	100%



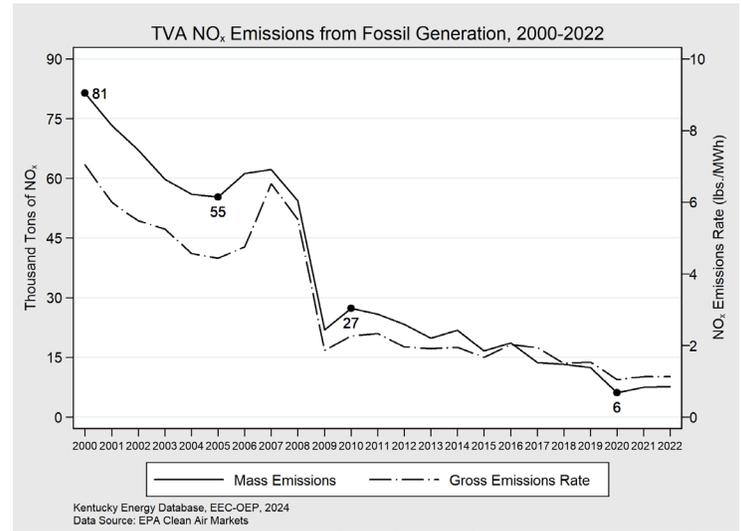
Carbon Dioxide	2022	Since 2012
Emissions (Tonnage)	10,322,948	-57.50%
Rate (lbs./MWh)	1,517	-26.00%

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.



Sulfur Dioxide	2022	Since 2012
Emissions (Tonnage)	14,340	-74.00%
Rate (lbs./MWh)	2.11	-54.60%

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.



Nitrogen Dioxide	2022	Since 2012
Emissions (Tonnage)	7,690	-67.00%
Rate (lbs./MWh)	1.13	-42.30%

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 Energy Resources

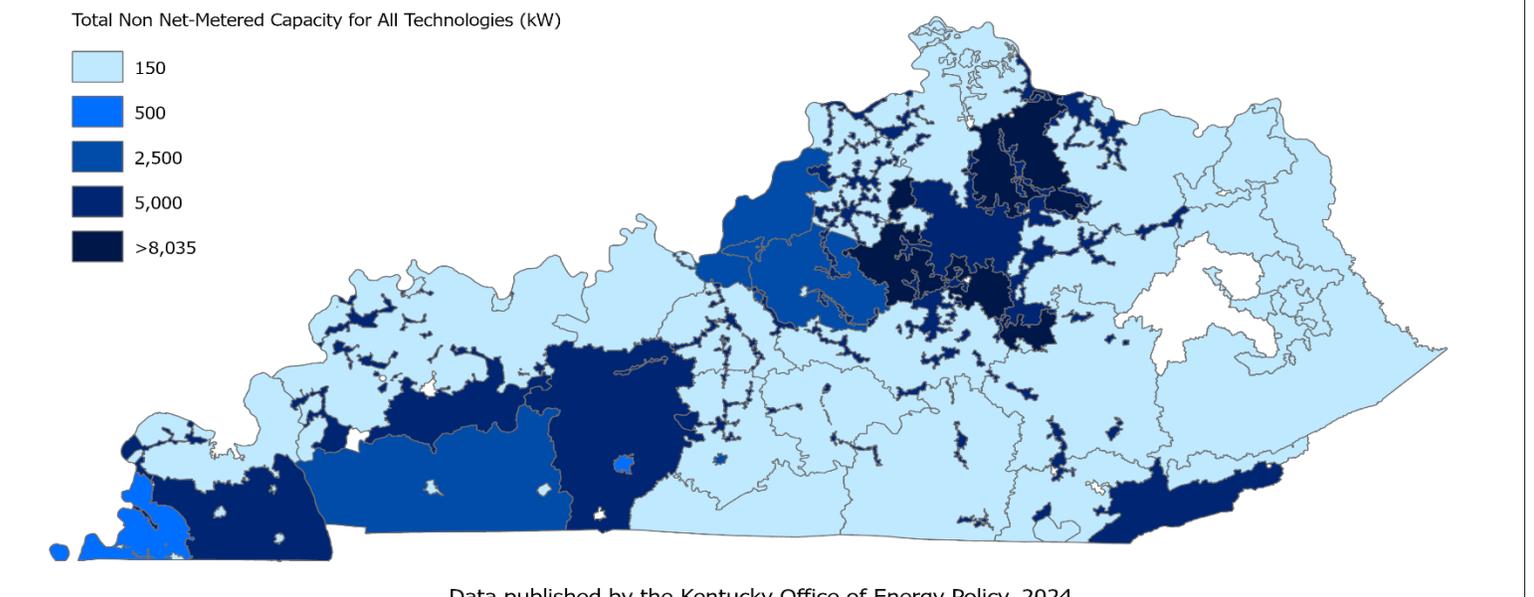
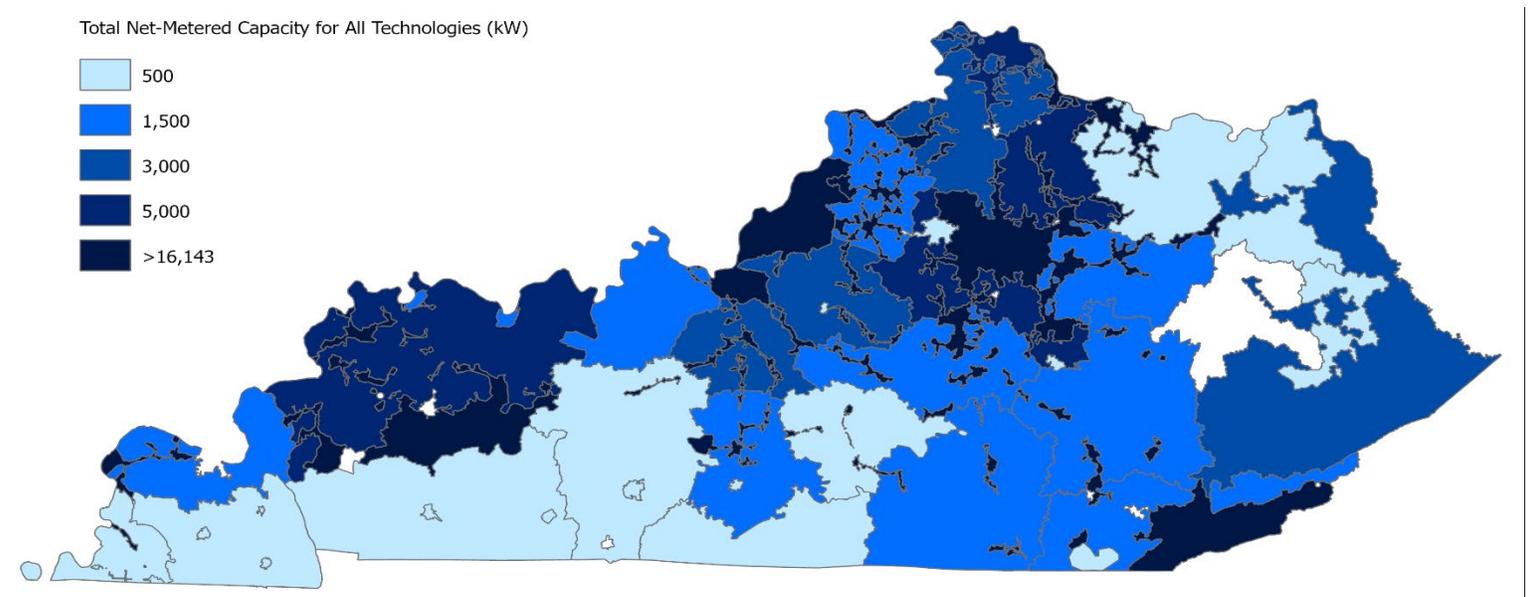
Distributed Renewable Generation (DG) refers to those distributed renewable energy systems that generate or store electricity for delivery to the electrical grid and includes the eligible electric generating facilities under KRS 278.465 and those connected under utility tariffs filed under the regulation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

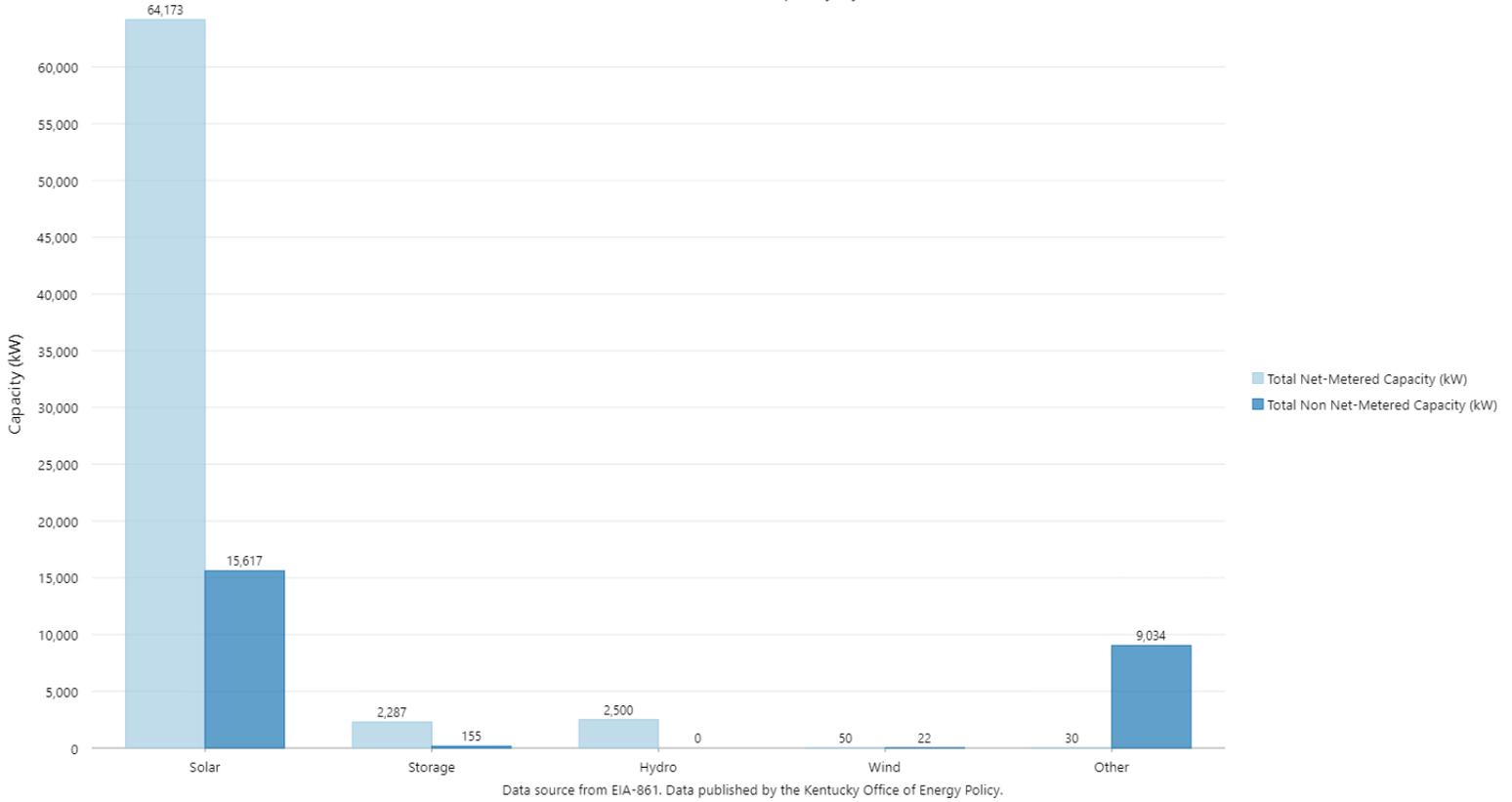
In addition to Net Metering, larger power generation systems interconnect to the electric grid via tariffs established by utilities under the Public Utility Regulatory Policies Act.

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

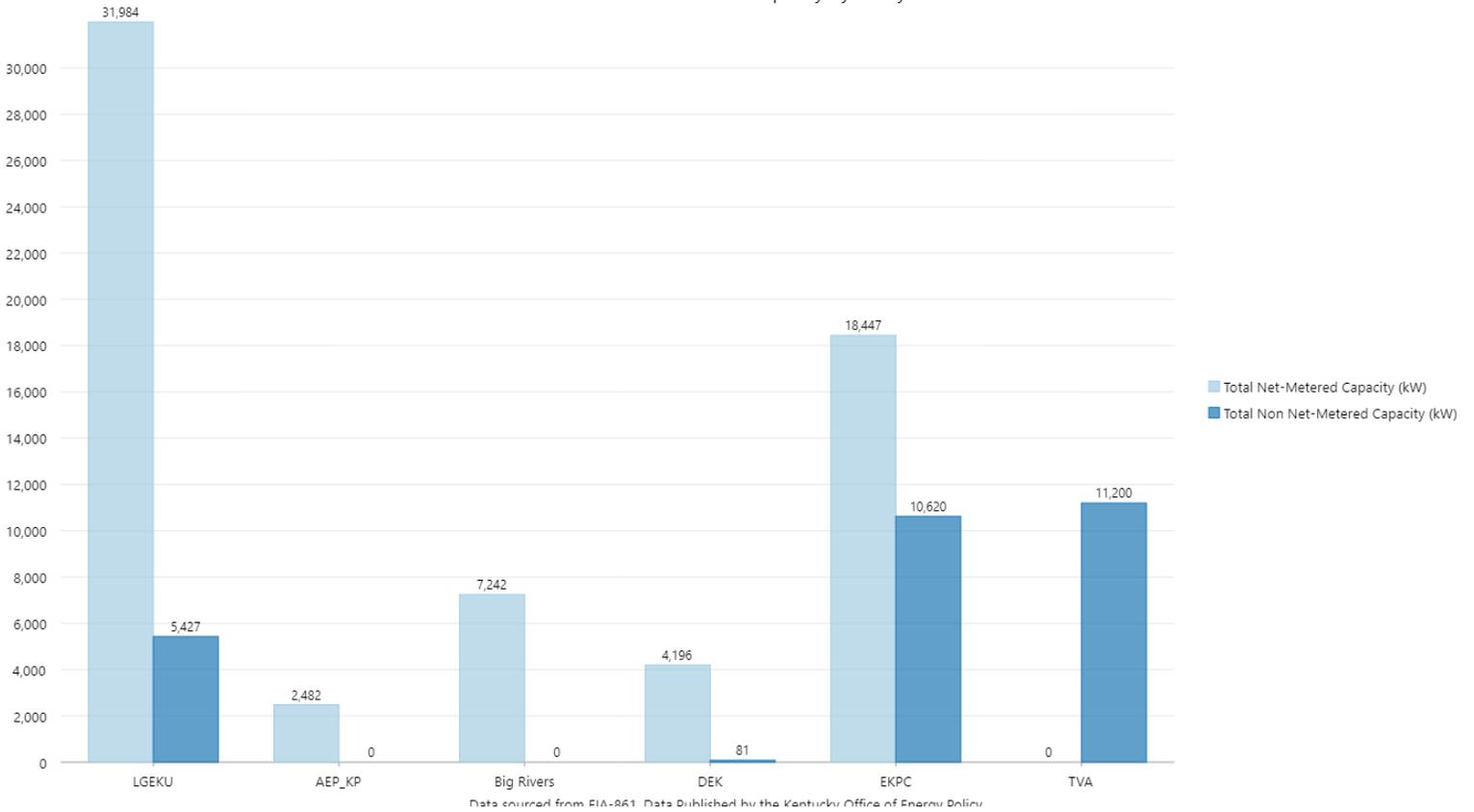


Data published by the Kentucky Office of Energy Policy, 2024

Distributed Generation Capacity by Resource



Distributed Generation Capacity by Utility

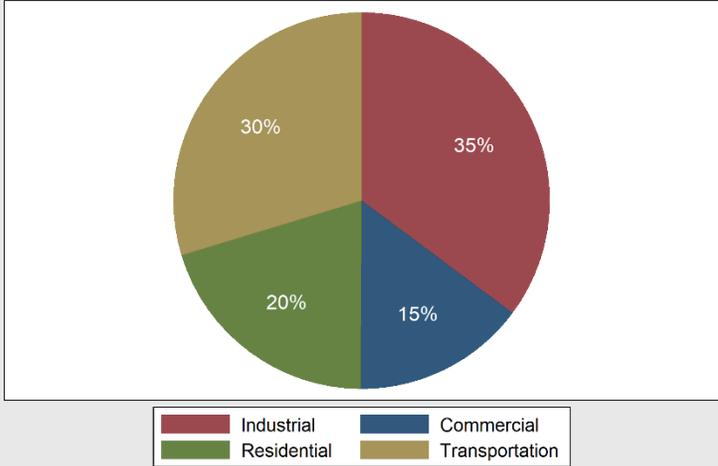


Kentucky Energy by Sector



Total Energy

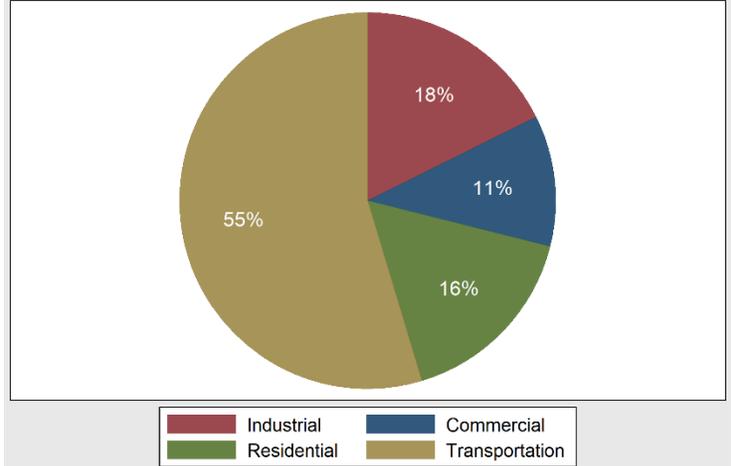
Kentucky Energy Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Sector	Billion Btu	1 Year Change
Total	1,673,214	1.50%
Industrial	589,194	-0.40%
Transportation	497,157	0.40%
Residential	338,374	3.50%
Commercial	249,363	6.00%

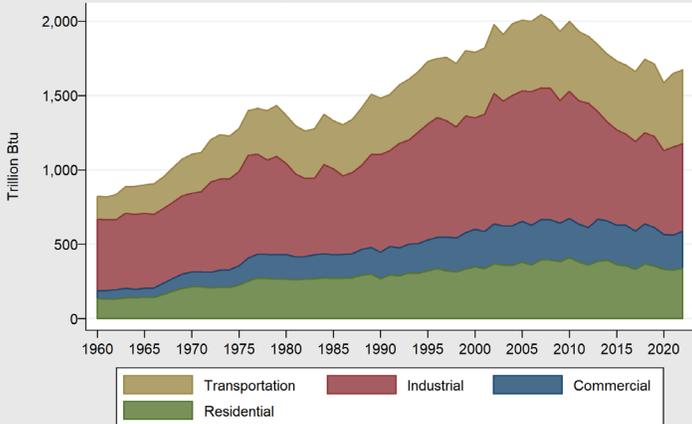
Kentucky Energy Expenditures by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Sector	Million Dollars	1 Year Change
Total	27,349	34.10%
Transportation	14,945	44.60%
Industrial	4,827	31.30%
Residential	4,494	17.30%
Commercial	3,083	20.70%

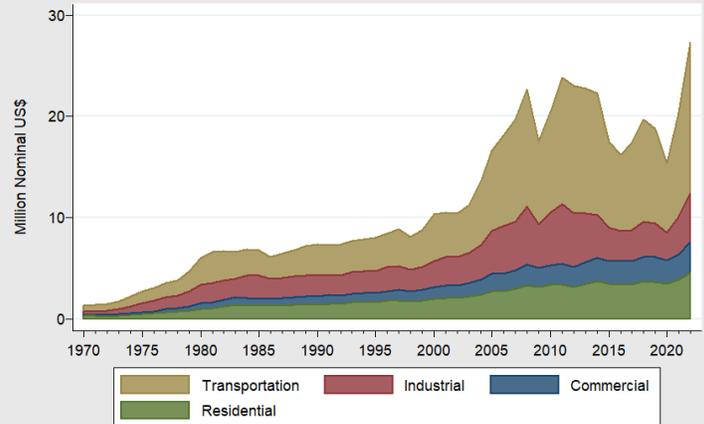
Kentucky Energy Consumption by Sector, 1960-2022



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.

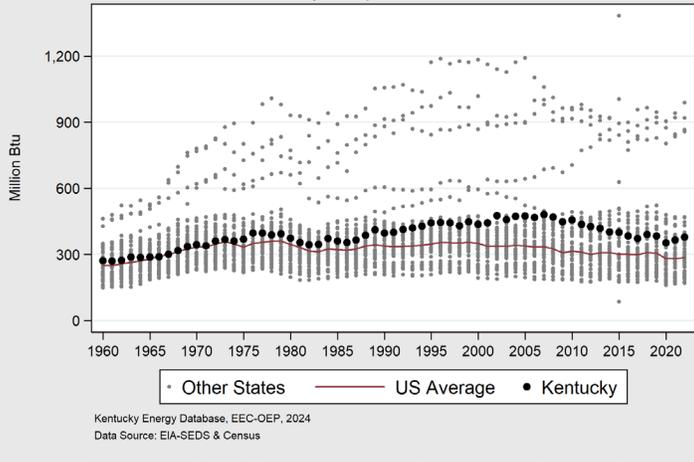
Kentucky Energy Expenditures by Sector, 1970-2022



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

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.

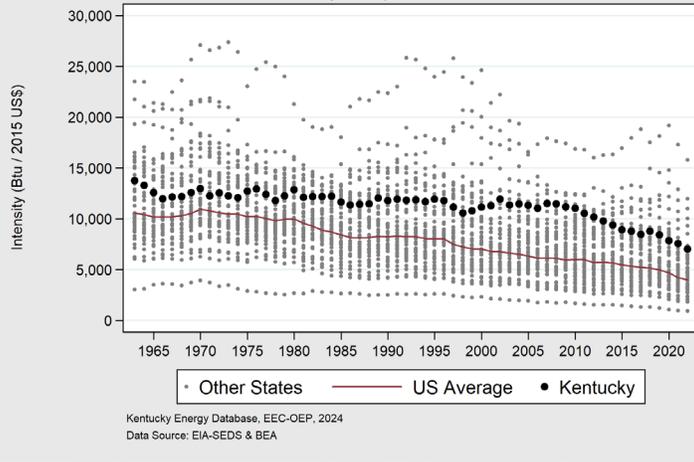
Kentucky Annual Energy Consumption per Capita, 1960-2022
Kentucky Compared to Other States



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.

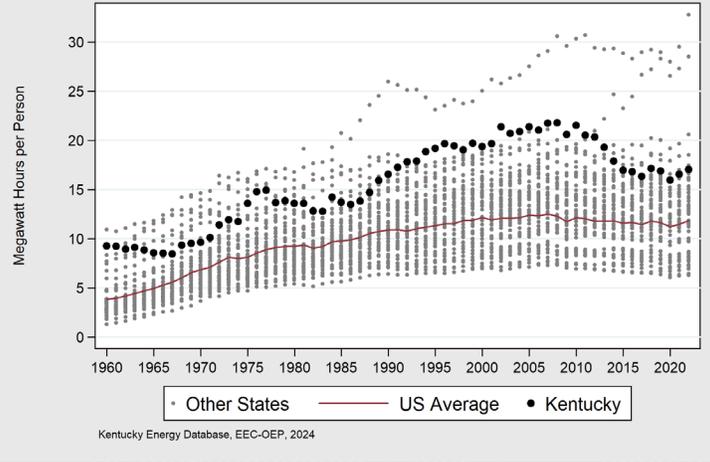
Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



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.

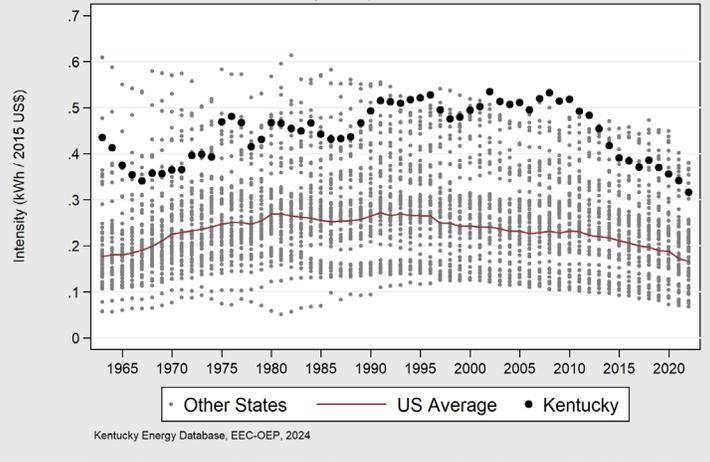
Electricity Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



State	MWh per Capita	Rank
North Dakota	32.8	1st
Kentucky	17	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.

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

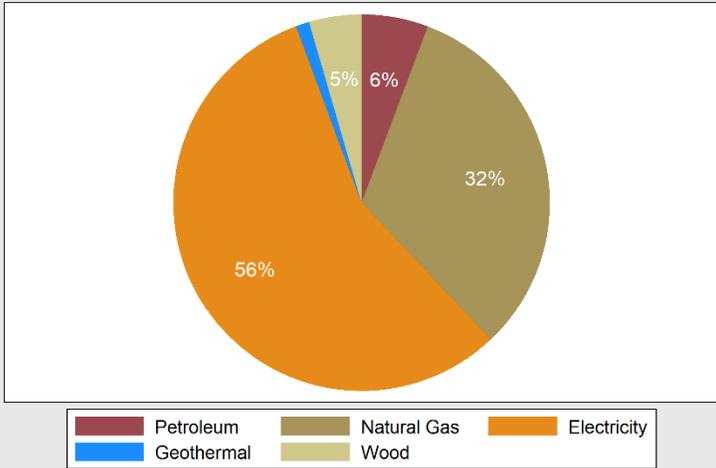


State	kWh/\$U.S. GDP	Rank
Mississippi	0.38	1st
Kentucky	0.32	8th
U.S. Average	0.17	-
California	0.07	50th

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.

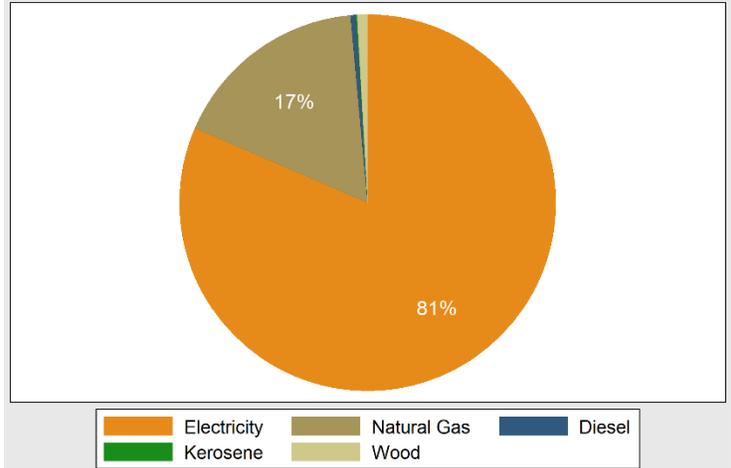
Residential Energy

Kentucky Residential Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Kentucky Residential Energy Expenditures by Fuel, 2022

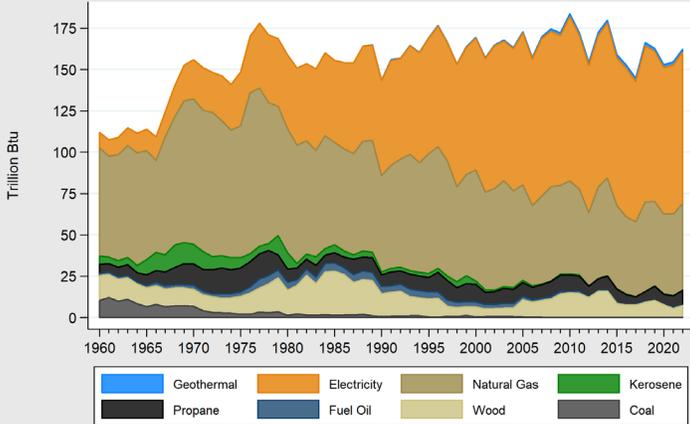


Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total Net	338,374	3.5
Electricity	91,579	1.50%
Natural Gas	52,392	6.30%
Wood	7,320	30.20%
Petroleum	9,276	21.50%
Geothermal	1,860	0.00%

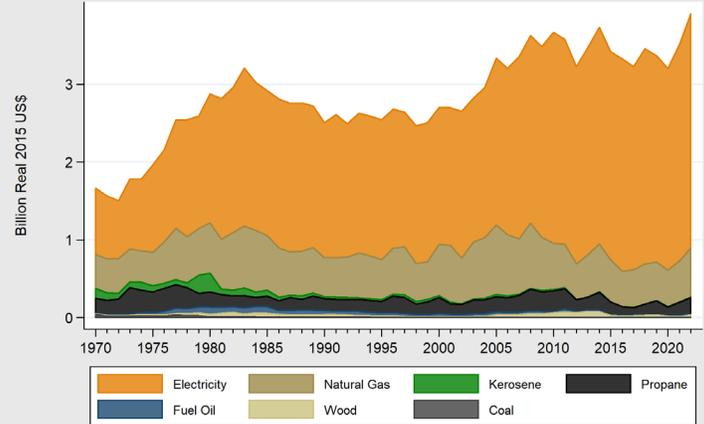
Fuel Type	Million Dollars	1 Year Change
Total	4,494	17.30%
Electricity	3,466	14.00%
Natural Gas	726	26.70%
Wood	37	94.70%
Diesel	20	55.60%

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



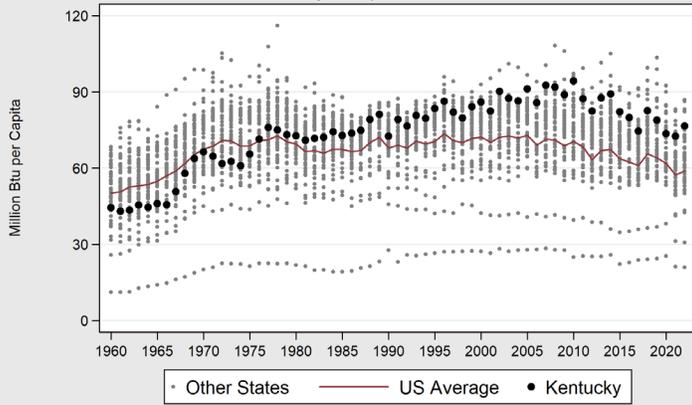
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

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.

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

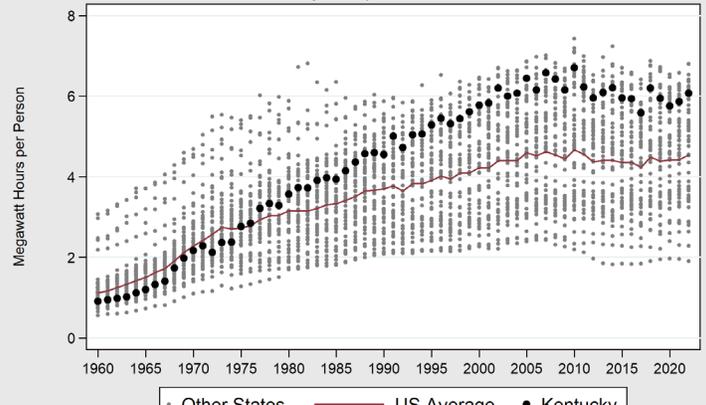


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

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.

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

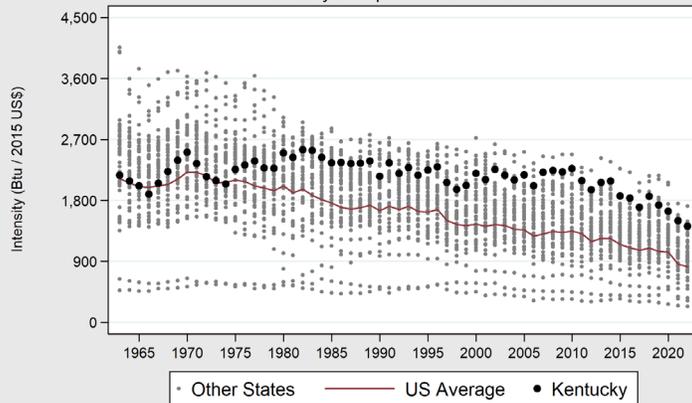


Kentucky Energy Database, EEC-OEP, 2024

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

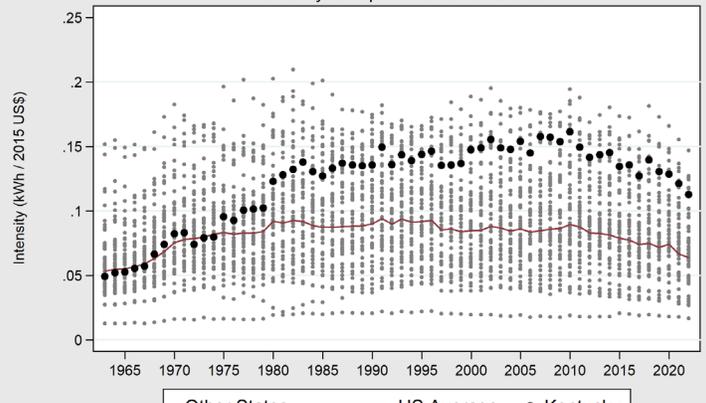


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

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.

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



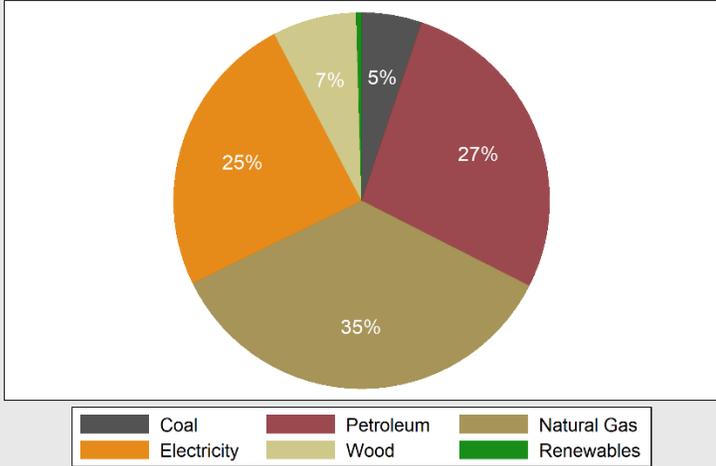
Kentucky Energy Database, EEC-OEP, 2024

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.

Industrial Energy

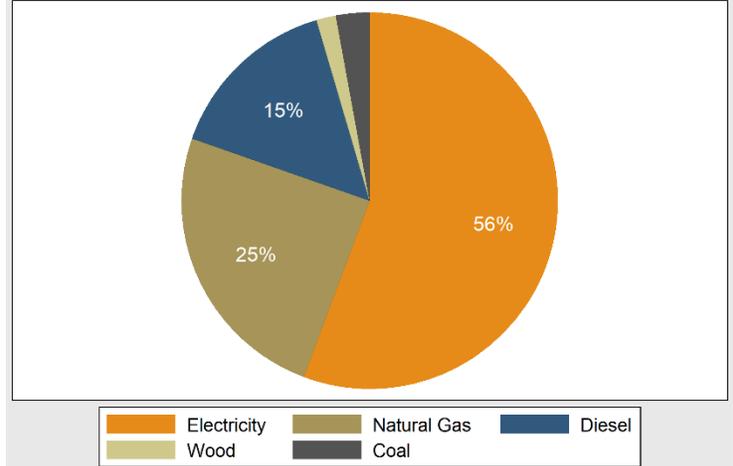
Kentucky Industrial Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total Net	589,194	-0.40%
Petroleum	109,402	-11.60%
Electricity	98,349	-1.90%
Natural Gas	141,297	5.00%
Coal	20,728	19.20%
Wood	26,863	33.10%

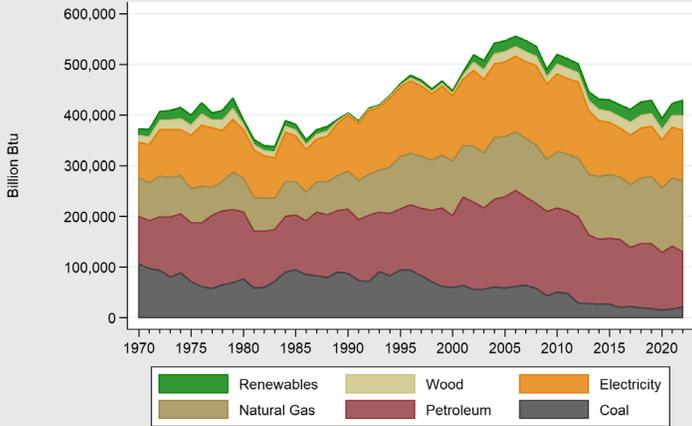
Kentucky Industrial Energy Expenditures by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

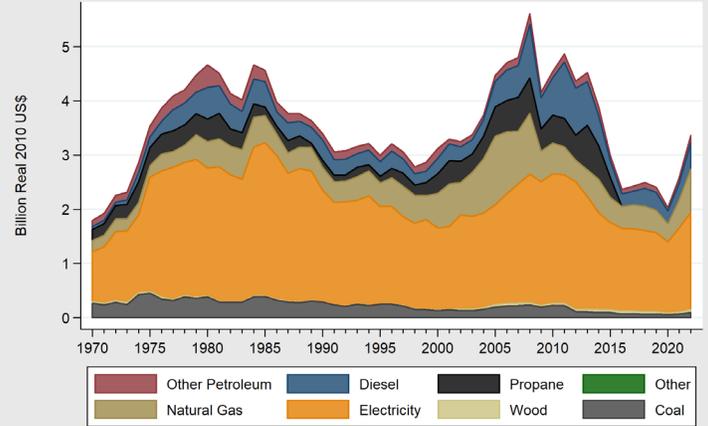
Fuel Type	Million Dollars	1 Year Change
Total	4,827	31.30%
Electricity	2,068	22.10%
Diesel	559	65.40%
Kerosene	2	31.30%
Natural Gas	916	62.10%
Coal	107	-50.70%

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



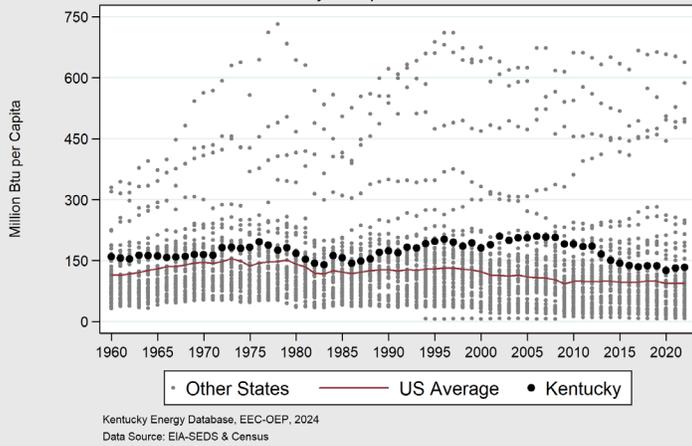
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

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.

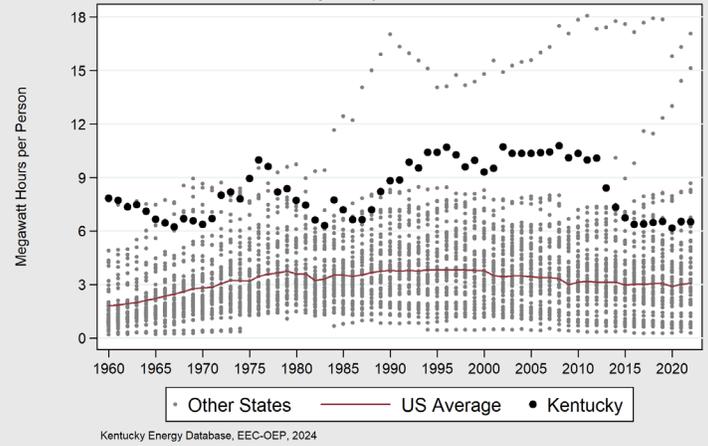
Annual Industrial Energy Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



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.

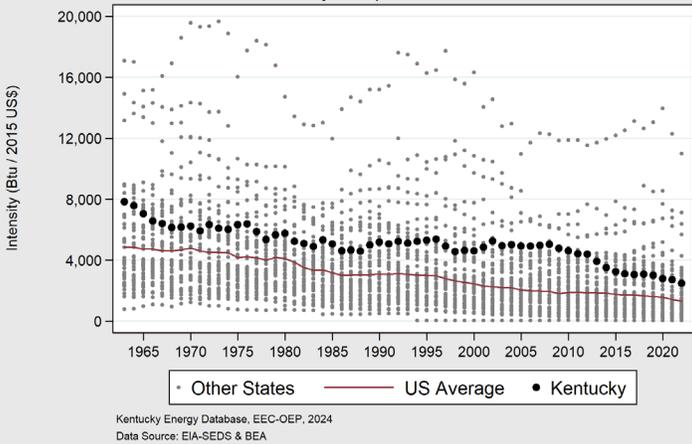
Industrial Electricity Consumption Per Capita, 1960-2022
Kentucky Compared to Other States



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.

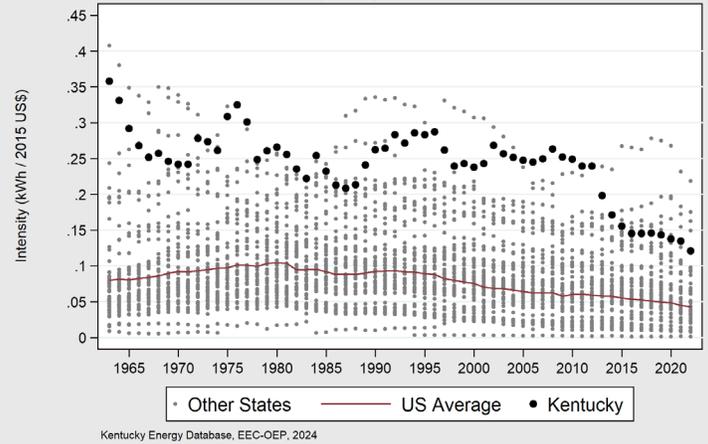
Industrial Energy Consumption per State GDP Dollar, 1963-2022
Kentucky Compared to Other States



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.

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

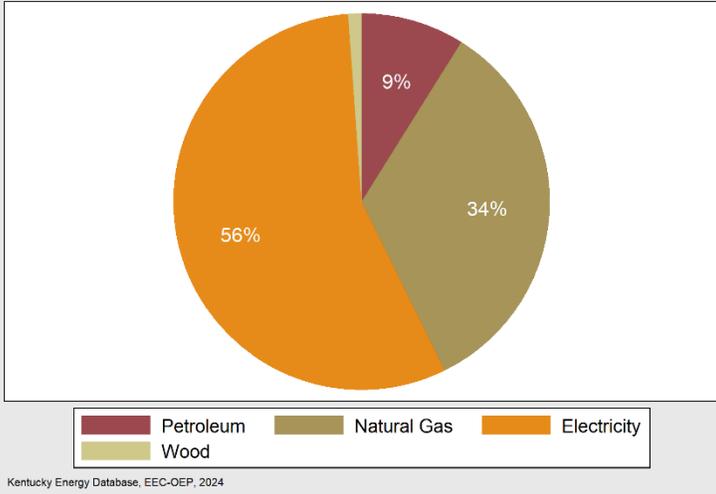


State	kWh/\$U.S. GDP	Rank
Wyoming	0.219	1st
Kentucky	0.121	8th
U.S. Average	0.043	-
DC	0.008	50th

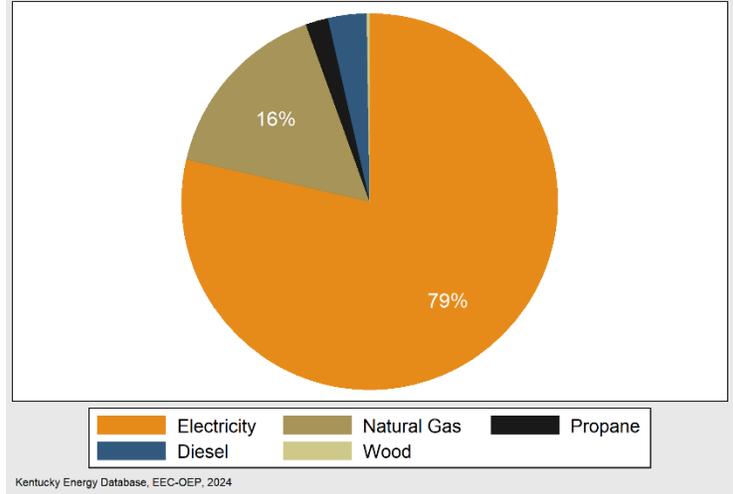
In 2022, Kentucky was 8th in terms of industrial electricity use per dollar of GDP. There was a 10.4% decrease compared to 2021.

Commercial Energy

Kentucky Commercial Energy Consumption by Fuel, 2022



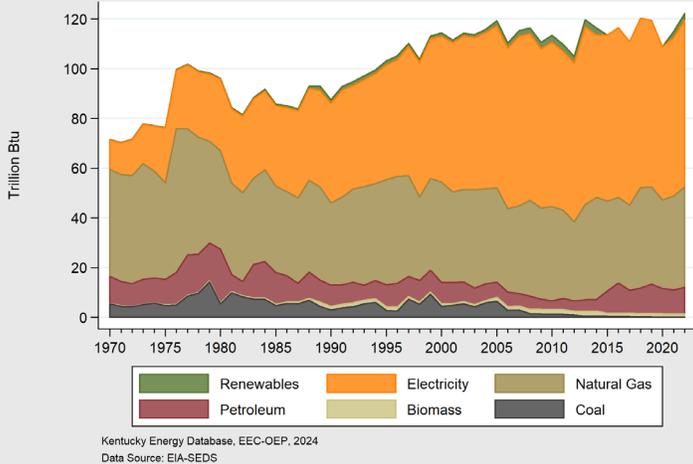
Kentucky Commercial Energy Expenditures by Fuel, 2022



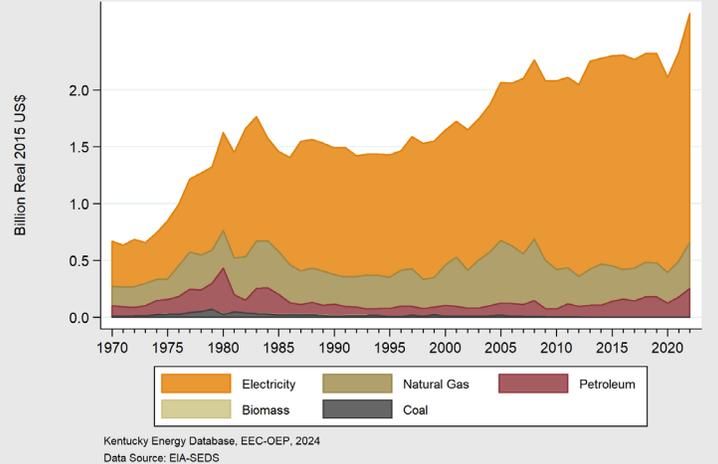
Fuel Type	Billion Btu	1 Year Change
Total Net	249,363	6.10%
Electricity	67,128	5.30%
Natural Gas	40,478	7.10%
Petroleum	10,644	10.40%
Wood	1,364	6.00%

Fuel Type	Million Dollars	1 Year Change
Total	3,083	20.70%
Electricity	2,318	15.40%
Natural Gas	468	35.70%
Diesel	98	71.90%
Propane	58	48.70%

Kentucky Commercial Energy Consumption by Fuel, 1970-2022



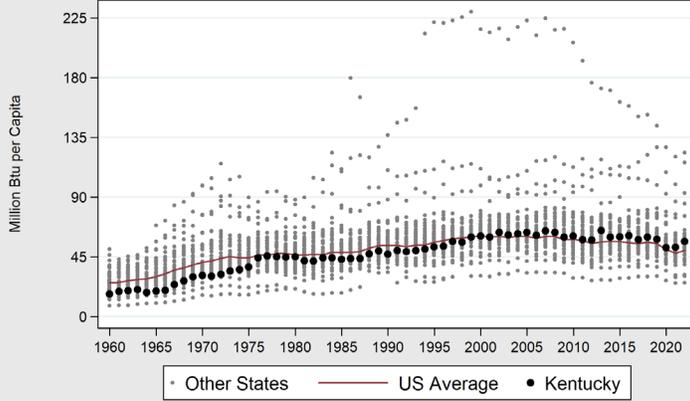
Kentucky Commercial Energy Expenditures by Fuel, 1970-2022



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.

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

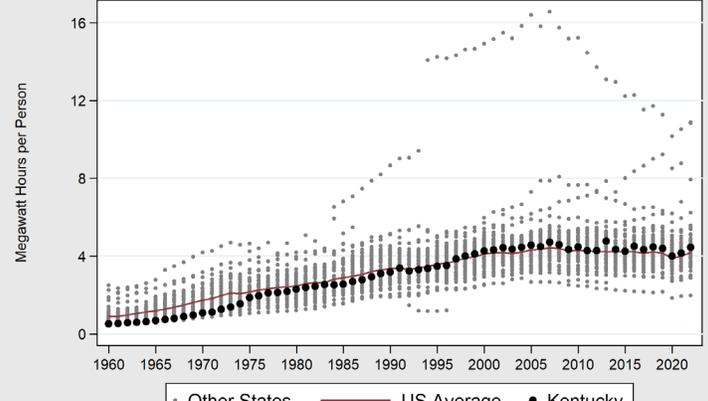


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & Census

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.

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

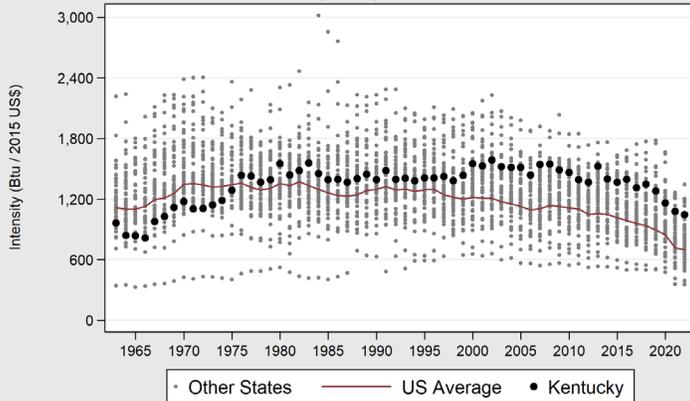


Kentucky Energy Database, EEC-OEP, 2024

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

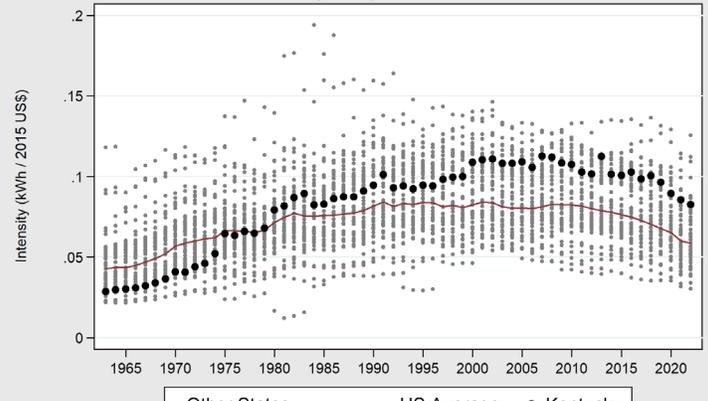


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS & BEA

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.

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



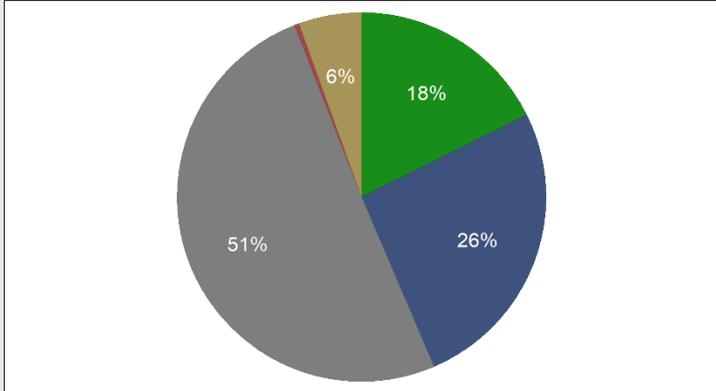
Kentucky Energy Database, EEC-OEP, 2024

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.

Transportation Energy

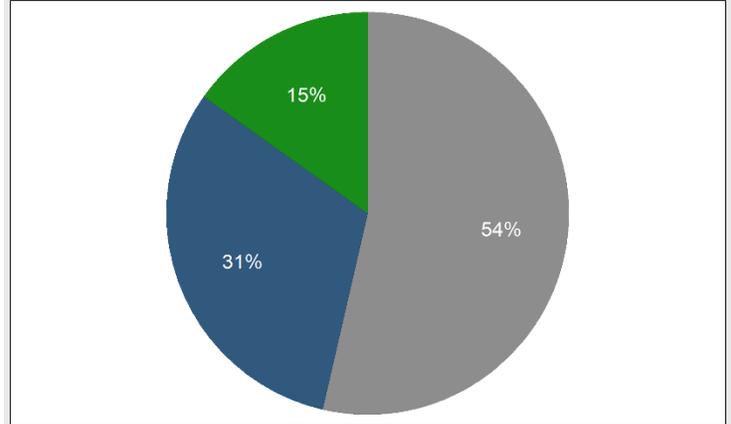
Kentucky Transportation Energy Consumption by Fuel, 2022



DEDI Energy Database, 2017

Fuel Type	Billion Btu	1 Year Change
Total	497,157	0.40%
Gasoline	249,804	-0.30%
Diesel	128,268	2.50%
Jet Fuel	87,255	4.90%
Natural Gas	27,247	-14.30%

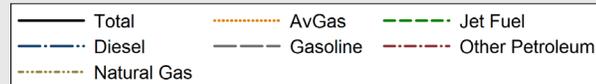
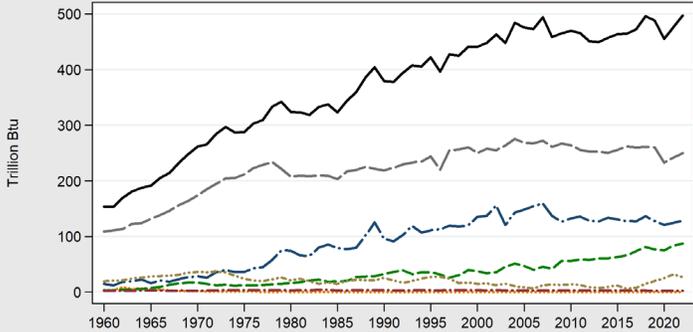
Kentucky Transportation Energy Expenditures by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Million Dollars	1 Year Change
Total	6,836	-30.80%
Gasoline	3,954	-30.70%
Diesel	2,111	-25.60%
Jet Fuel	771	-47.20%

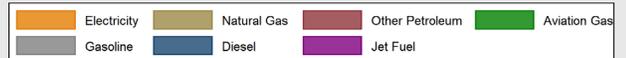
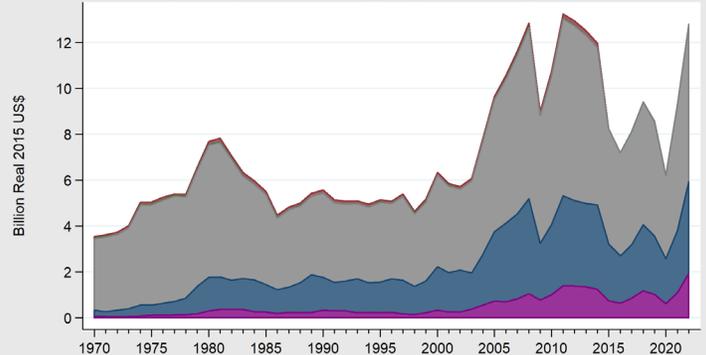
Kentucky Transportation Energy Consumption by Fuel, 1960-2022



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

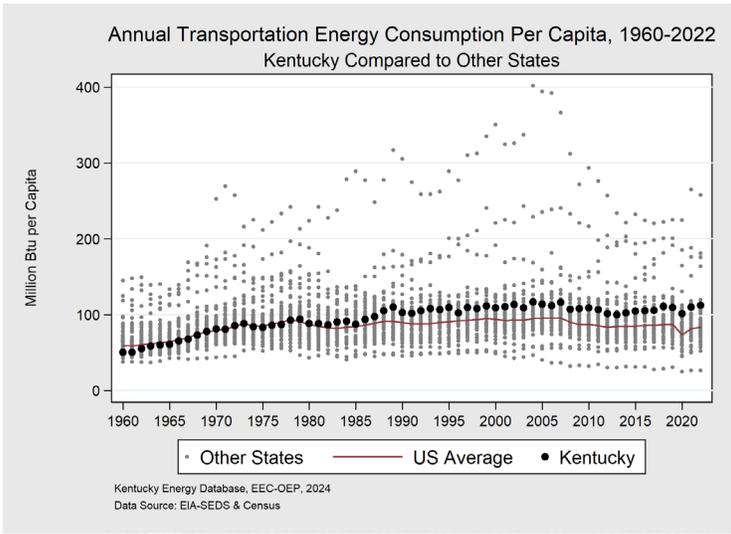
Transportation sector energy consumption in Kentucky was 497 trillion Btu in 2022, a 0.4% increase compared with 2021. Gasoline was 51% of transportation energy consumption in 2022, followed by diesel at 26%. The other 23% of transportation energy consumption came from jet fuel, natural gas and propane.

Kentucky Transportation Energy Expenditures by Fuel, 1970-2022



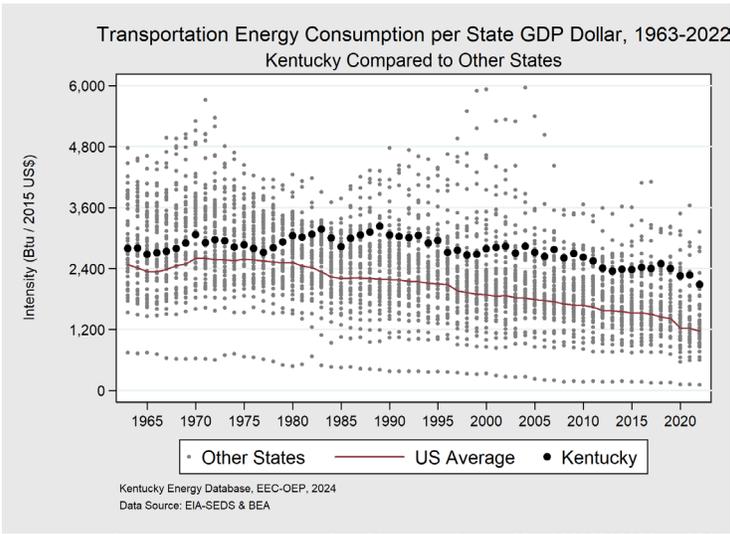
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

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.)



State	MMBtu per Capita	Rank
Alaska	258	1st
Kentucky	112.4	8th
U.S. Average	83.3	-
Rhode Island	52.3	50th

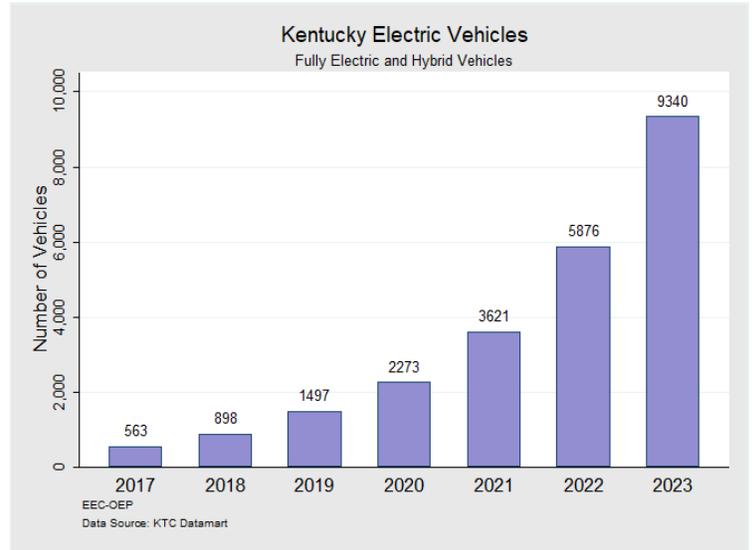
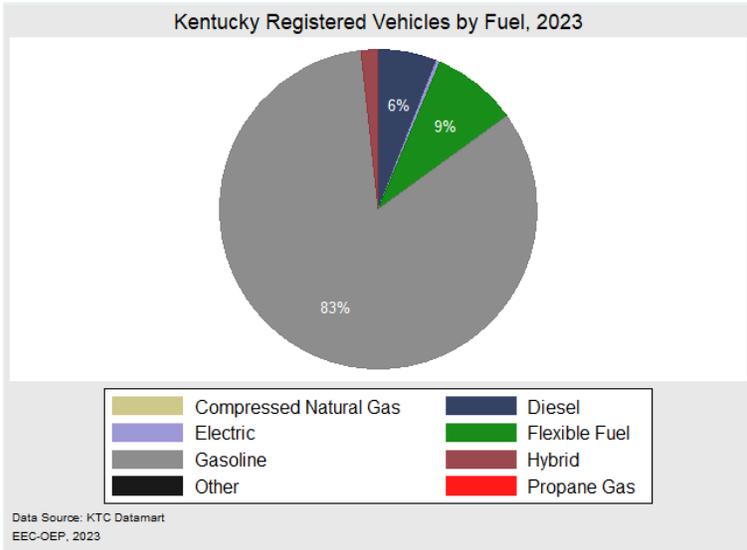
In 2022, Kentucky transportation energy consumption per capita increase by 2.4% compared with 2021, which is 8th highest of all states.



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.

Electric Vehicles



Fuel	Number of Vehicles	Percent of Total
Total	3,506,044	100%
Gasoline	2,916,806	83%
Flex Fuel	307,418	8.80%
Diesel	209,993	6.00%
Hybrid	61,685	1.80%
Electric	9,340	0.30%
CNG	615	>0.1%
Propane Gas	70	>0.1%
Other	117	>0.1%

Year	Number of EVs
2017	563
2018	898
2019	1,497
2020	2,273
2021	3,621
2022	5,876
2023	9,340

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.

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.

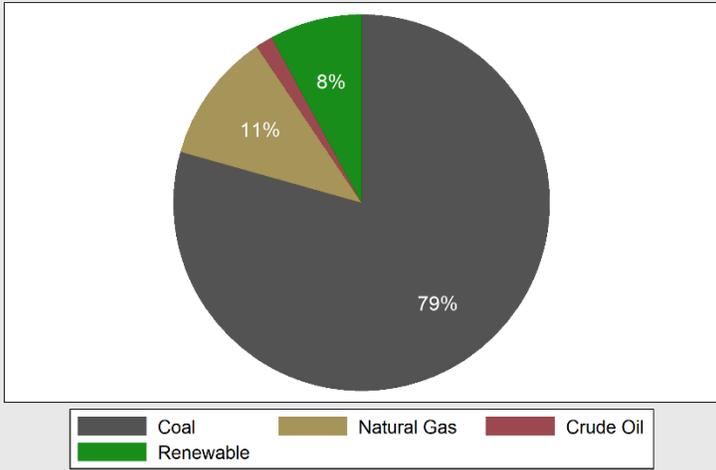
Petroleum products have traditionally been used in Kentucky primarily for transportation and industrial purposes rather than electricity generation. In the past, the state relied heavily on petroleum for heating, diesel fuel, and gasoline, especially in the rural and agricultural sectors. With advancements 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.

Energy Production

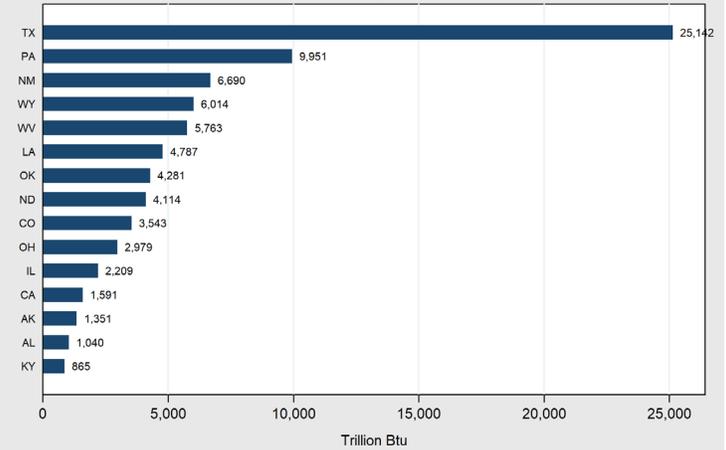
Kentucky Energy Production by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	865,410	10.10%
Coal	686,921	10.20%
Natural Gas	97,151	12.50%
Renewable	68,537	10.70%
Crude Oil	12,800	-8.70%

Energy Production Among Top 15 Producing States, 2022

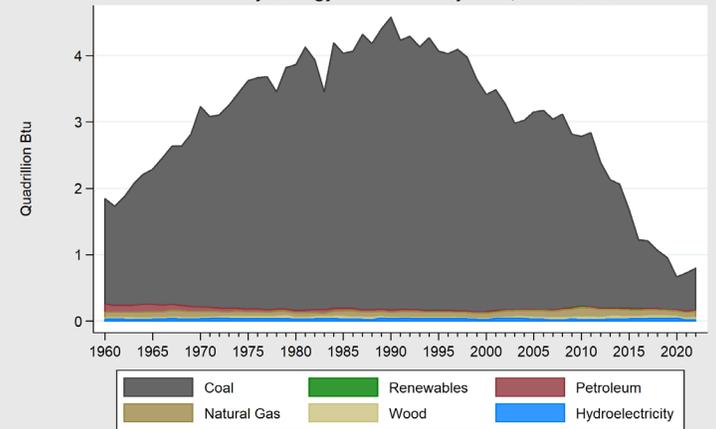


Kentucky Energy Database, EEC-OEP, 2024

State	Quadrillion Btu	Rank
Texas	25.1	1st
Kentucky	0.9	15th

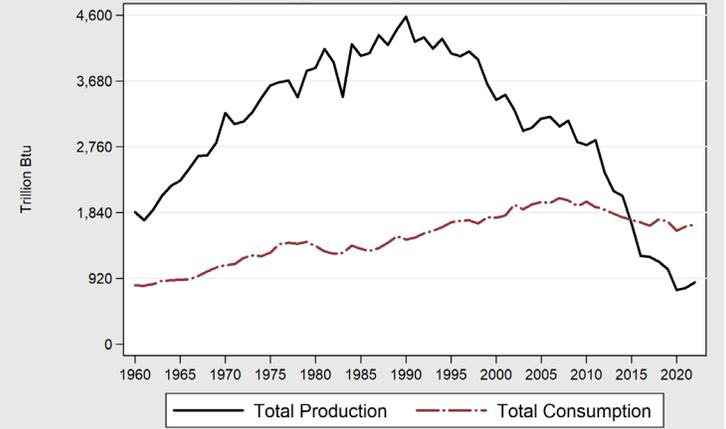
Kentucky was the 15th largest producer of energy in 2022. As recently as 2009, Kentucky ranked 4th among all states; however, the increased adoption of horizontal hydraulic fracturing has increased production in other states and the decline of coal mining has decreased production in Kentucky.

Kentucky Energy Production by Fuel, 1960-2022



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

Kentucky Energy Consumption & Production, 1960-2022



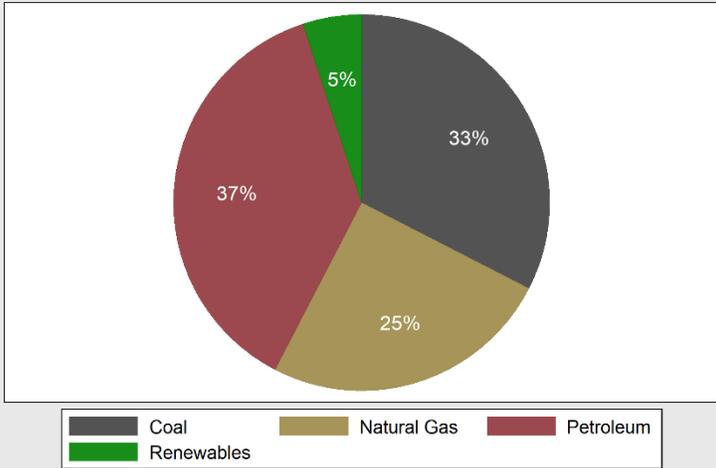
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

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.

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.

Energy Consumption

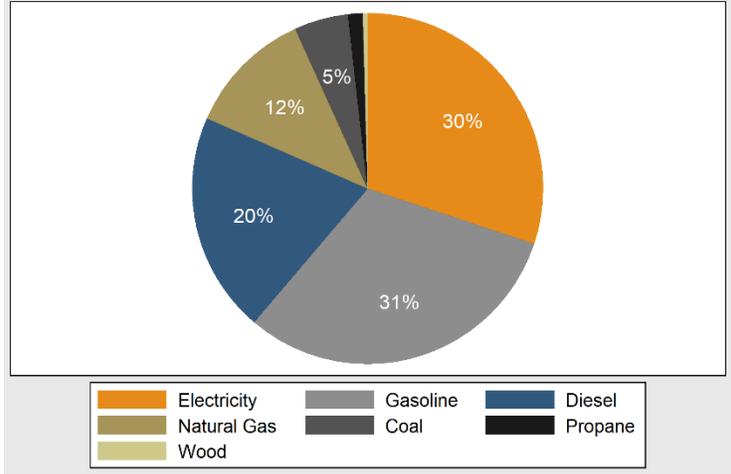
Kentucky Energy Consumption by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	1,673,214	1.50%
Coal	523,276	-4.60%
Petroleum	600,664	-0.80%
Natural Gas	402,659	10.00%
Renewables	80,976	9.70%

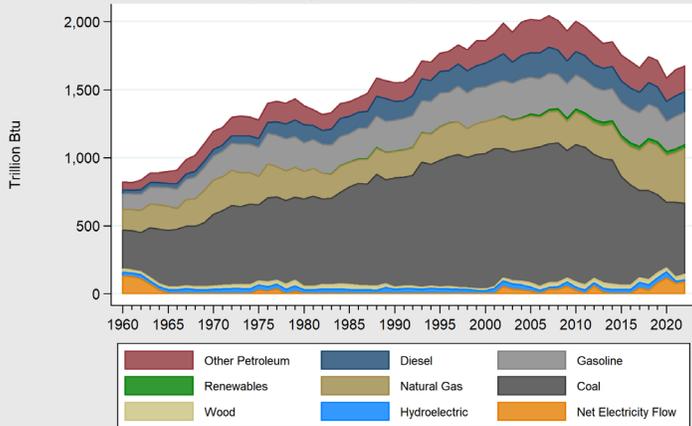
Kentucky Energy Expenditures by Fuel, 2022



Kentucky Energy Database, EEC-OEP, 2024

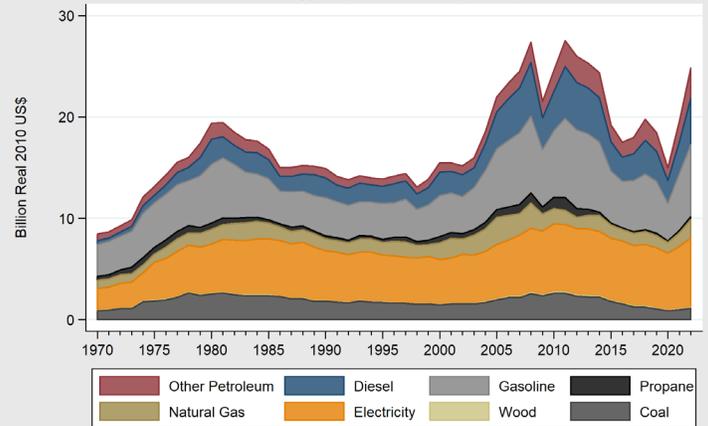
Fuel Type*	Million (\$ US)	1 Year Change
Total	27,346	34.10%
Gasoline	8,112	31.40%
Electricity	7,852	16.40%
Diesel	5,308	57.60%
Coal	1,301	21.20%
Natural Gas	3,045	56.10%

Kentucky Energy Consumption by Fuel, 1960-2022



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

Kentucky Energy Expenditures by Fuel, 1970-2022

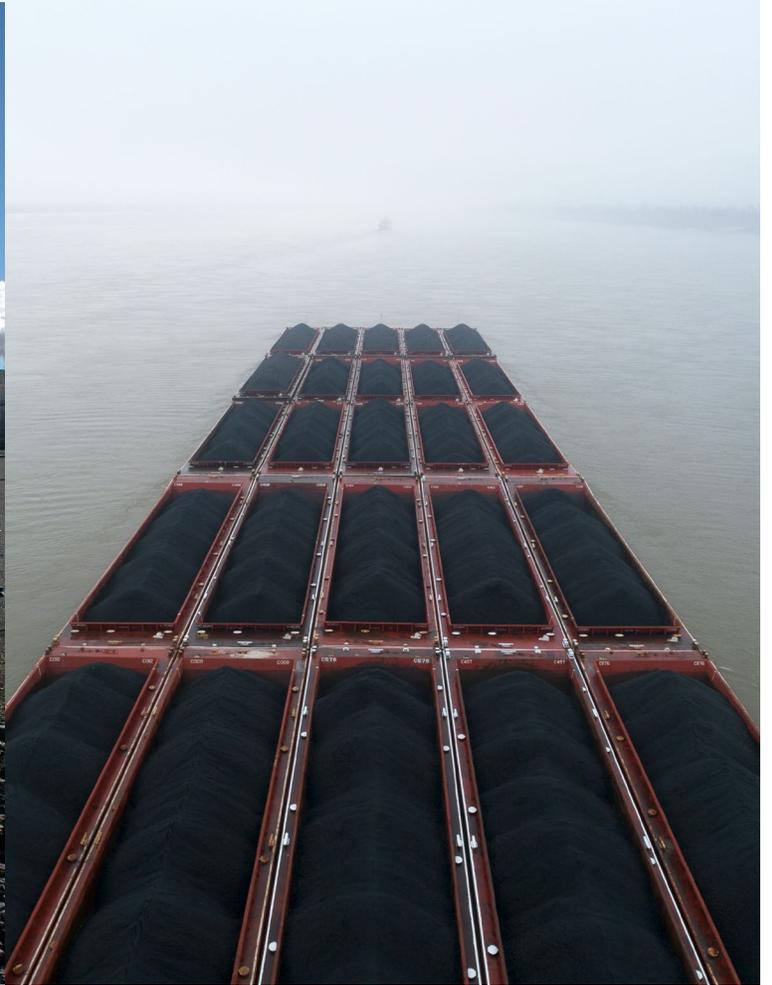


Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

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



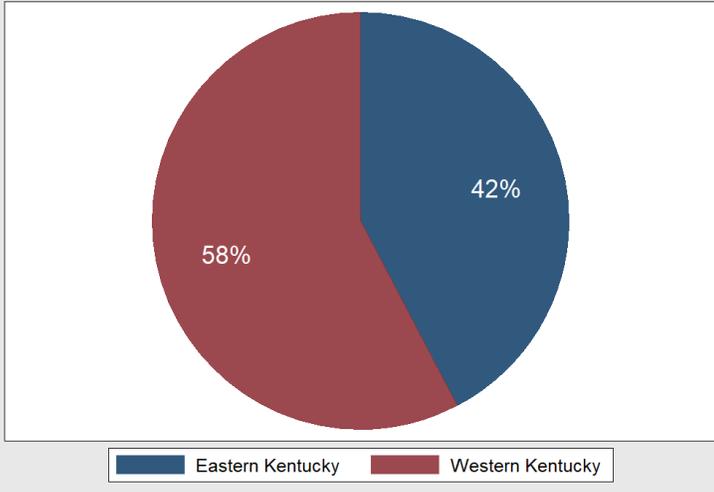
Coal Production

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.

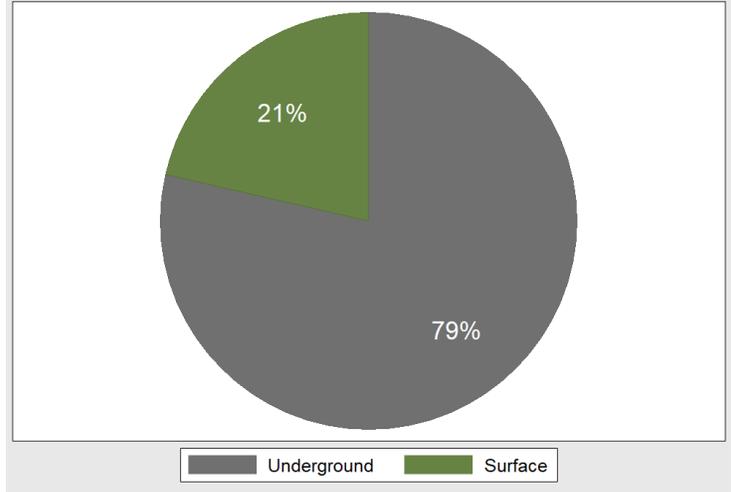
Kentucky Total Coal Production, 2022



Region	2022 Tonnage	Annual Change
Total	28,479,713	7.70%
Western Kentucky	16,429,856	0.80%
Eastern Kentucky	12,049,857	18.60%

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.

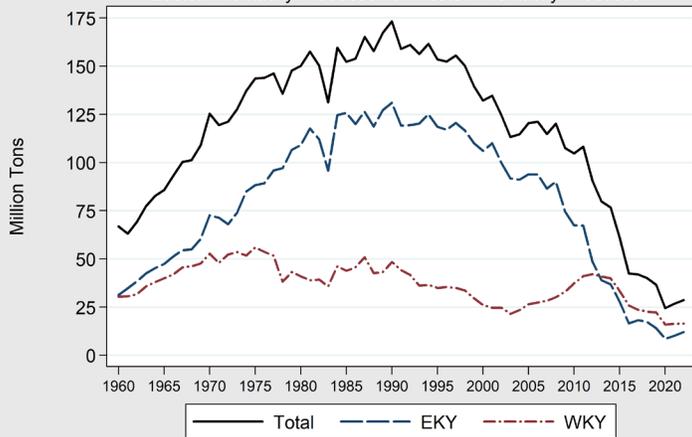
Kentucky Total Coal Production, 2022



Mine Type	2022 Tonnage	Annual Change
Total	28,479,713	7.70%
Underground	22,504,852	4.70%
Surface	6,127,875	17.60%

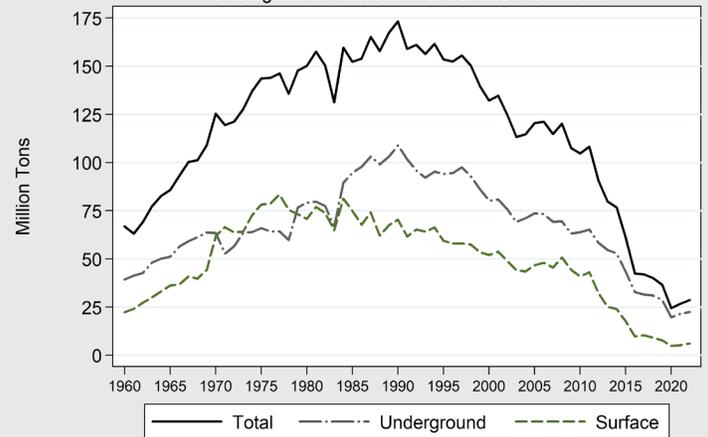
The majority of Kentucky coal production has been from underground operations since 1979, following the passage of the Surface Mine Control and Reclamation Act of 1977.

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.

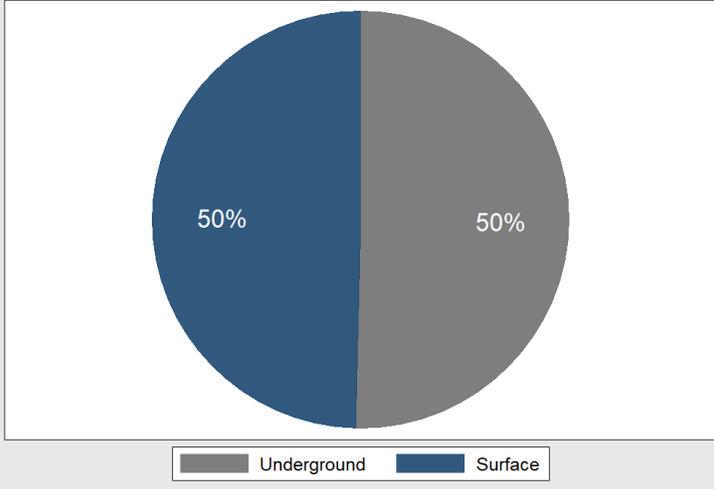
Kentucky Total Coal Production, 1960-2022
Underground Production vs. Surface Production



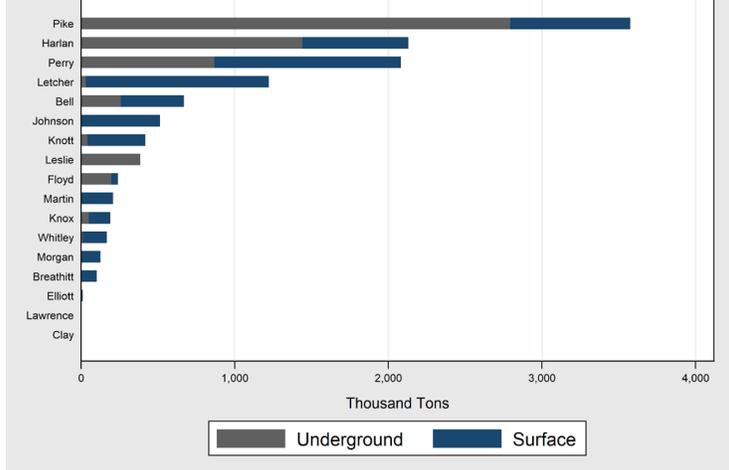
Underground coal mines produced 22.5 million tons of coal, or 79% of total Kentucky production in 2022, an increase of 4.7% from 2021. Surface mining operations, which mined 6.1 million tons of coal, increased production by 17.6% since 2021. Production has trended down in both surface and underground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

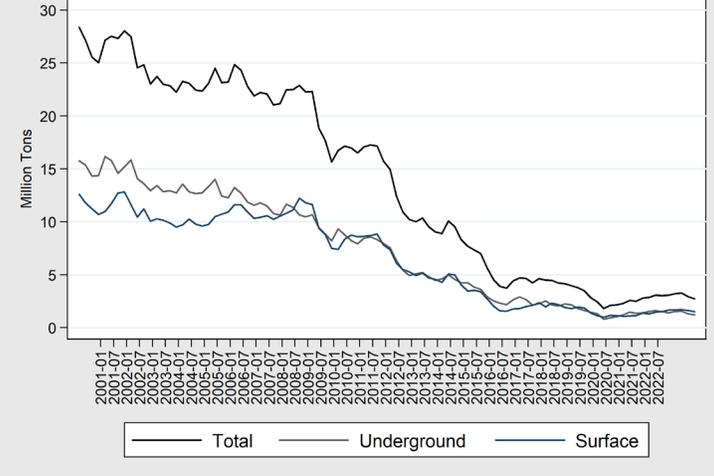


Mine Type	2022 Tonnage	Annual Change
Total	12,049,857	18.60%
Surface	5,974,860	26.70%
Underground	6,074,997	11.60%

Eastern County	2022 Tonnage	Annual Change
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Pike	3,576,072	13.50%
Harlan	2,131,407	19.80%
Perry	2,081,843	10.10%
Letcher	1,222,488	82.90%
Bell	669,802	21.80%
Johnson	513,435	-9.90%
Knott	418,735	-15.30%
Leslie	384,394	12.90%
Floyd	239,324	70.30%
Martin	208,933	52.00%
Knox	190,488	-17.00%
Whitley	167,261	1.00%
Morgan	126,642	681.30%
Breathitt	102,016	434.50%
Elliott	10,737	+>100%

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

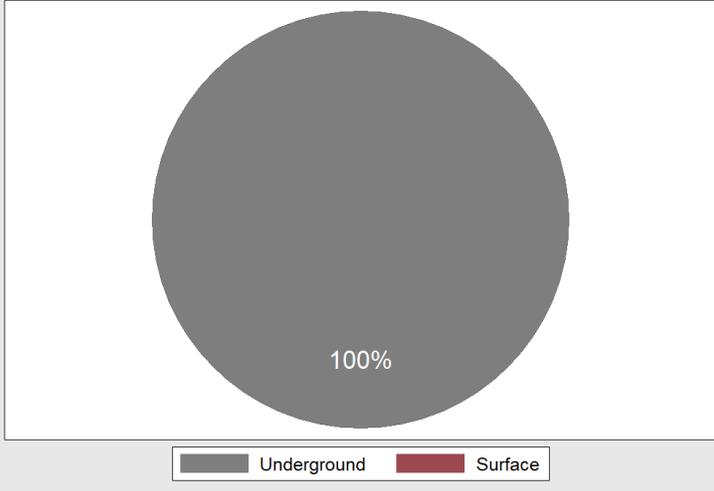


Annual production increased at both underground and surface mining operations in eastern Kentucky in 2022, by 11.6% and 26.7% respectively.

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

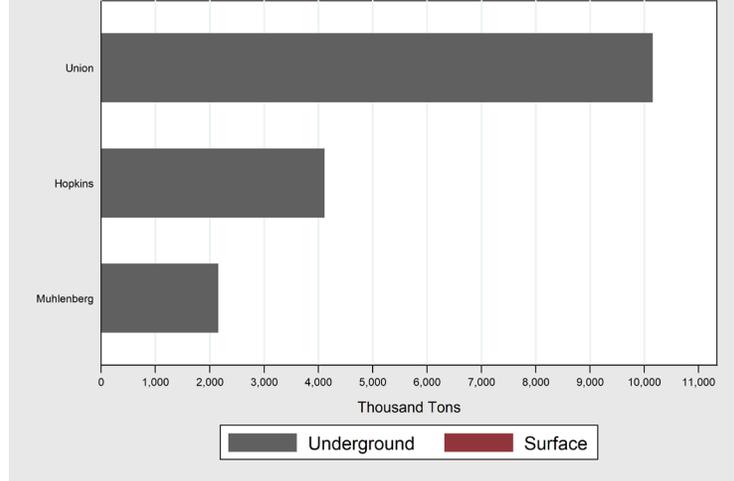
Western Kentucky Total Coal Production, 2022



Mine Type	2022 Tonnage	Annual Change
Total	16,429,856	0.80%
Underground	16,429,856	2.30%
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.

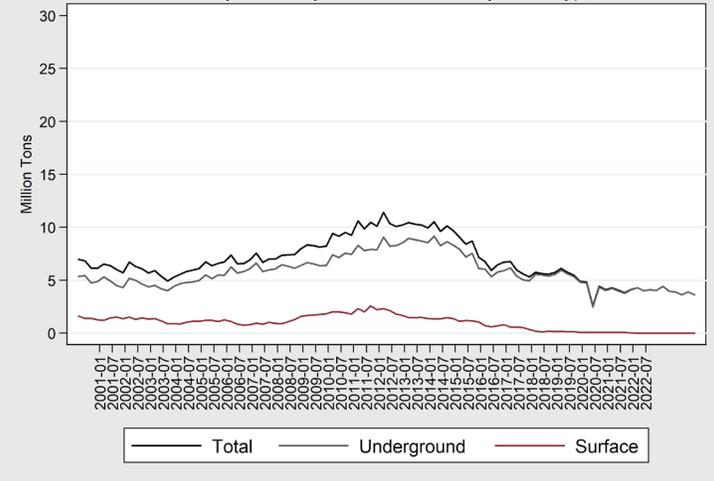
Western Kentucky Coal Production by County, 2022



Western County	2022 Tonnage	Annual Change
Union	10,158,148	3.20%
Hopkins	4,115,682	-0.60%
Muhlenberg	2,156,026	4.20%

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.

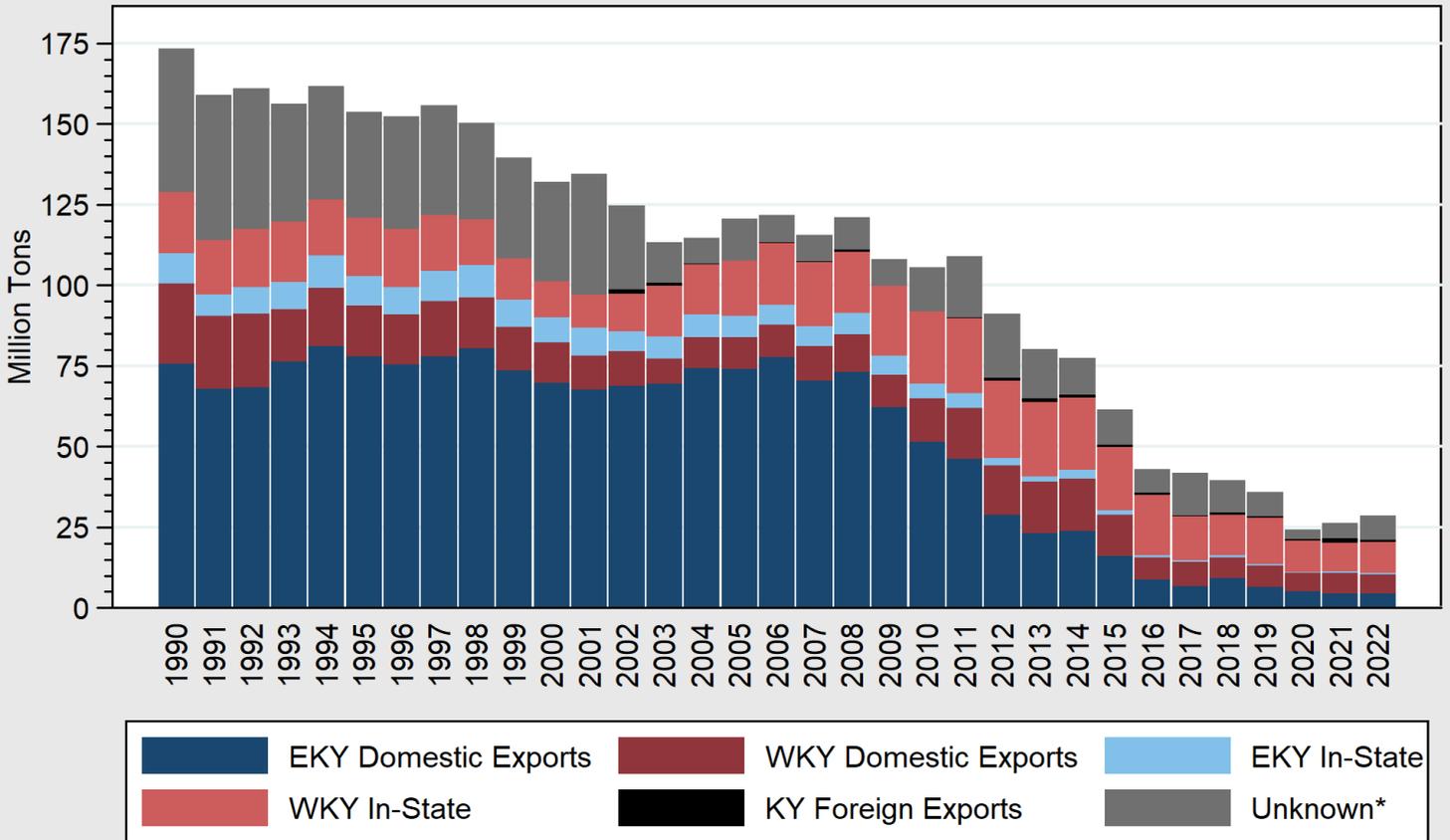
Western Kentucky Quarterly Coal Production by Mine Type, 2000-2022



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.

Coal Distribution

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

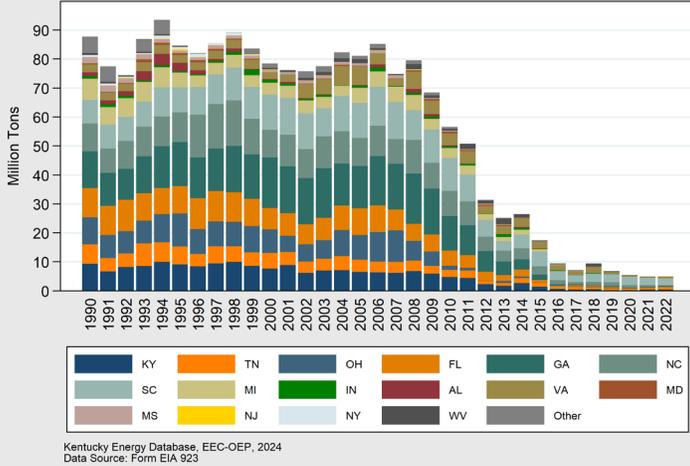
Coal Distribution by Destination, 2022

Coal and Destination	Thousand Tons	Percentage
Total Production	28,480	100%
WKY In-State	9,584	33.60%
WKY Out-of-State	5,980	21.00%
EKY Out-of-State	4,459	15.70%
EKY In-State	425	1.50%
Foreign Exports	679	2.40%
Unknown*	7,353	25.80%

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.

Eastern Kentucky Coal Deliveries by Destination, 1990-2022

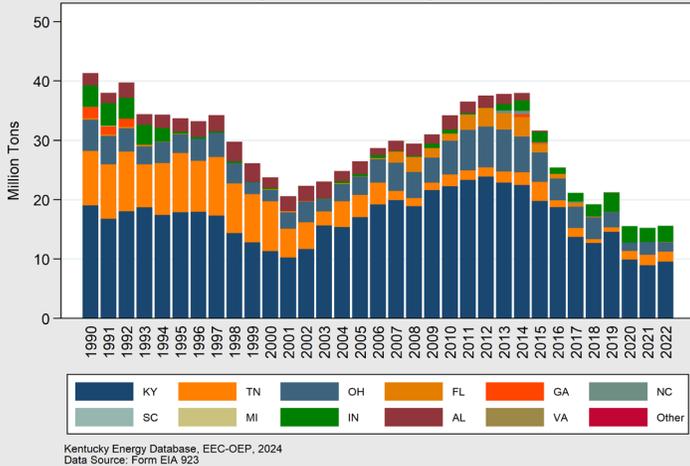


Known shipments of steam coal from eastern Kentucky to power plants within the United States remained around 4.8 million tons in 2022. The largest markets for eastern Kentucky coal are traditionally located in the southeast, and were led by South Carolina and Virginia. Overall, coal mined in the region 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	45.10%
Virginia	318	6.60%
North Carolina	396	8.20%
Tennessee	696	14.50%
Florida	174	3.60%
Kentucky	425	8.80%
West Virginia	254	5.30%
Ohio	10	0.20%
Georgia	303	6.30%
Michigan	65	1.40%

Western Kentucky Coal Deliveries by Destination, 1990-2022



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	61.50%
Florida	1,559	10.00%
Indiana	2,688	17.30%
Tennessee	1,658	10.70%
Ohio	75	0.50%

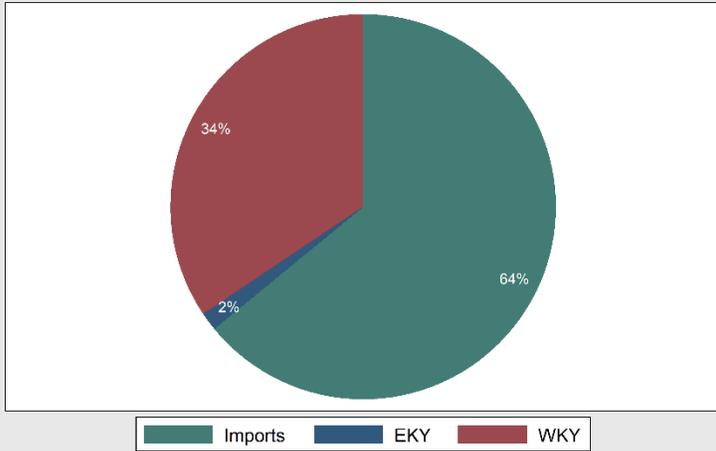
Kentucky Coal Deliveries, 2022

Origin	Thousand Tons	1 Year Change
Total	20,374	1.20%
WKY	15,564	2.00%
EKY	4,810	-1.40%

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.

Coal Consumption

Kentucky Coal Consumption, 2022

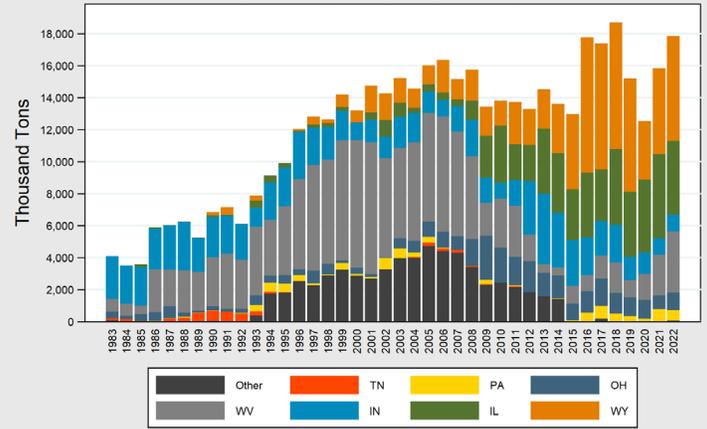


Kentucky Energy Database, EEC-OEP, 2023
Data Source: Form EIA-923. EKY=Eastern Kentucky. WKY=Western Kentucky

Origin of Coal	Thousand Tons	1 Year Change
Total	27,857	12.20%
Western Kentucky	9,584	6.90%
Imports	17,828	12.60%
Eastern Kentucky	425	2.40%

All values have been rounded to the nearest thousand tons.

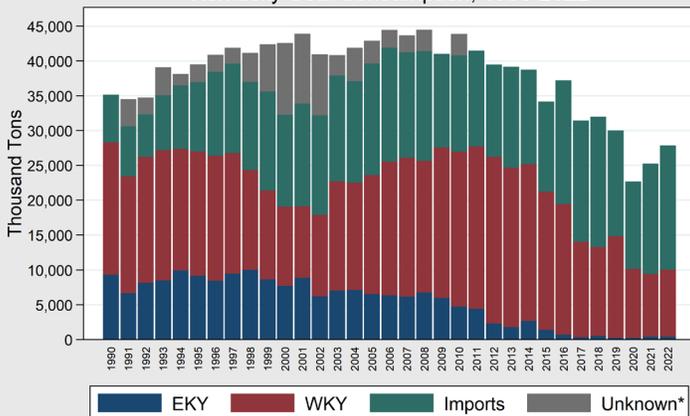
Kentucky Coal Imports by Origin State, 1983-2022



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

Imported Coal	Thousand Tons	1 Year Change
Total Imports	17,828	12.20%
Wyoming	6,539	21.50%
Illinois	4,631	-12.00%
Indiana	1,048	1.90%
Ohio	1,088	24.30%
West Virginia	3,813	50.20%
Pennsylvania	656	-13.30%

Kentucky Coal Consumption, 1983-2022



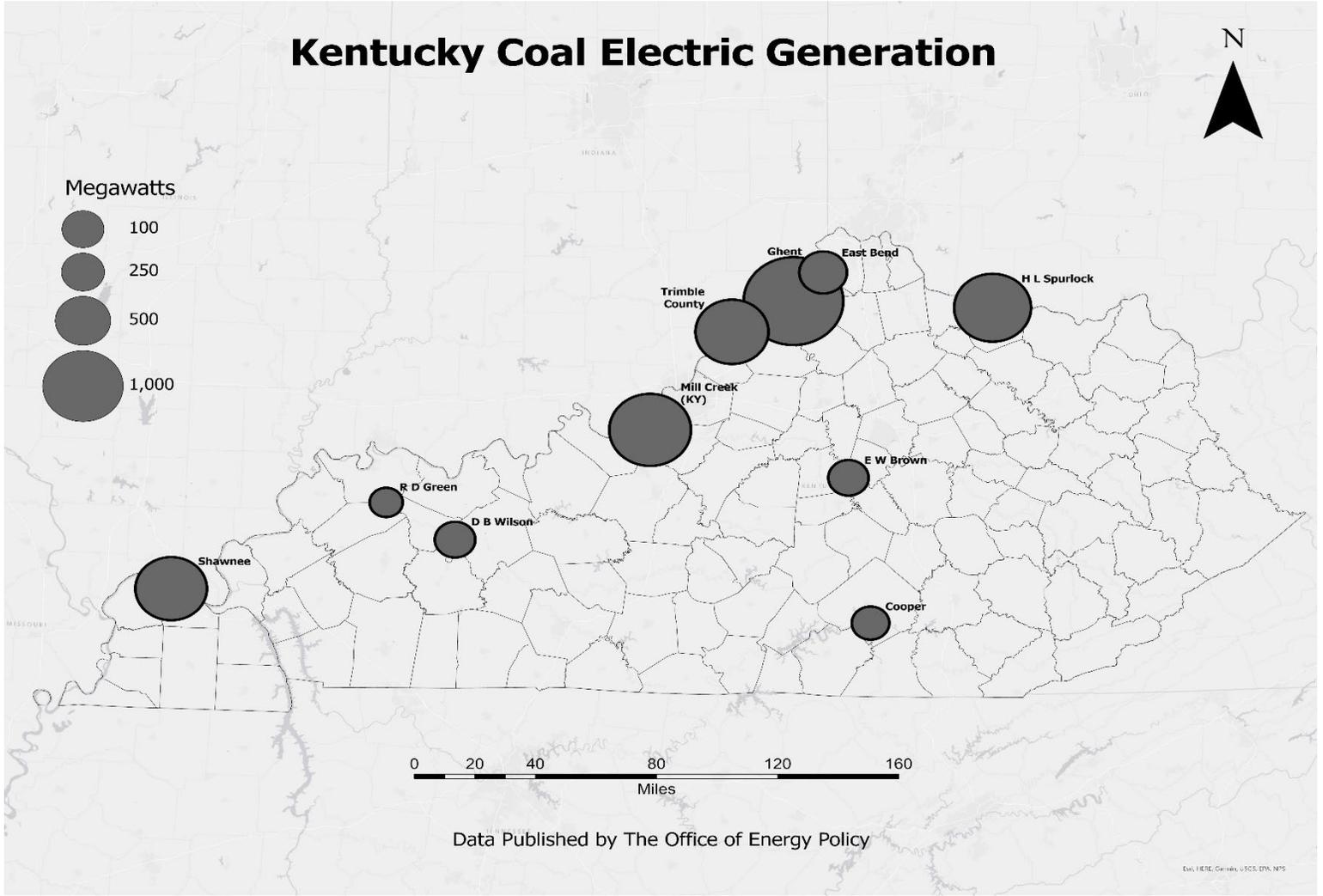
Kentucky Energy Database, EEC-OEP, 2024
*Combination of Industrial, Institutional, & Unknown
Data Source: Form EIA-923. EKY=Eastern Kentucky. WKY=Western Kentucky

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.

Coal Fired Electric Generation

Kentucky Coal Electric Generation



Data Published by The Office of Energy Policy

Env. HERE, Census, USGS, DYN, NPS

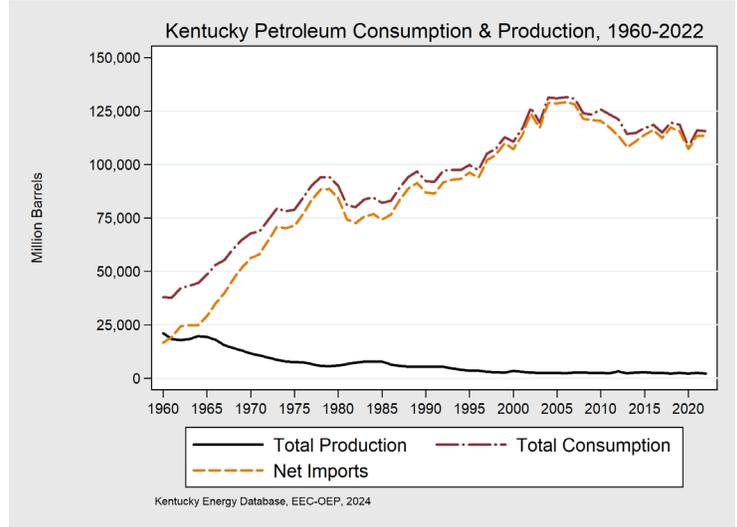
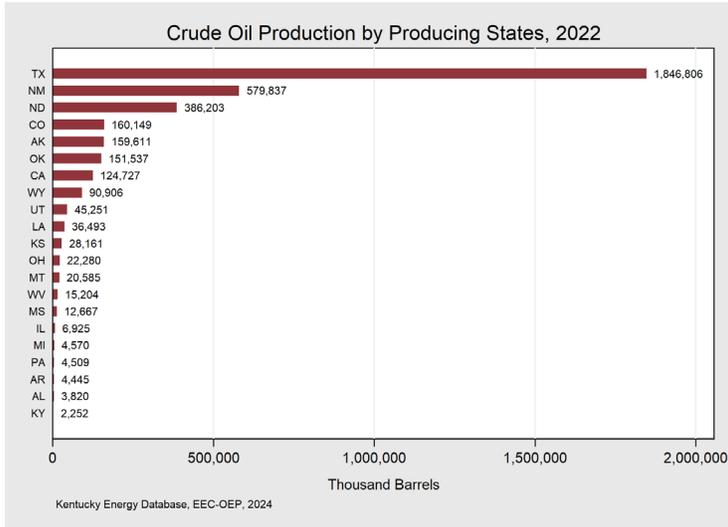
Name

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



Crude Oil Production



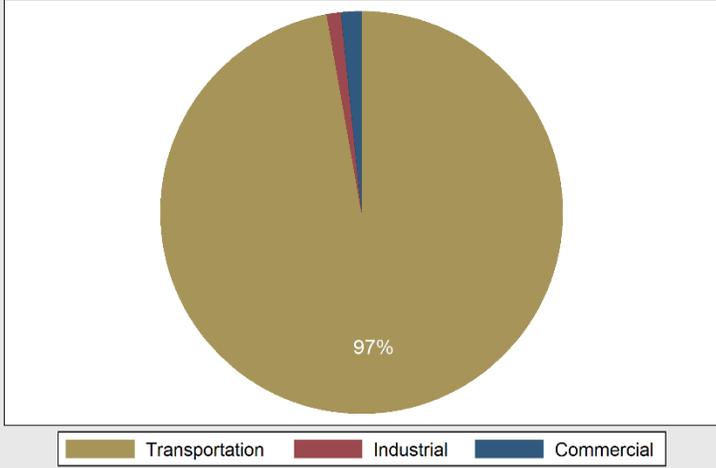
Production	2022 Million Barrels	Rank
Texas	1,847	1st
Kentucky	2	22nd

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.

Liquid Fuel Consumption

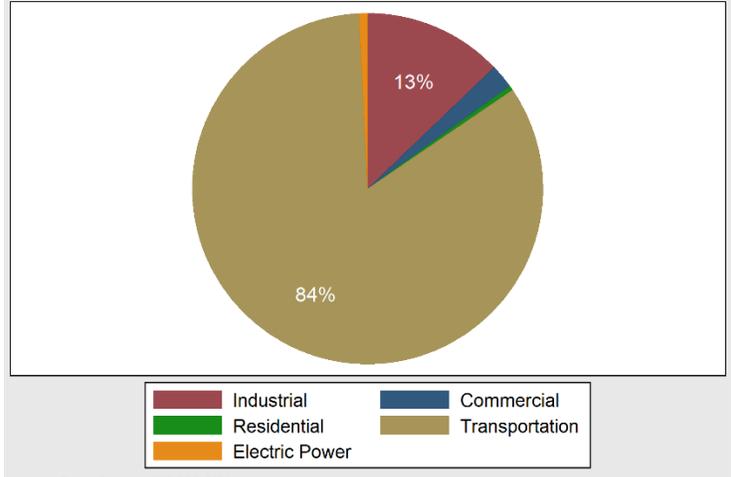
Kentucky Gasoline Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Sector	Thousand Barrels	1 Year Change
Total	50,891	-0.20%
Transportation	49,476	-0.30%
Industrial	580	2.80%
Commercial	835	2.70%

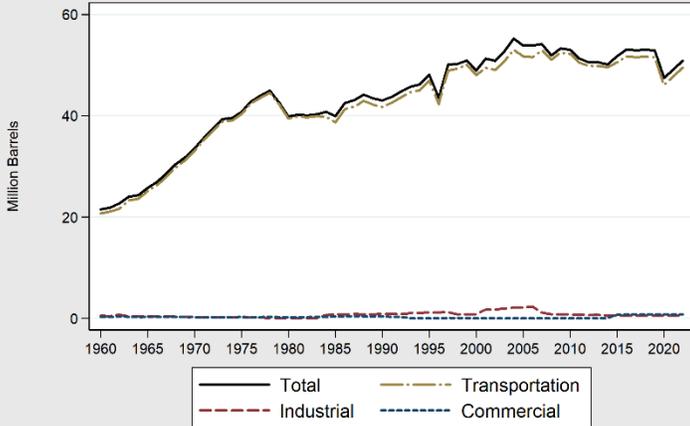
Kentucky Diesel Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Sector	Thousand Barrels	1 Year Change
Total	26,576	2.40%
Transportation	22,249	2.40%
Industrial	3,407	1.10%
Commercial	598	1.40%
Electric Power	212	34.20%
Residential	111	2.80%

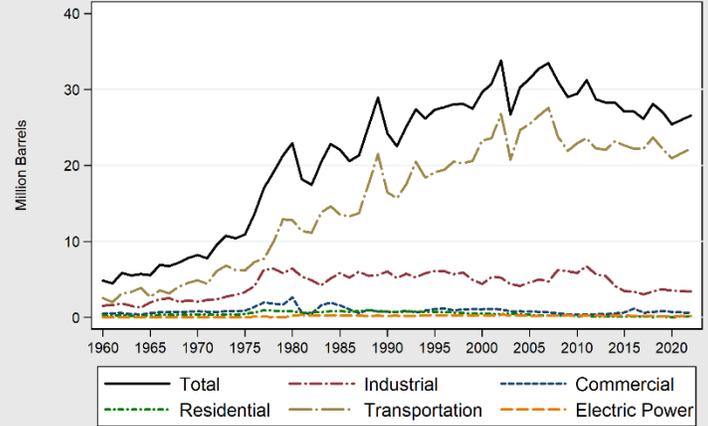
Kentucky Gasoline Consumption by Sector, 1960-2022



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%.

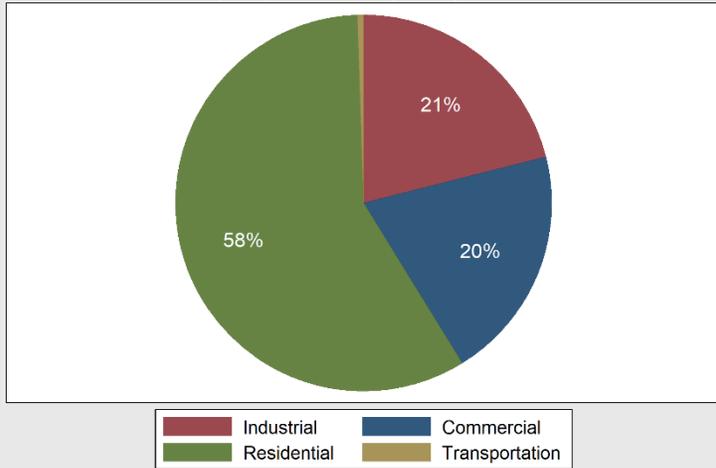
Kentucky Diesel Consumption by Sector, 1960-2022



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.

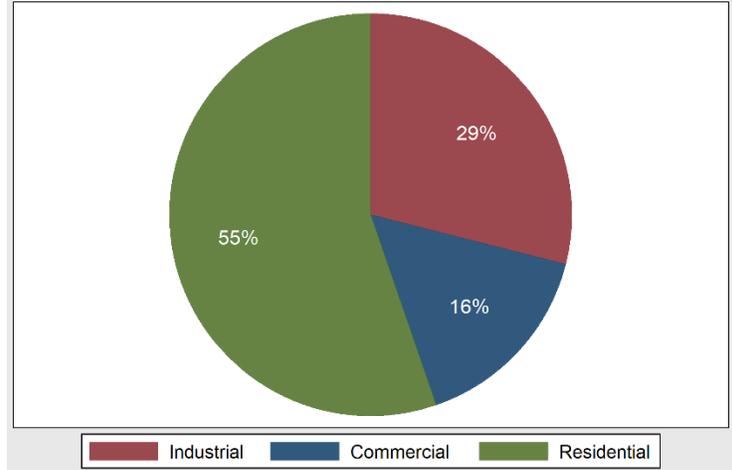
Kentucky Propane Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

Sector	Thousand Barrels	1 Year Change
Total	3,806	36.20%
Industrial	801	80.80%
Residential	2,218	23.70%
Commercial	768	40.00%
Transportation	20	81.80%

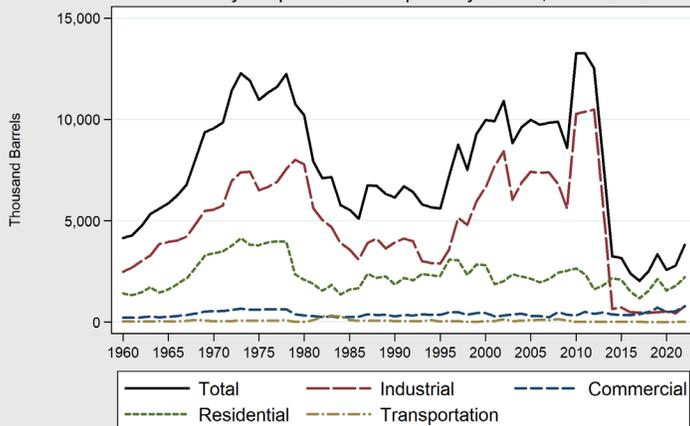
Kentucky Kerosene Consumption by Sector, 2022



Kentucky Energy Database, EEC-OEP, 2024

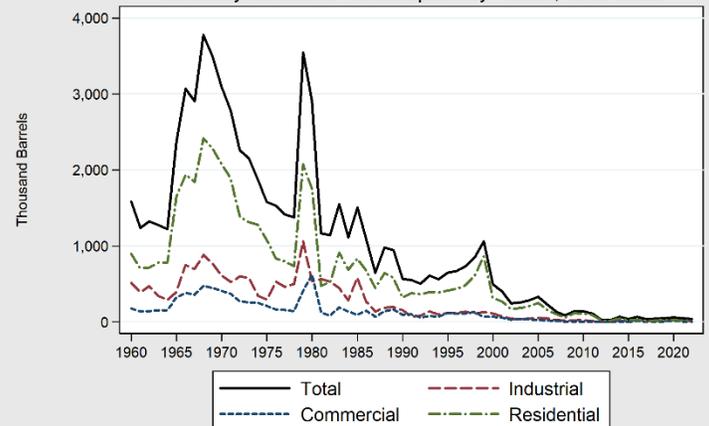
Sector	Thousand Barrels	1 Year Change
Total	37	-14.00%
Residential	21	-8.70%
Industrial	11	-21.40%
Commercial	6	-14.30%

Kentucky Propane Consumption by Sector, 1960-2022



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

Kentucky Kerosene Consumption by Sector, 1960-2022



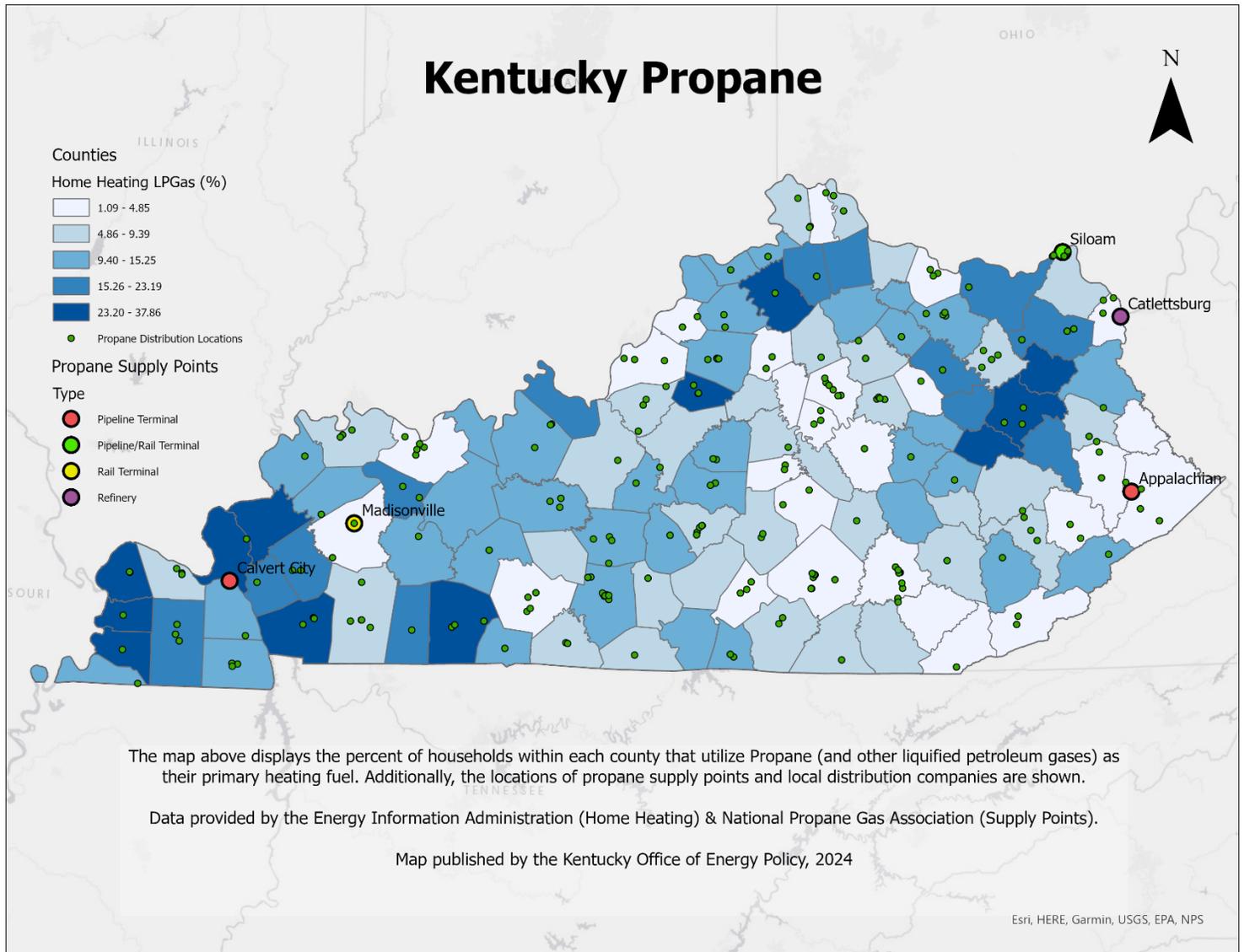
Kentucky Energy Database, EEC-OEP, 2024
Data Source: EIA-SEDS

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.

Propane



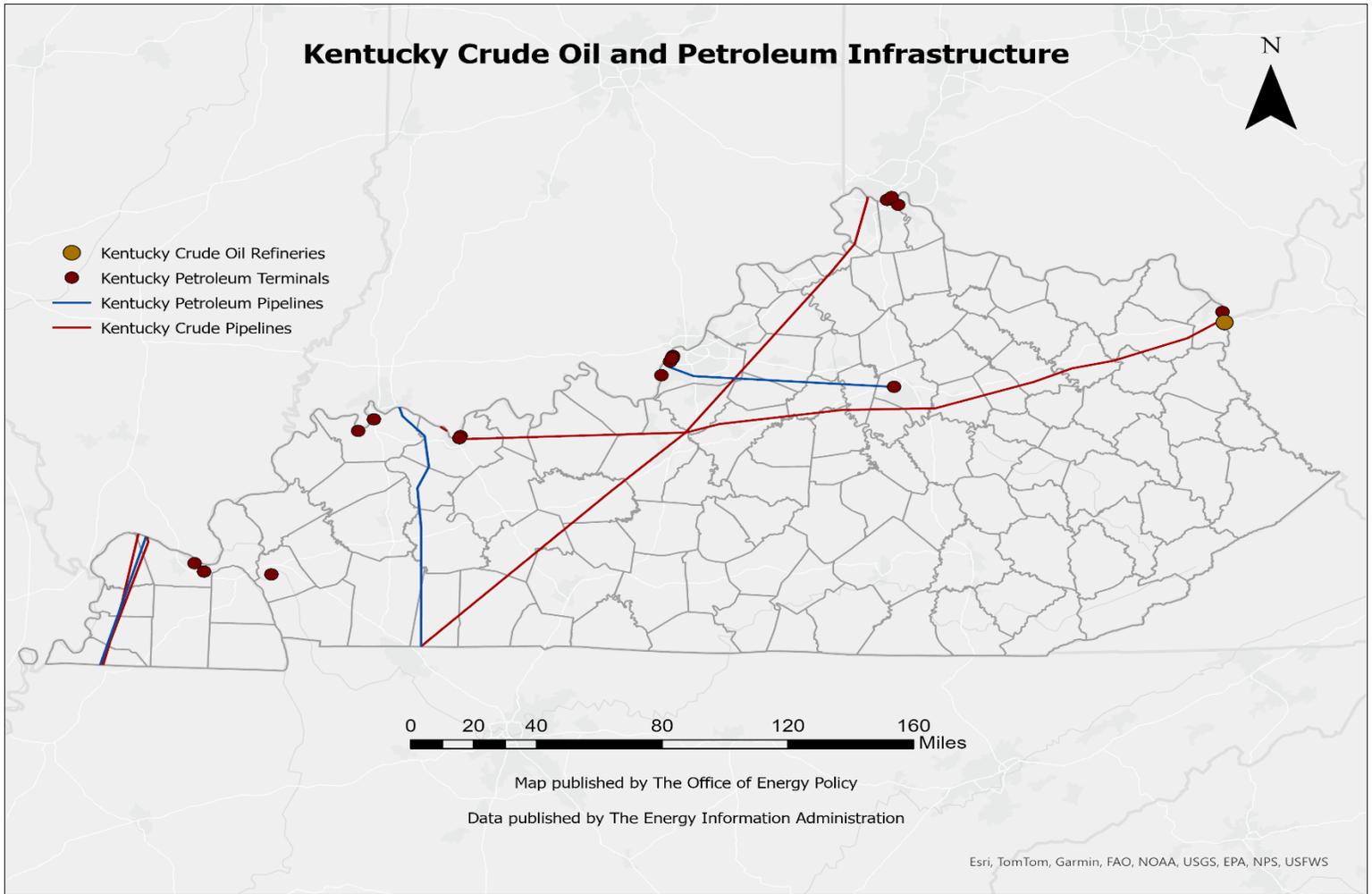
Propane is used in approximately 10 percent of Kentucky homes. It is also used in home appliances such as air conditioning units, cook stoves, water heaters, fireplaces, generators, clothes dryers, and gas grills. Numerous industries use propane as a catalyst to heat industrial processes. Propane is 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.

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/kgsgeserver/viewer.asp>

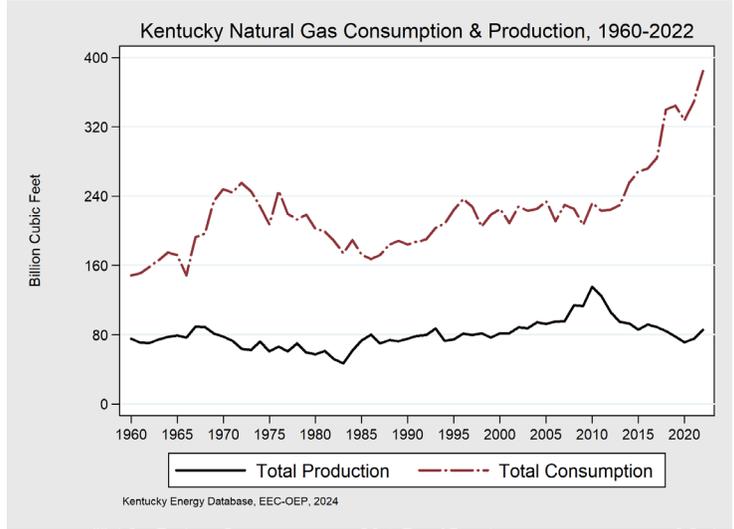
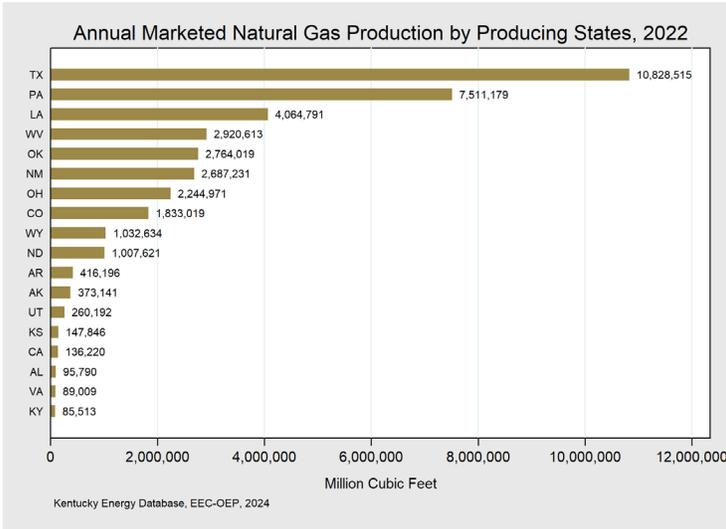
Kentucky has 22 petroleum product terminals throughout the state, with the majority being within proximity to the Ohio River.

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

Kentucky Natural Gas



Natural Gas Production



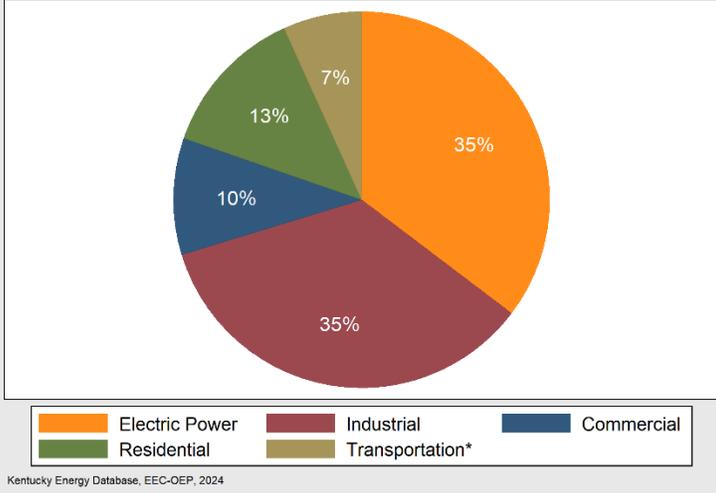
State	BCF Production	Rank
Texas	10,829	1st
Kentucky	86	18th

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.

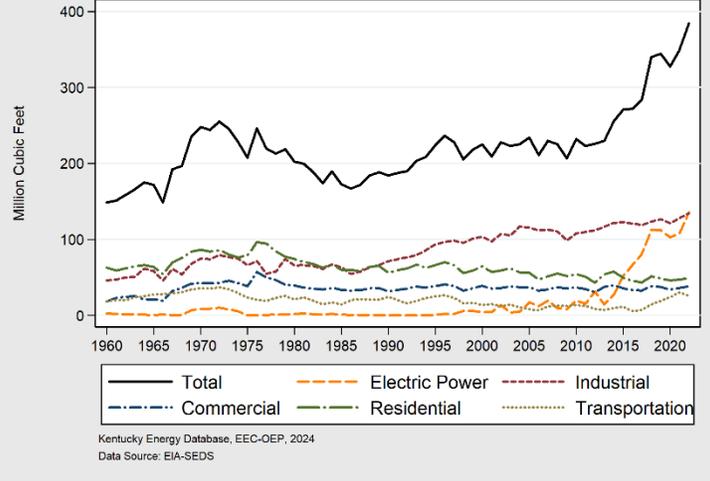
Kentucky has 2 natural gas processing plants located in eastern Kentucky and 22 underground storage locations, mostly located in western Kentucky. Additional information on the location of natural gas fields and wells is available from the Kentucky Geological Survey Geologic Map Information Service at: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

Natural Gas Consumption

Kentucky Natural Gas Consumption by Sector, 2022



Kentucky Natural Gas Consumption by Sector, 1960-2022



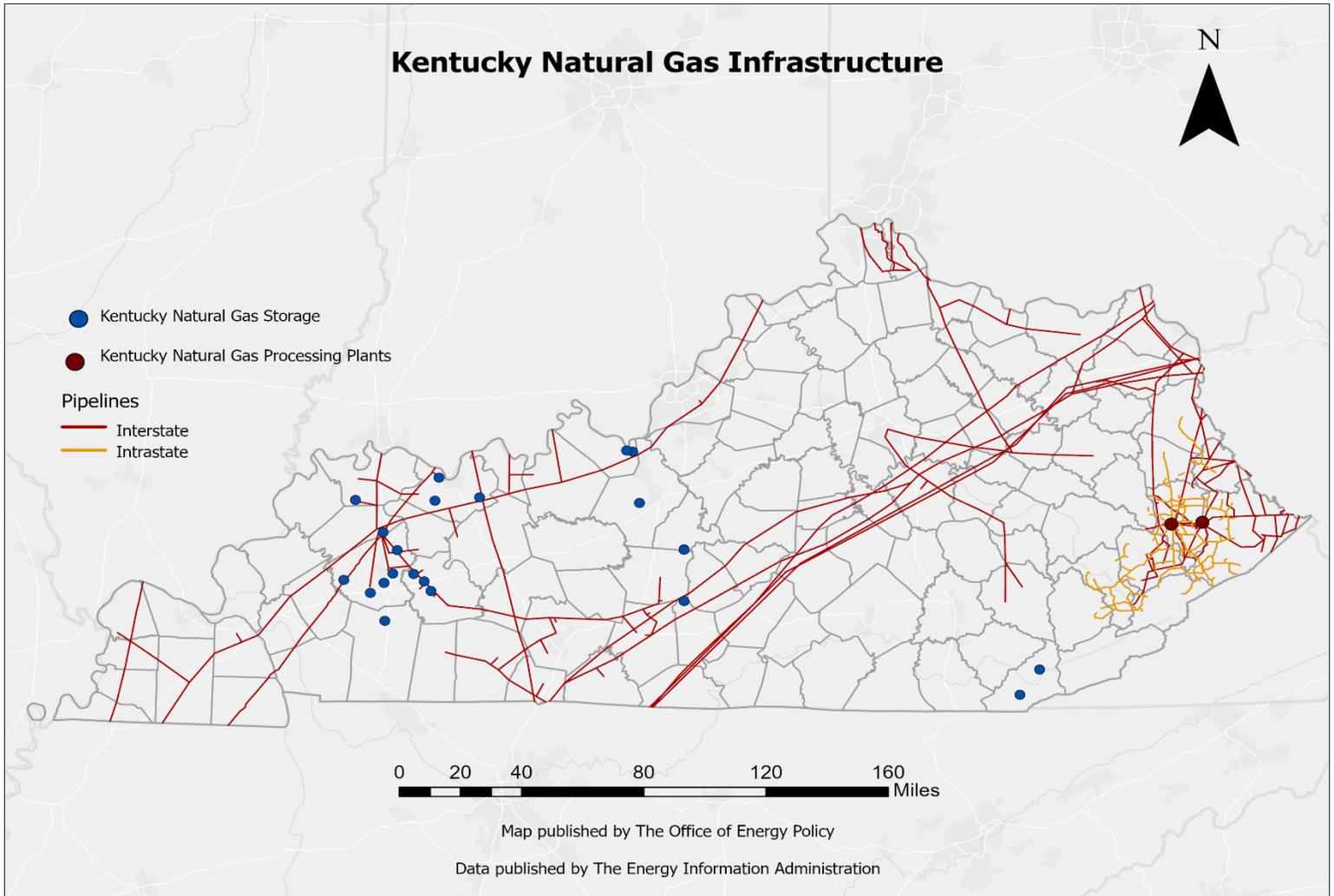
Sector	Million Cubic Feet	1 Year Change
Total	384,217	10.00%
Industrial	134,364	4.90%
Residential	49,821	6.20%
Commercial	38,492	7.00%
Electric Power	135,630	25.60%
Transportation	25,910	-14.40%

*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.

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.

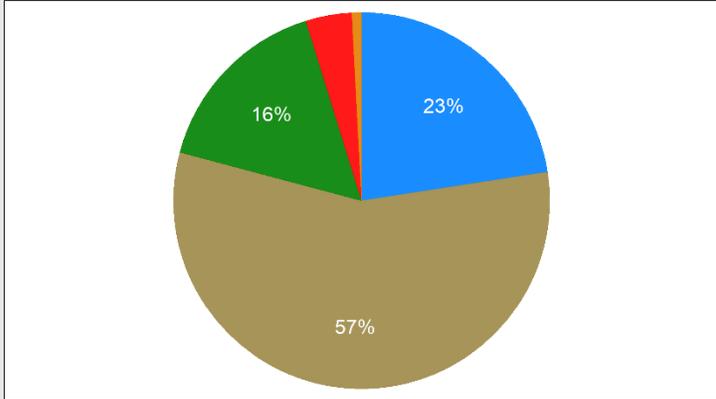
Kentucky has 22 natural gas underground storage areas. In 2022, Kentucky had a storage capacity of 1,084 billion cubic feet of working natural gas. The majority of the storage areas are in the western part of the state with eastern Kentucky has 2 storage areas, one active and one inactive, with a working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

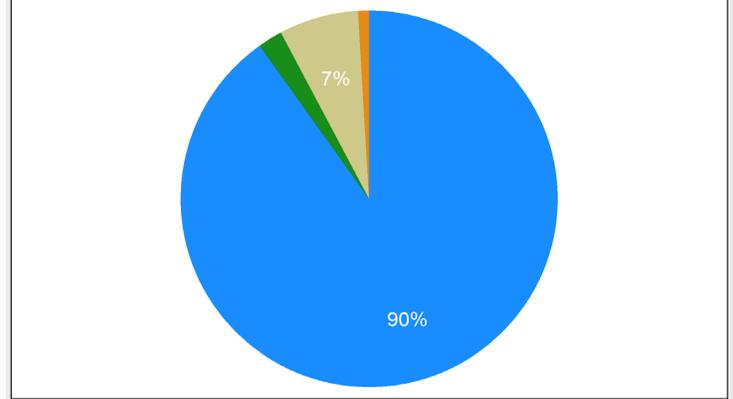
Kentucky Renewable Energy Production by Fuel Type, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Billion Btu	1 Year Change
Total	68,537	10.70%
Wood & Biomass	38,787	27.20%
Hydroelectric	15,456	-7.10%
Biofuels	11,007	-5.00%
Geothermal	2,712	0.00%
Solar	575	23.70%

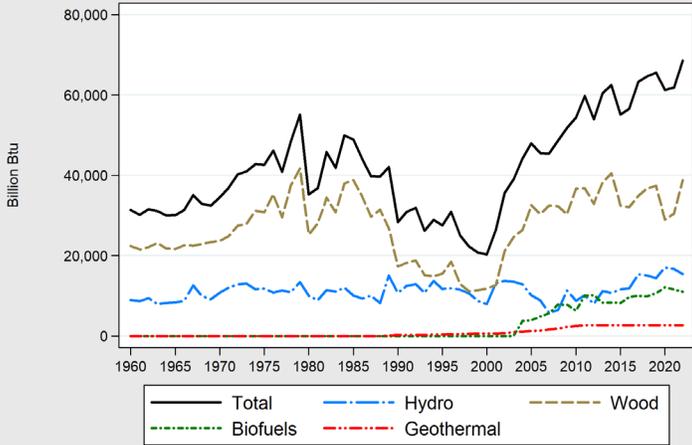
Kentucky Renewable Electricity Generation by Fuel Type, 2022



Kentucky Energy Database, EEC-OEP, 2024

Fuel Type	Gigawatt Hours	1 Year Change
Total	5,024	-5.90%
Hydroelectric	4,530	-7.10%
Wood & Biomass	343	14.30%
Biofuels	105	-8.80%
Solar	47	1.90%

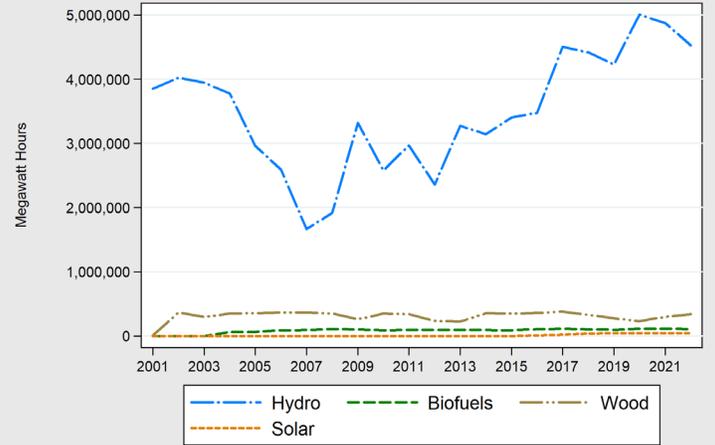
Kentucky Renewable Energy Production by Fuel, 1960-2022



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.

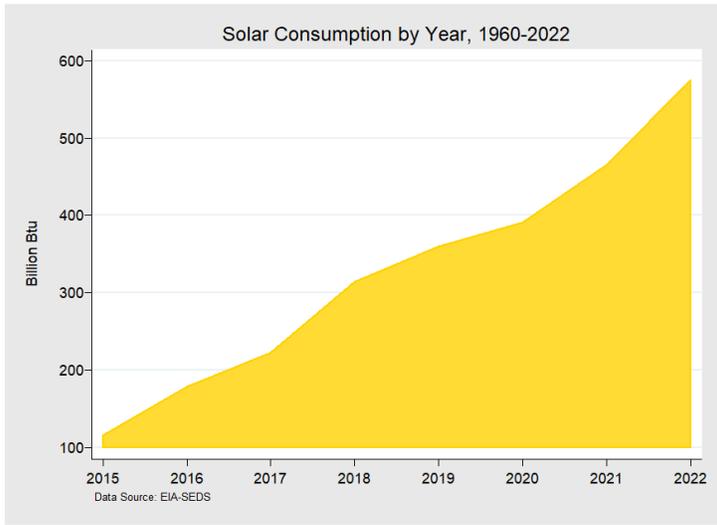
Kentucky Renewable Electricity Generation by Fuel, 2001-2022



Kentucky Energy Database, EEC-OEP, 2024

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

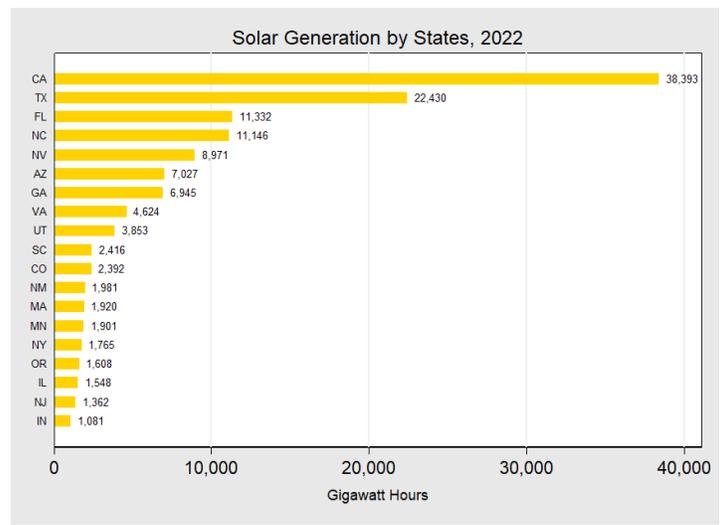
Kentucky Solar



Year	Billion Btu	1 Year Change
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2022	575	23.70%
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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.



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

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 Ordinances and Projects

As of March 2024

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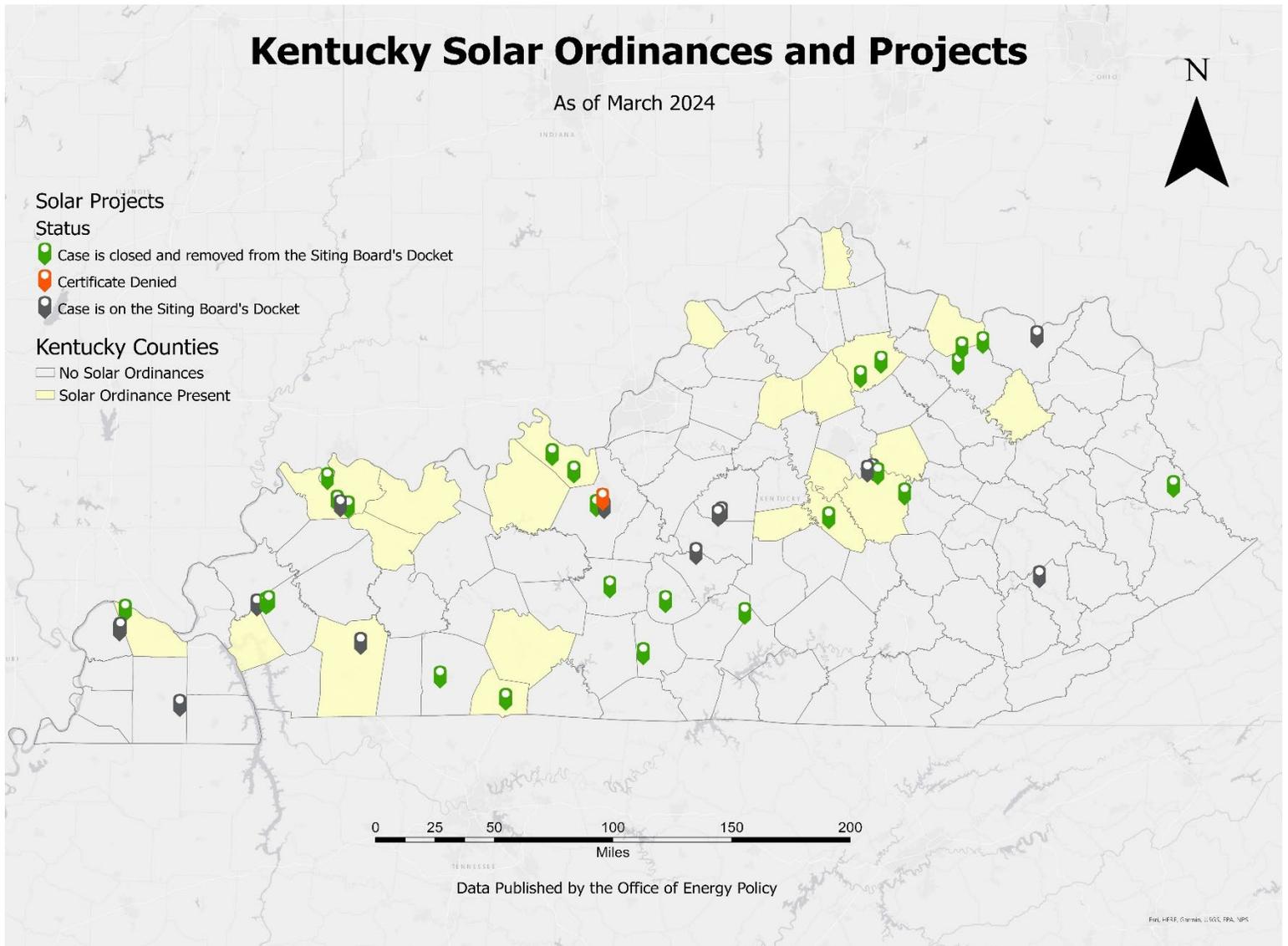
Solar Projects

Status

-  Case is closed and removed from the Siting Board's Docket
-  Certificate Denied
-  Case is on the Siting Board's Docket

Kentucky Counties

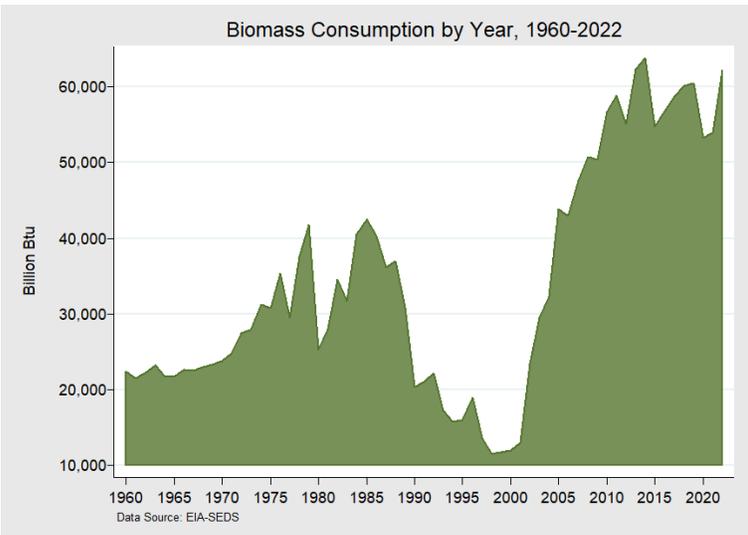
-  No Solar Ordinances
-  Solar Ordinance Present



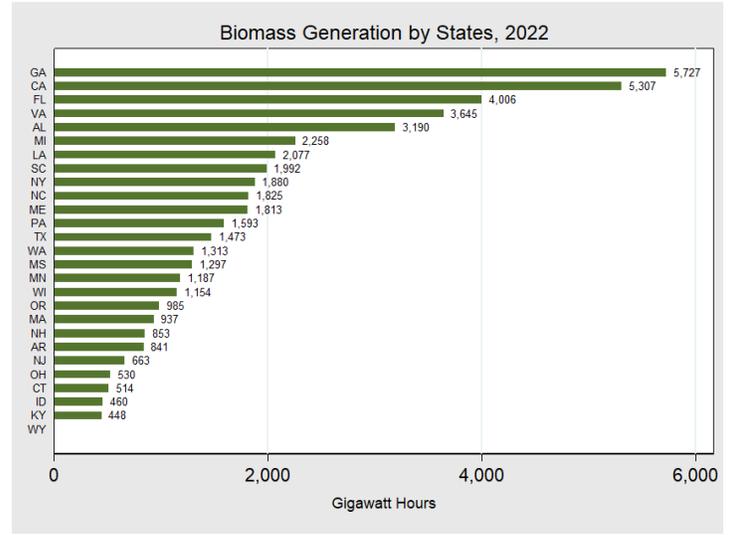
The Kentucky Solar Ordinance and Projects Dashboard provides users with a comprehensive view of solar projects that have applied for a certificate of construction to the Siting Board, and the county/local regulations that govern these projects. In the past several years, the nation has seen an exponential 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



Year	Billion BTU
2022	62,233

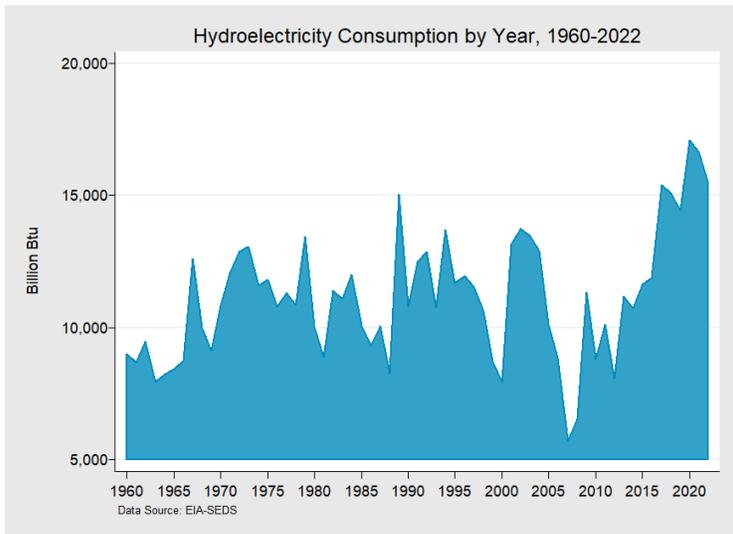


State	Gigawatt Hours	Rank
Georgia	5,727	1st
Kentucky	448	26th

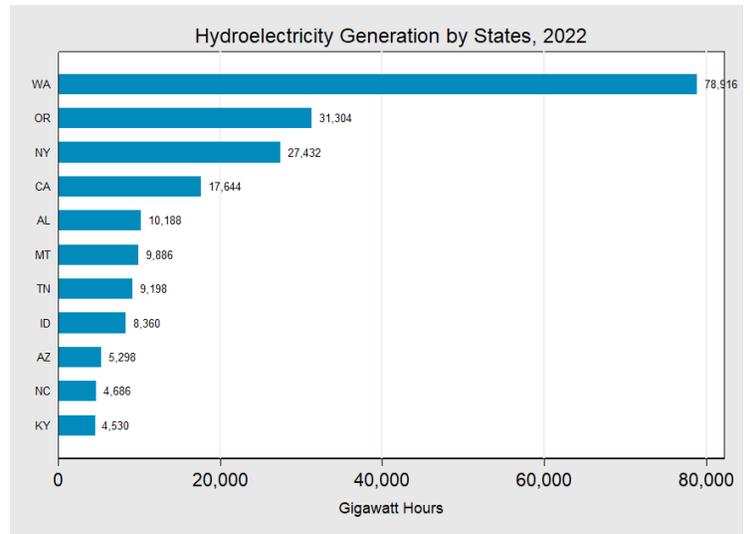
Kentucky's biomass energy consumption has witnessed dynamic changes since the 1960s, reflecting evolving energy trends and environmental considerations. Initially relying on traditional biomass sources like wood and agricultural residues, the state gradually transitioned towards modern biomass technologies, 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.

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 Hydroelectricity



Year	Billion BTU	1 Year Change
2022	15,456	-7.10%



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

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.

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.

Acknowledgements

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