



Transcending Boundaries

Southern States Regional Energy Profiles

2018





July 3, 2018

Dear Board Members, Associate Members, and Colleagues:

The Southern States Energy Board is pleased to present this fourth edition of *Southern States Energy Profiles*, which provides an overview of energy trends in the region along with how the region's energy profile compares with the United States. This is a cooperative venture between the Southern States Energy Board and Kentucky's Energy Office within the Energy and Environment Cabinet. Both organizations are indebted to the United States Department of Energy's Office of Fossil Energy, which provided grant funding to perform the assessments contained in the report.

As with previous editions, this report serves as an informational resource and as a foundation for the discussion of energy programs, policies, and technologies that can enhance economic development and the quality of life in the region. Affordable, reliable energy is vital to the region's economy. Fortunately for the region, given the diversity of resources and energy production, we can showcase relative energy stability overall, even as certain trends have an impact on how energy is produced or used. For example, when the first edition of this report was published in 2012, coal accounted for 44 percent of the region's electricity generation. Today coal-fired generation accounts for 31 percent of the region's electricity generation, with natural gas primarily making up the difference. At the same time, economic and technological forces and many states' policy objectives are creating significant growth in renewable energy.

We have some additions to this year's Energy Profiles, including new maps that show comparisons among the states in the region in electricity consumption, electricity use per capita, and electricity consumption per state gross domestic product, as well as maps depicting the region's electric transmission system, building energy codes, transportation metrics, and natural gas infrastructure.

We would like to recognize the public sources used in aggregating data for this report, the *Southern States Energy Profiles*. The Energy Information Administration of the U.S. Department of Energy; U.S. Environmental Protection Agency; the Bureau of Labor Statistics; the Bureau of Economic Analysis; and the Census Bureau have all provided data used in the report. The document compares energy consumption, energy sources, electricity consumption, electricity generation and emissions, electricity prices, and energy exports between all SSEB member states, the SSEB region, and the United States.

A handwritten signature in black ink, appearing to read "Ken Nemeth", written in a cursive style.

Kenneth J. Nemeth
Secretary and Executive Director

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Southern States Energy Board

About Southern States Energy Board

The Southern States Energy Board (SSEB) is a non-profit interstate compact organization created in 1960 and established under Public Laws 87-563 and 92-440. The Board's mission is to enhance economic development and the quality of life in the South through innovations in energy and environmental policies, programs and technologies. Sixteen southern states and two territories comprise the membership of SSEB: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, Virginia, and West Virginia. Each jurisdiction is represented by the governor and a legislator from the House and Senate. A governor serves as the chair and legislators serve as vice-chair and treasurer. Ex-officio non-voting Board members include a federal representative appointed by the president of the United States and SSEB's executive director, who serves as secretary.

SSEB was created by state law and consented to by Congress with a broad mandate to contribute to the economic and community well-being of the southern region. The Board exercises this mandate through the creation of programs in the fields of energy and environmental policy research, development, and implementation, science and technology exploration, and related areas of concern. SSEB serves its members directly by providing timely assistance designed to develop effective energy and environmental policies and programs and represents its members before governmental agencies at all levels.

Long-term Goals

- ◆ Perform essential services that provide direct scientific and technical assistance to state governments;
- ◆ Develop, promote, and recommend policies and programs on energy, environment, and economic development that encourage sustainable development;
- ◆ Provide technical assistance to executive and legislative policy-makers and the private sector in order to achieve synthesis of energy, environment, and economic issues that ensure energy security and supply;
- ◆ Facilitate the implementation of energy and environmental policies between federal, state, and local governments and the private sector;
- ◆ Sustain business development throughout the region by eliminating barriers to the use of efficient energy and environmental technologies; and
- ◆ Support improved energy efficient technologies that reduce environmental impacts and contribute to a clean global environment while protecting indigenous natural resources for future generations.

Executive Summary

This is the fourth edition of *Southern States Energy Profiles*, which provides an overview of energy trends within the SSEB region. This report is a collaboration between the SSEB and the Kentucky Office of Energy Policy within the Energy and Environment Cabinet. All of the data summarized in this report were aggregated from public sources, specifically the following agencies of the U.S. government: Energy Information Administration (EIA); Environmental Protection Agency (EPA); Bureau of Labor Statistics (BLS); Bureau of Economic Analysis (BEA); and the Census Bureau. Data in the report are used to compare the SSEB region and individual states with national averages for energy and electricity consumption, electricity generation and emissions, electricity prices, and energy exports. Note that comparable data for Puerto Rico and the U.S. Virgin Islands were not available at the time of publication.

Changing Electricity Generation Portfolio

The electricity generation portfolios of the SSEB region and the United States have changed significantly in recent years, influenced by market conditions, environmental regulations, and state and federal policies related to energy production. Since the first edition of this report published in 2012, electricity generation in the region and nationally has declined, with a larger decline occurring nationally; natural gas has increased its share of generation within the region from 31 percent to 40 percent; and wind has increased its share from two percent to five percent. Wind is the fastest growing electricity generation source, but solar had the largest year over year growth in 2017. Hydroelectric generation, which varies from year to year due to rainfall and temperature, had been the largest share of renewable generation until around 2013. Now wind power is the largest share of renewable generation for the region (primarily in Oklahoma and Texas), while hydroelectric power is the largest share of renewable power for the nation.

Emissions Reductions

Pollution mitigation measures at regional power plants include the use of lower-sulfur fuels and the installation of pollution control technologies. Emissions from the sector continue to decline—both as a result of control technologies and the changing overall generation portfolio. The graphs beginning on page 58 depict the dramatic reductions in emissions of sulfur dioxide since 1995. For the region as a whole, emissions from the electric power sector continue to decrease compared with 2005. Overall, most states in the region have had a decline in emissions since 2015. The same is true for emissions reductions for the United States as a whole.

Electricity Prices

Since 2005, average prices in the region have increased at a faster rate than have average prices nationally. Many factors influence energy prices, among them are utility costs incurred to comply with environmental regulations (capital expenditures on pollution control technology at a power plant); declining load—which spreads fixed costs among fewer kWh sales; and increased costs of providing service (inflation). While nominal electricity prices in the SSEB region were 12.4% lower than the national average, monthly electricity bills paid by residential consumers averaged \$120.11 in 2017 which was eight percent higher than the national average.

Energy Consumption

The 16 member states and two territories in the SSEB region consumed 46 percent of the total energy used in the United States in 2016 (the last year for available data on total energy consumption). Overall energy consumption, which includes the transportation sector, has increased slightly for the region and the United States in 2016. For both the region and nationally, residential and commercial sector energy consumption has declined, while transportation and industrial energy consumption has increased. Within the region, consumption by sector varies significantly. Regionally and nationally, industrial energy consumption is the largest by sector, with transportation ranking second.

SSEB Region States

**This document is intended to provide an overview of energy in the following states,
both individually and as a region.**

ALABAMA

ARKANSAS

FLORIDA

GEORGIA

KENTUCKY

LOUISIANA

MARYLAND

MISSISSIPPI

MISSOURI

NORTH CAROLINA

OKLAHOMA

PUERTO RICO

SOUTH CAROLINA

TENNESSEE

TEXAS

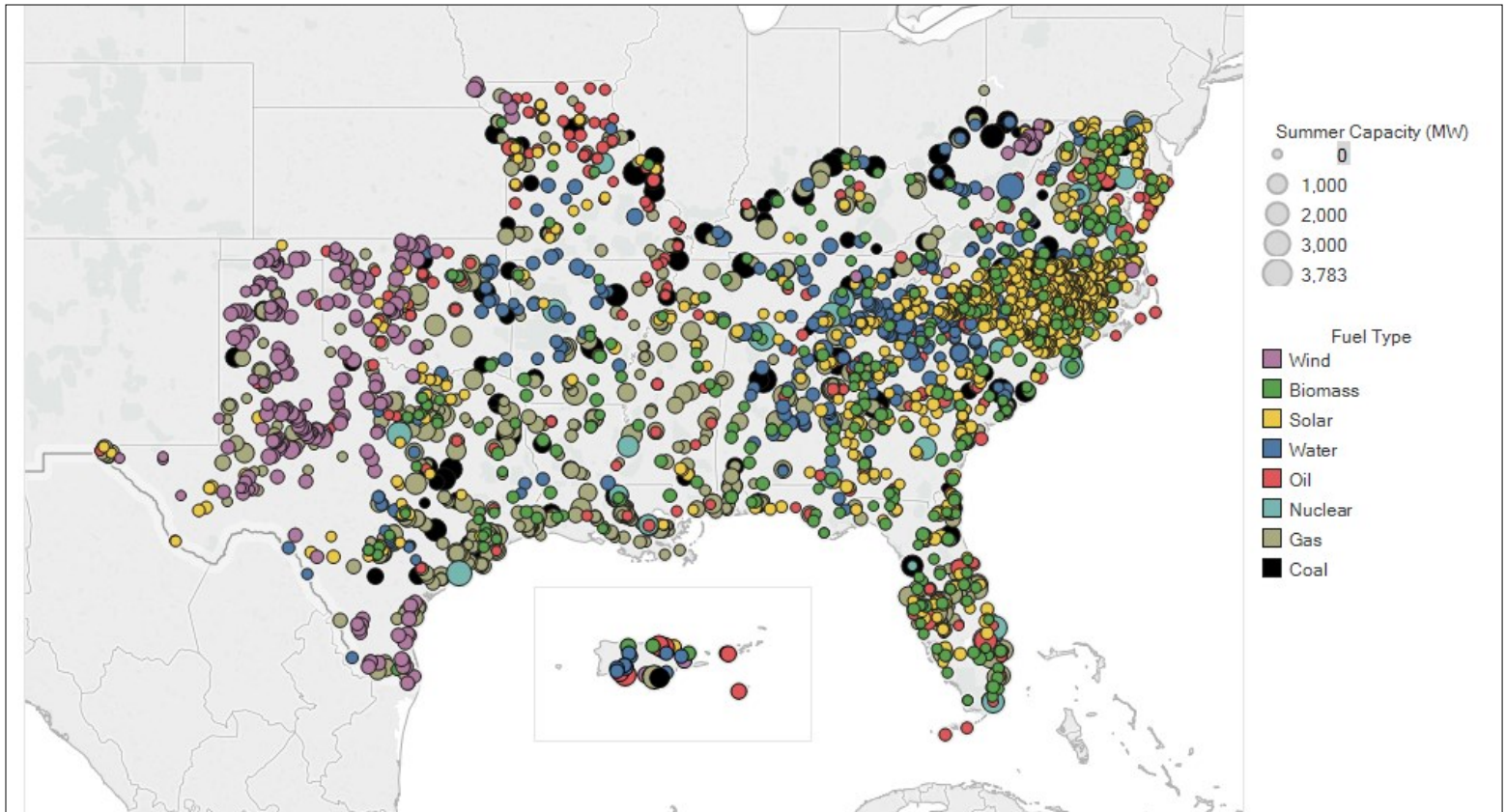
U.S. VIRGIN ISLANDS

VIRGINIA

WEST VIRGINIA

Puerto Rico and the U. S. Virgin Islands are represented in this document with limited data due to the extent of data availability.

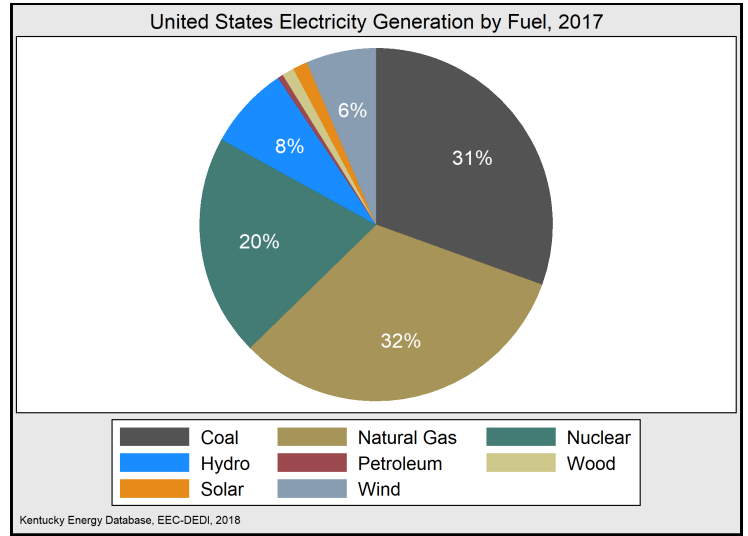
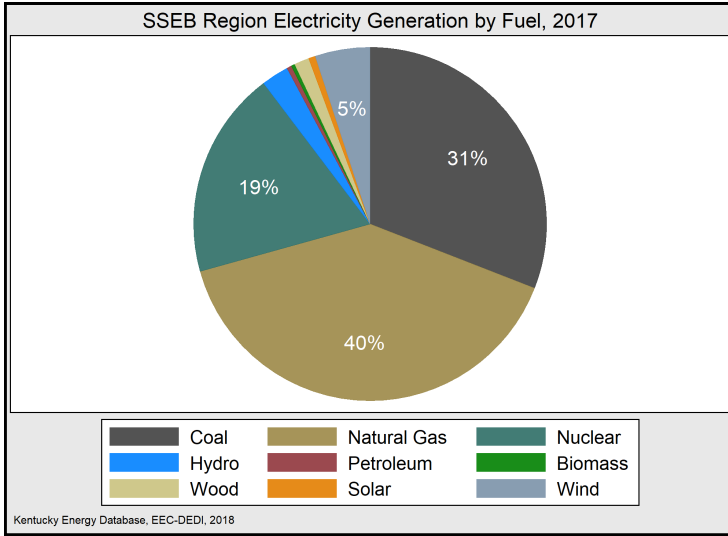
Electricity Generation Capacity, 2016



State	Coal	Hydro	Natural Gas	Nuclear	Other	Petroleum	Pumped Storage	Solar	Wind	Wood	Total
Alabama	6,283	3,042	13,882	5,060	26	43	-	75	-	666	29,077
Arkansas	5,116	1,267	6,117	1,818	18	12	28	13	-	322	14,711
Florida	9,881	55	37,994	3,572	1,142	4,974	-	327	-	489	58,432
Georgia	9,361	2,275	16,578	4,061	105	1,035	1,862	968	-	833	37,078
Kentucky	13,093	1,068	5,900	-	20	12	-	10	-	52	20,155
Louisiana	2,853	192	16,961	2,133	717	937	-	-	-	410	24,203
Maryland	4,712	590	3,630	1,708	150	1,217	-	138	190	3	12,338
Missouri	11,726	546	5,718	1,190	18	1,134	657	26	654	-	21,669
Mississippi	1,820	-	12,414	1,401	3	44	-	3	-	273	15,958
North Carolina	10,746	2,002	10,683	5,114	145	397	86	2,437	208	474	32,290
Oklahoma	4,866	860	13,235	-	18	74	258	3	6,644	58	26,016
South Carolina	5,212	1,362	5,747	6,576	46	513	2,716	19	-	485	22,676
Tennessee	7,014	2,619	5,244	4,523	14	43	1,616	70	29	182	21,355
Texas	23,589	670	67,685	4,960	629	113	-	581	20,182	313	118,722
Virginia	3,800	866	11,800	3,568	314	2,350	3,241	104	-	578	26,622
West Virginia	12,958	350	1,194	-	66	11	-	-	686	-	15,265
TOTAL SSEB REGION	133,030	17,762	234,781	45,683	3,431	12,910	10,465	4,773	28,594	5,136	496,565
UNITED STATES	266,620	79,913	446,816	99,565	9,568	34,382	22,779	21,951	81,287	8,936	1,074,333

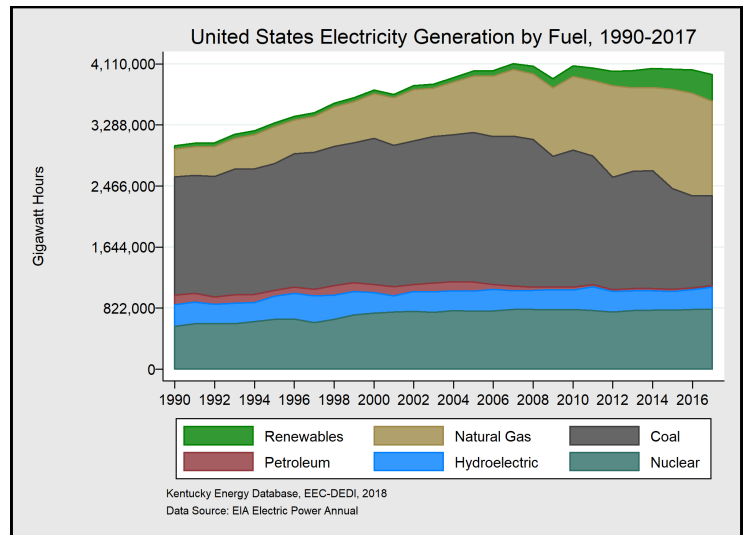
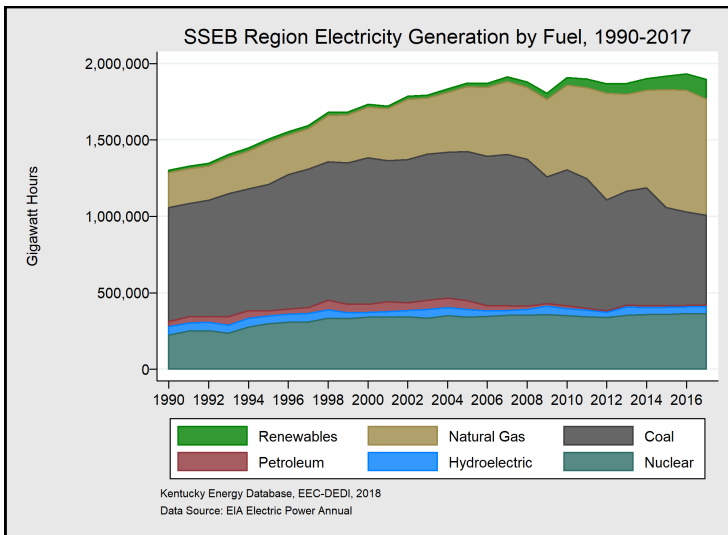
*MW of Summer Generating Capacity

SSEB Region Electricity Generation



Source Type	Gigawatt-hours	2017 Change
Total	1,907,492	-1.9%
Natural Gas	758,922	-4.7%
Coal	589,358	-3.7%
Nuclear	362,055	-0.6%
Hydroelectric	48,414	+14.2%
Wind	96,064	+19.2%
Solar	12,102	+90.3%

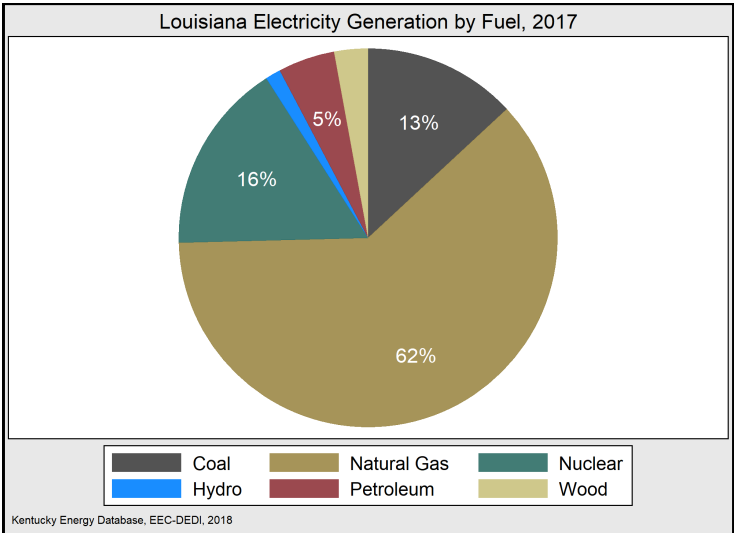
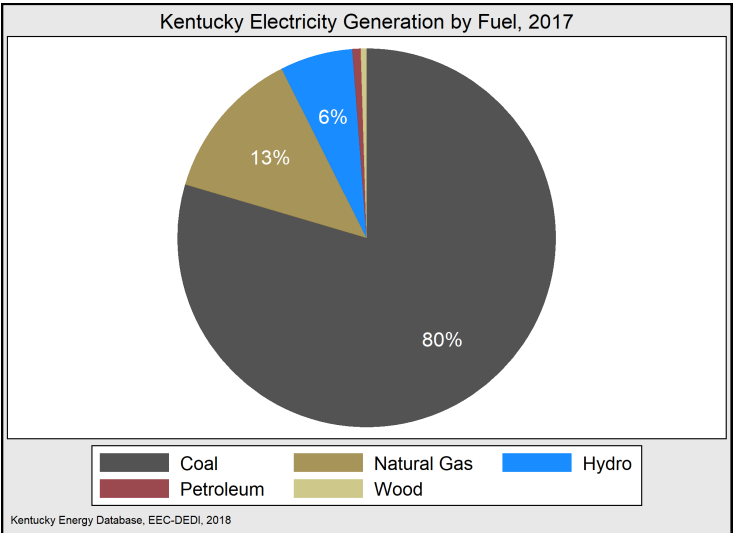
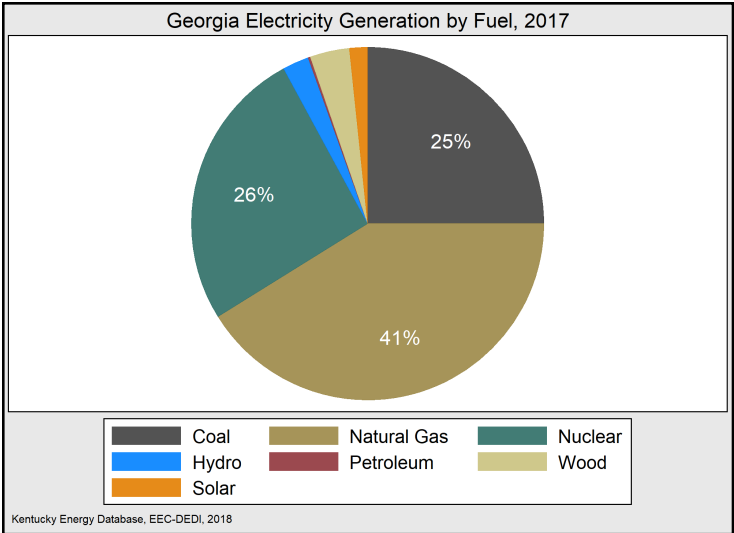
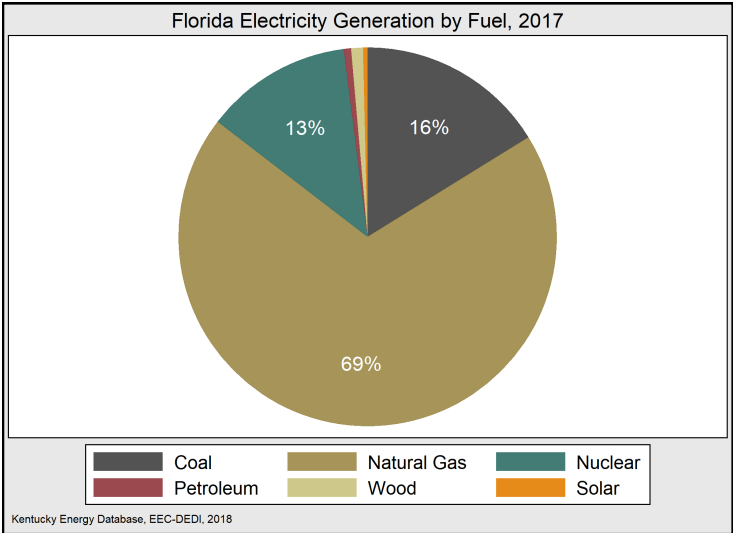
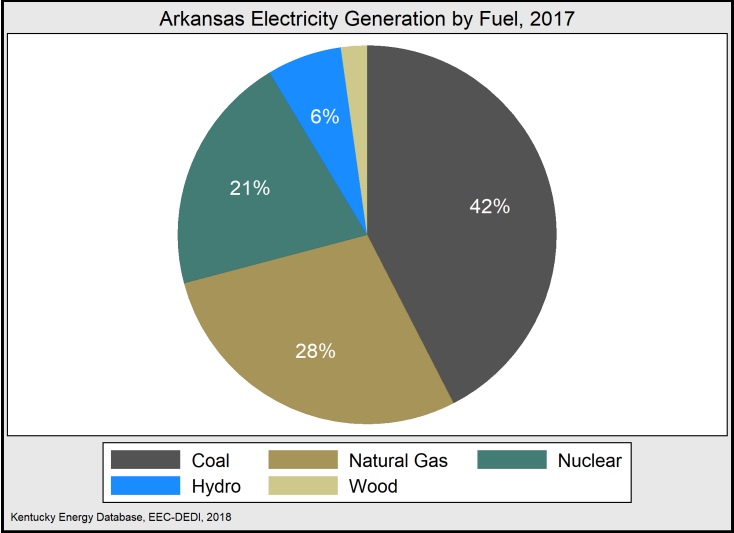
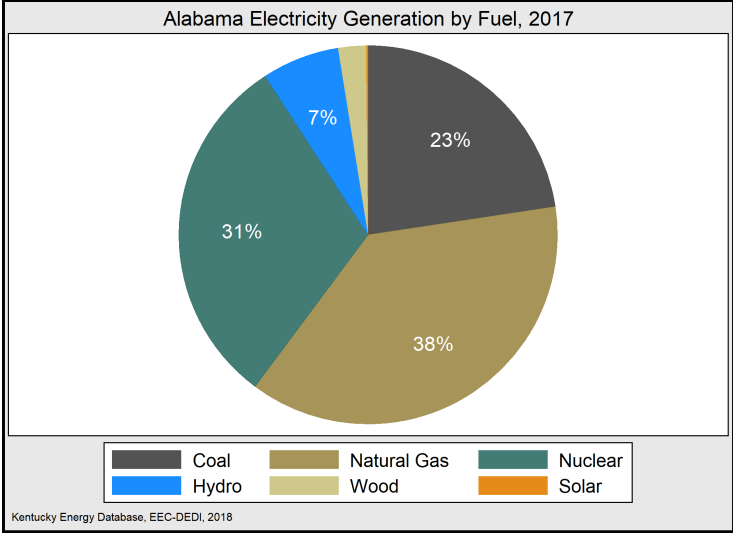
Source Type	Gigawatt Hours	2017 Change
Total	3,978,119	-1.57%
Natural Gas	1,272,864	-7.78%
Coal	1,207,901	-2.6%
Nuclear	804,950	-0.05%
Hydroelectric	300,045	+12.87%
Wind	254,254	+12.07%
Solar	52,957	+44.1%



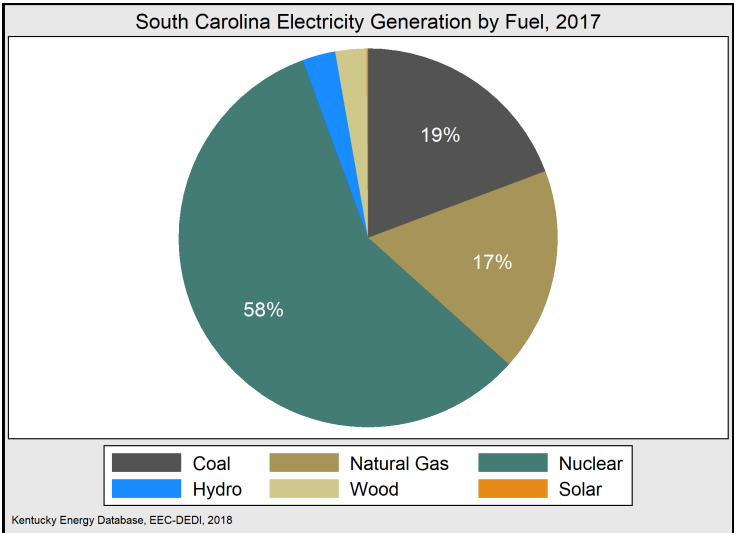
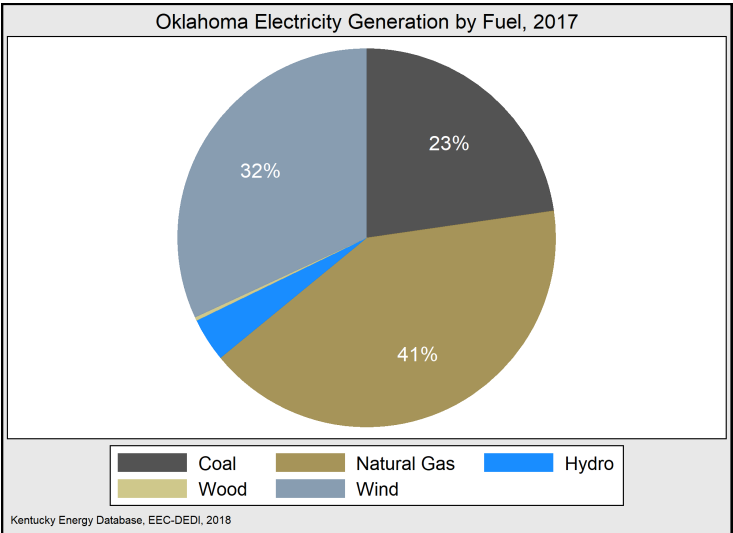
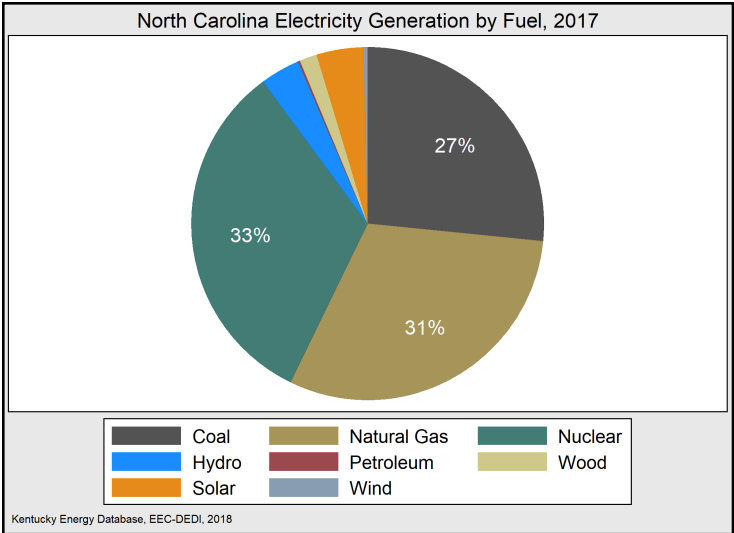
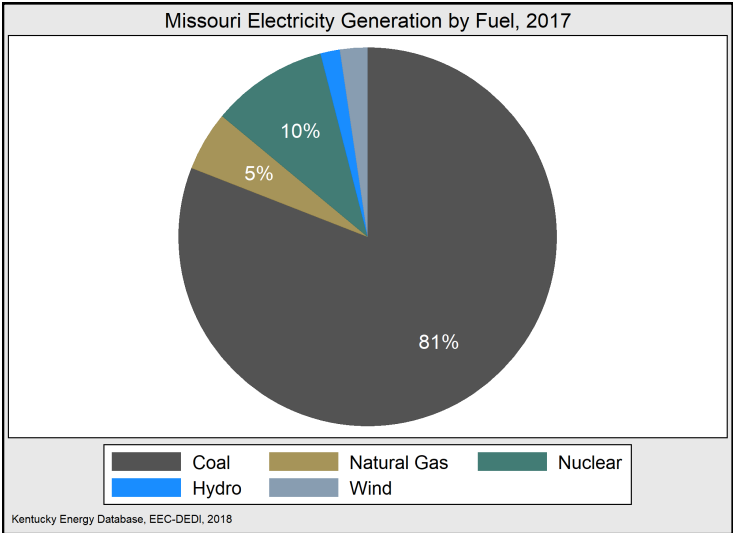
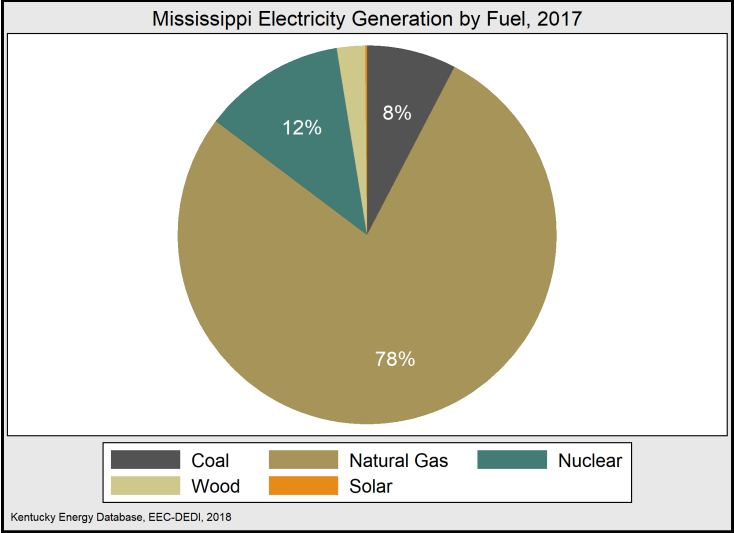
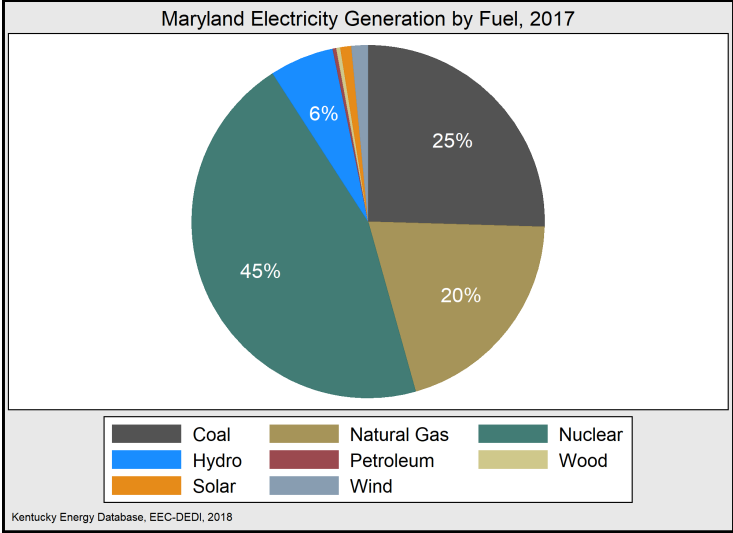
Overall electricity generation has declined in the SSEB region—this trend is occurring nationally, as well. Declining electricity generation reflects a number of factors, including increased energy efficiency, increased adoption of on-site energy resources such as roof-top solar, and shifting patterns in industrial usage. Wind power continues to be the fastest growing source of electricity generation in the region.

As with the SSEB region, total electricity generation declined slightly in 2017. Wind and hydroelectric power made significant gains in 2017, while nuclear power remained relatively steady. Within the past decade coal-fired power has gone from 50 percent of the nation's total electricity generation to 31 percent in 2017. While natural gas had been the source making gains on coal, increasingly renewable sources, especially wind, have been growing.

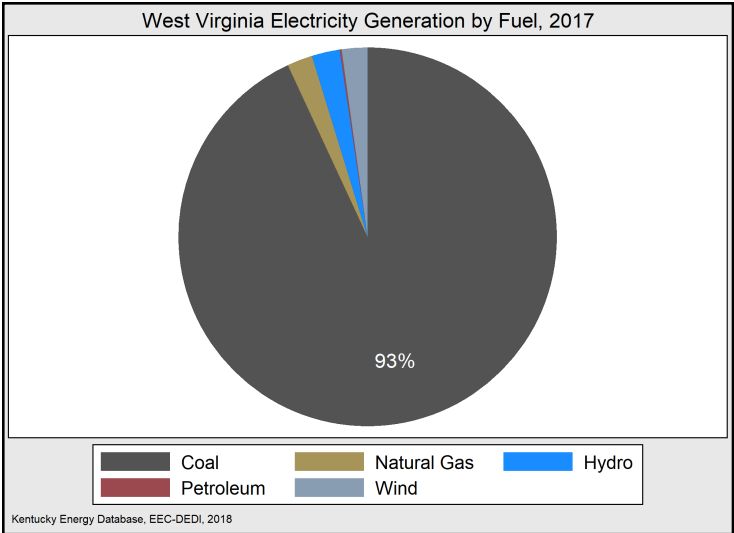
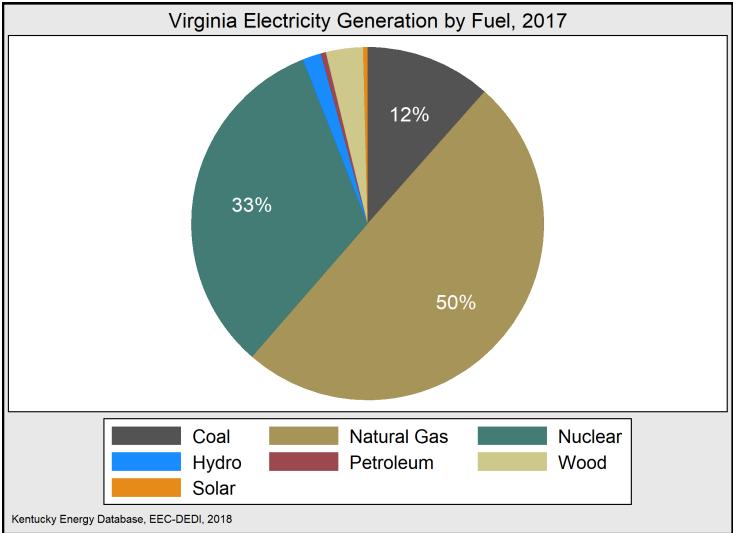
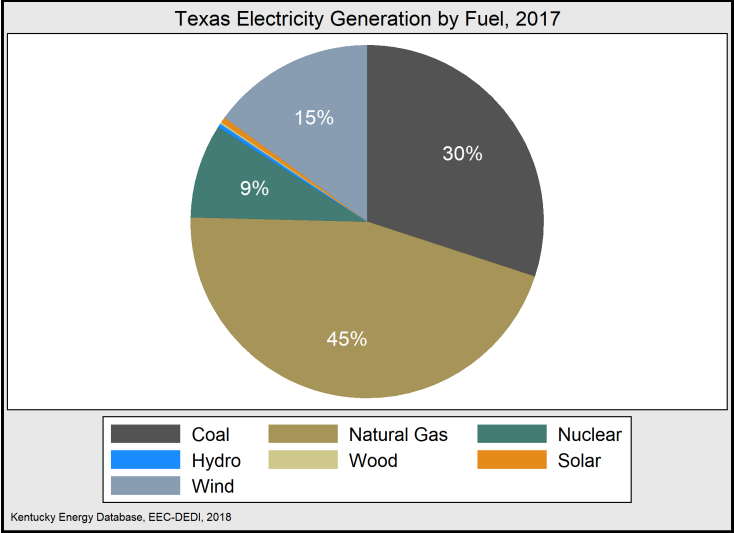
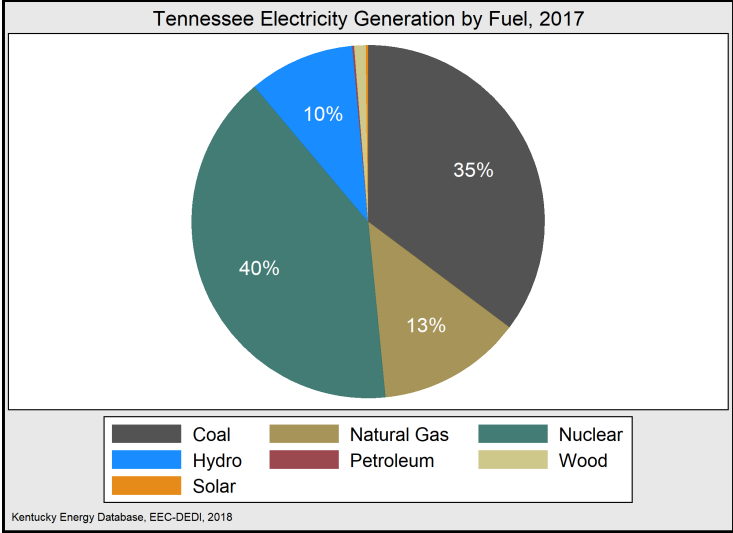
Electricity Generation



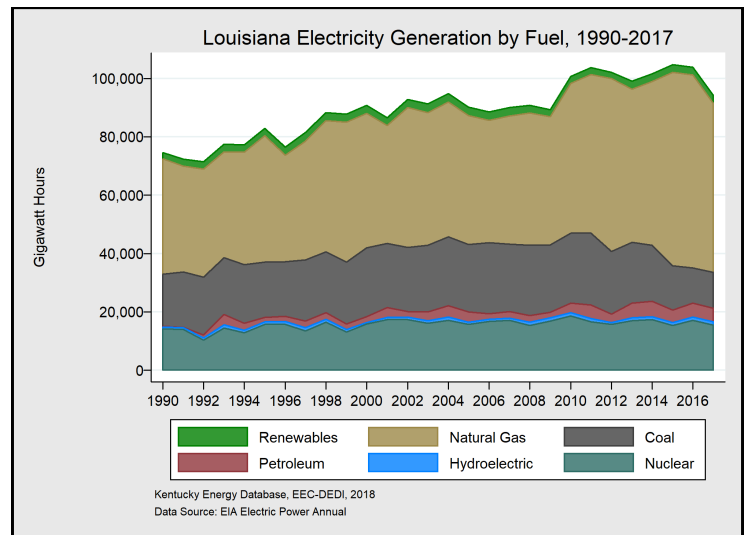
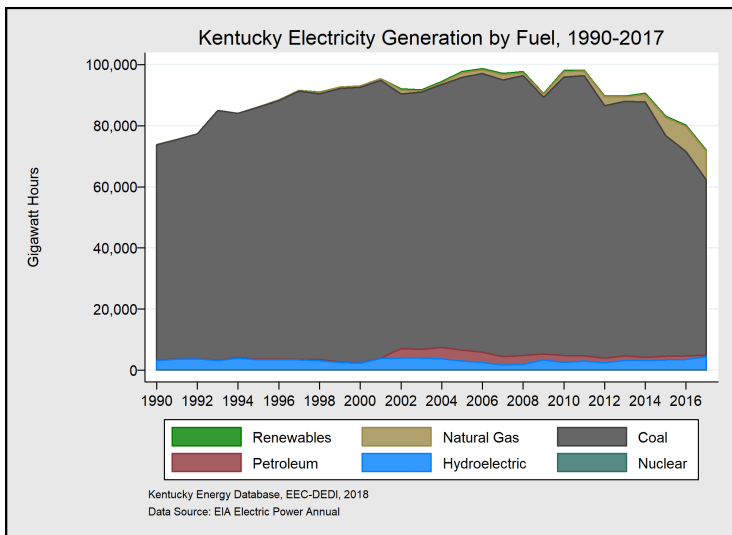
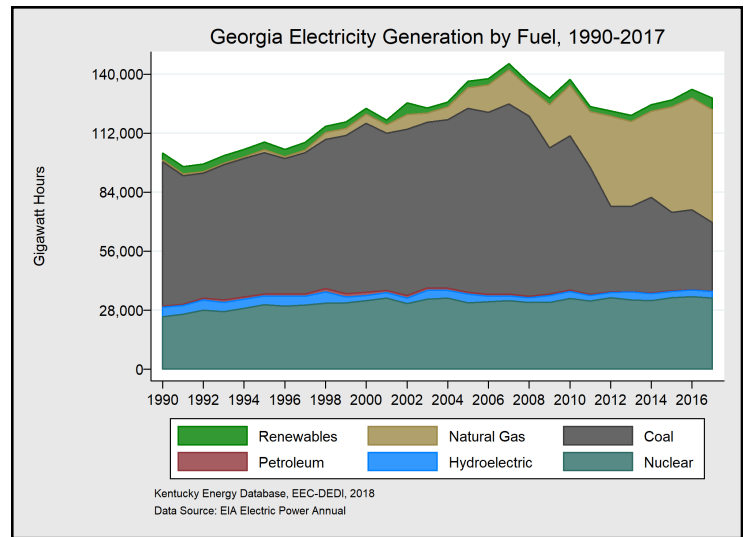
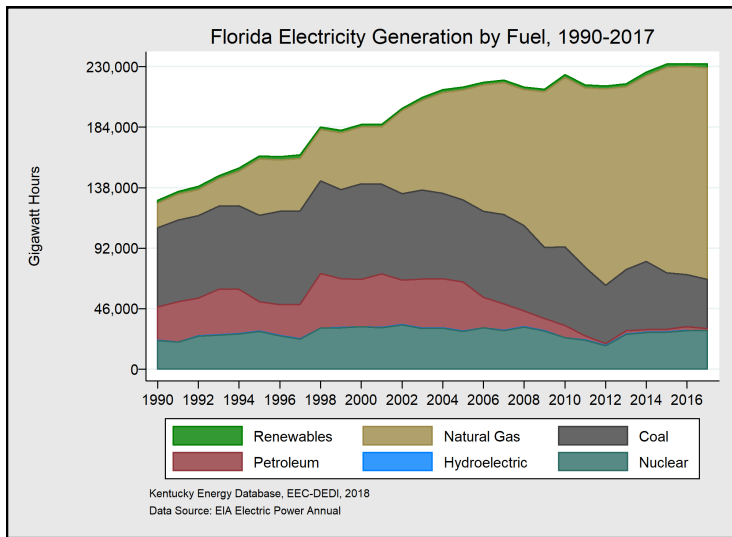
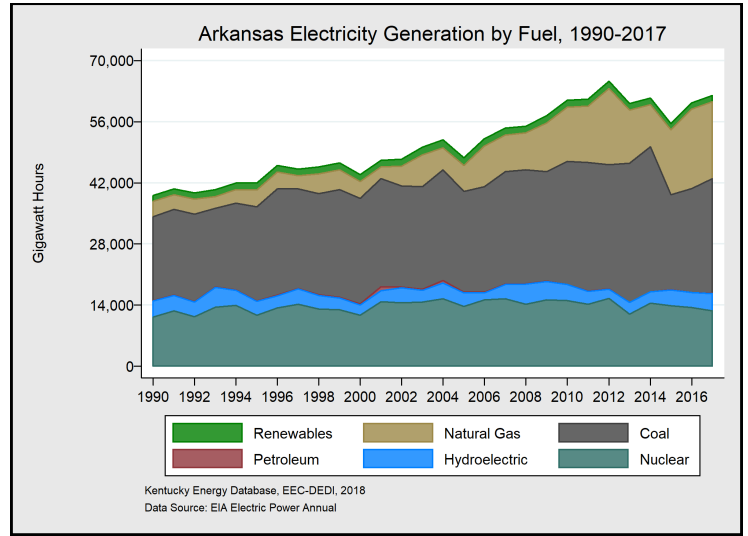
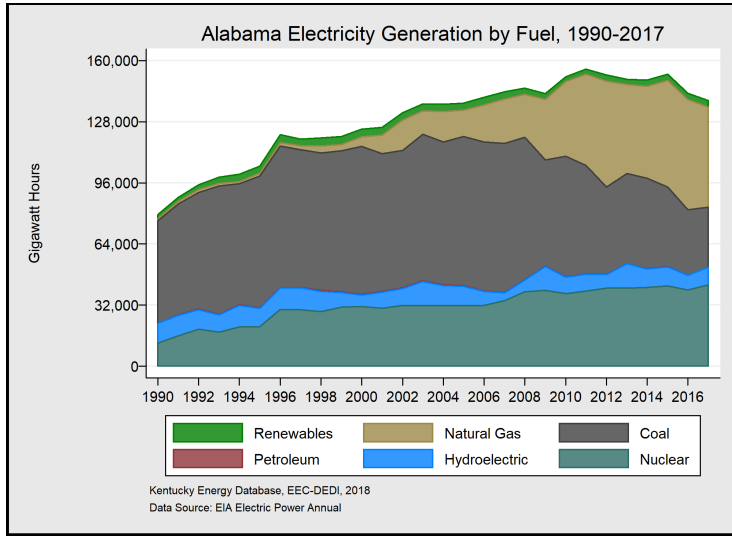
Electricity Generation



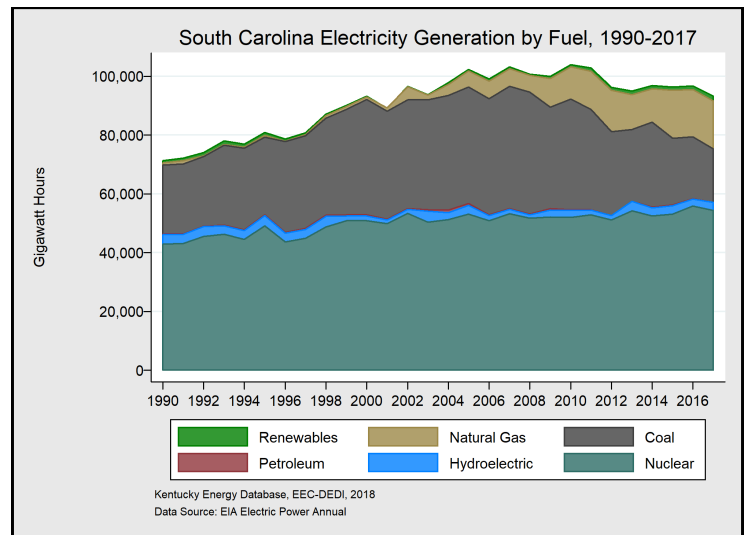
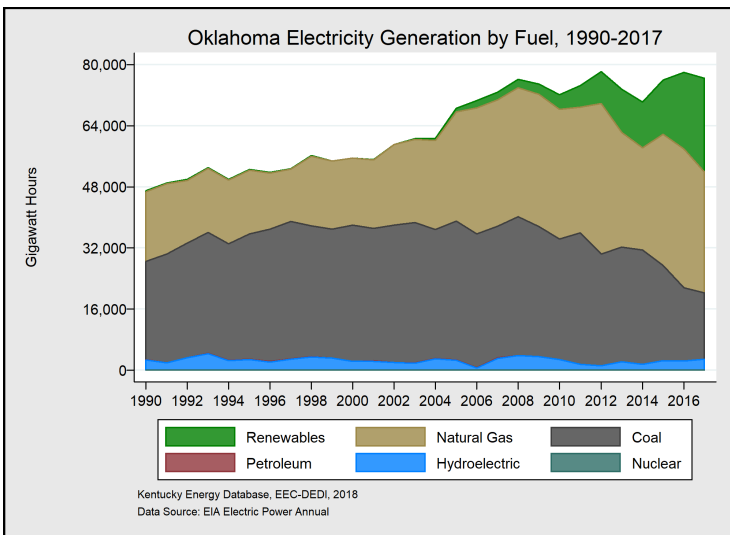
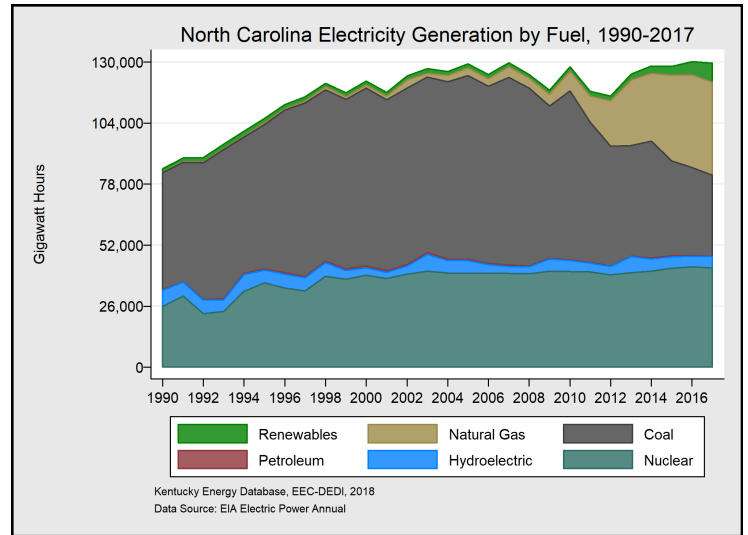
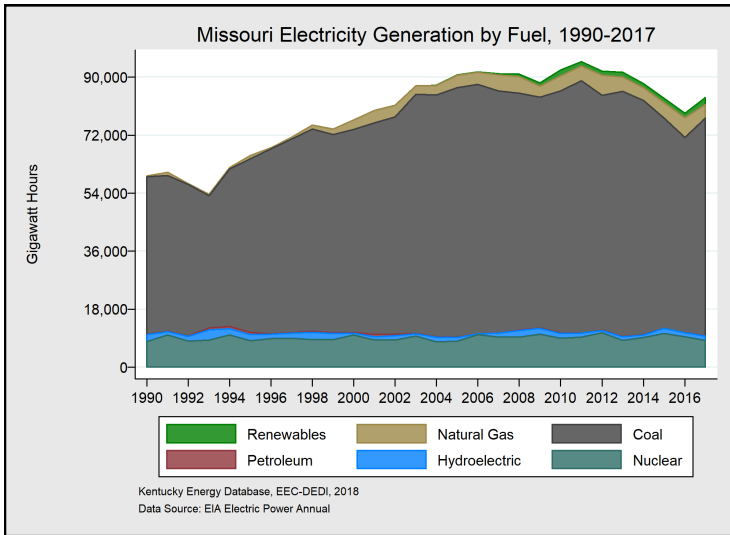
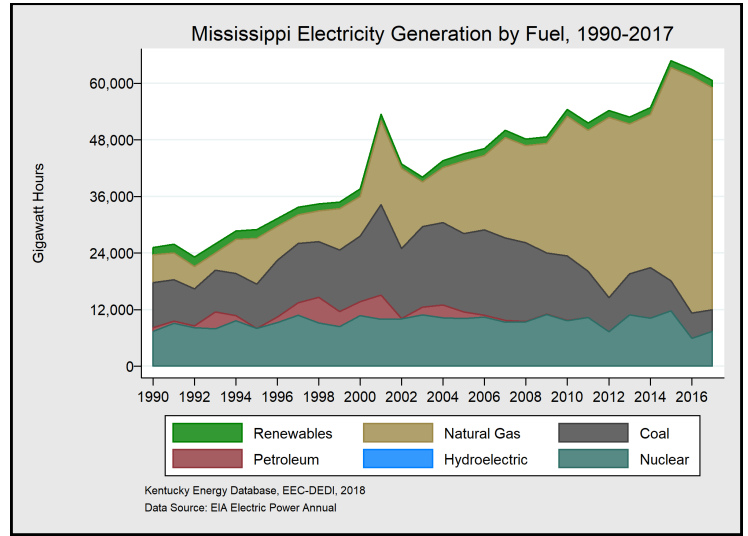
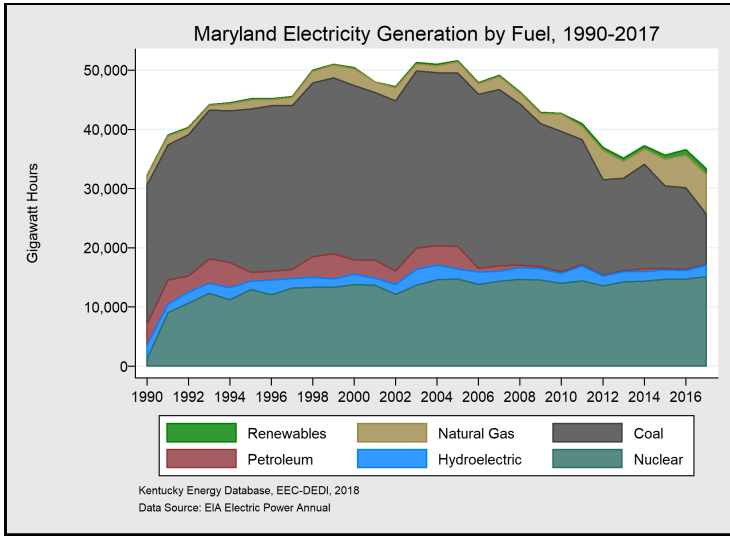
Electricity Generation



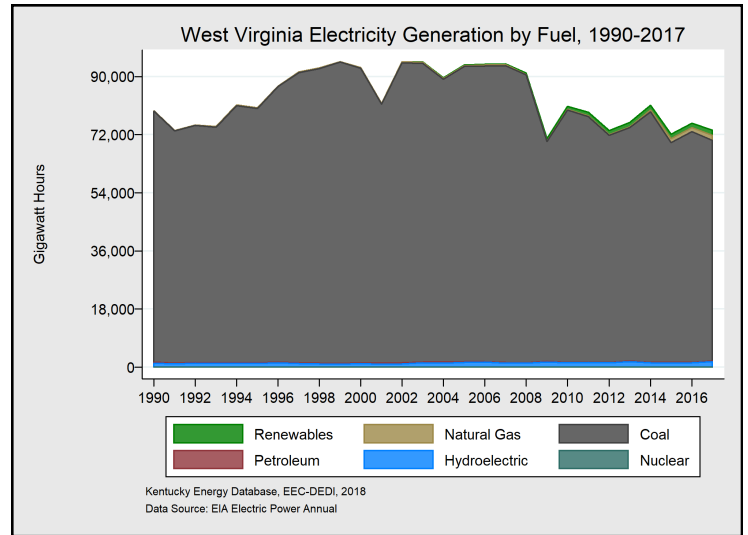
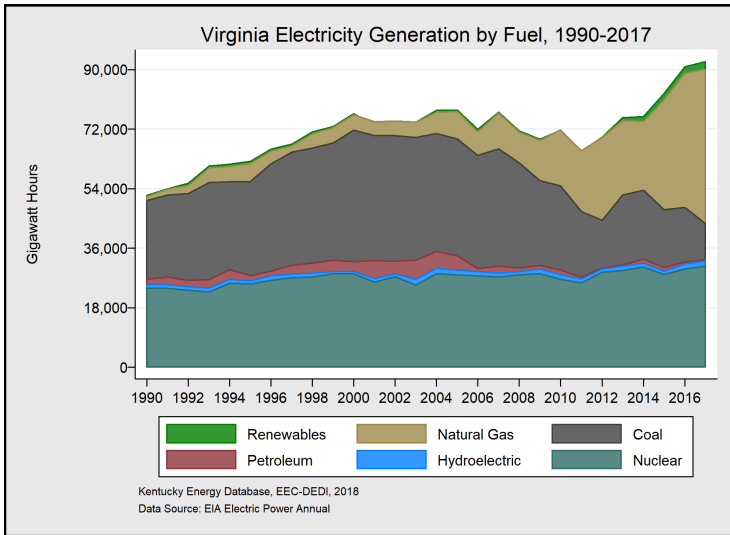
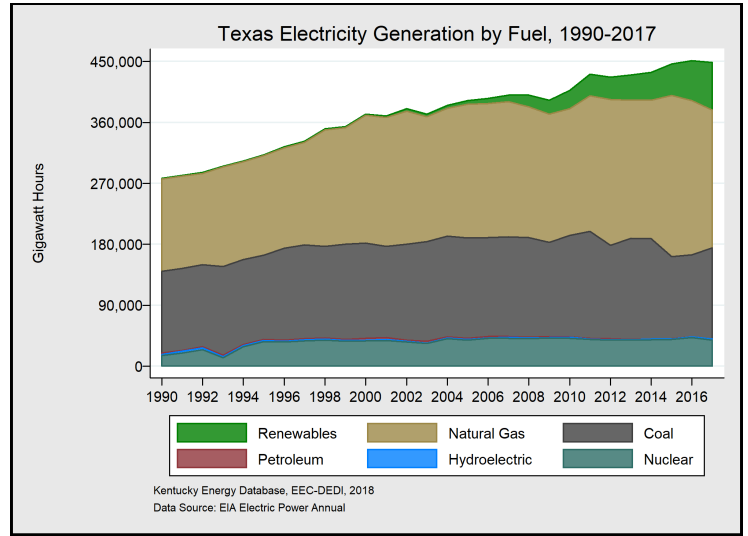
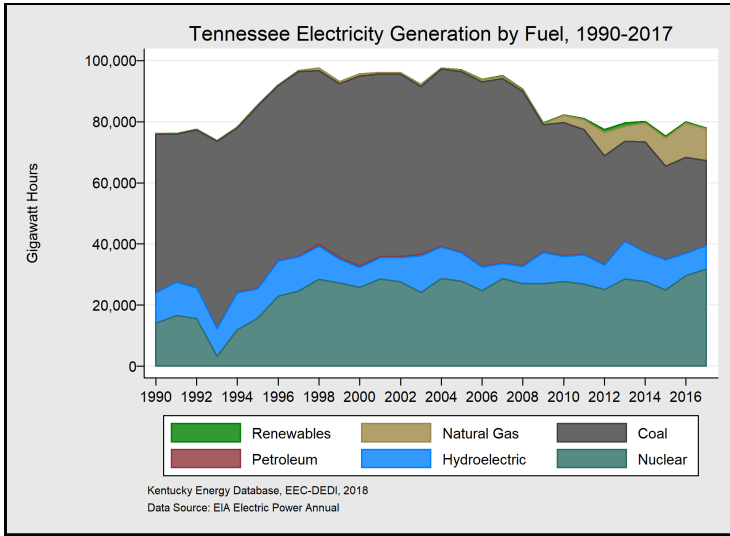
Historical Electricity Generation



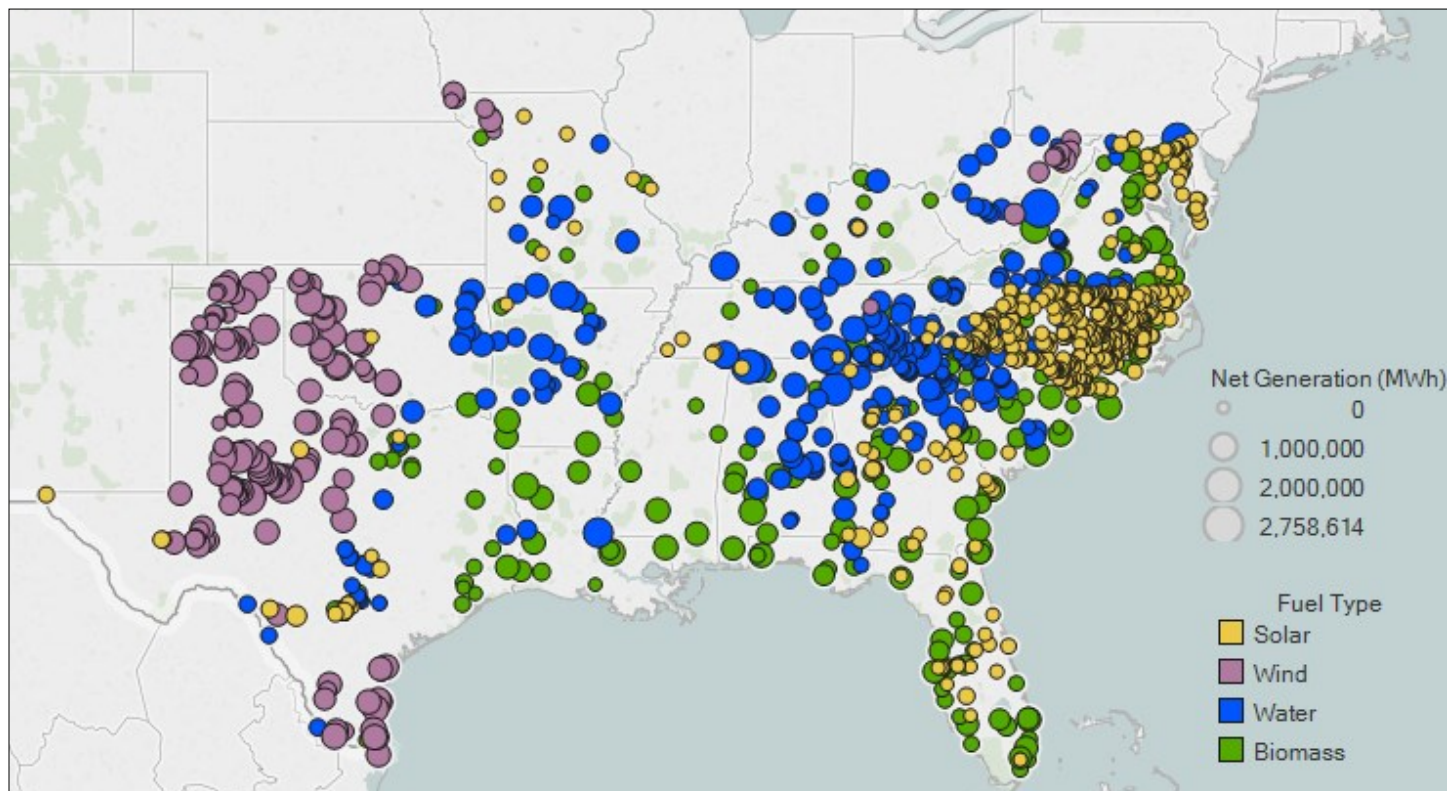
Historical Electricity Generation



Historical Electricity Generation

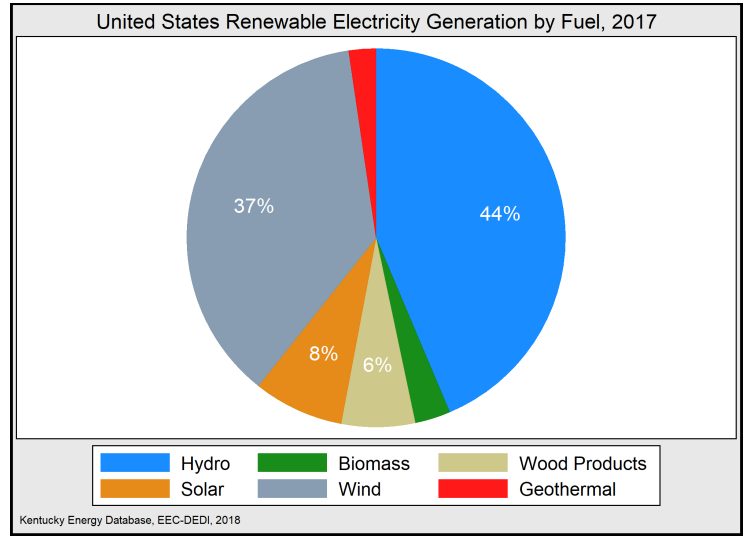
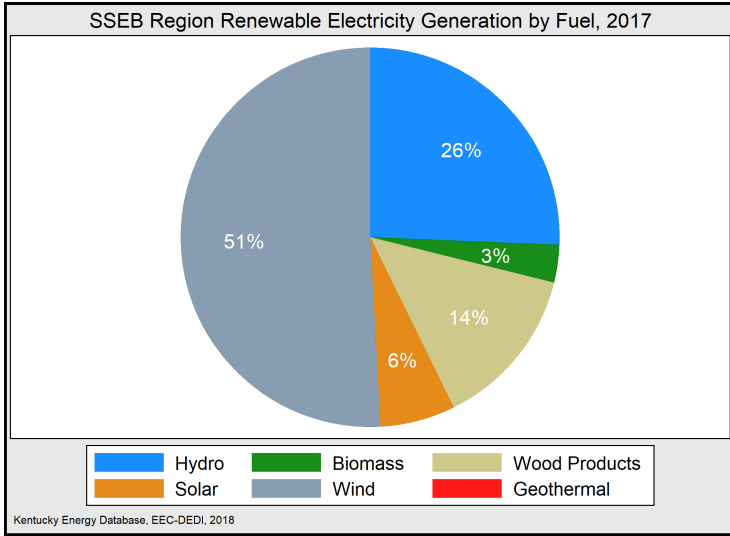


SSEB Renewable Electricity Generation



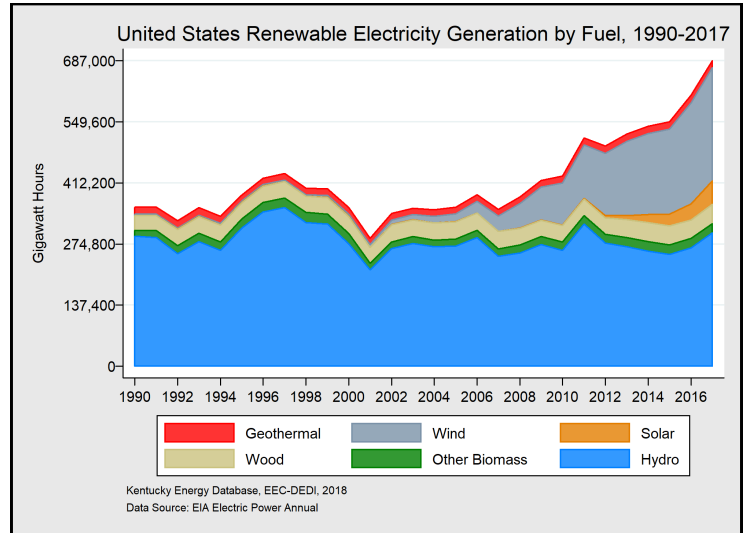
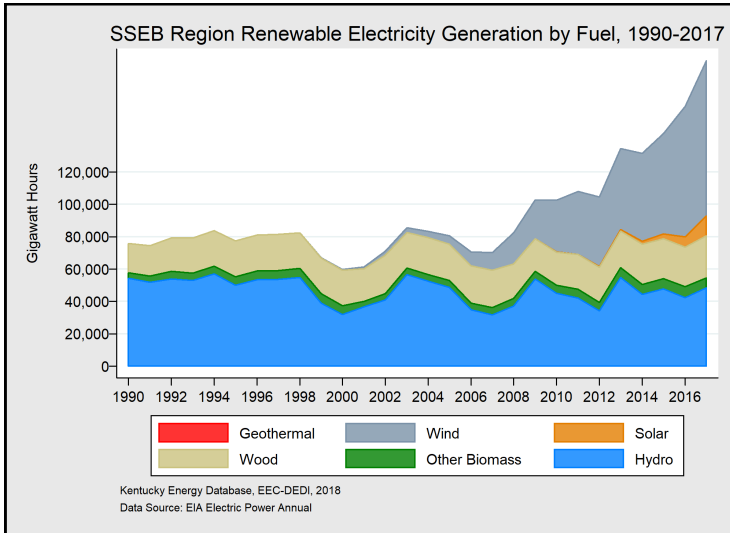
State	Solar (GWh)	Hydro (GWh)	Biomass (GWh)	Wind (GWh)	Wood (GWh)
Alabama	203	9,202	38	-	3,339
Arkansas	29	3,951	119	-	1,372
Florida	870	195	2,627	-	2,314
Georgia	2,137	3,140	188	-	4,730
Kentucky	20	4,465	96	-	347
Louisiana	-	1,231	86	-	2,710
Maryland	329	1,963	429	511	120
Mississippi	59	1,400	88	1,949	56
Missouri	88	-	13	-	1,472
North Carolina	5,578	4,716	557	471	2,076
Oklahoma	39	2,861	64	24,404	231
South Carolina	106	2,704	185	-	2,502
Tennessee	150	7,614	89	30	843
Texas	2,119	1,586	669	67,092	878
Virginia	375	1,617	848	-	3,187
West Virginia	-	1,769	-	1,607	-
TOTAL SSEB REGION	12,102	48,414	6,096	96,064	26,177

SSEB Renewable Electricity Generation



Fuel Type	Gigawatt-hours	2017 Change
Total	188,853	+17.6%
Hydroelectric	48,414	+14.2%
Wind	96,064	+19.2%
Wood Products	26,177	-8.9%
Biomass	6,096	+6.9%
Solar	12,102	+90.3%

Fuel Type	Gigawatt-hours	2017 Change
Total	671,313	+13.4%
Hydroelectric	300,045	+12.87%
Wind	254,254	+12.07%
Wood Products	43,284	-5.87%
Solar	52,958	+44.1%
Biomass	20,773	+3.5%

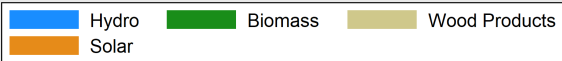
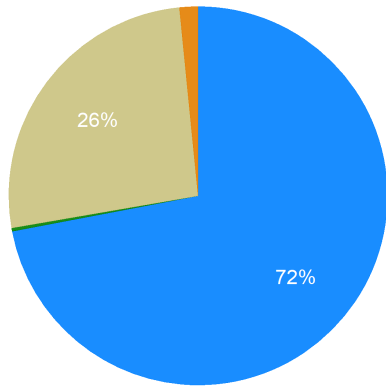


Renewable electricity generation increased by slightly more than 17 percent in the SSEB region in 2017. Wind power has more than doubled since 2013, and solar power had the largest year over year gain in 2017. Hydroelectric generation can vary substantially from year to year with fluctuations in rainfall and temperature. States within the region vary significantly in their renewable generation profiles, largely reflecting a variety of factors including energy policy, resource potential, and economics.

Renewable electricity generation in the United States continues to grow as costs decline and also as a result of state and federal policies supporting renewable energy development. As with the SSEB region, solar power made the largest increase in 2017, and wood products generation declined as a percentage of overall renewable generation.

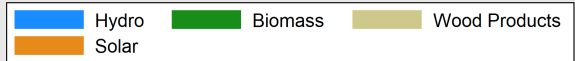
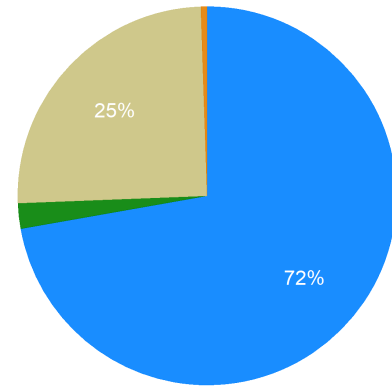
Renewable Electricity Generation

Alabama Renewable Electricity Generation by Fuel, 2017



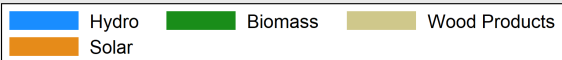
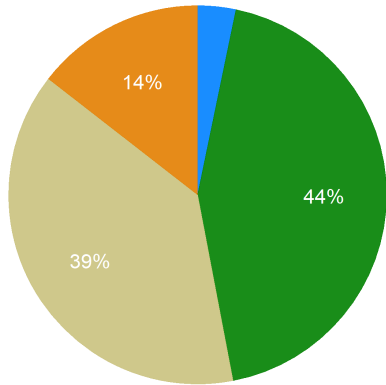
Kentucky Energy Database, EEC-DEDI, 2018

Arkansas Renewable Electricity Generation by Fuel, 2017



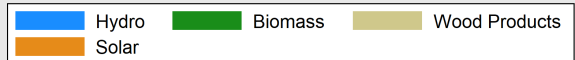
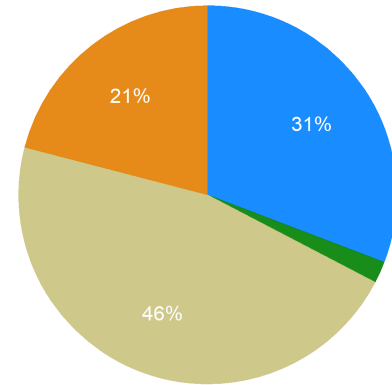
Kentucky Energy Database, EEC-DEDI, 2018

Florida Renewable Electricity Generation by Fuel, 2017



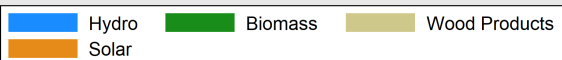
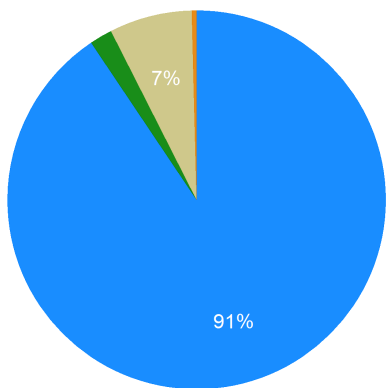
Kentucky Energy Database, EEC-DEDI, 2018

Georgia Renewable Electricity Generation by Fuel, 2017



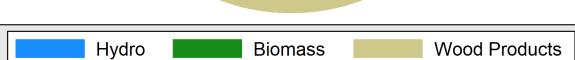
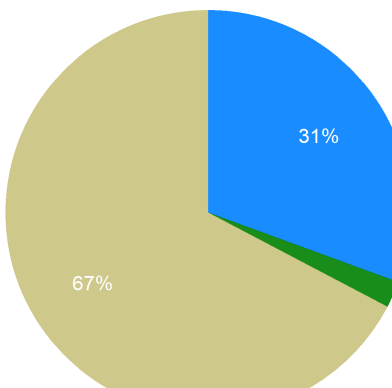
Kentucky Energy Database, EEC-DEDI, 2018

Kentucky Renewable Electricity Generation by Fuel, 2017



Kentucky Energy Database, EEC-DEDI, 2018

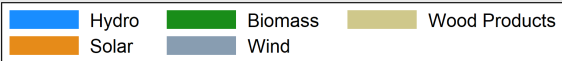
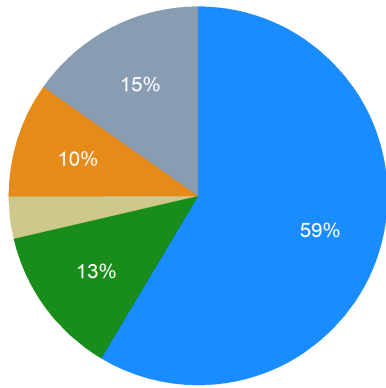
Louisiana Renewable Electricity Generation by Fuel, 2017



Kentucky Energy Database, EEC-DEDI, 2018

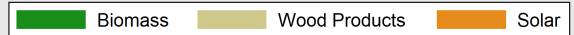
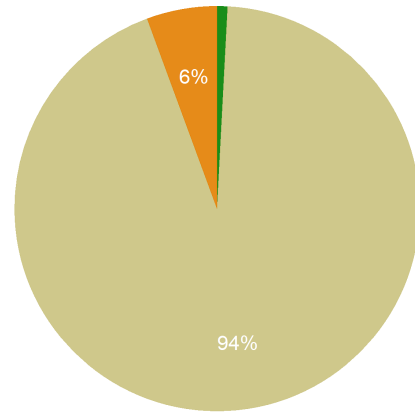
Renewable Electricity Generation

Maryland Renewable Electricity Generation by Fuel, 2017



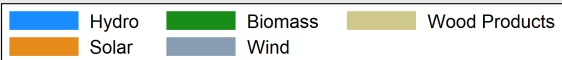
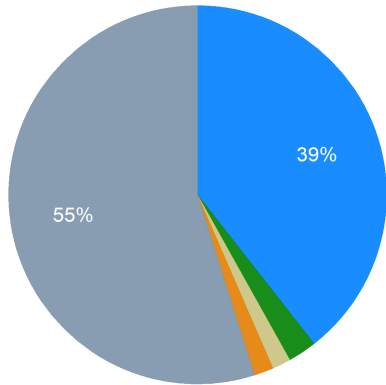
Kentucky Energy Database, EEC-DEDI, 2018

Mississippi Renewable Electricity Generation by Fuel, 2017



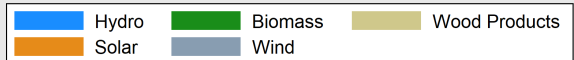
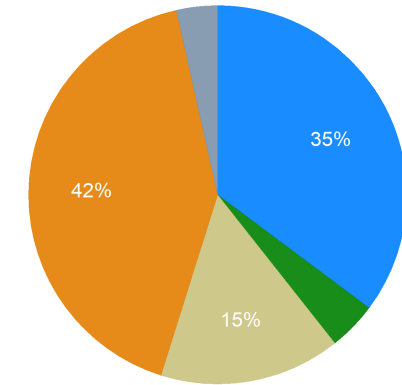
Kentucky Energy Database, EEC-DEDI, 2018

Missouri Renewable Electricity Generation by Fuel, 2017



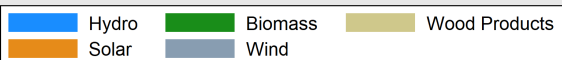
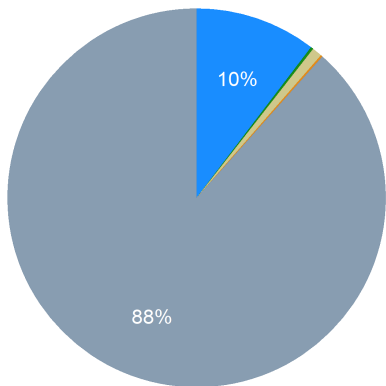
Kentucky Energy Database, EEC-DEDI, 2018

North Carolina Renewable Electricity Generation by Fuel, 2017



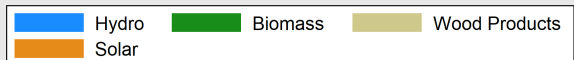
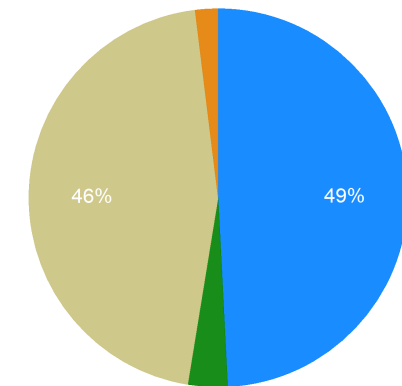
Kentucky Energy Database, EEC-DEDI, 2018

Oklahoma Renewable Electricity Generation by Fuel, 2017



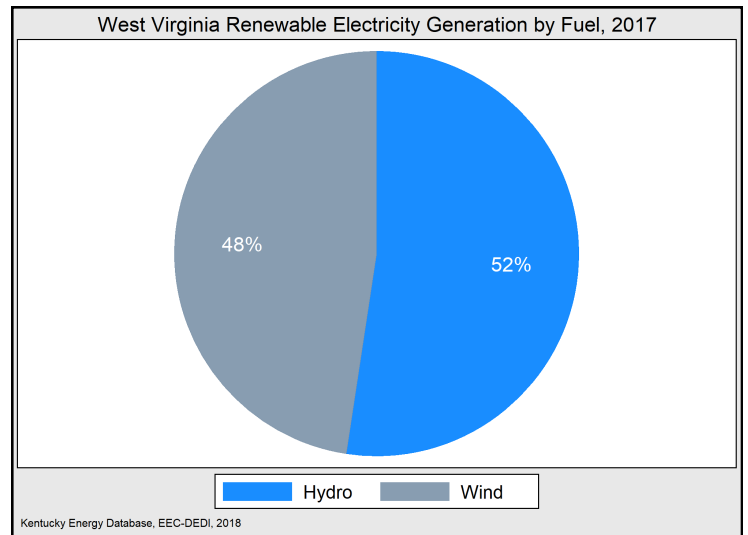
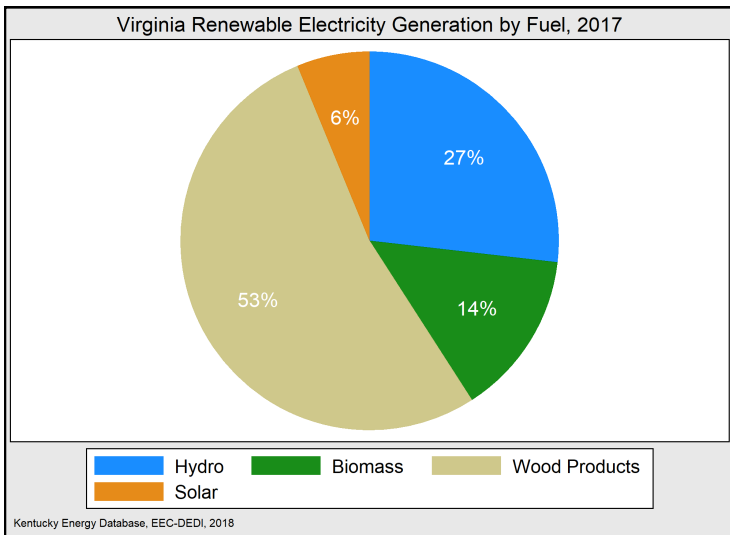
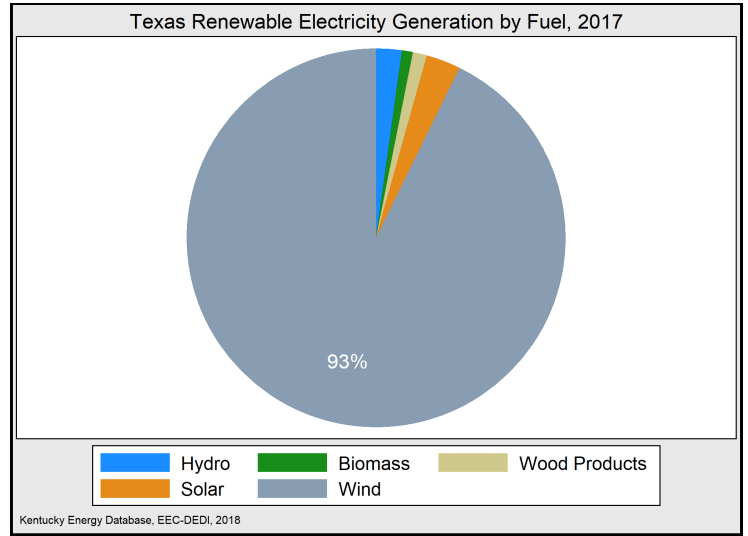
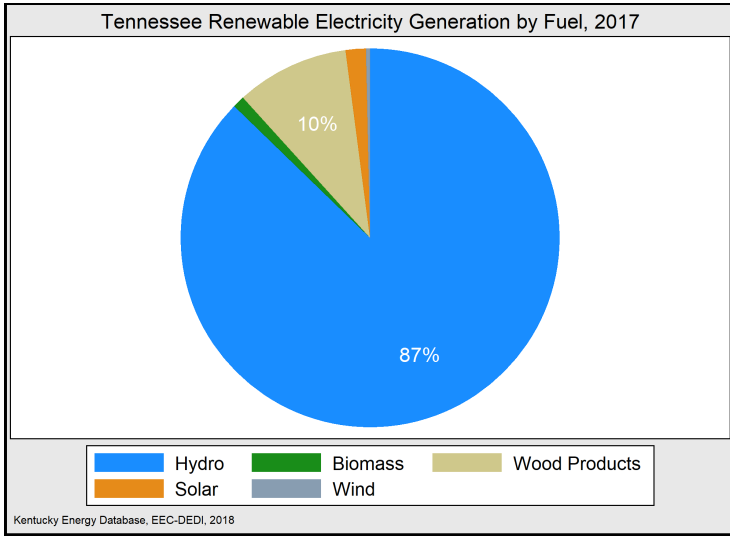
Kentucky Energy Database, EEC-DEDI, 2018

South Carolina Renewable Electricity Generation by Fuel, 2017

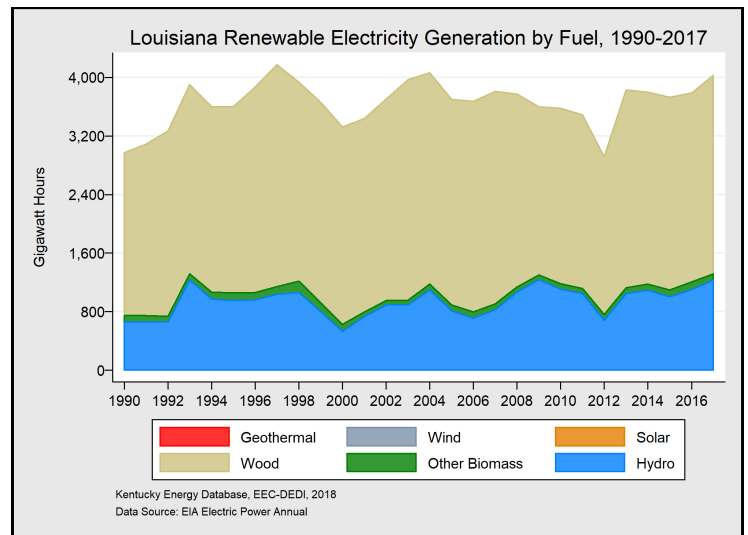
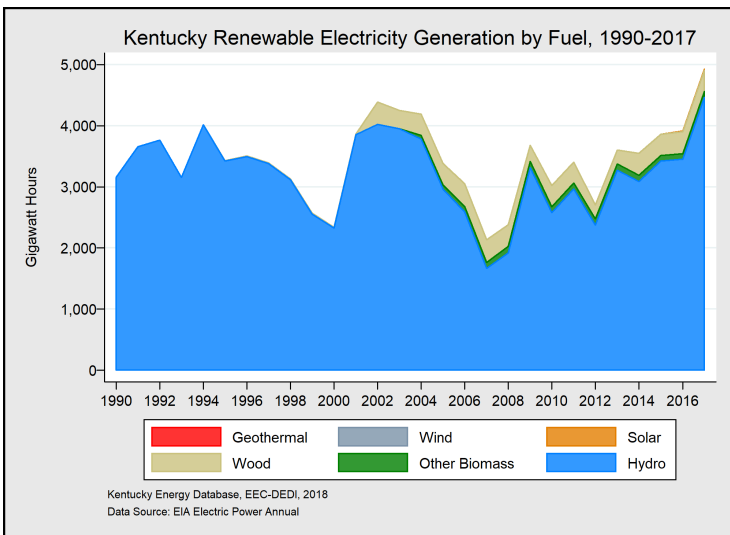
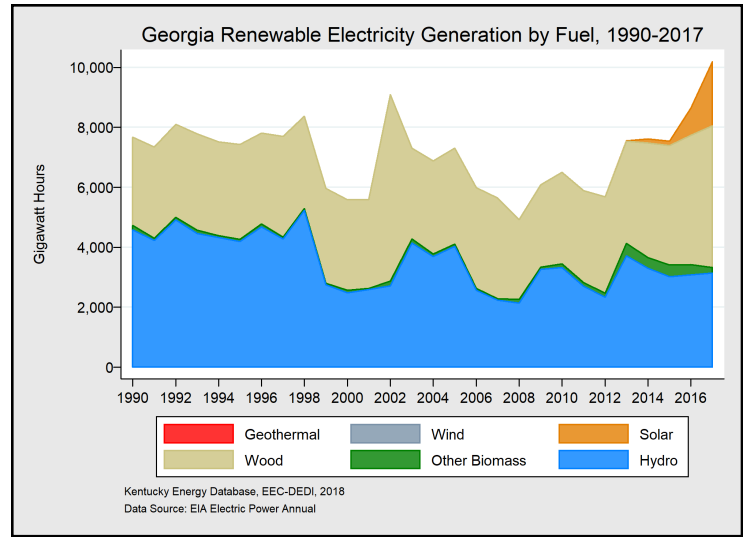
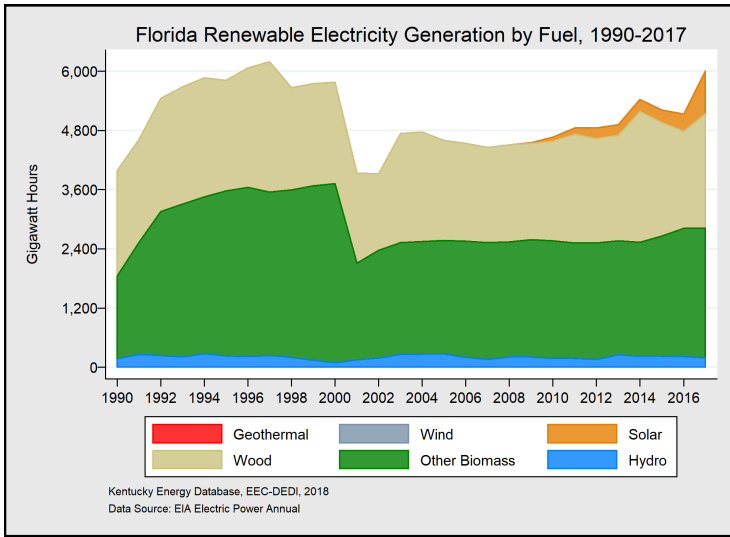
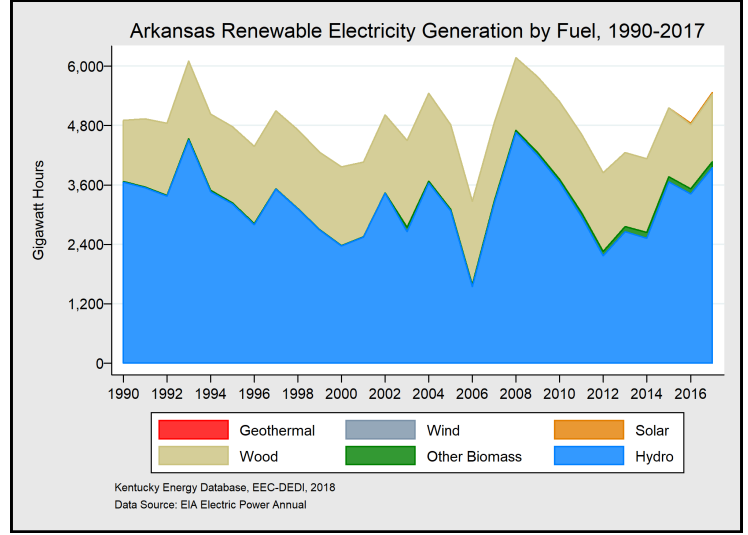
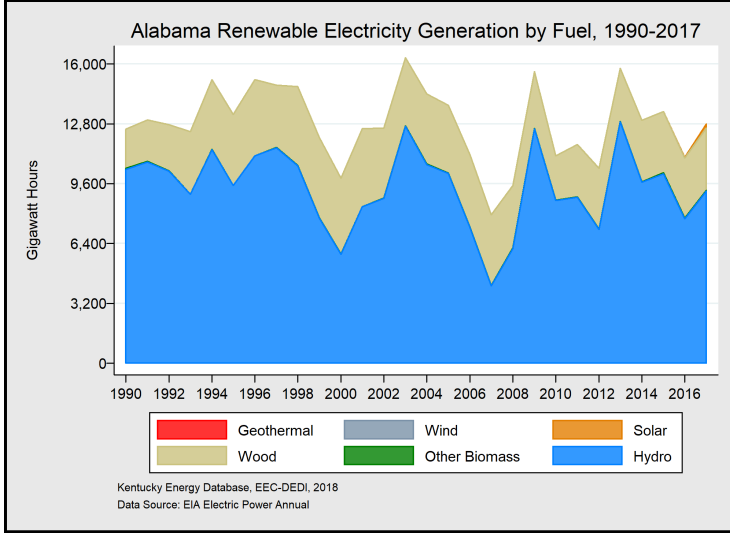


Kentucky Energy Database, EEC-DEDI, 2018

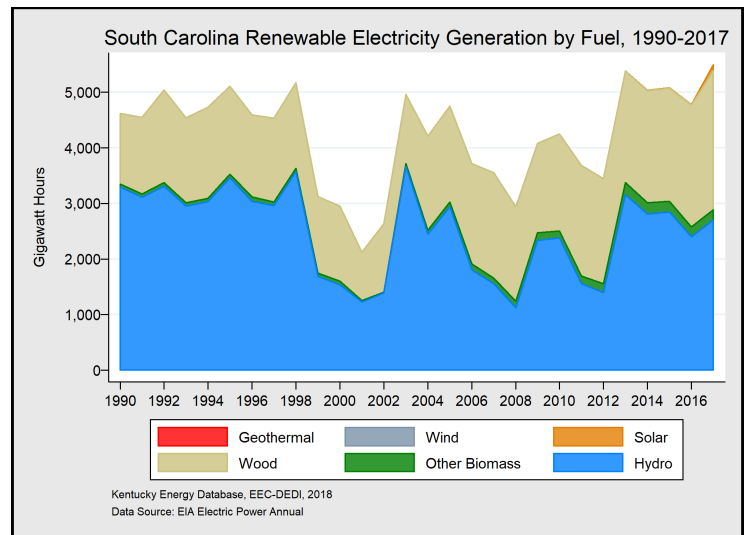
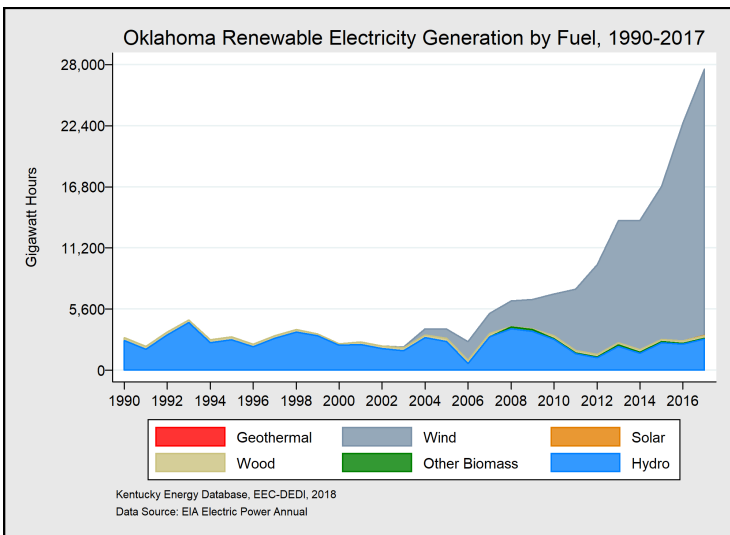
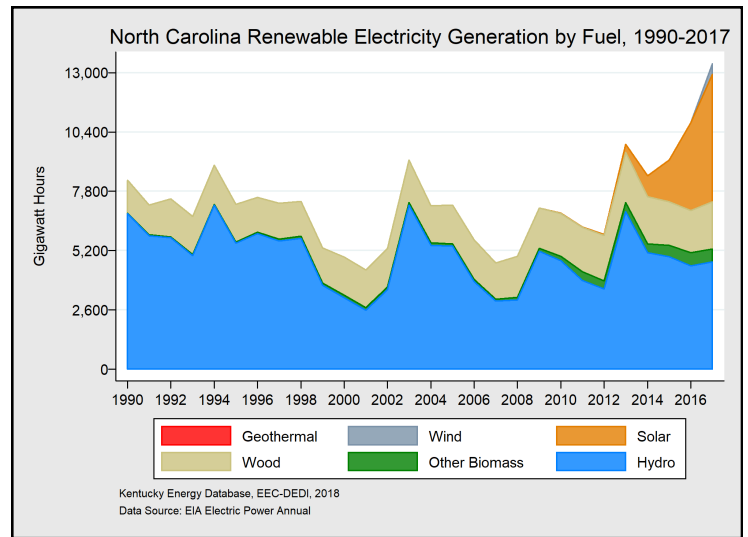
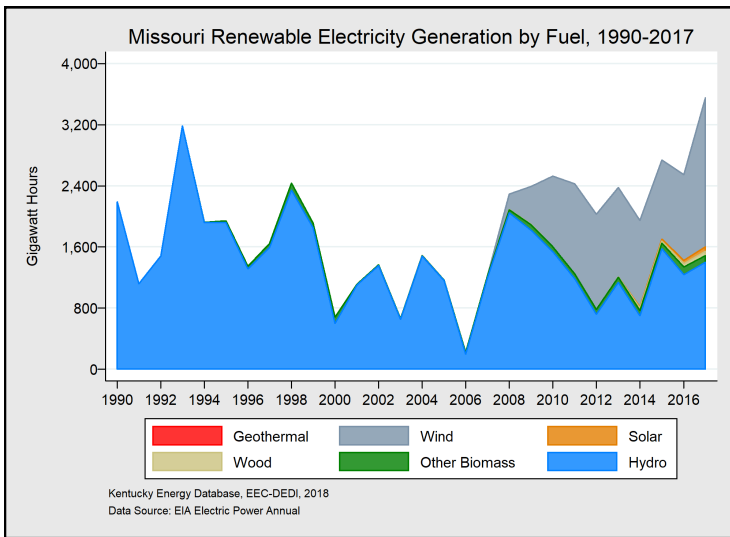
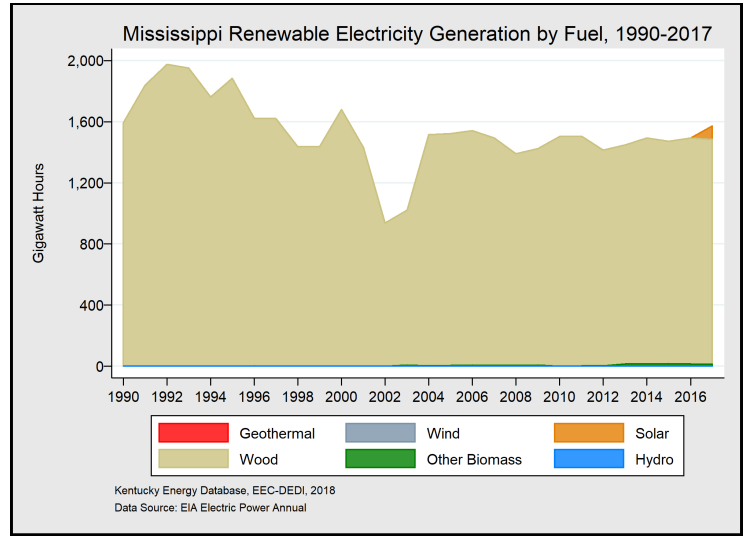
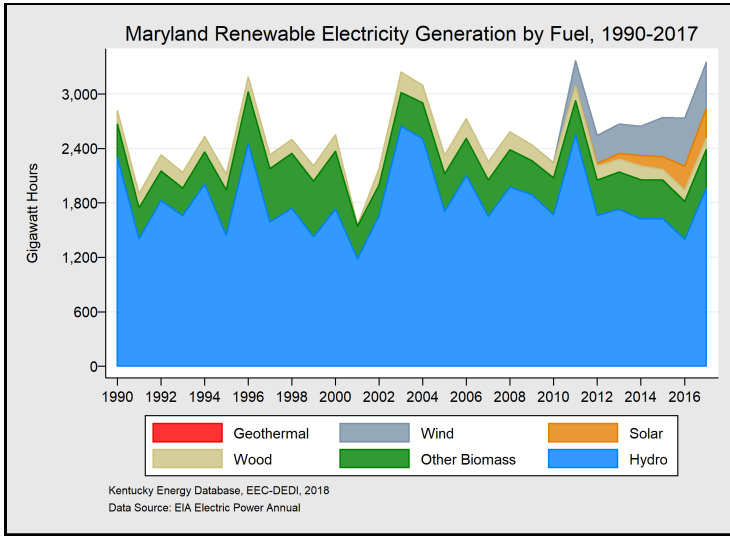
Renewable Electricity Generation



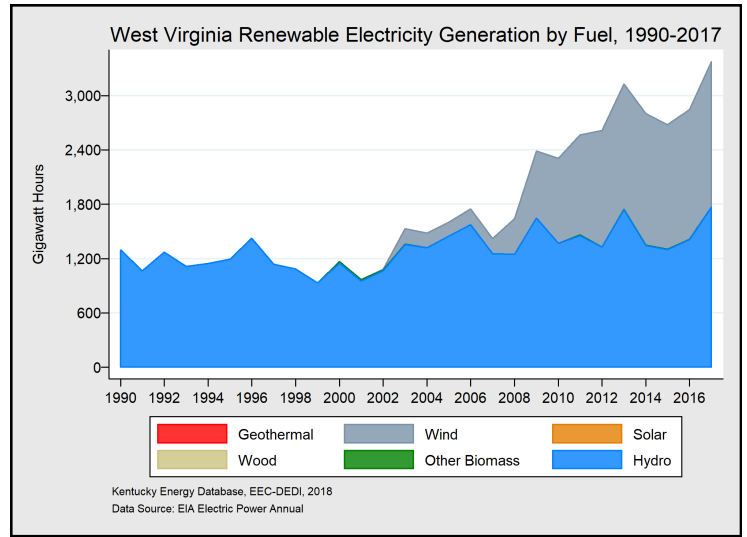
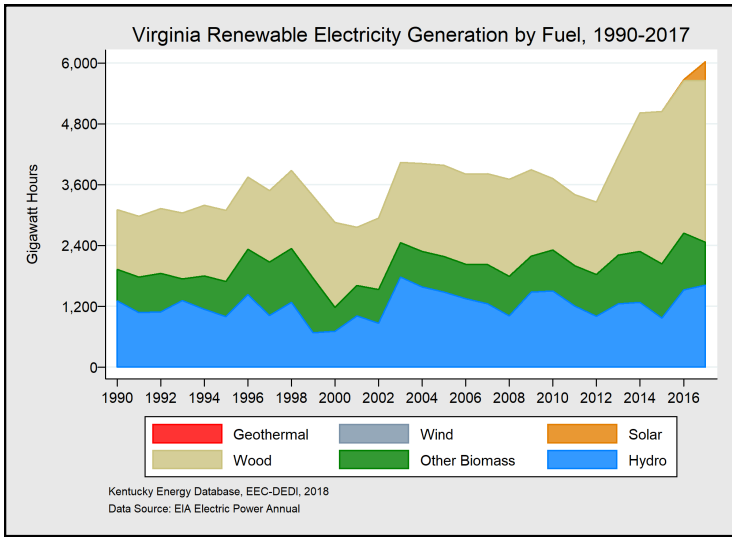
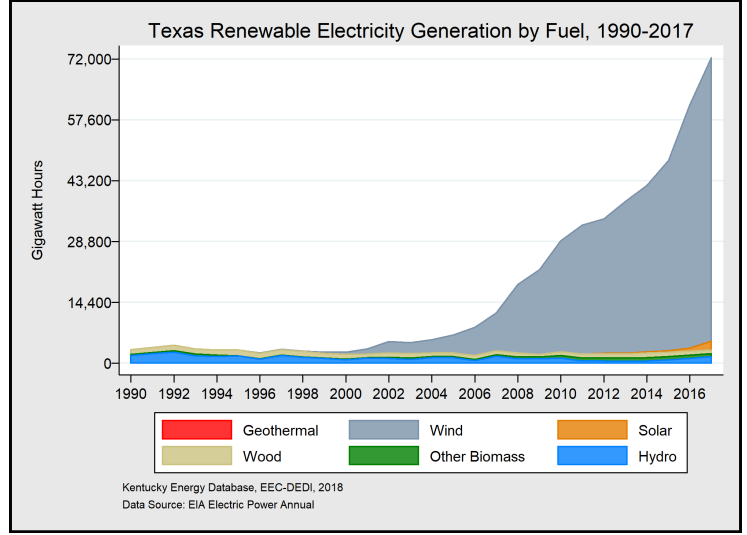
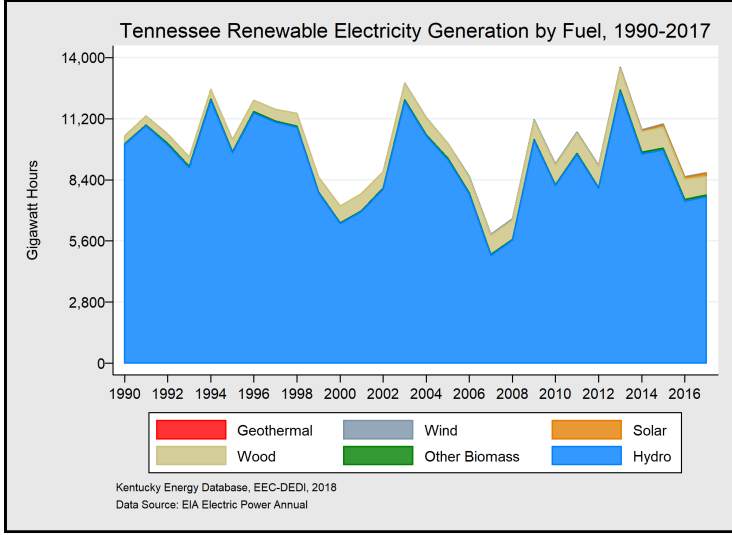
Historical Renewable Electricity Generation



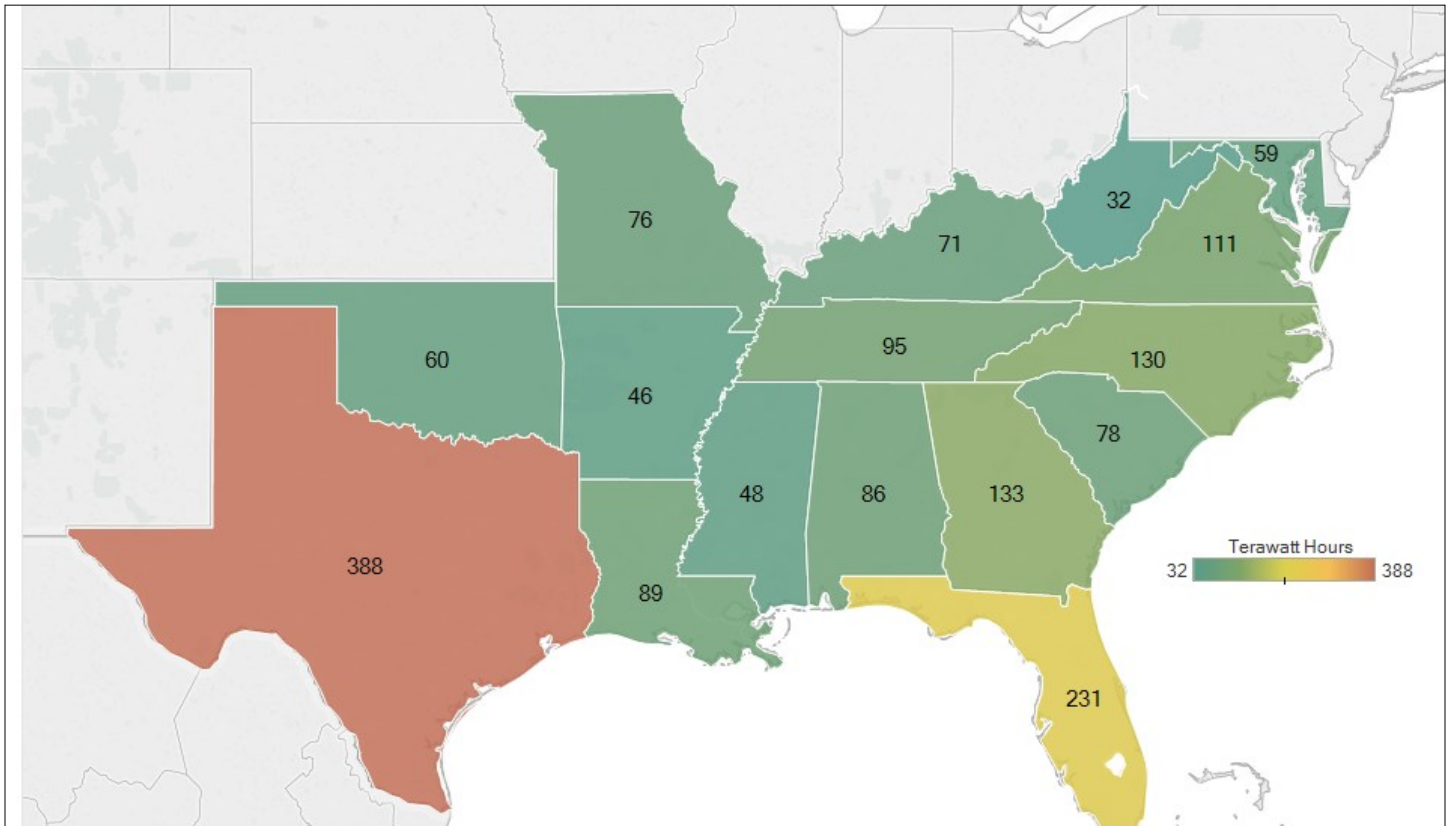
Historical Renewable Electricity Generation



Historical Renewable Electricity Generation

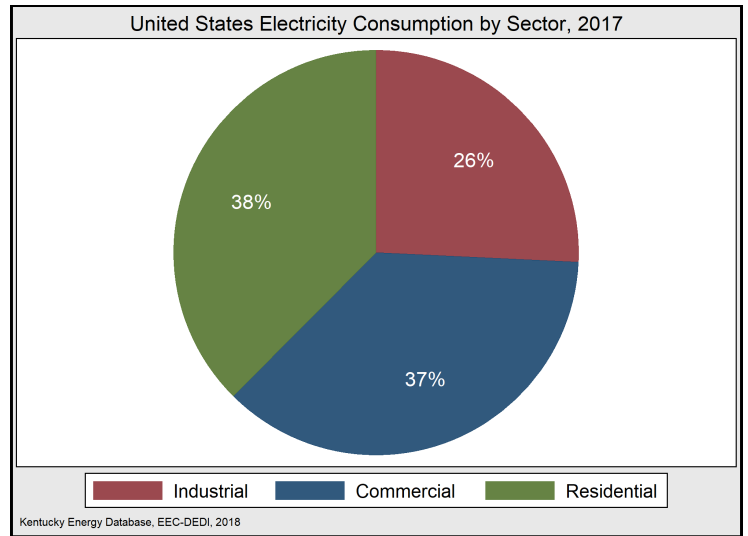
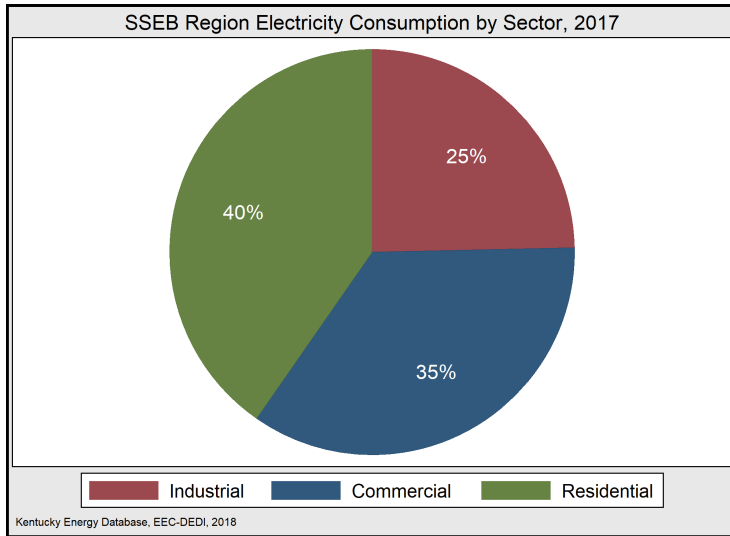


SSEB Region Electricity Consumption (TWh)



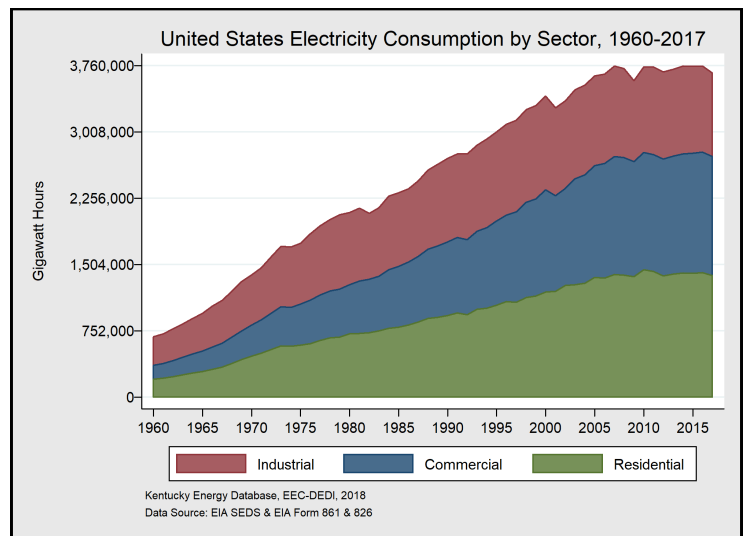
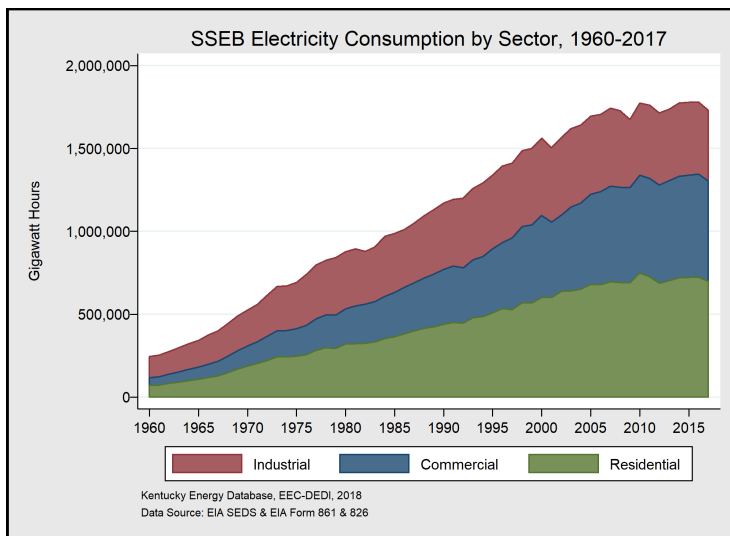
State	Residential (GWh)	Commercial (GWh)	Industrial (GWh)	Total (GWh)
Alabama	30,490	22,484	33,229	86,203
Arkansas	17,118	11,911	16,843	45,872
Florida	119,751	94,429	16,361	230,541
Georgia	55,039	46,443	31,384	132,866
Kentucky	25,049	18,806	27,614	71,469
Louisiana	29,664	24,571	34,584	88,819
Maryland	26,058	28,844	3,743	58,645
Mississippi	17,802	13,813	16,523	48,138
Missouri	33,479	30,283	11,753	75,515
North Carolina	55,605	47,845	26,770	130,220
Oklahoma	22,146	20,196	17,316	59,658
South Carolina	29,247	21,563	26,813	77,623
Tennessee	39,702	33,462	21,559	94,723
Texas	142,289	134,213	111,760	388,262
Virginia	43,797	50,216	16,788	110,801
West Virginia	10,570	7,547	13,585	31,702
TOTAL SSEB REGION	697,806	606,626	426,625	1,731,054

SSEB Region Electricity Consumption



Sector	Gigawatt-hours	2017 Change
Total	1,731,053	-2.8%
Residential	697,805	-3.7%
Commercial	606,624	-2.5%
Industrial	426,623	-1.9%

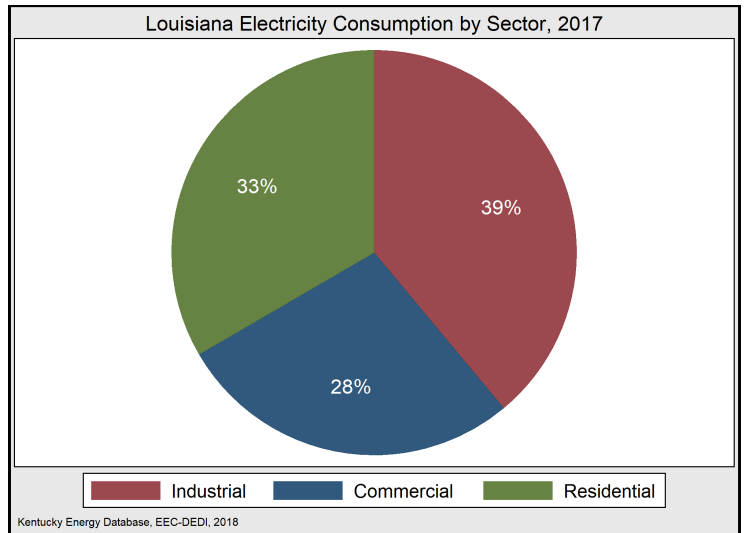
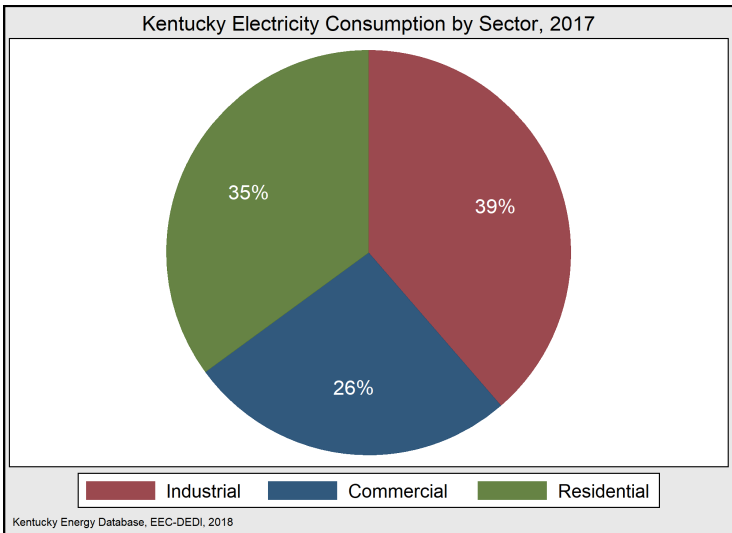
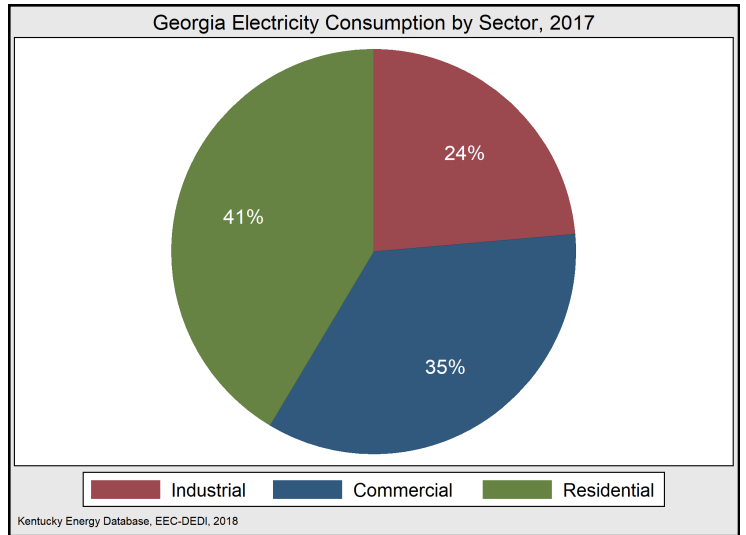
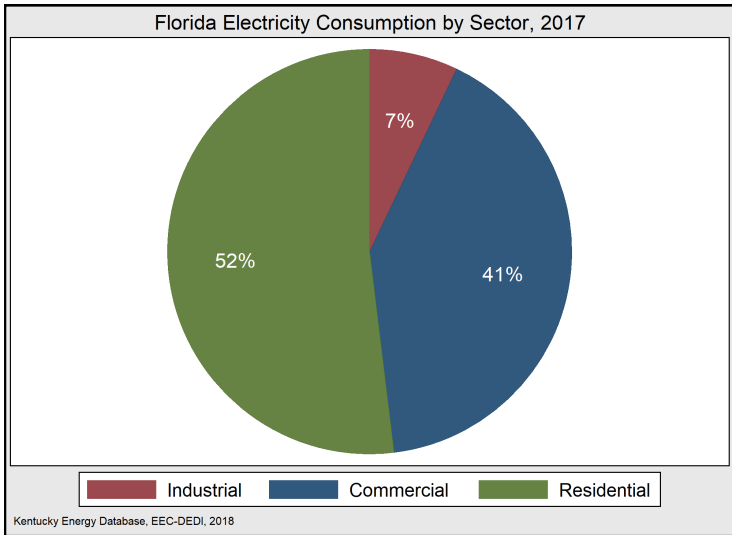
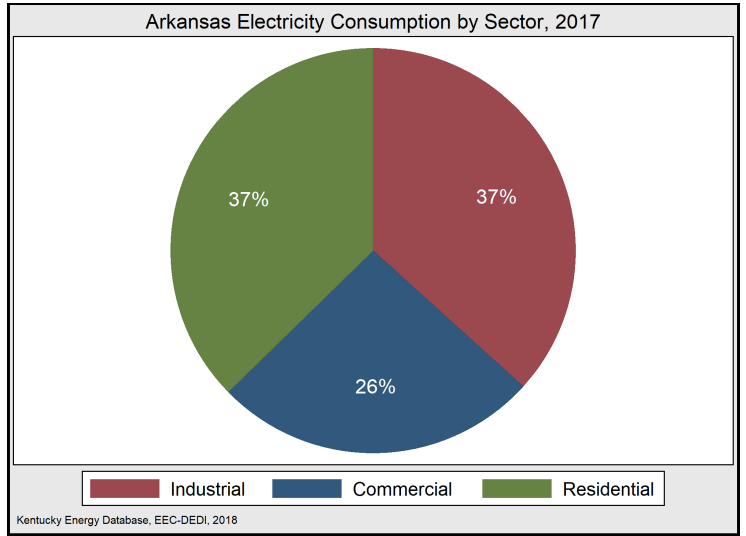
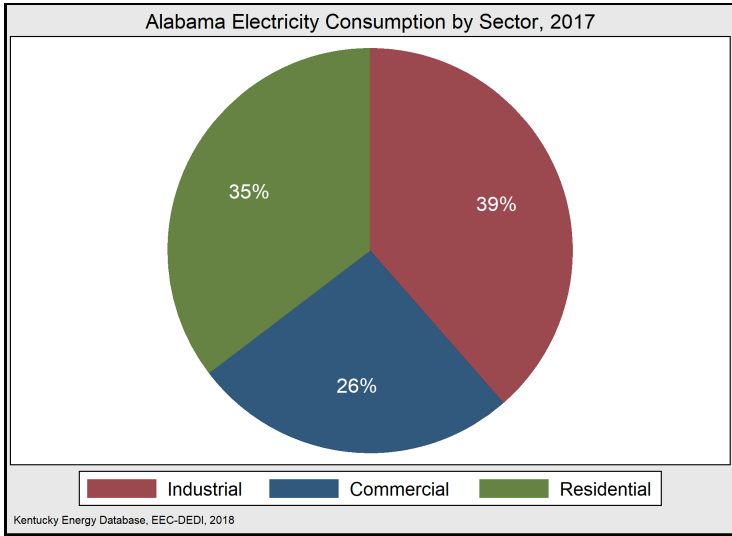
Sector	Gigawatt-hours	2017 Change
Total	3,674,470	-2.1%
Residential	1,378,819	-2.3%
Commercial	1,349,208	-1.3%
Industrial	946,443	-3.1%



Electricity consumption across the SSEB region declined by almost three percent in 2017, with declines in all sectors. Residential consumption declined the most at almost four percent. While there are a number of reasons for the overall decline in energy consumption, more energy efficient products and buildings are the primary drivers. States within the region show much more variability in sector specific consumption, especially in the industrial sector.

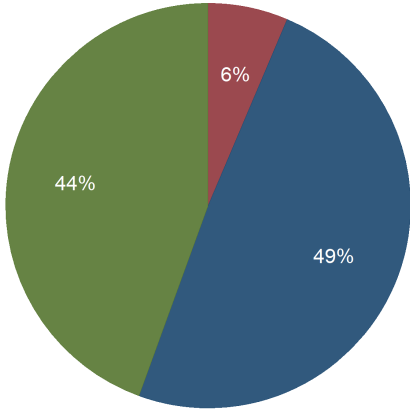
As with the region, overall electricity consumption declined in 2017, and all sectors consumed less than in previous years. Since the mid-1980s, residential demand has accounted for the largest proportion of electricity consumption in both the SSEB region and the United States as a whole. Nationally, the percentage consumption for each sector has not changed since 2015.

Electricity Consumption by Sector



Electricity Consumption by Sector

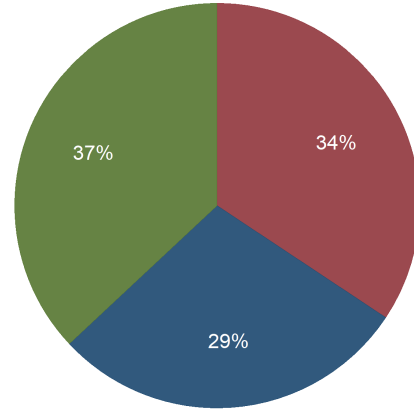
Maryland Electricity Consumption by Sector, 2017



Industrial Commercial Residential

Kentucky Energy Database, EEC-DEDI, 2018

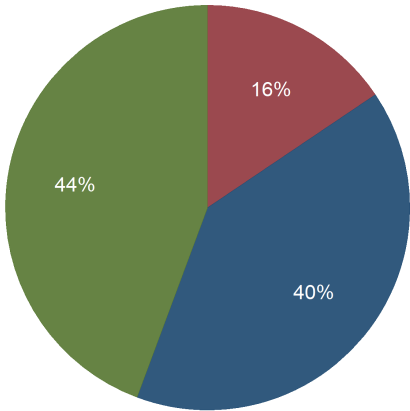
Mississippi Electricity Consumption by Sector, 2017



Industrial Commercial Residential

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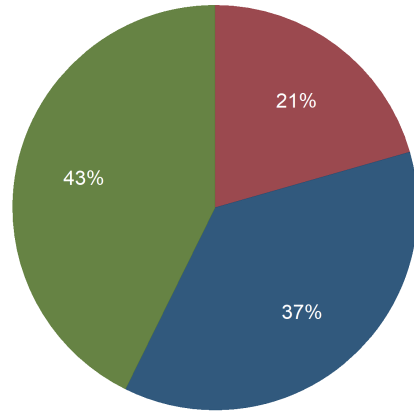
Missouri Electricity Consumption by Sector, 2017



Industrial Commercial Residential

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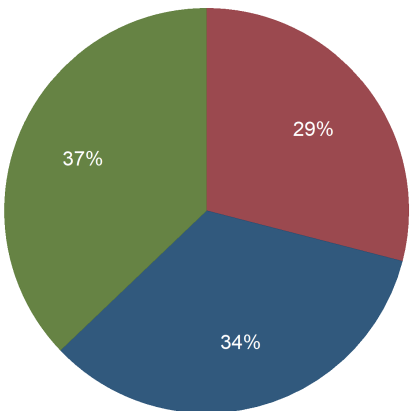
North Carolina Electricity Consumption by Sector, 2017



Industrial Commercial Residential

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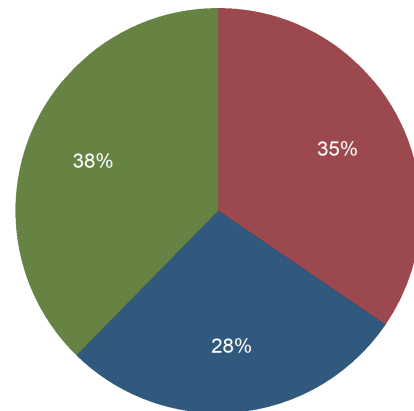
Oklahoma Electricity Consumption by Sector, 2017



Industrial Commercial Residential

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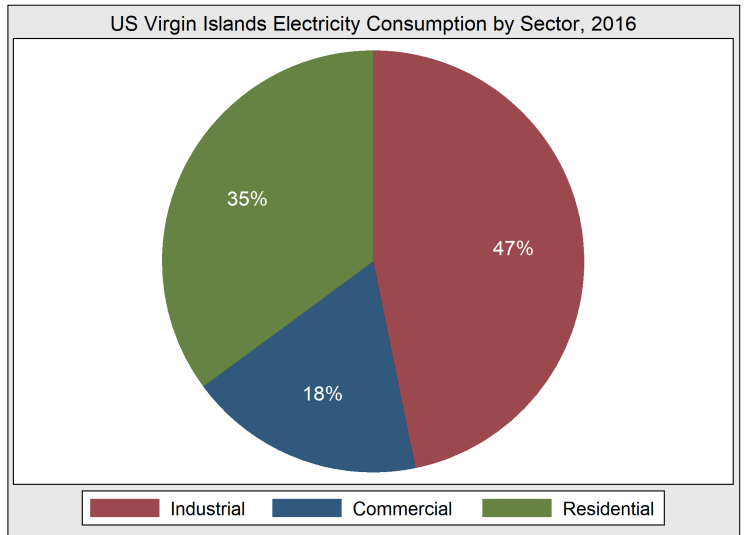
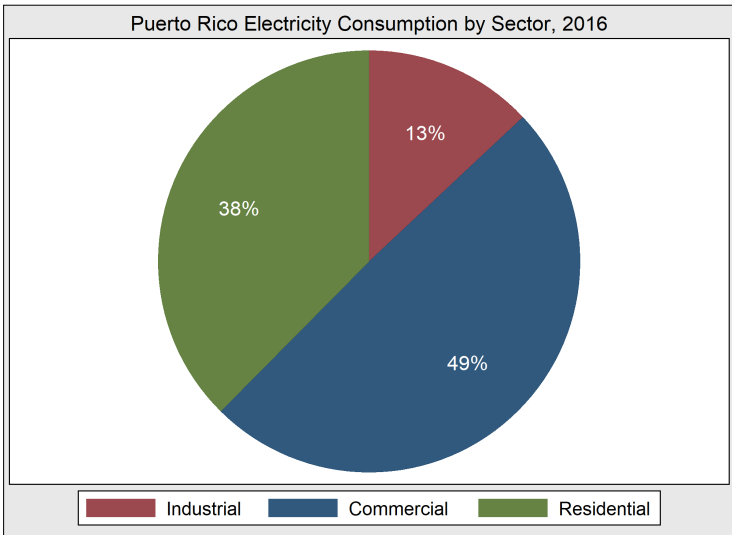
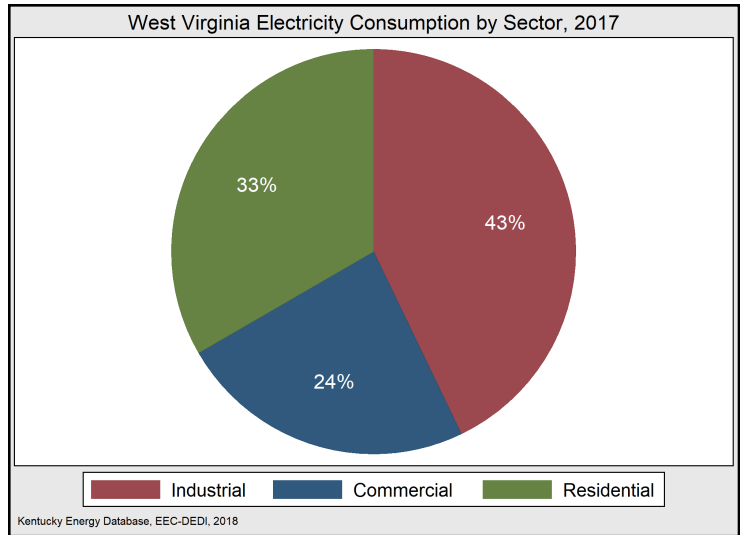
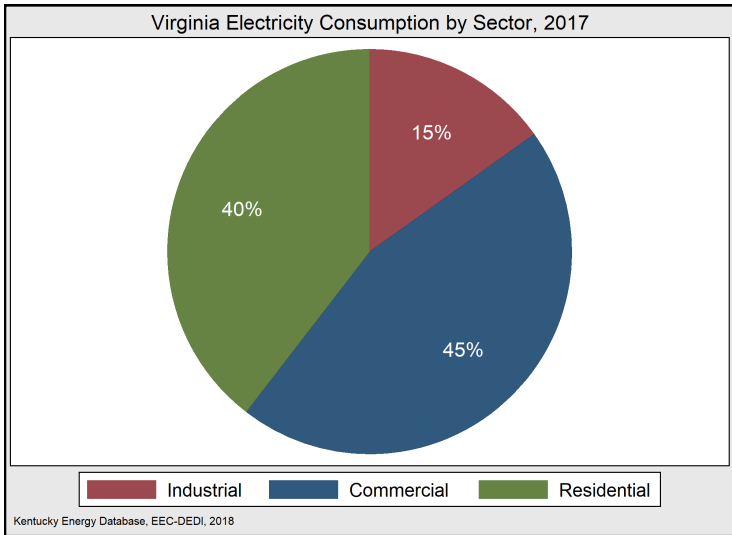
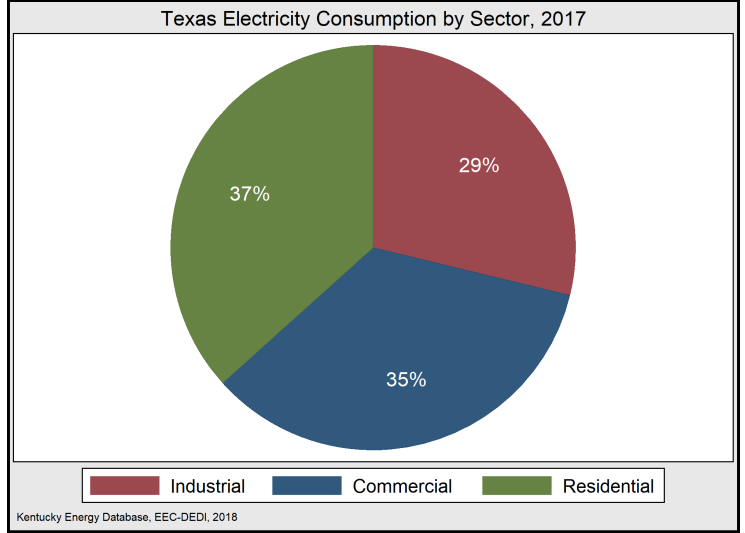
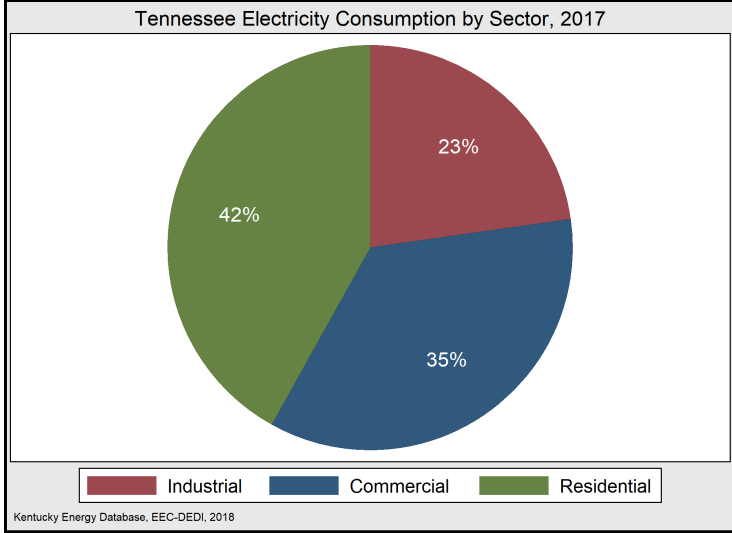
South Carolina Electricity Consumption by Sector, 2017



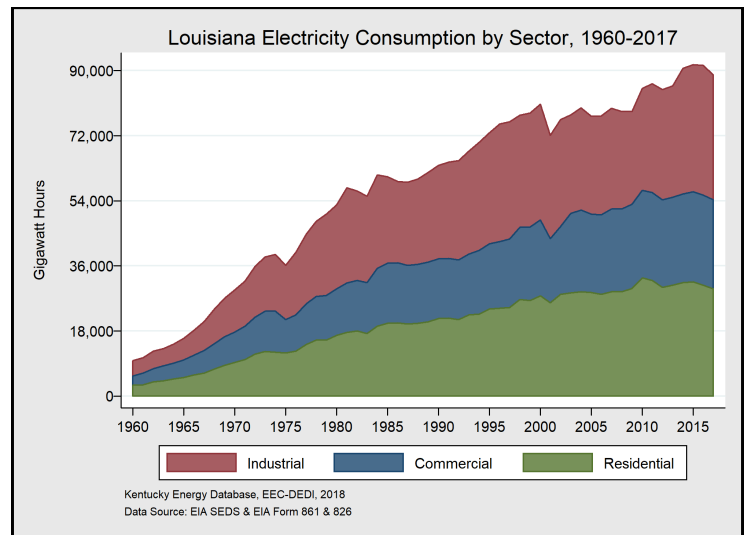
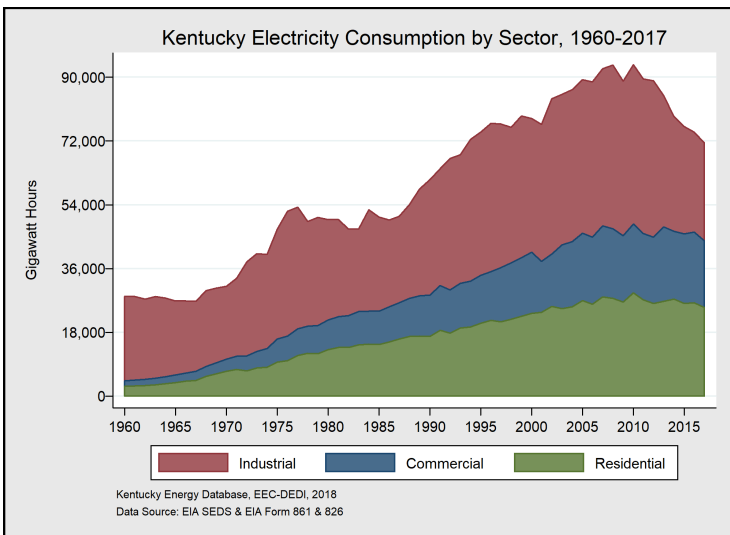
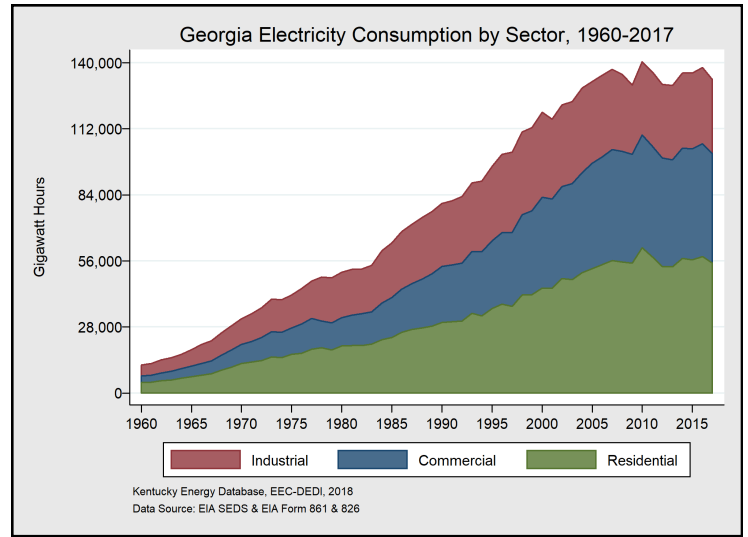
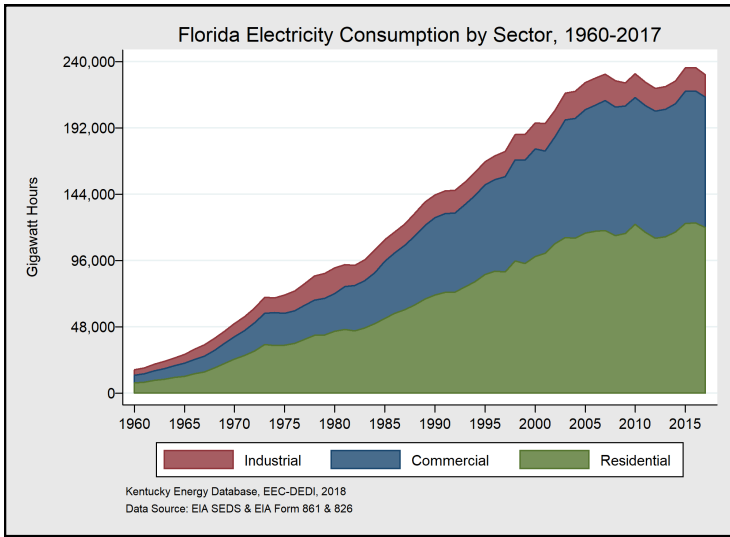
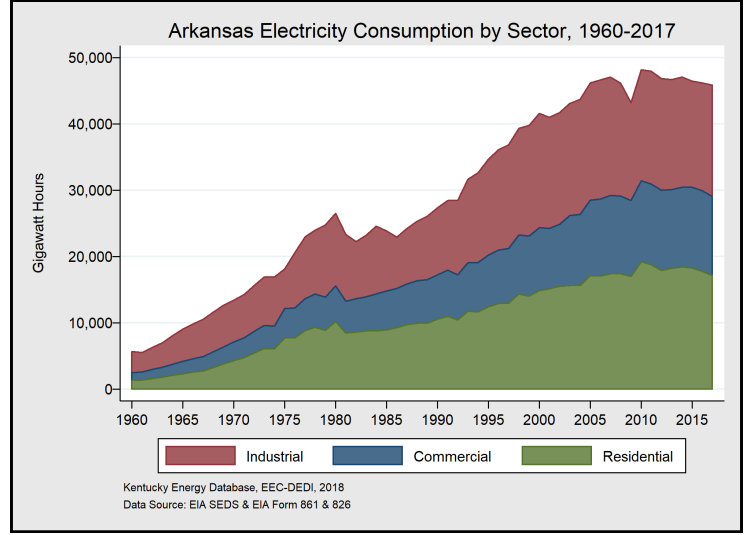
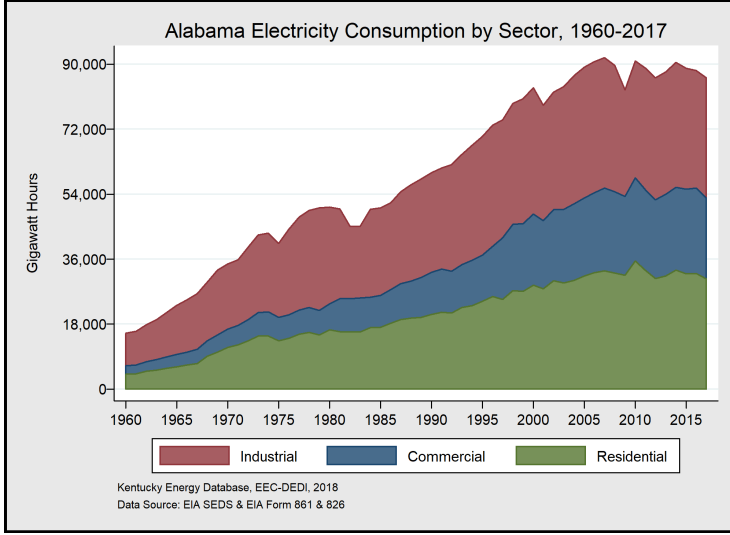
Industrial Commercial Residential

Kentucky Energy Database, EEC-DEDI, 2018

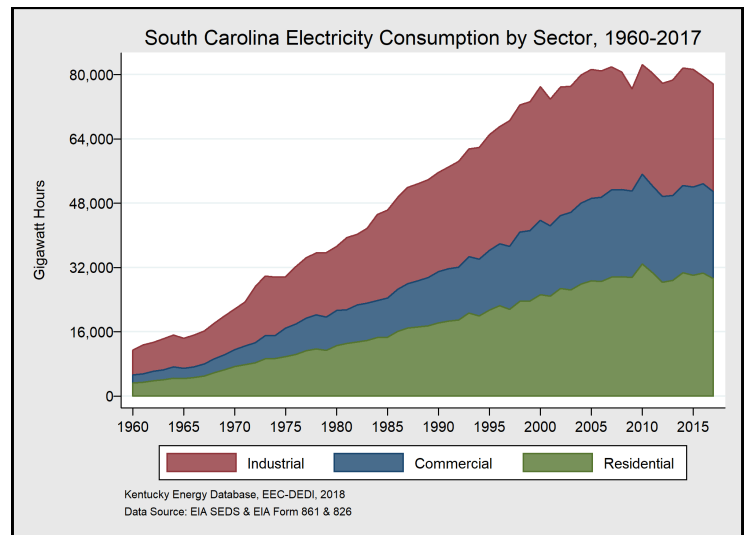
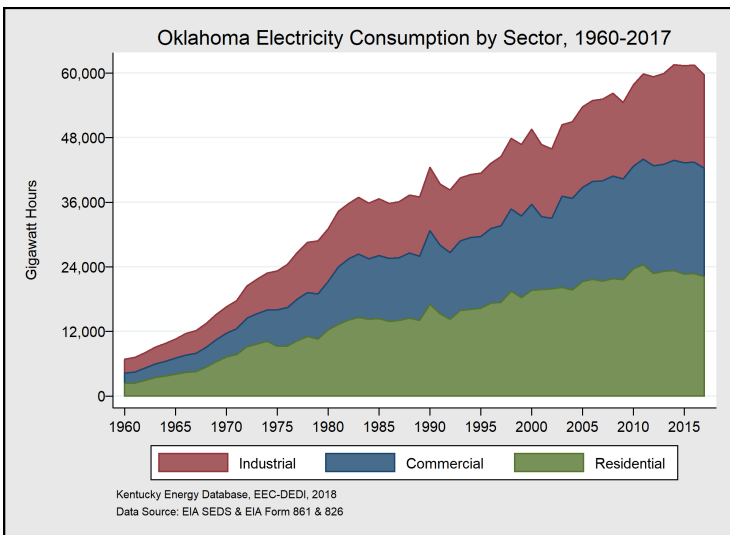
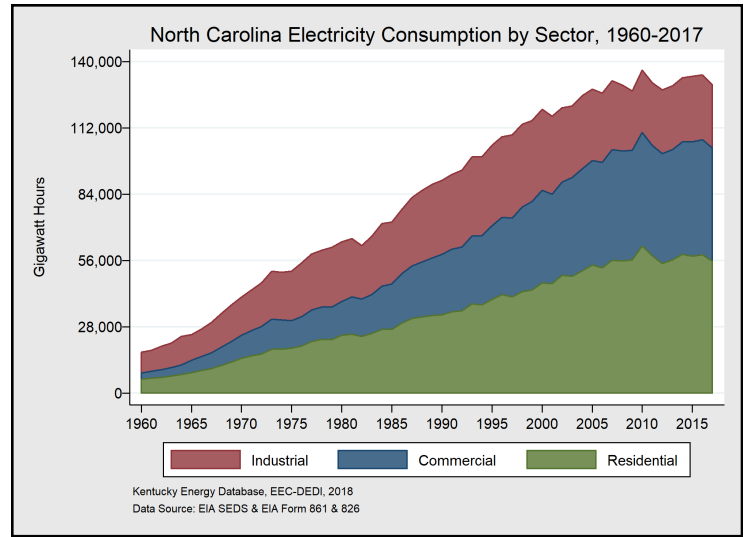
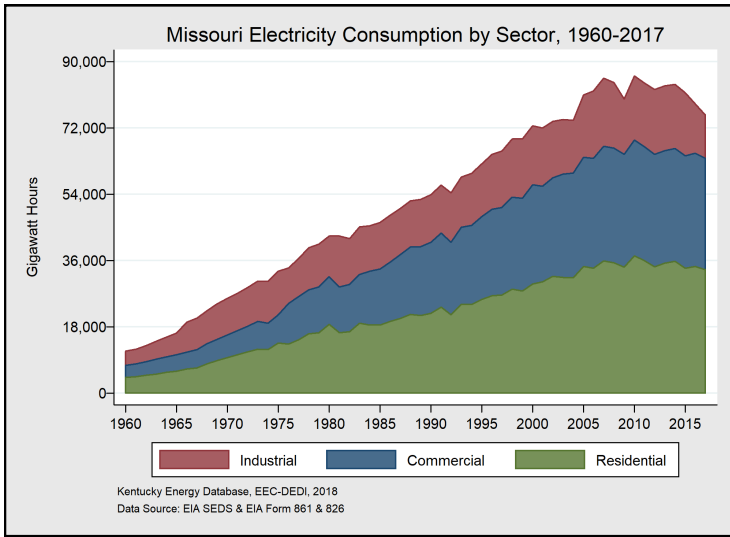
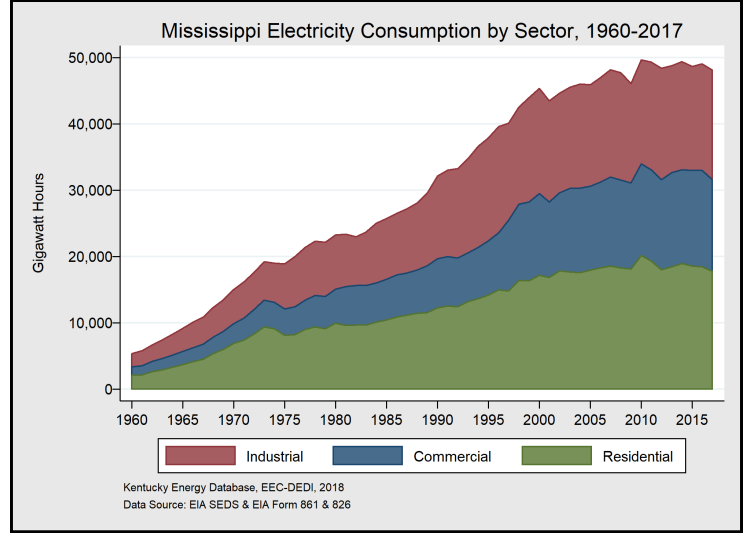
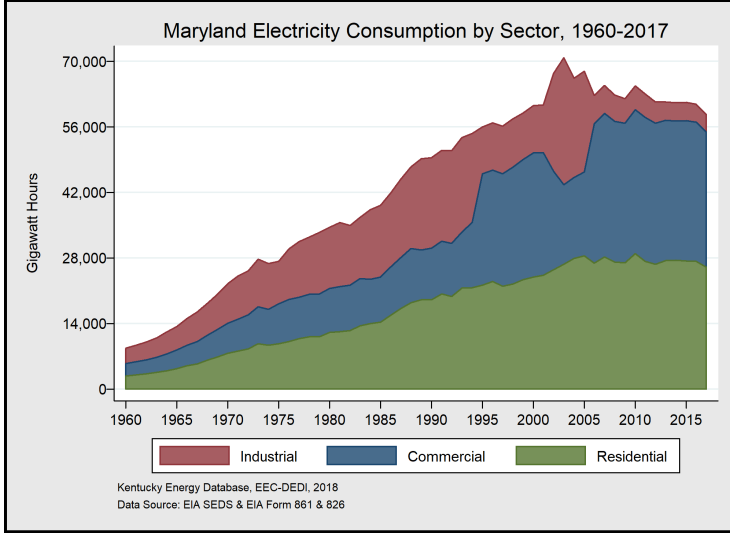
Electricity Consumption by Sector



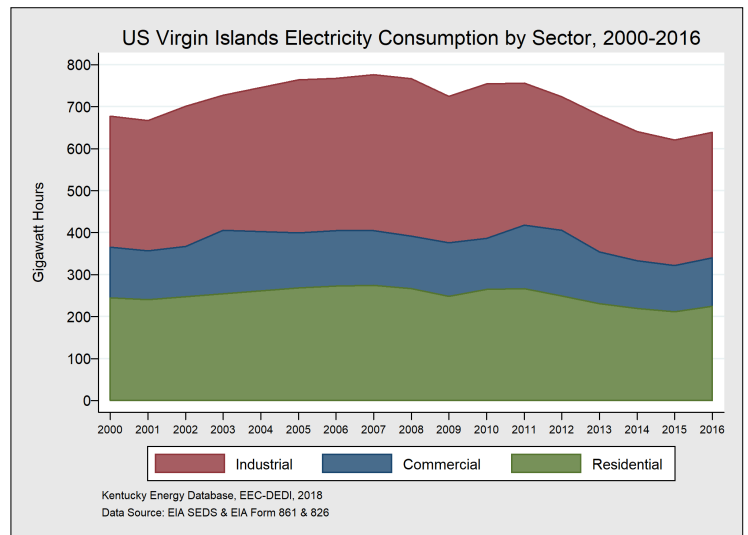
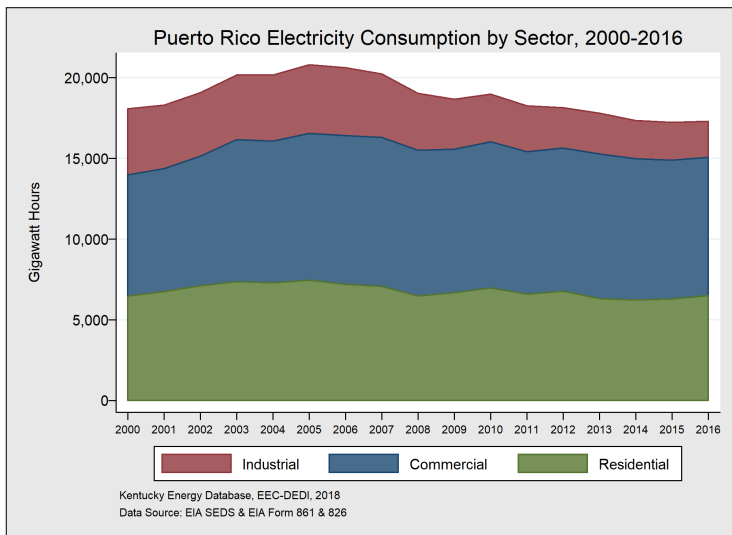
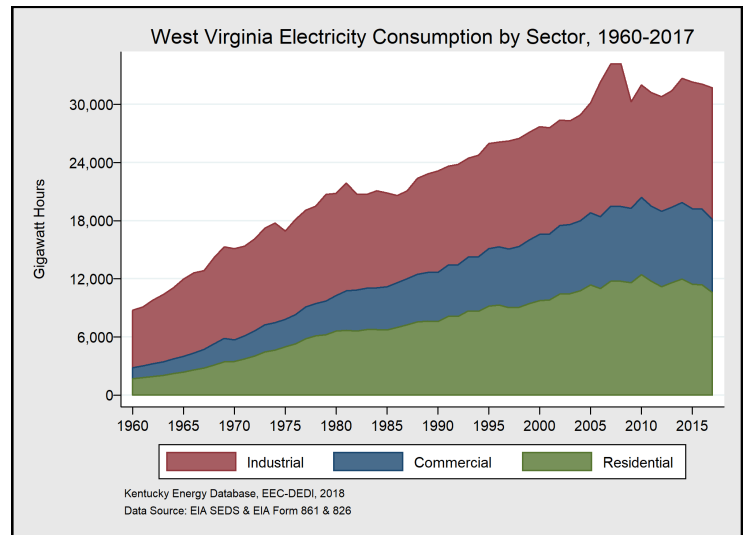
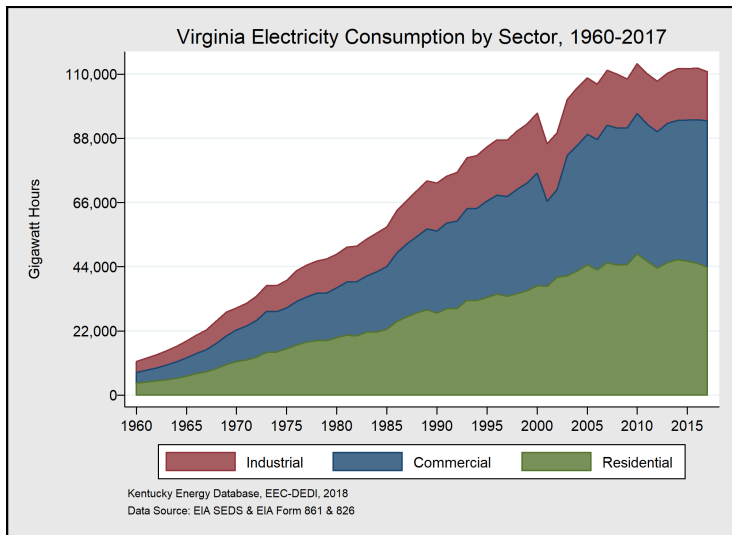
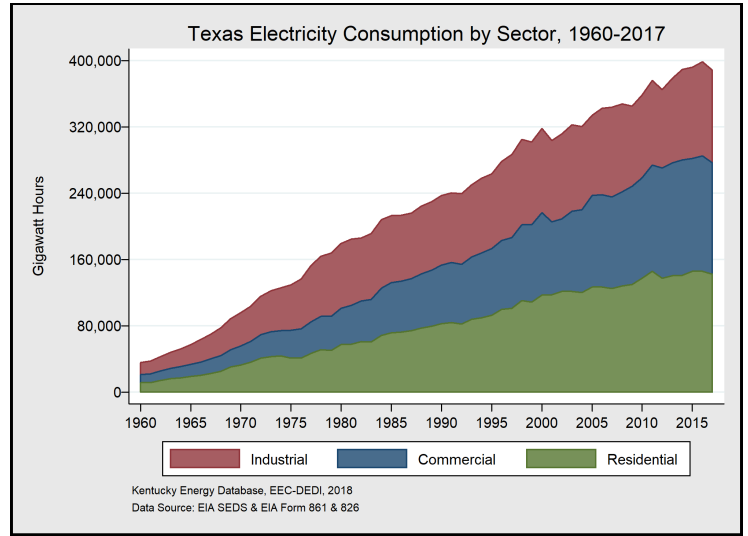
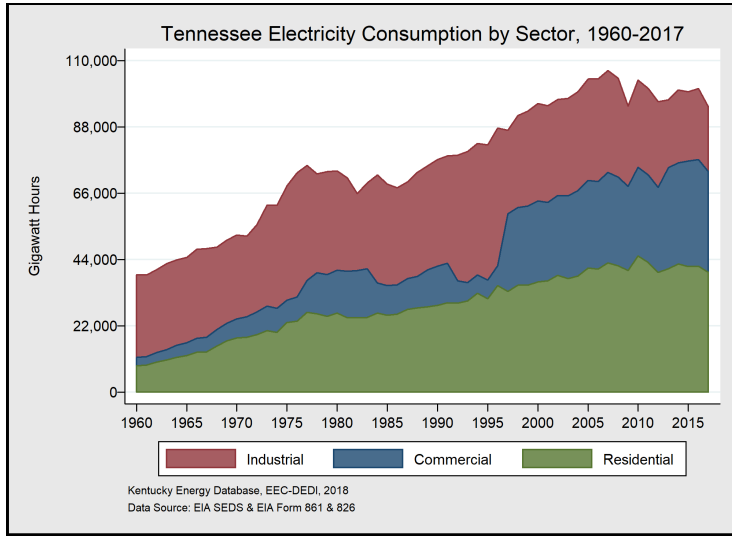
Historical Electricity Consumption by Sector



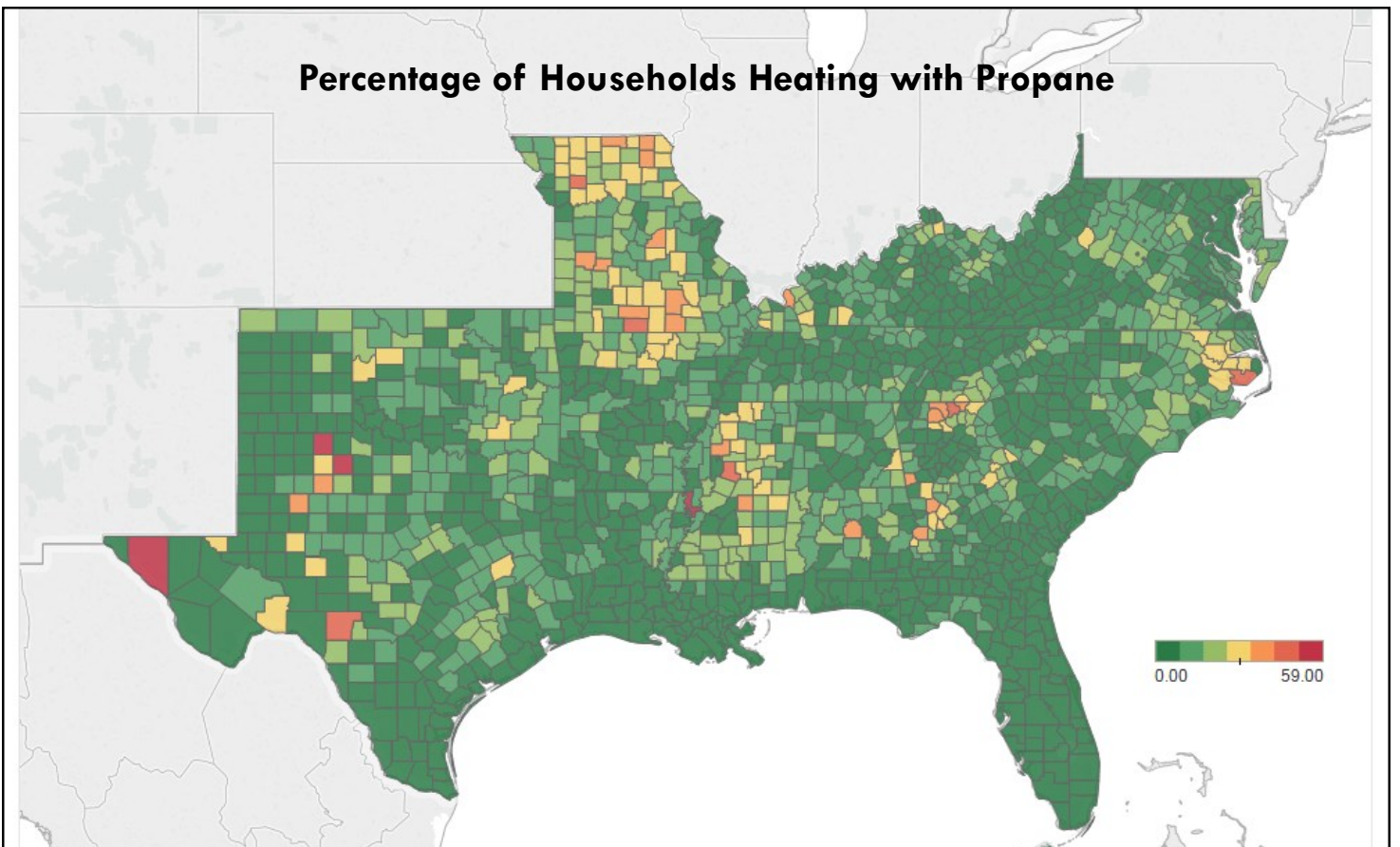
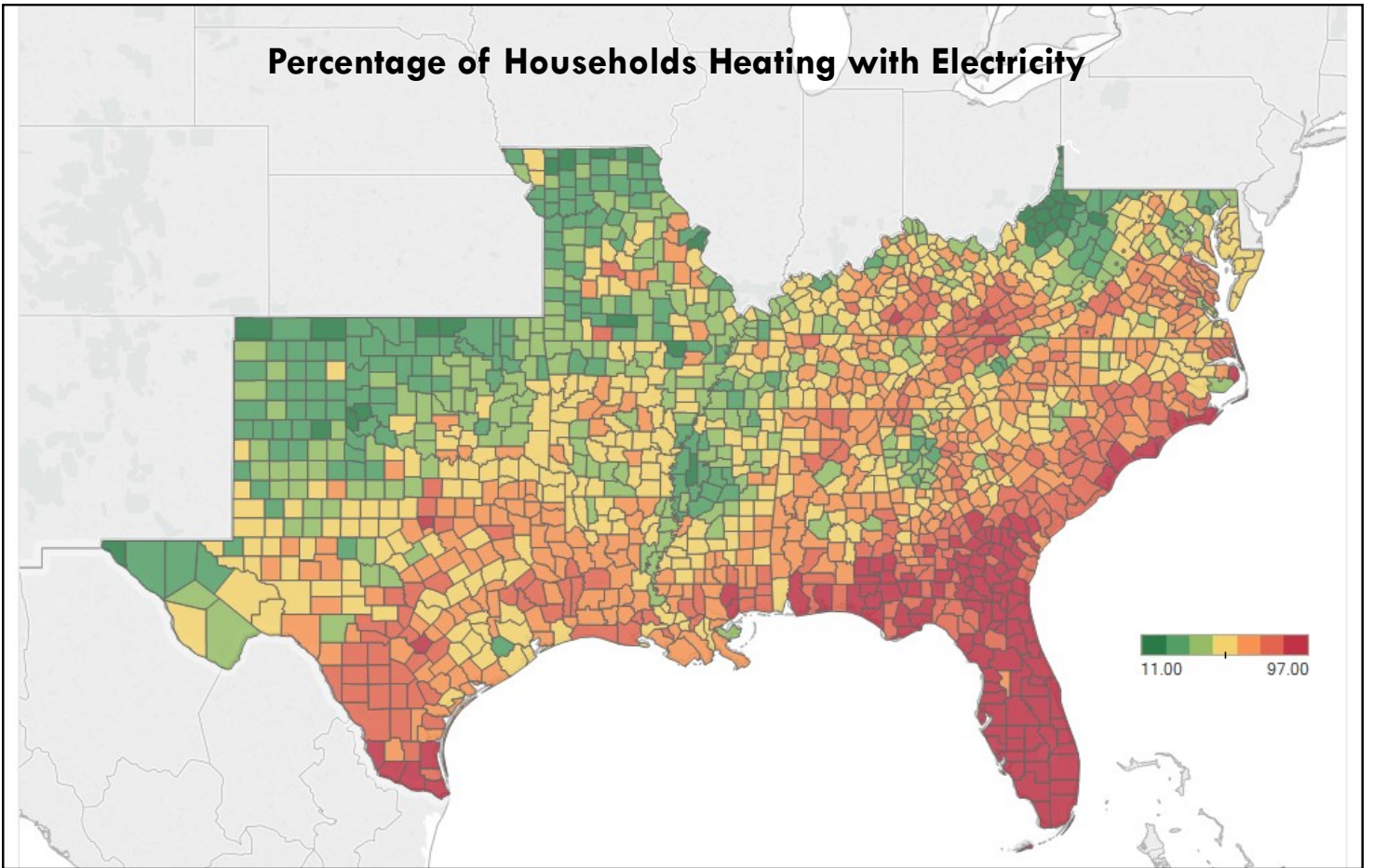
Historical Electricity Consumption by Sector



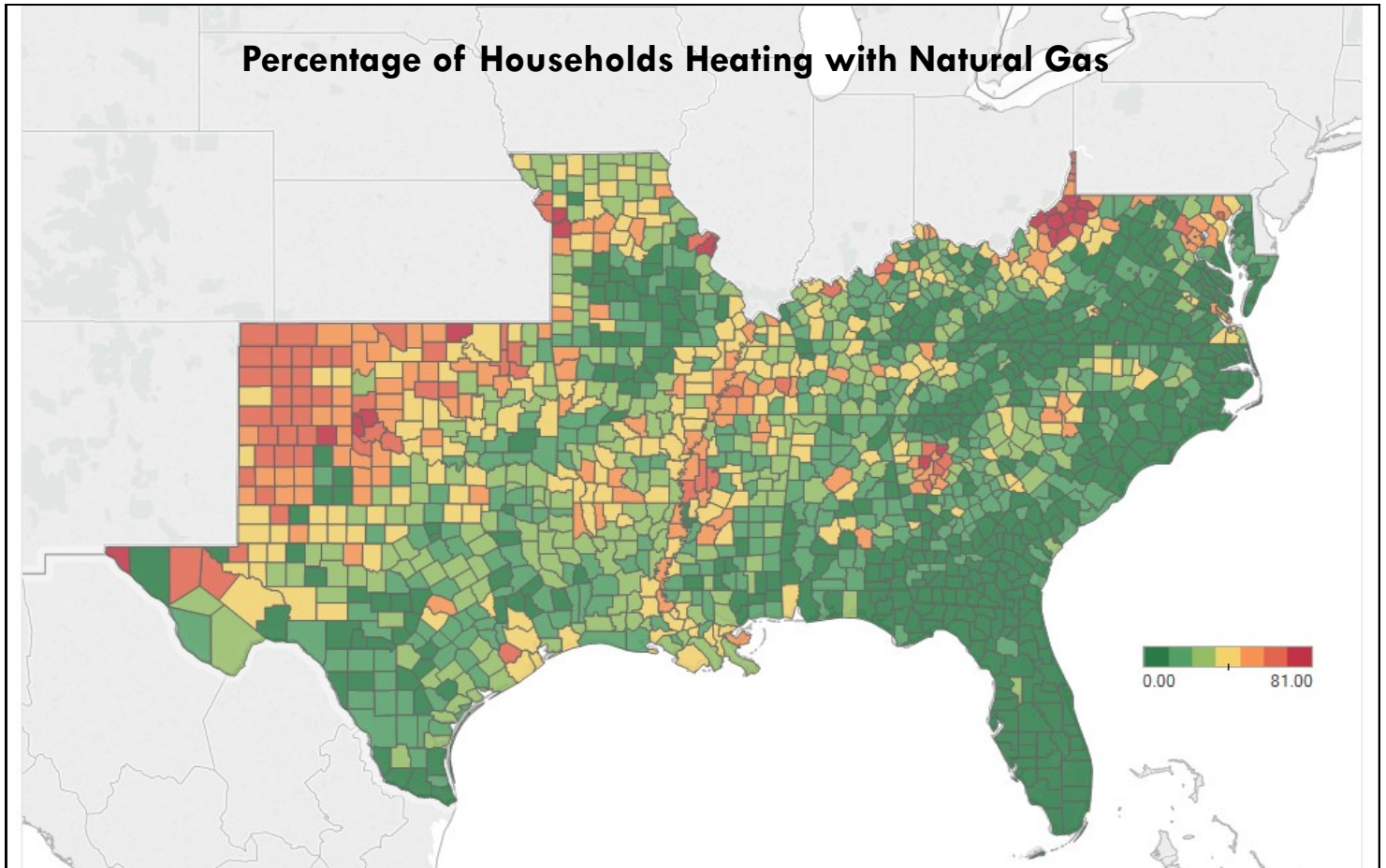
Historical Electricity Consumption by Sector



Home Heating



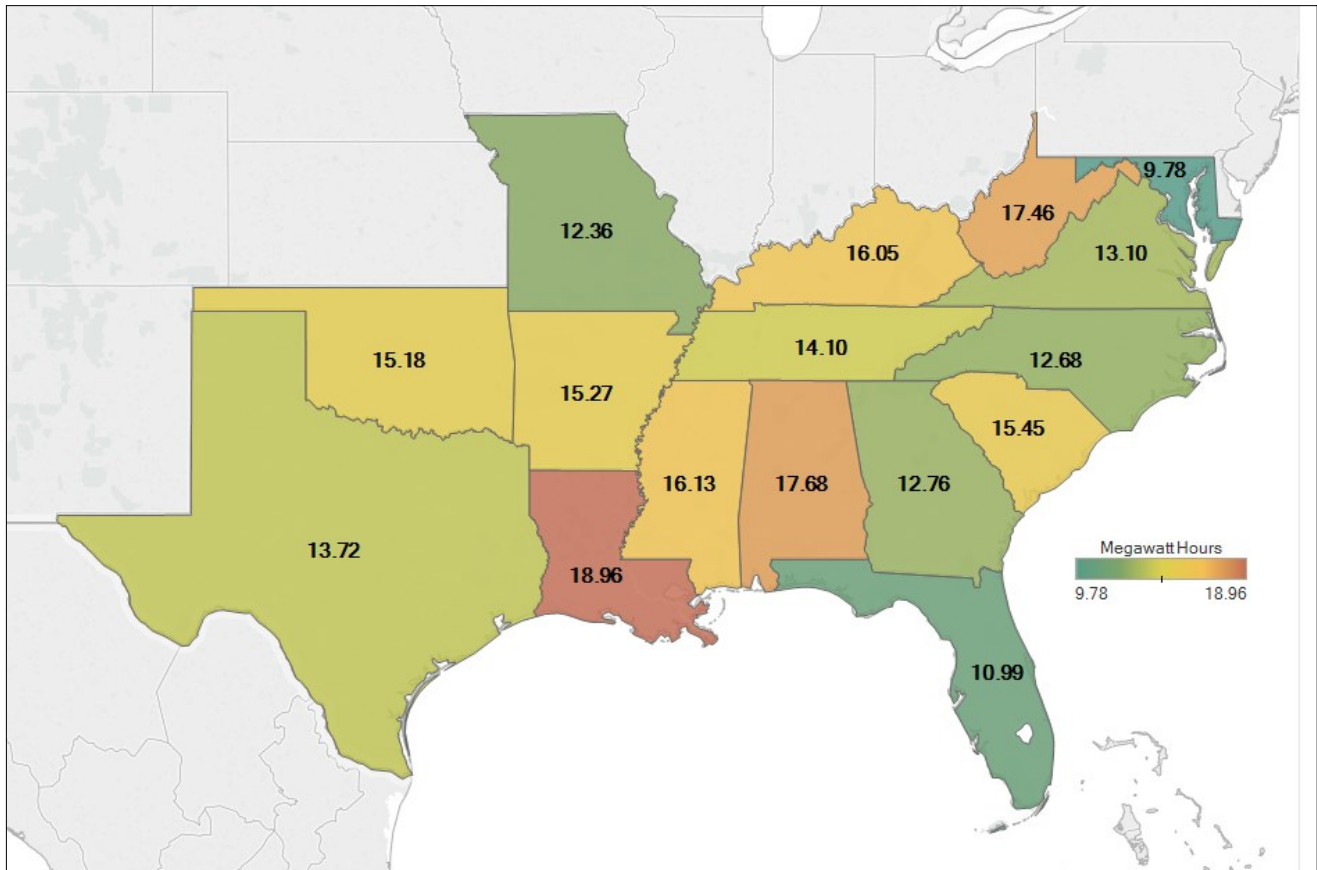
Home Heating



Homes in the southern Atlantic seaboard, Florida, and across the Gulf coast heat mostly with electricity; electricity heating usages diminishes further north and west, with the exception of pockets in the Appalachian Mountains region. Electric heating further north can present a financial hardship, especially to lower income households.

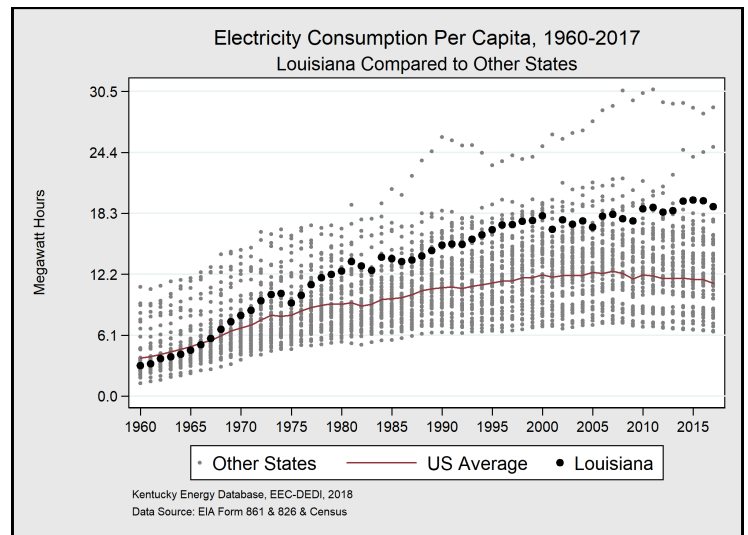
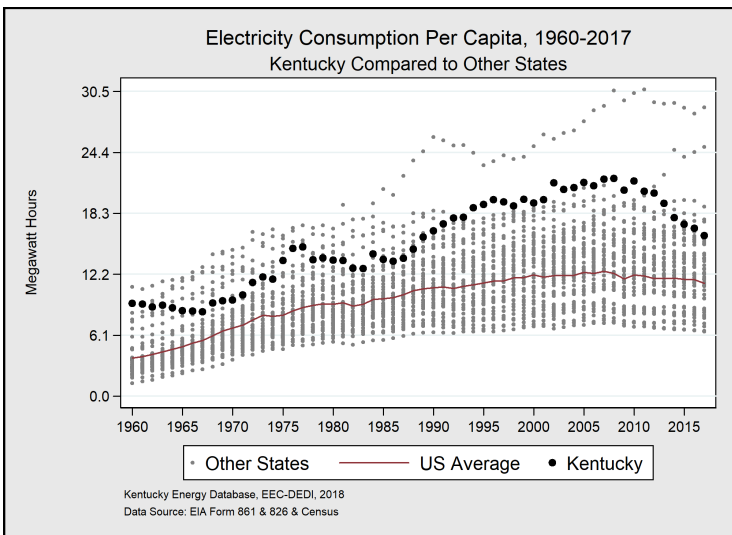
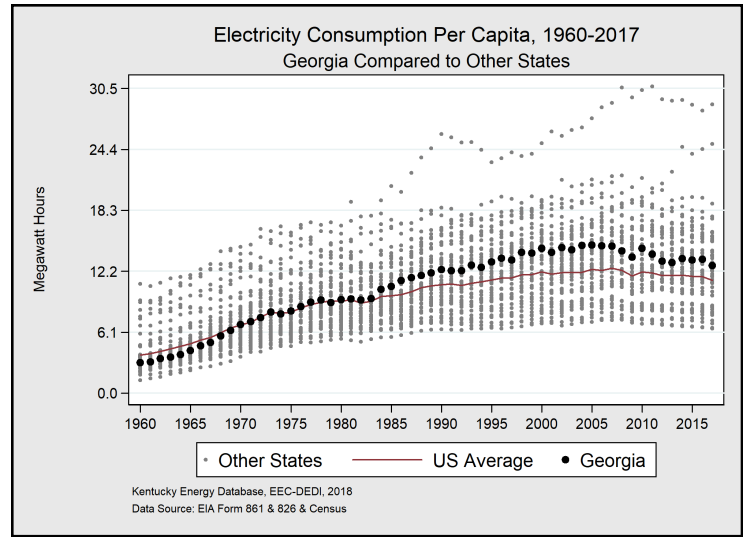
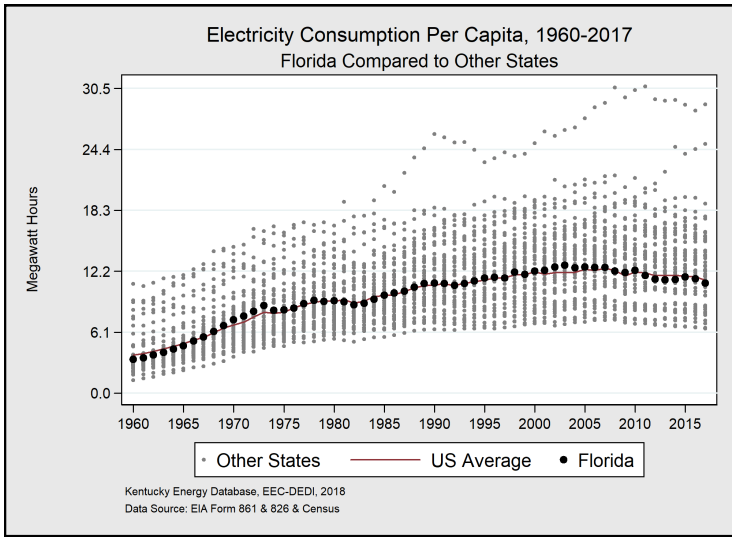
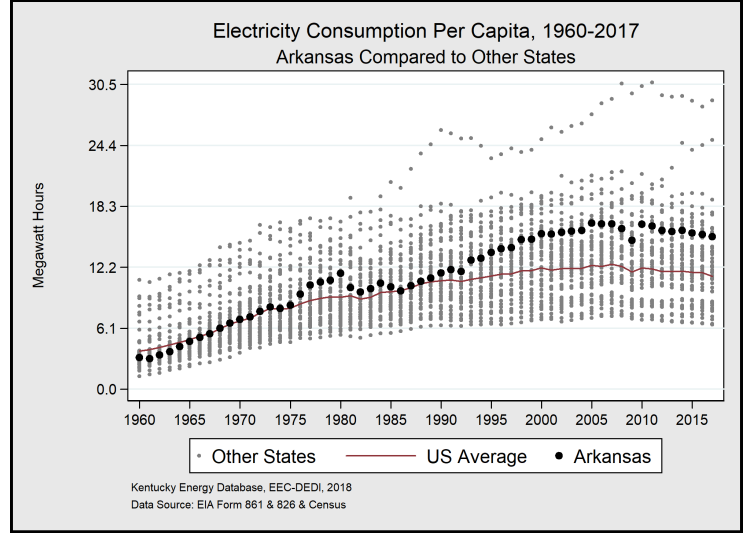
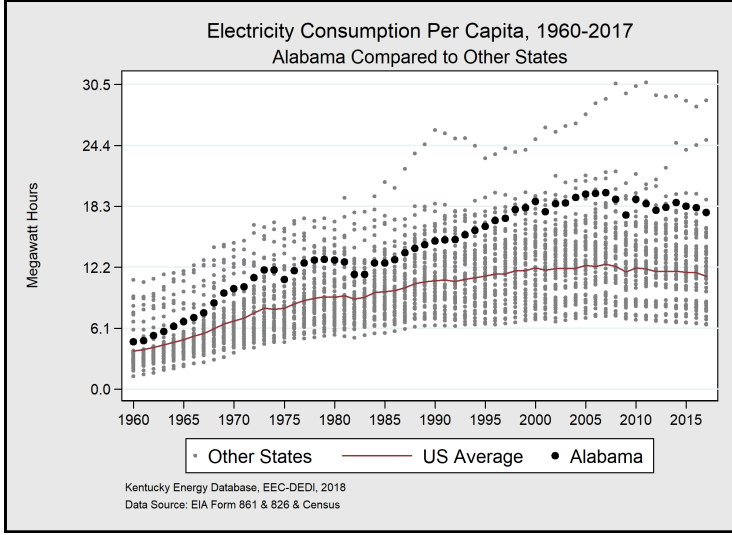
Propane is commonly used in rural areas, owing to its transport and storage characteristics. Overall, however, proportional usage is lower along the Gulf Coast and in the Appalachian coal fields; highest in Missouri, northern Arkansas, and throughout the cotton belt, running from Mississippi up to coastal North Carolina. Because of distribution infrastructure limitations, natural gas heating is typically limited to more urban areas, with the exception of northern West Virginia, Oklahoma panhandle, and northern Texas.

Electricity Use per Capita (MWh)

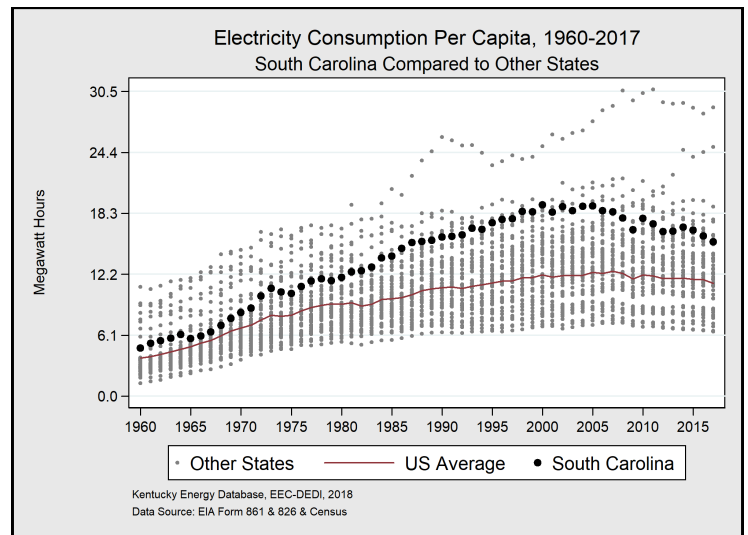
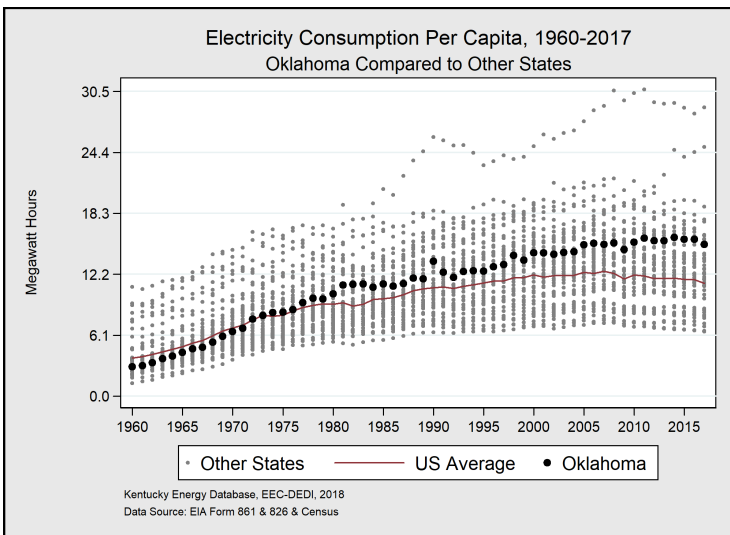
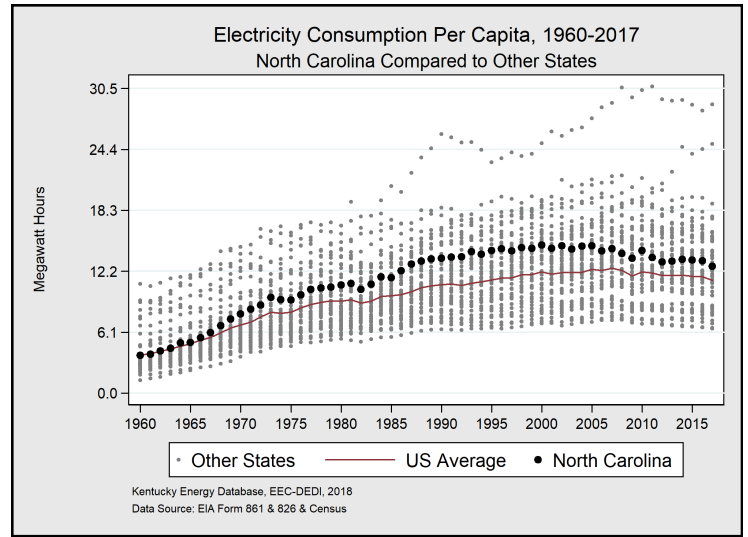
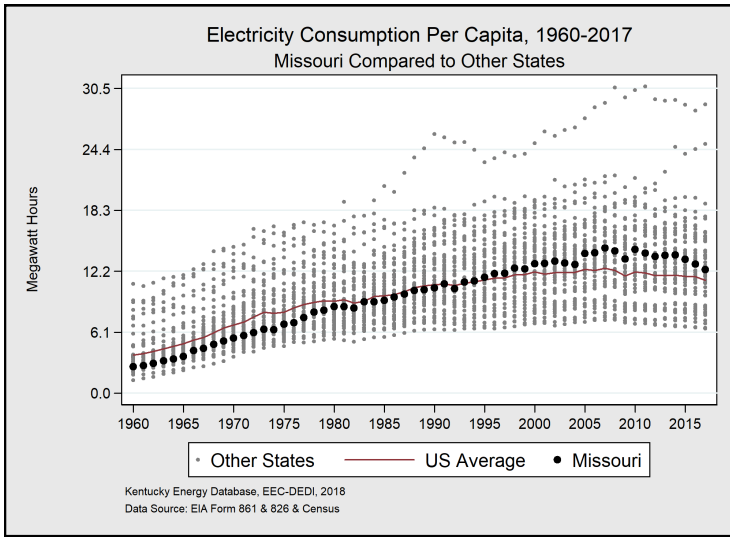
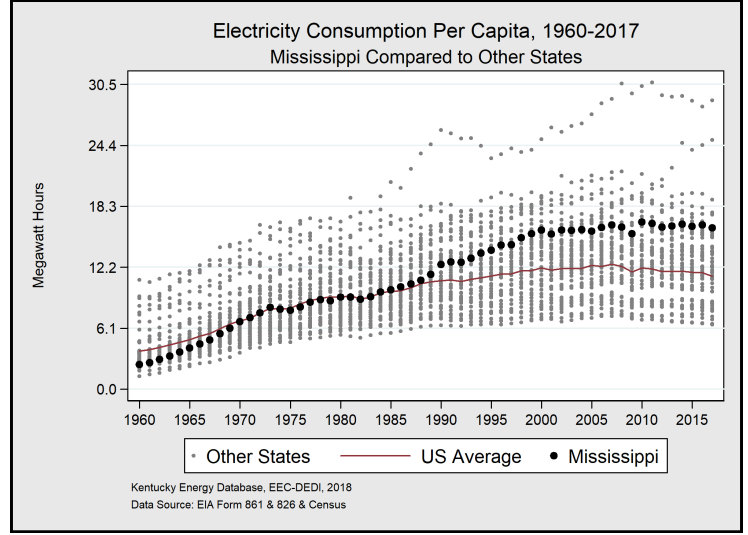
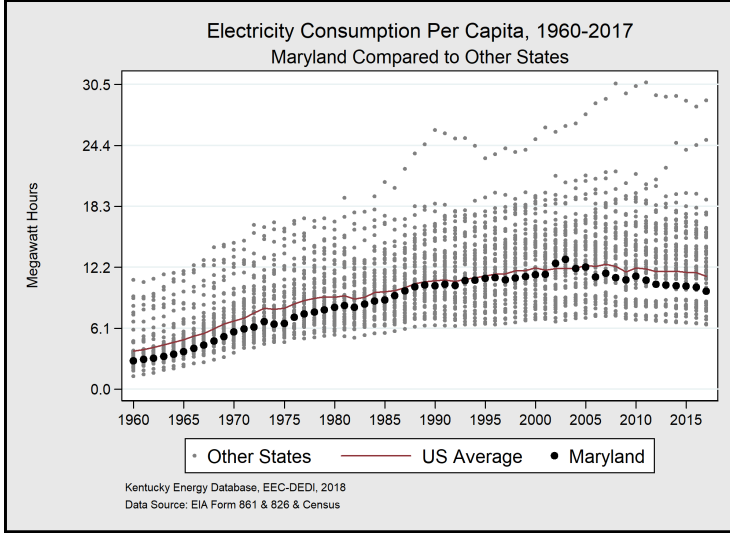


State	Residential	Commercial	Industrial	Total
Alabama	6.25	4.61	6.82	17.68
Arkansas	5.70	3.96	5.61	15.27
Florida	5.71	4.50	0.78	10.99
Georgia	5.28	4.45	3.01	12.76
Kentucky	5.62	4.22	6.20	16.05
Louisiana	6.33	5.25	7.38	18.96
Maryland	4.31	4.77	0.62	9.78
Mississippi	5.97	4.63	5.54	16.13
Missouri	5.48	4.95	1.92	12.36
North Carolina	5.41	4.66	2.61	12.68
Oklahoma	5.63	5.14	4.41	15.18
South Carolina	5.82	4.29	5.34	15.45
Tennessee	5.91	4.98	3.21	14.10
Texas	5.03	4.74	3.95	13.72
Virginia	5.17	5.93	1.98	13.10
West Virginia	5.82	4.16	7.48	17.46
AVERAGE SSEB REGION	5.44	4.73	3.33	13.52

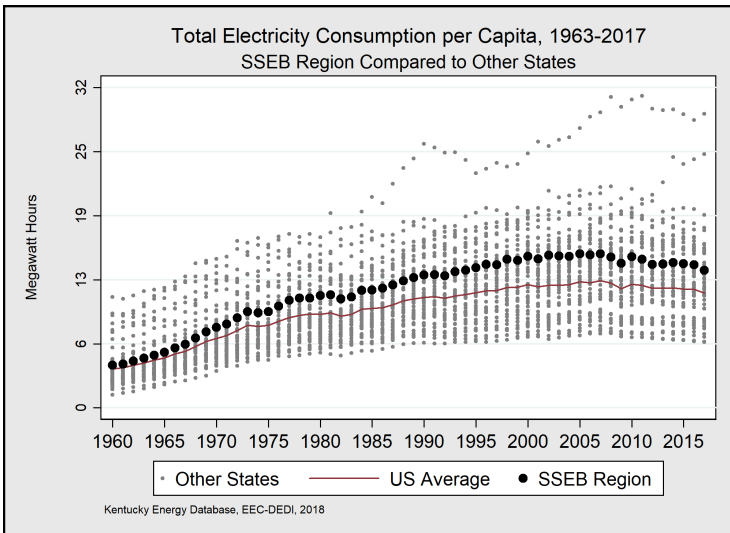
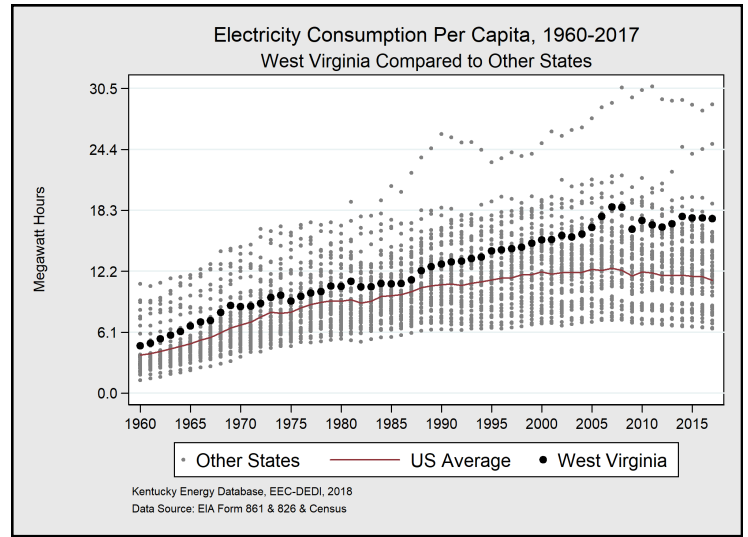
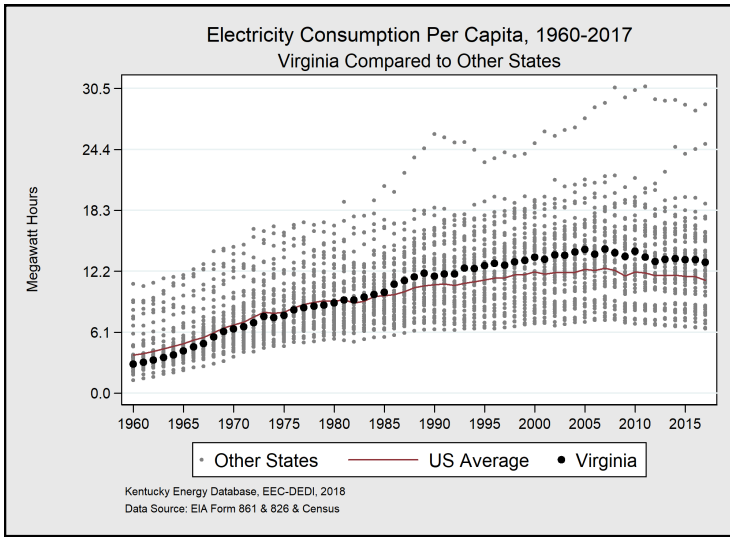
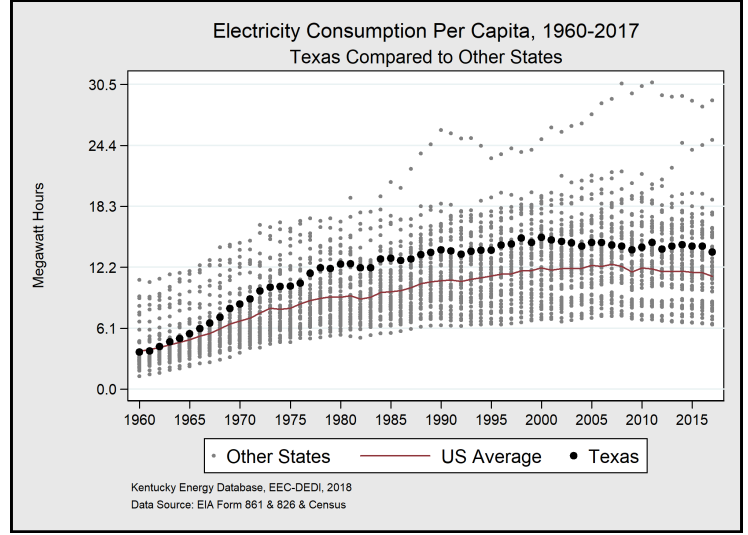
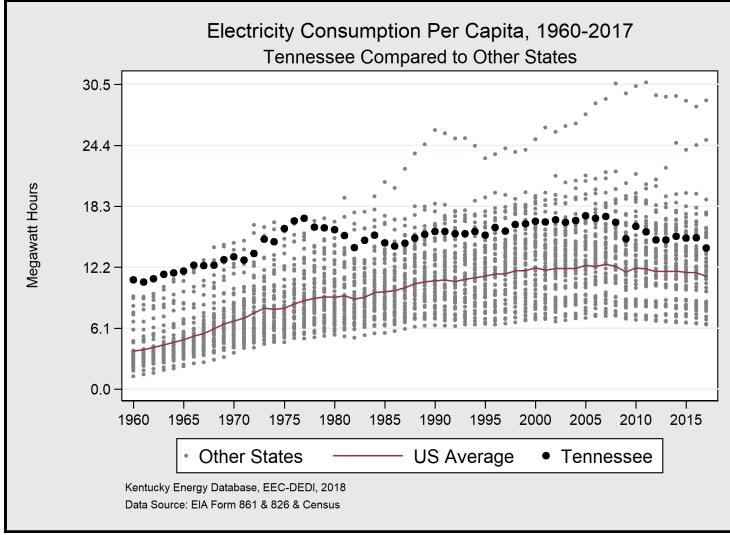
Historical Electricity Use per Capita



Historical Electricity Use per Capita

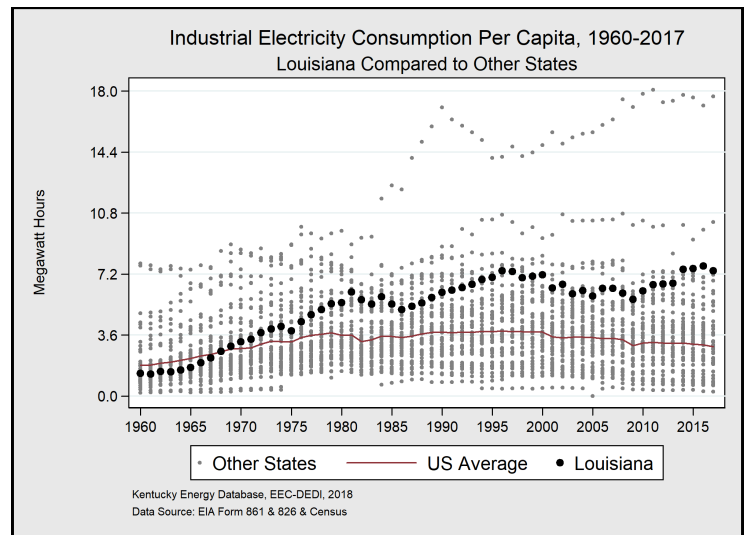
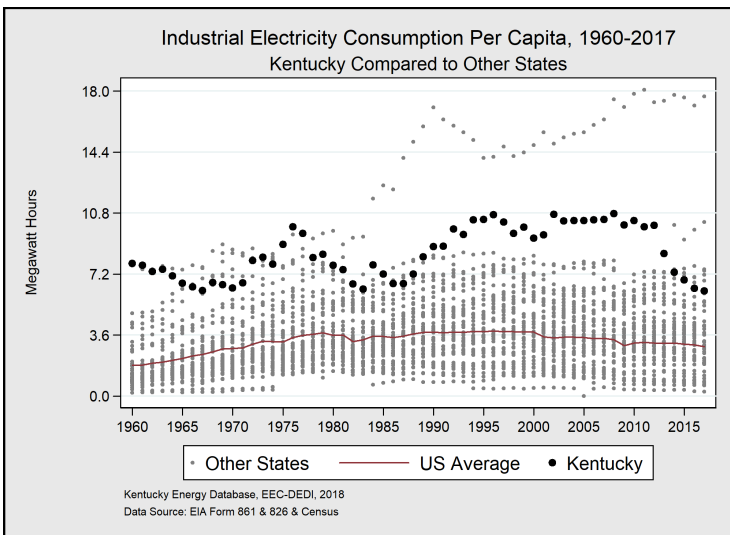
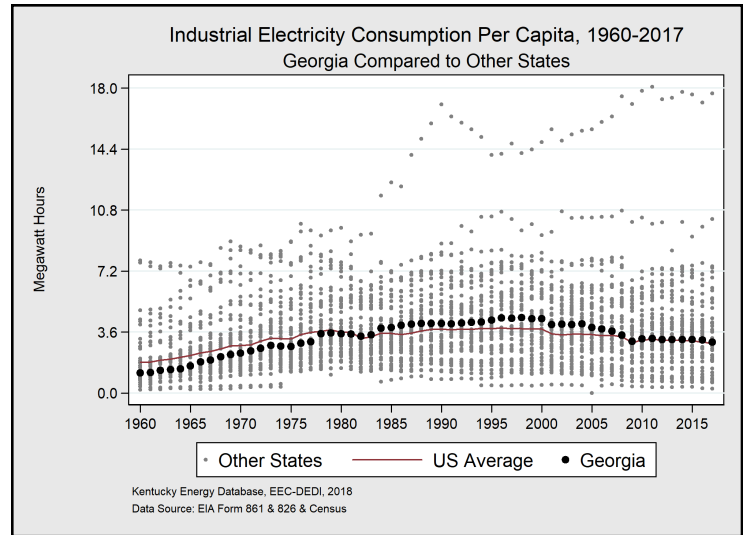
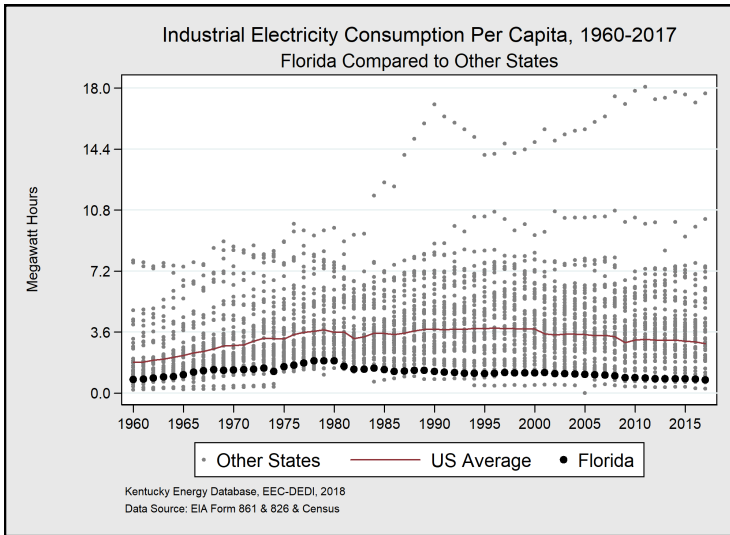
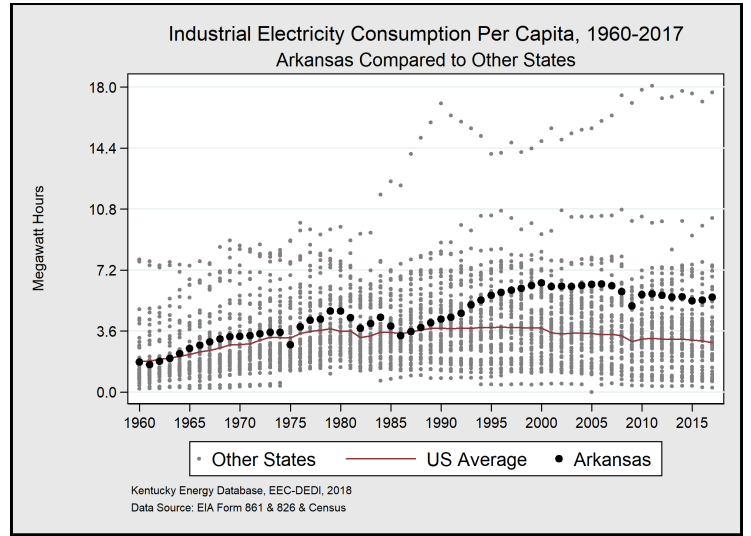
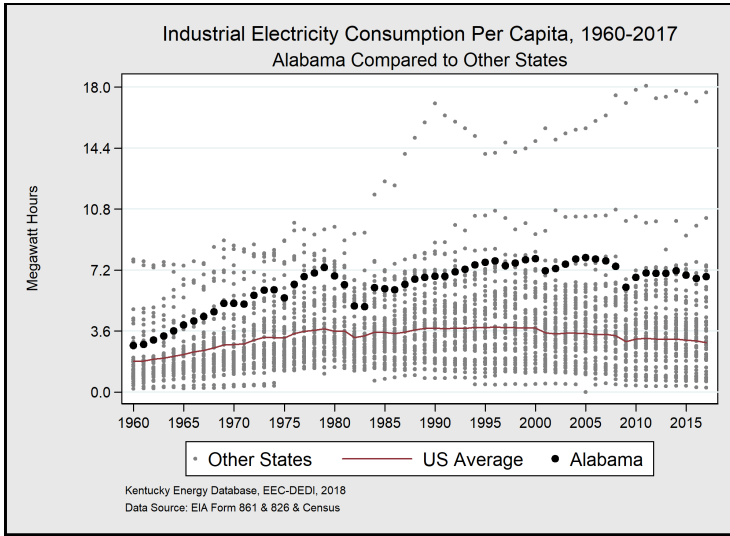


Historical Electricity Use per Capita

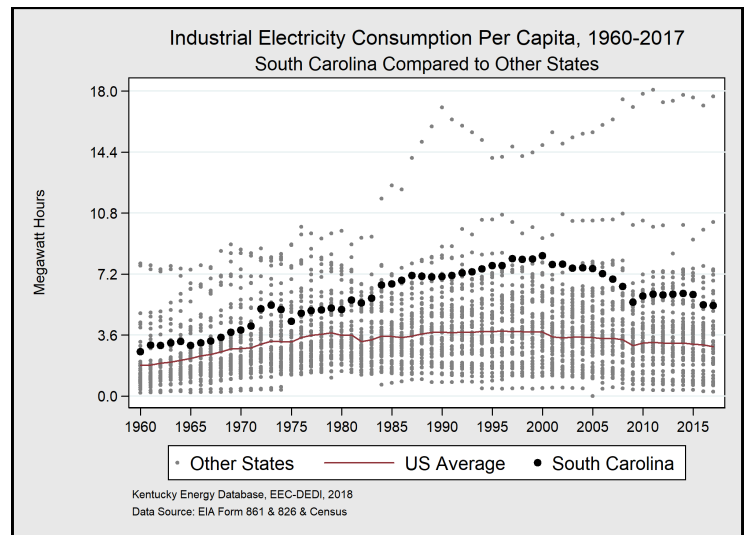
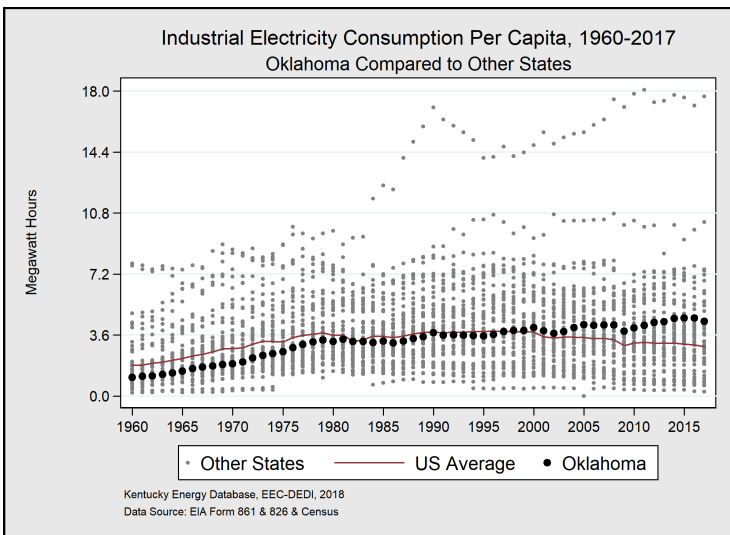
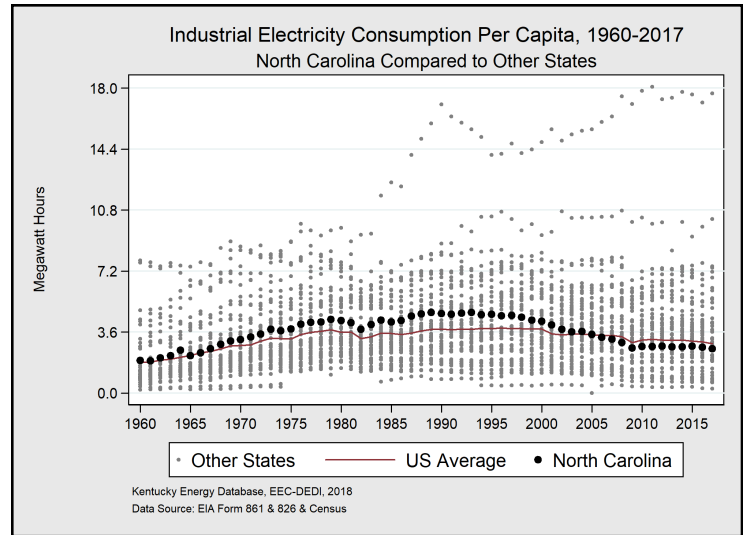
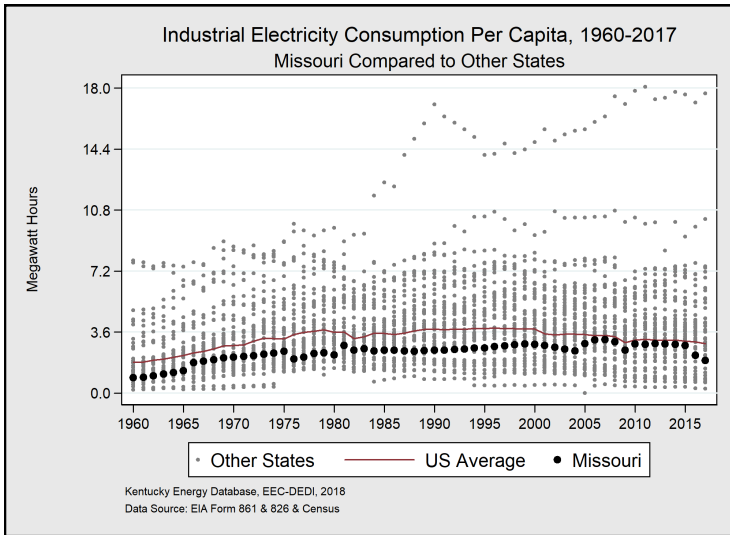
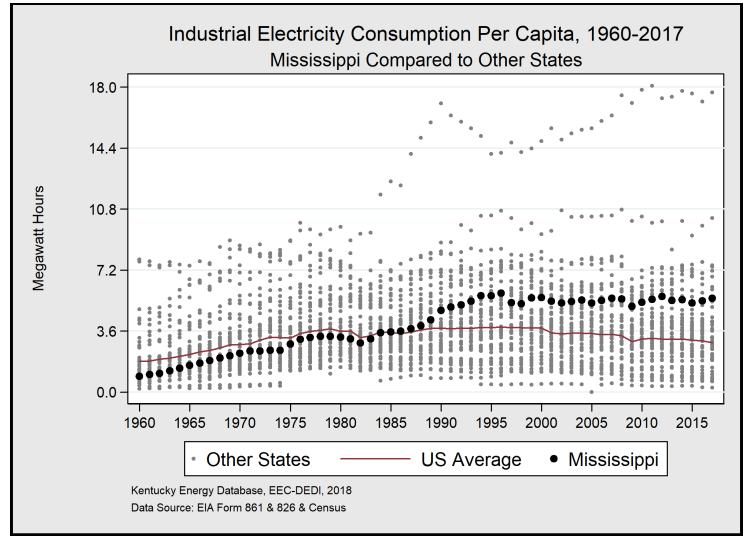
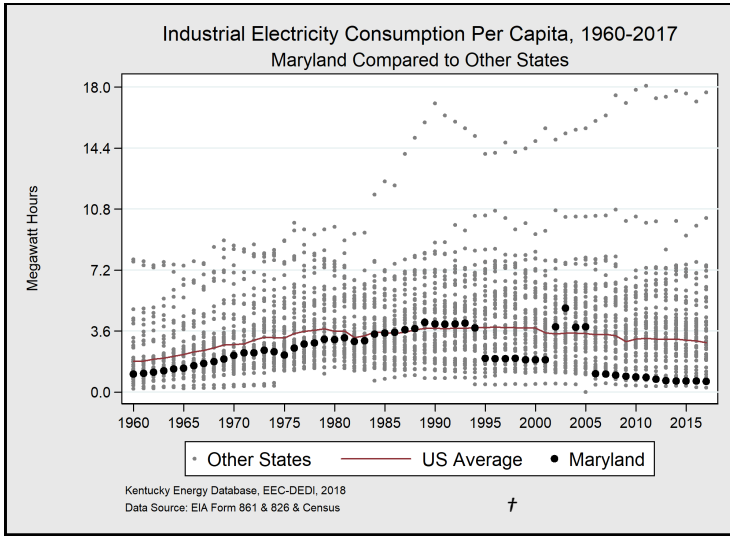


† Maryland and Tennessee show substantial fluctuation in per capita industrial electricity consumption due to the reclassification of certain industrial processes as commercial during this time series.

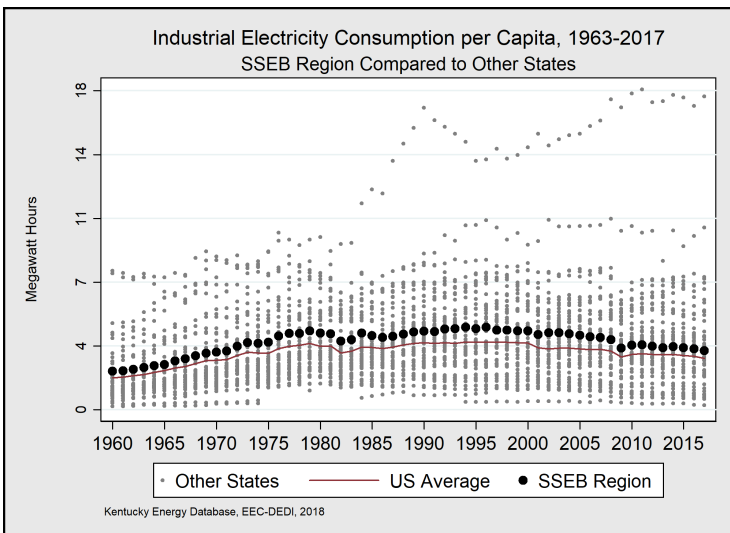
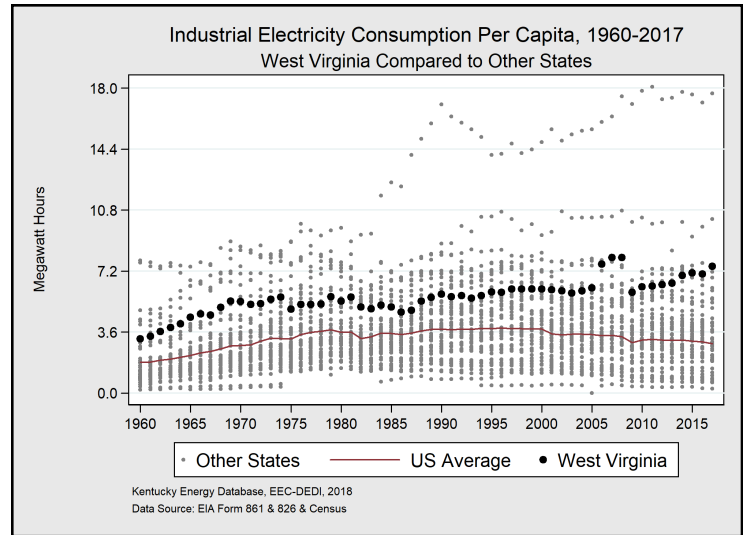
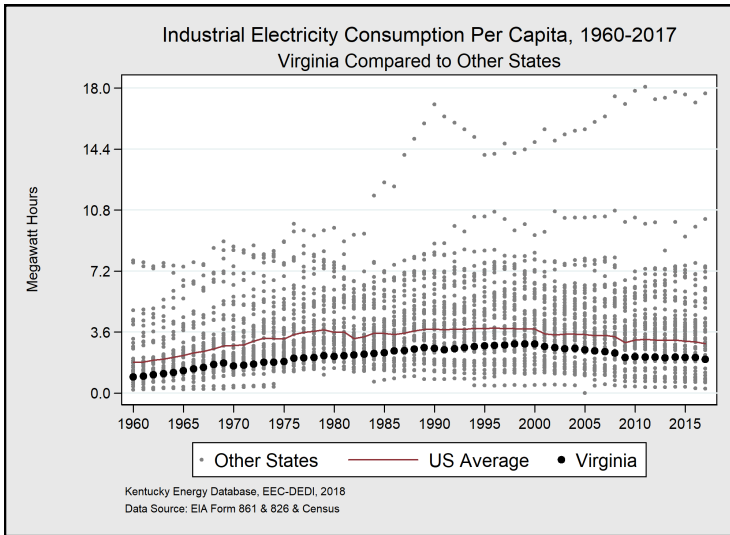
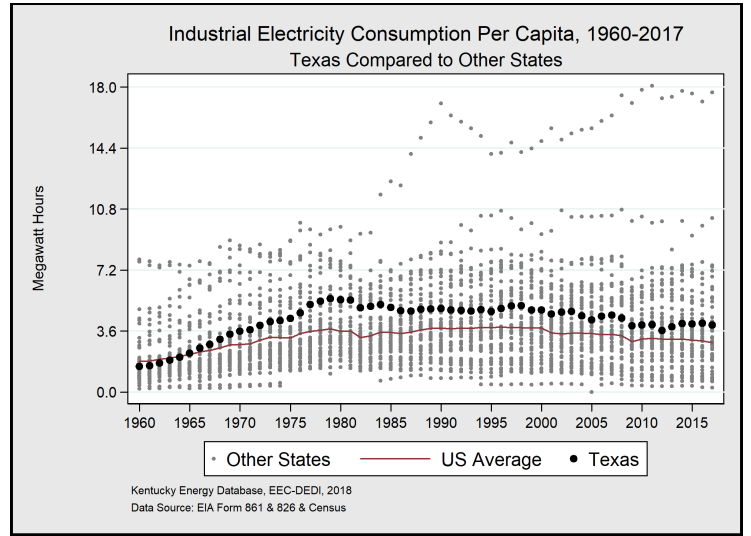
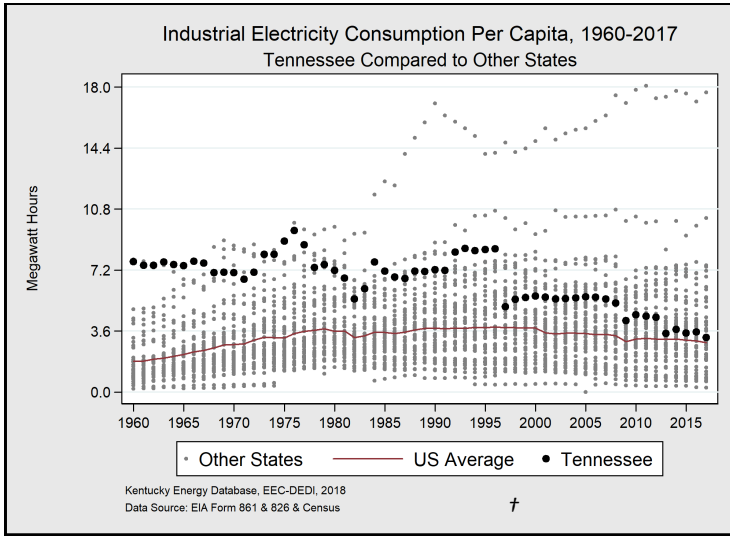
Historical Industrial Electricity Use per Capita



Historical Industrial Electricity Use per Capita

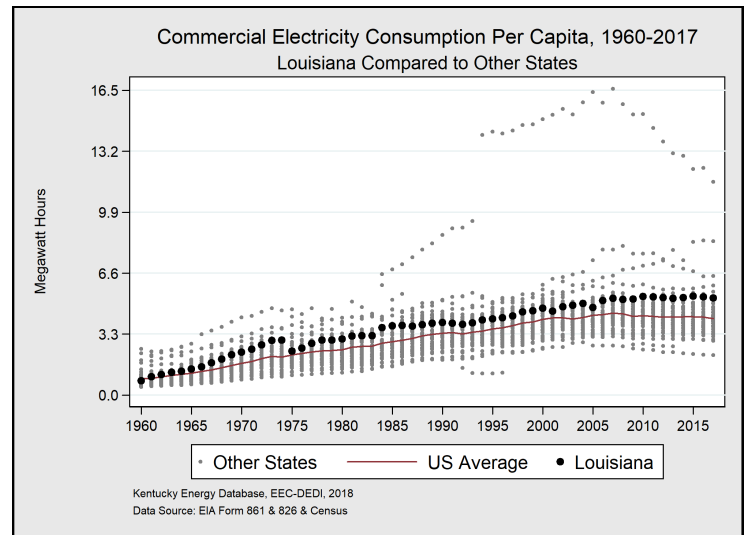
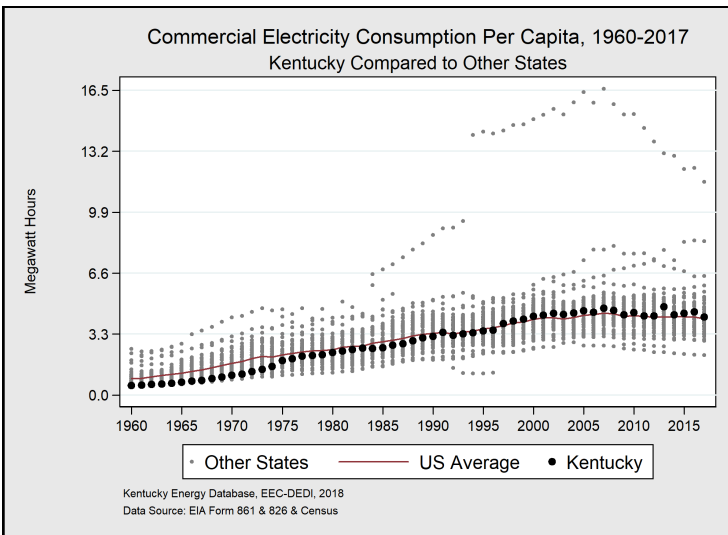
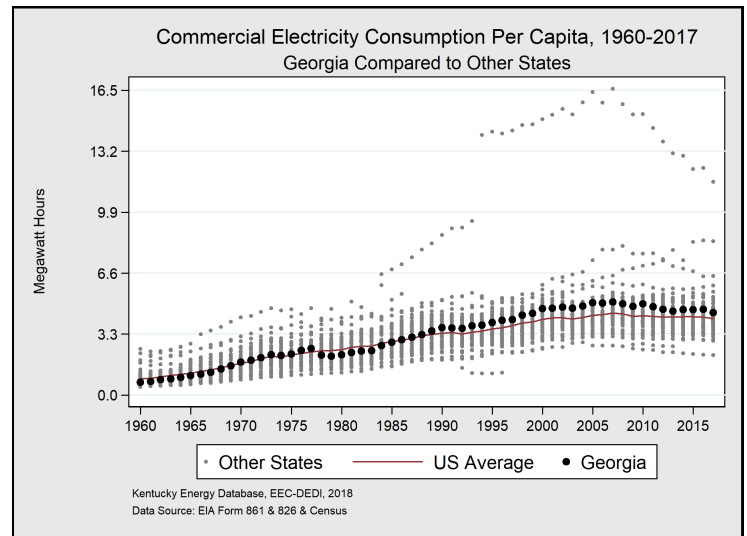
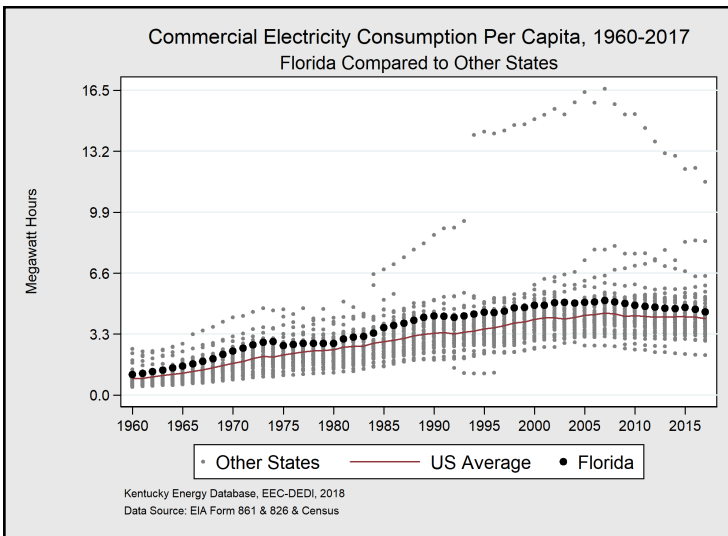
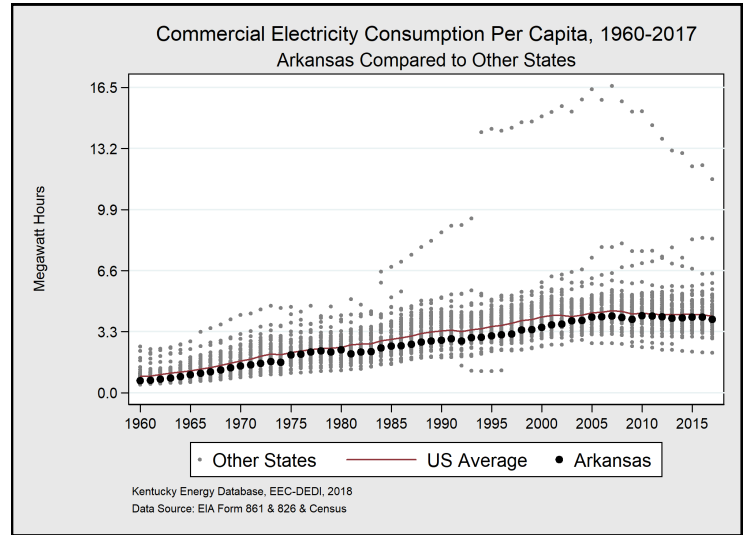
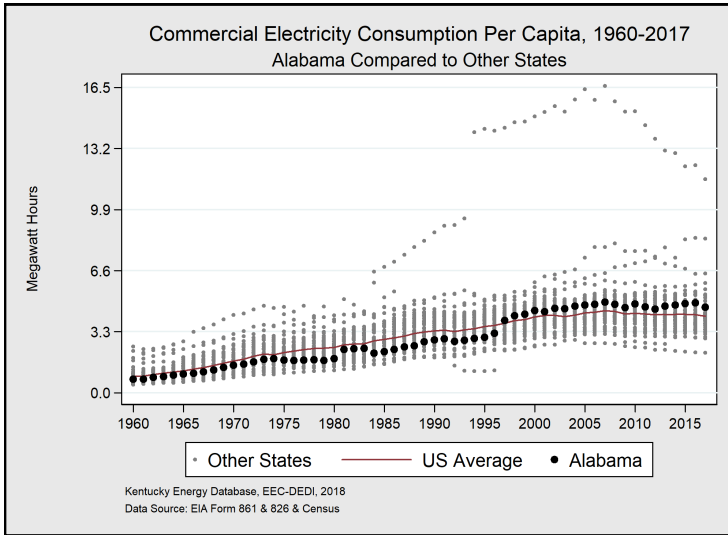


Historical Industrial Electricity Use per Capita

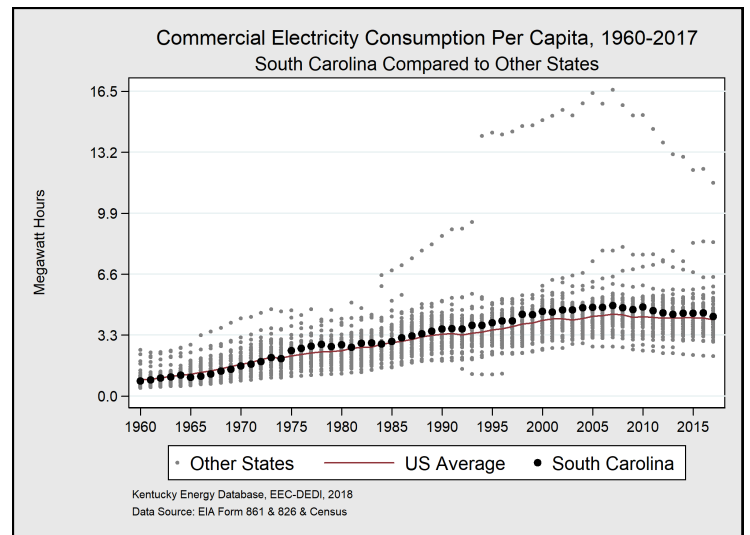
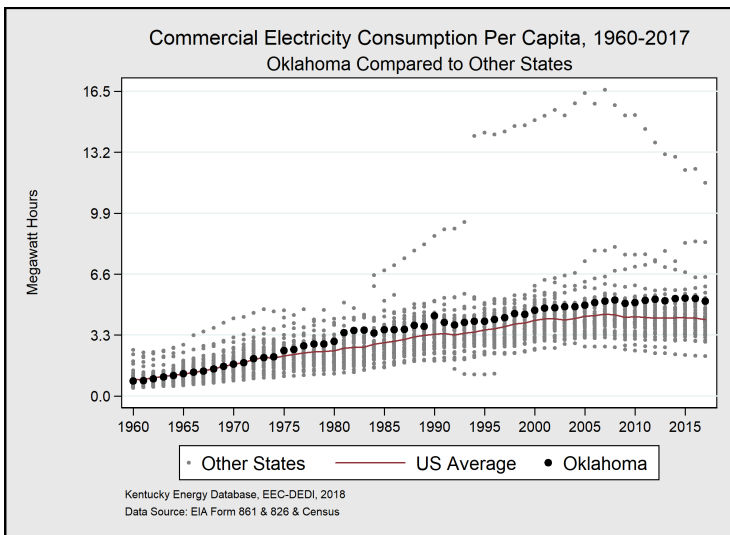
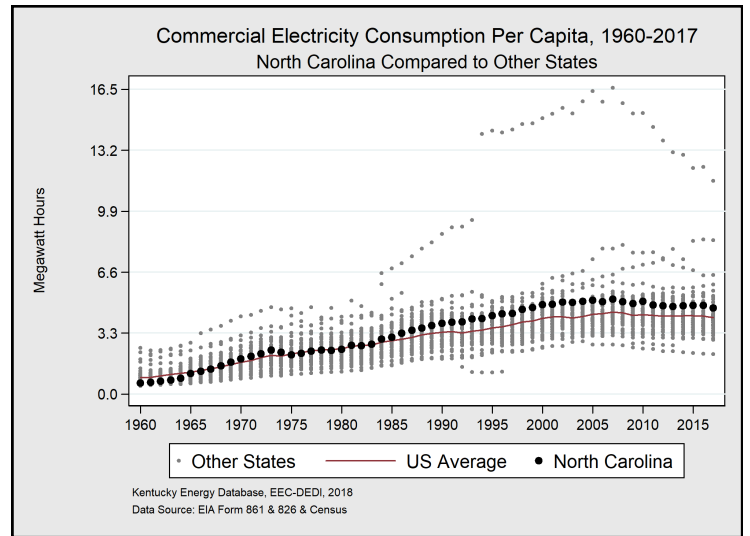
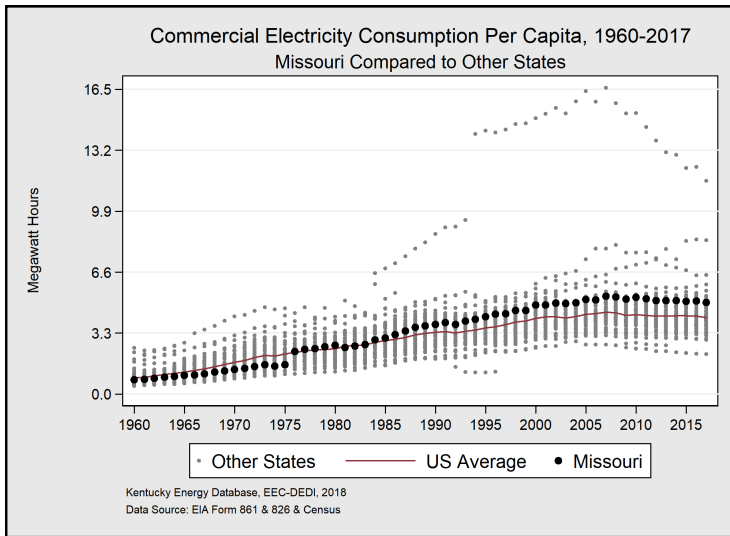
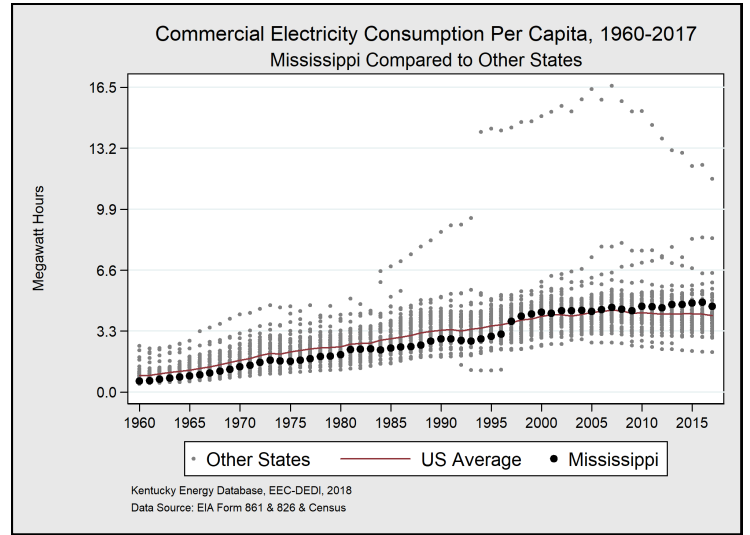
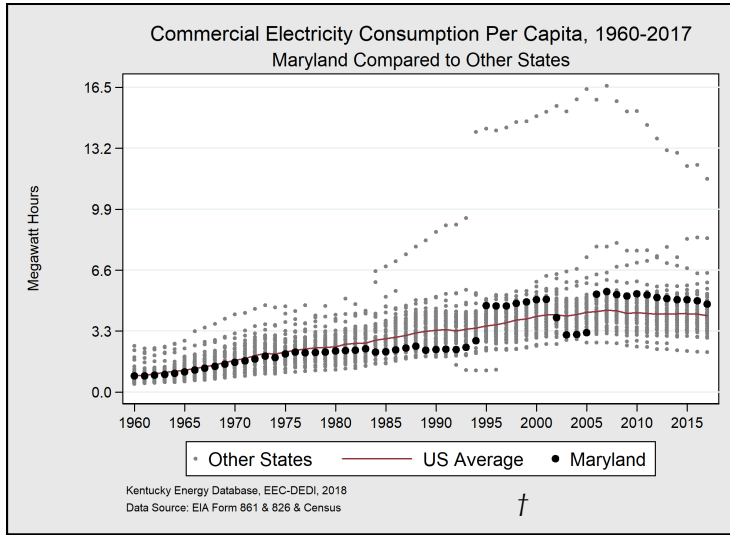


t Maryland and Tennessee show substantial fluctuation in per capita industrial electricity consumption due to the reclassification of certain industrial processes as commercial during this timeseries.

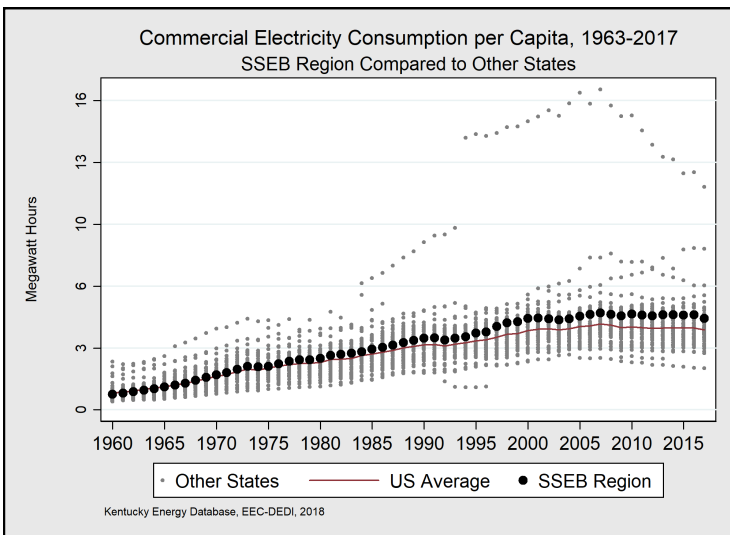
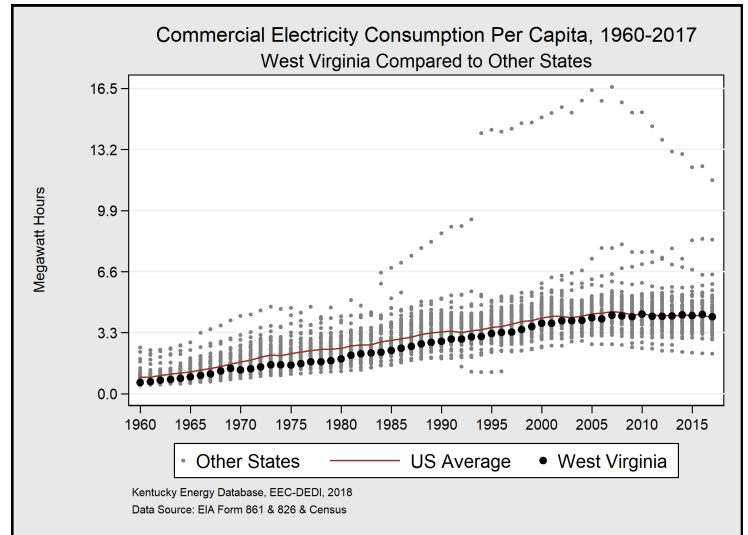
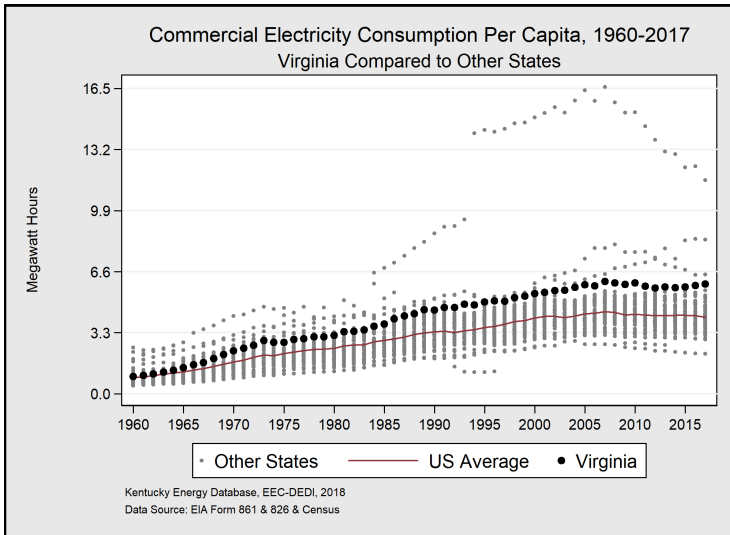
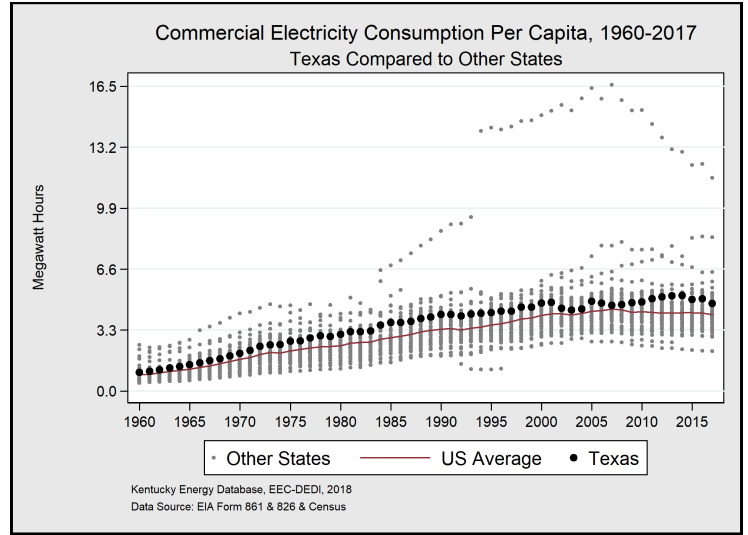
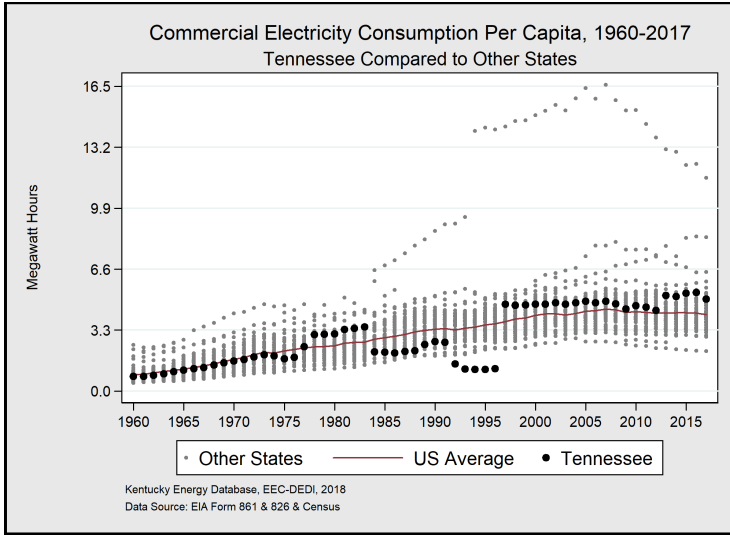
Historical Commercial Electricity Use per Capita



Historical Commercial Electricity Use per Capita

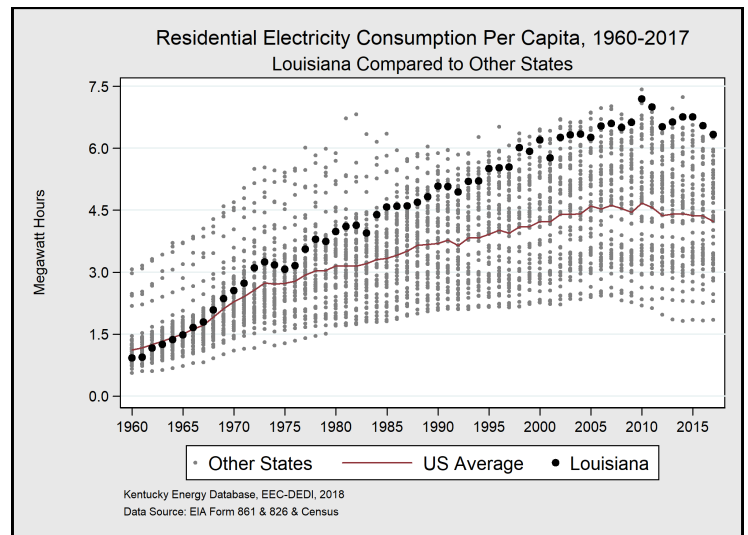
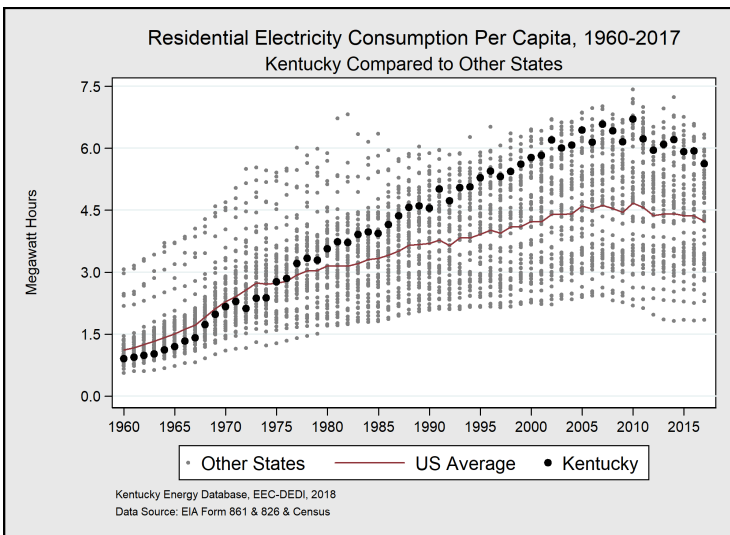
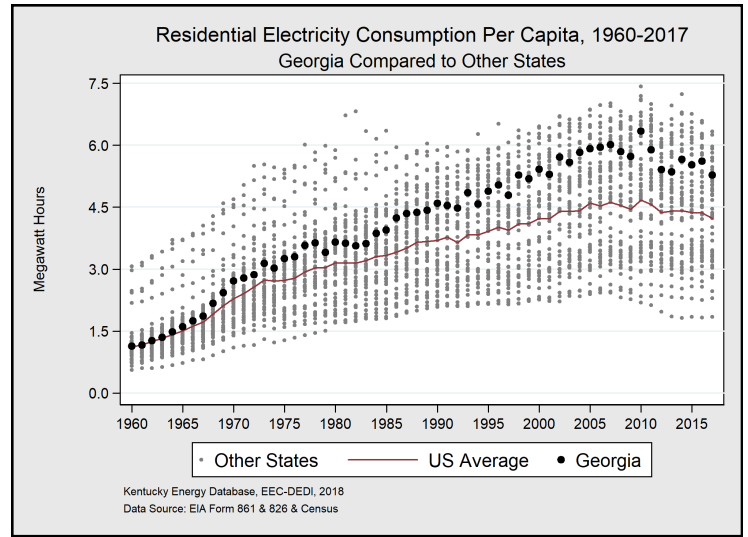
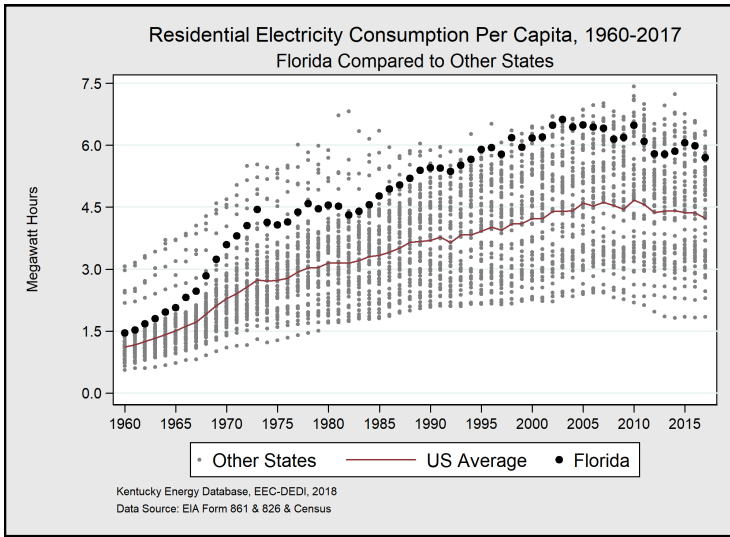
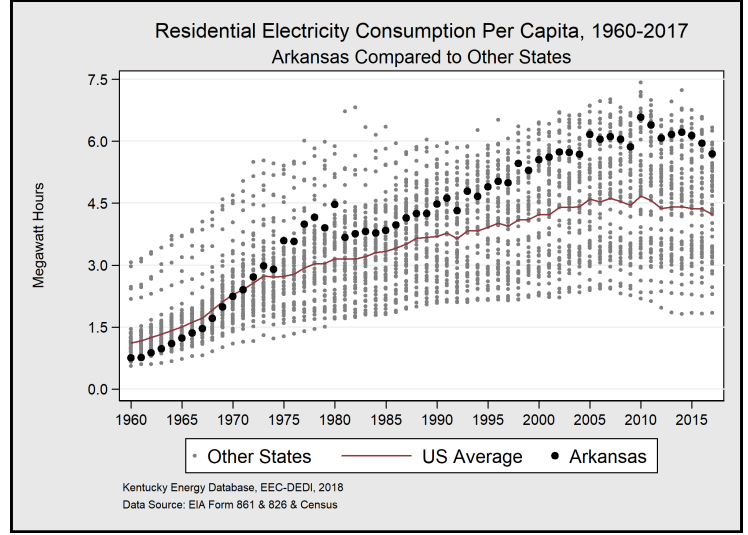
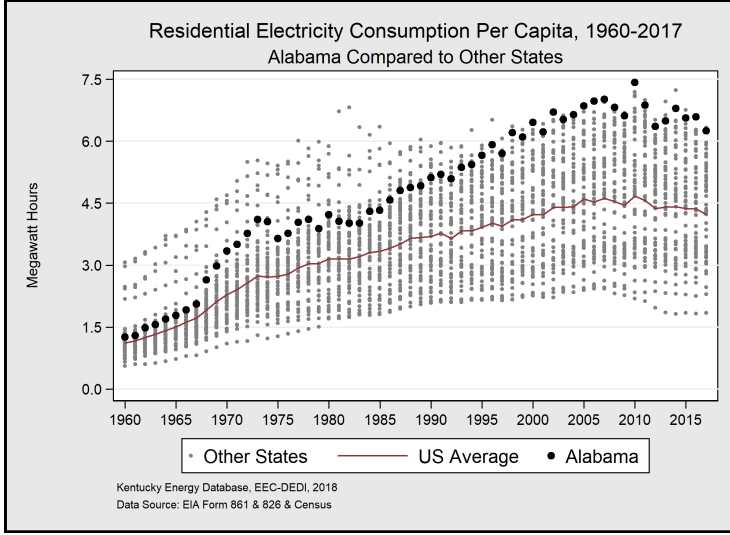


Historical Commercial Electricity Use per Capita

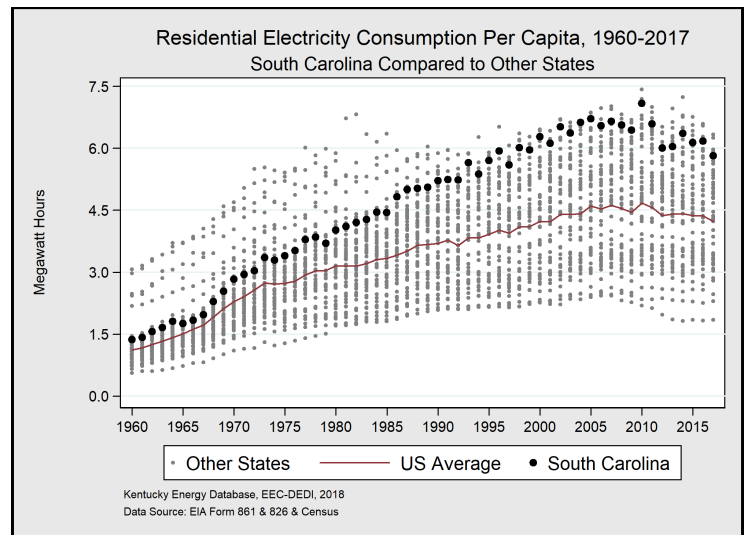
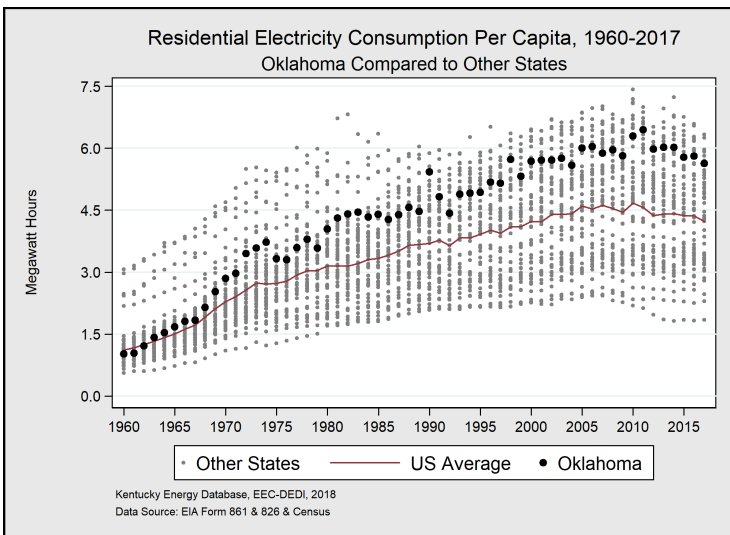
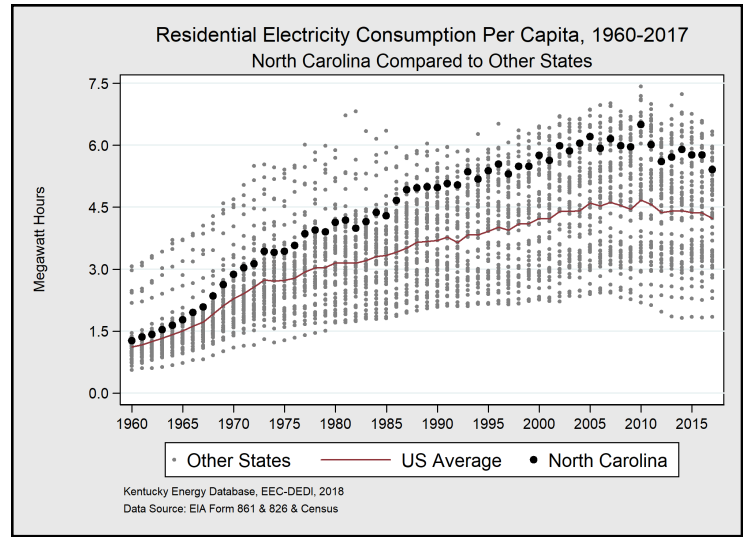
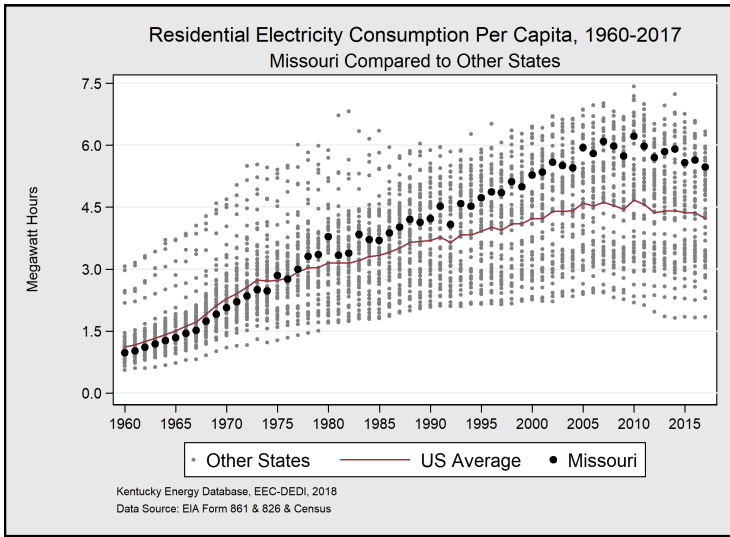
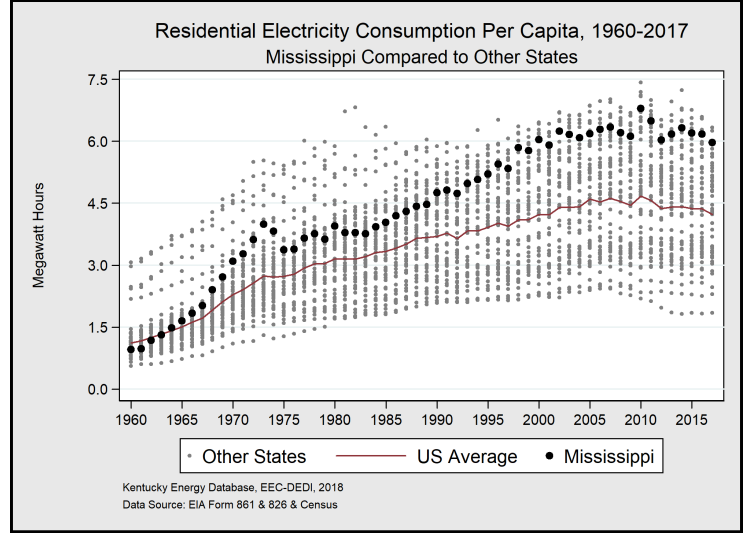
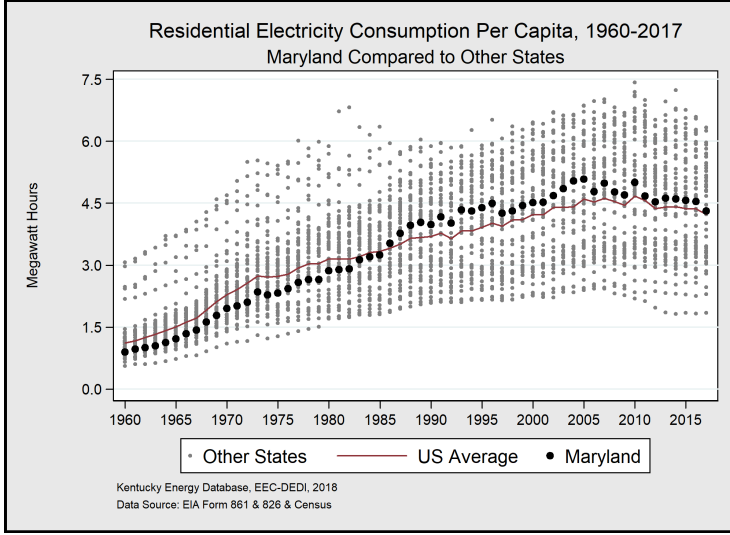


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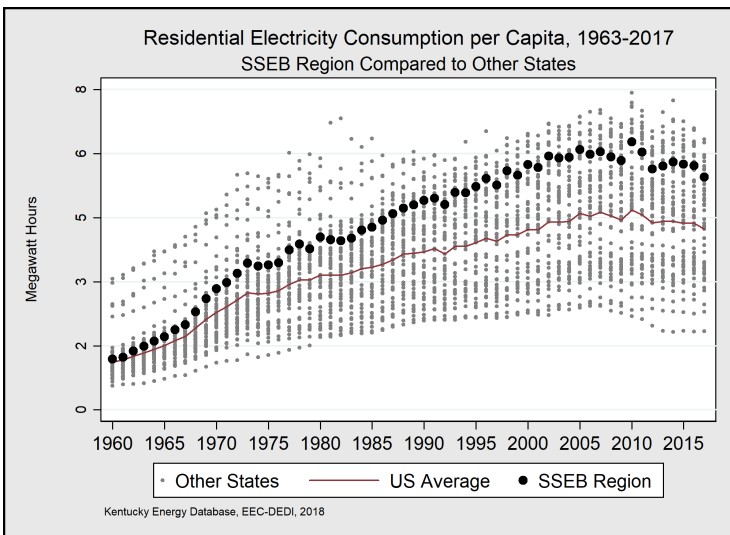
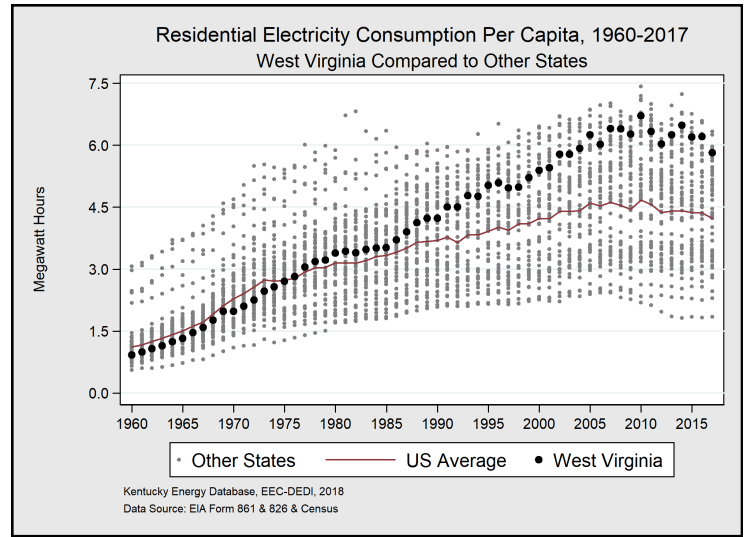
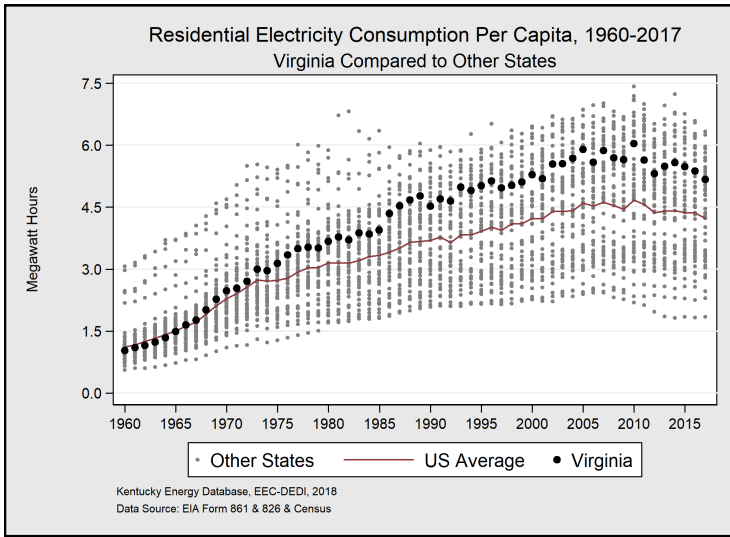
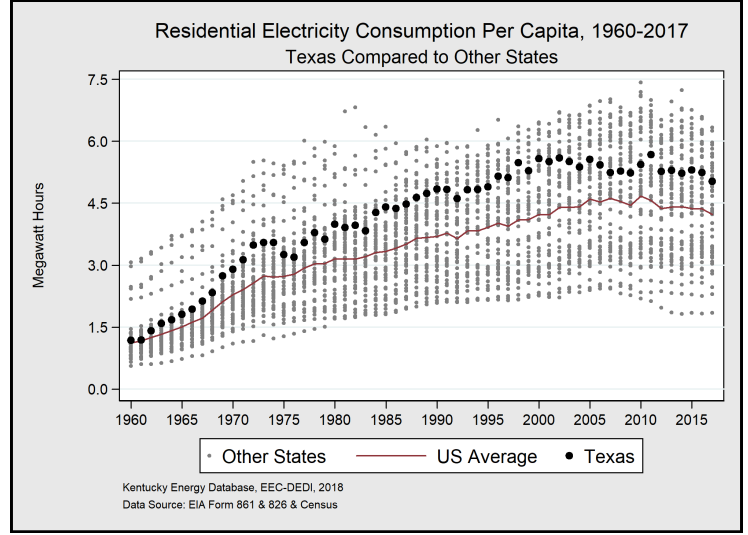
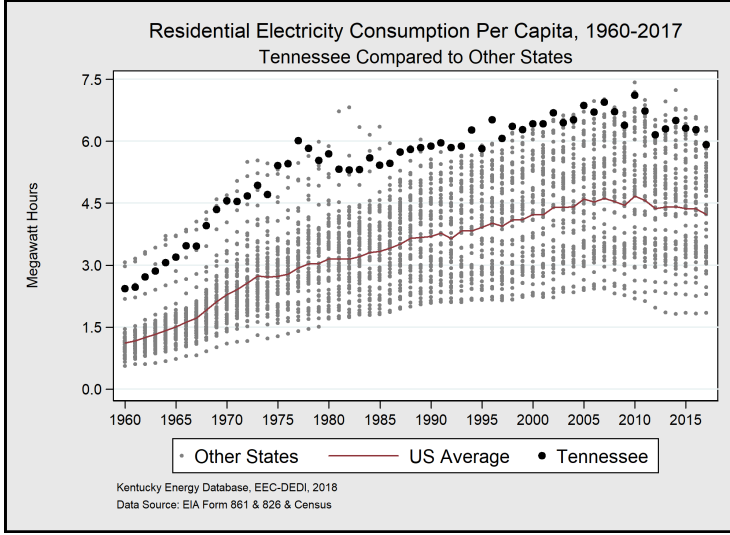
Historical Residential Electricity Use per Capita



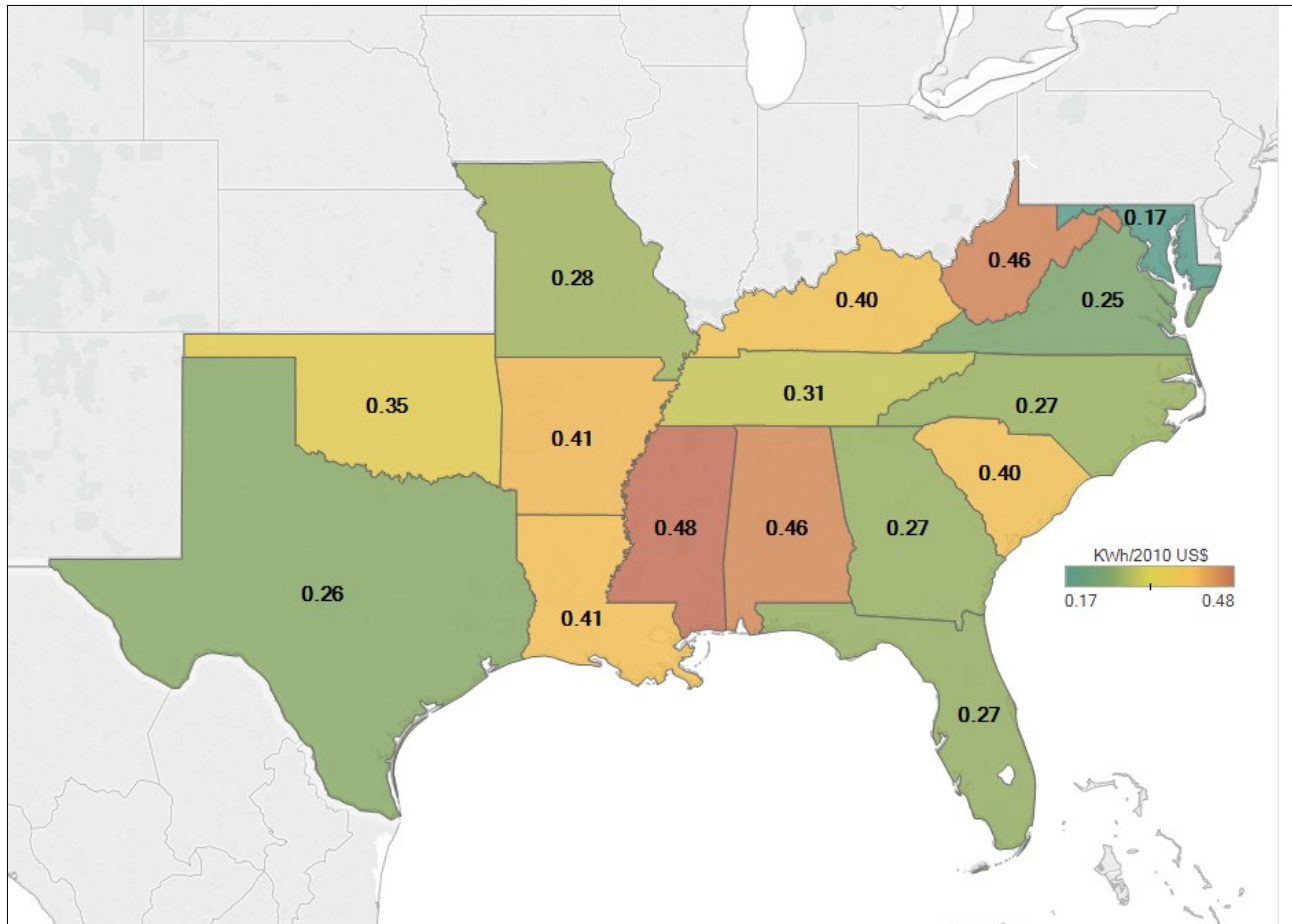
Historical Residential Electricity Use per Capita



Historical Residential Electricity Use per Capita

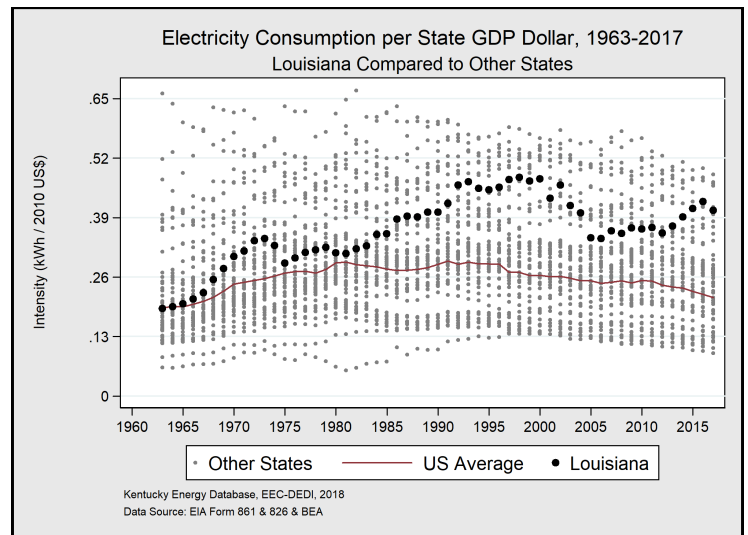
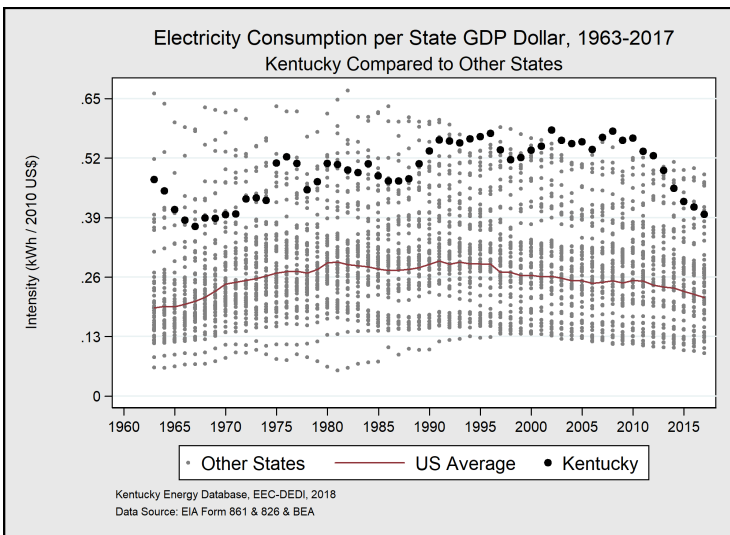
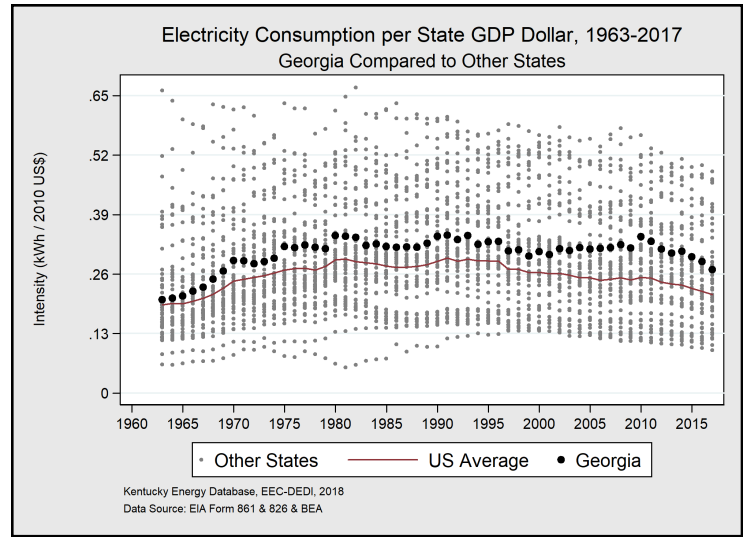
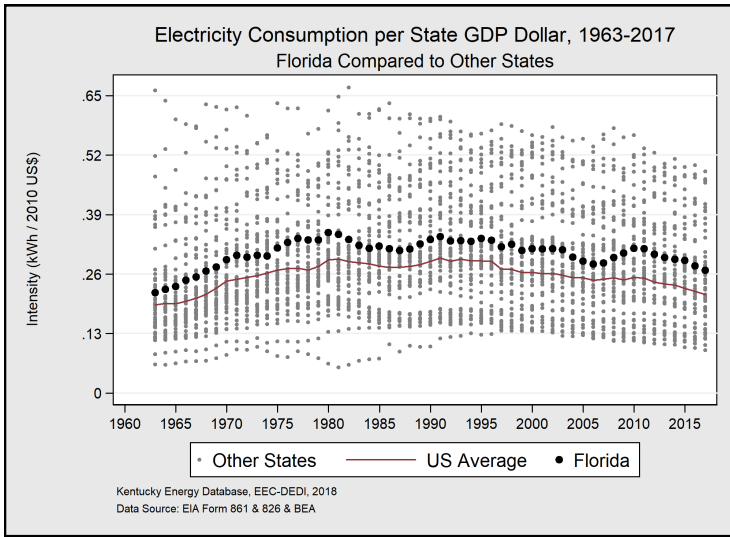
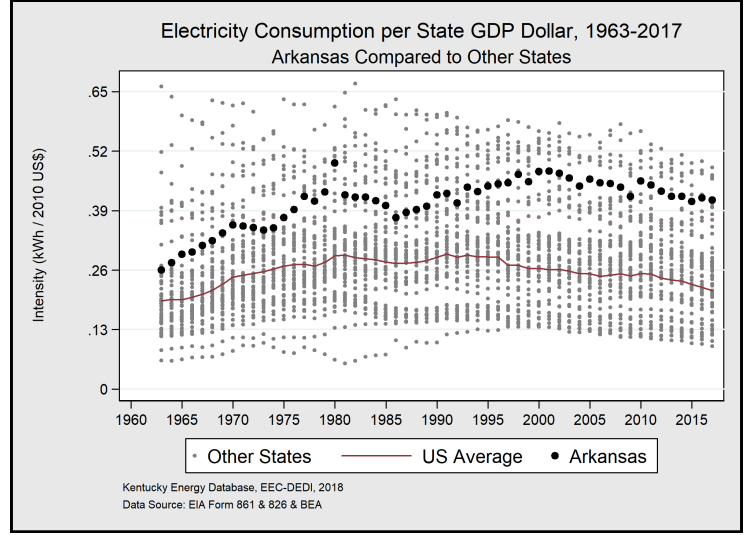
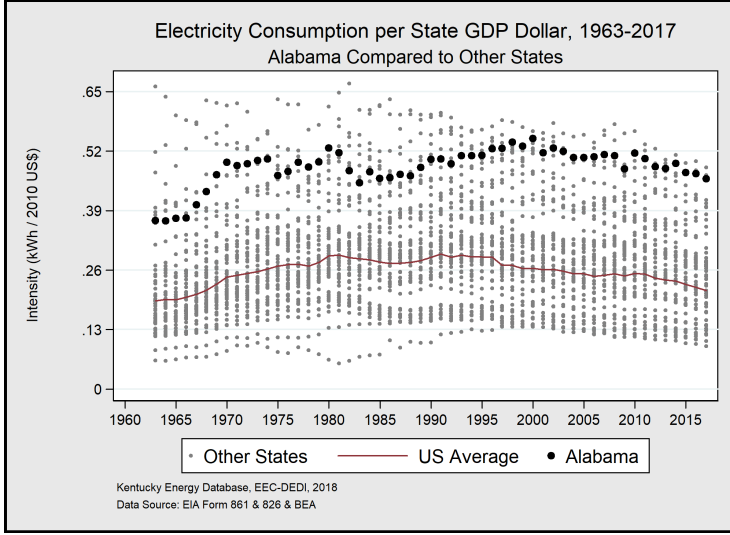


Electricity Consumption per State GDP Dollar

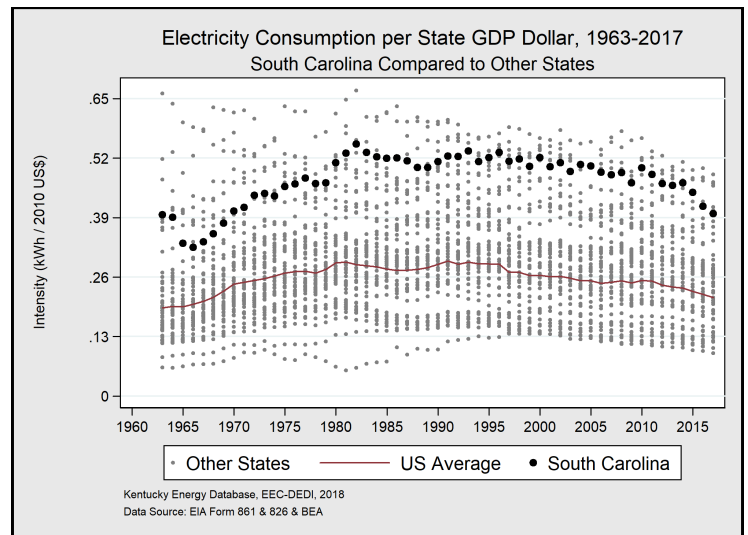
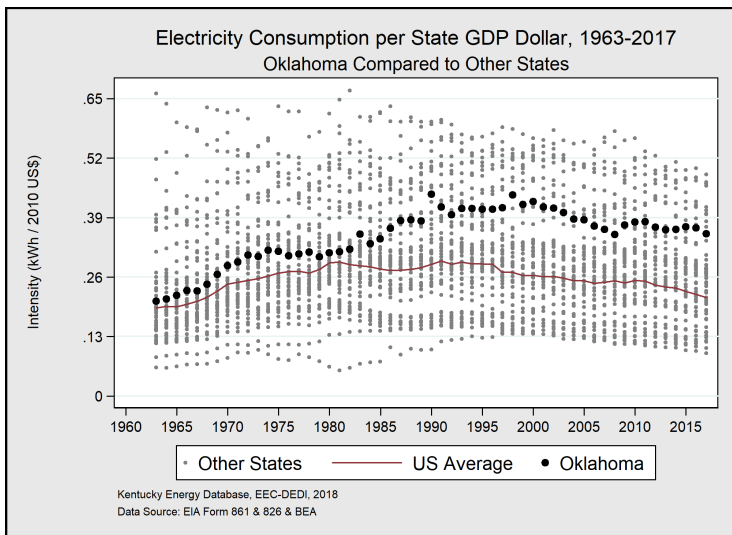
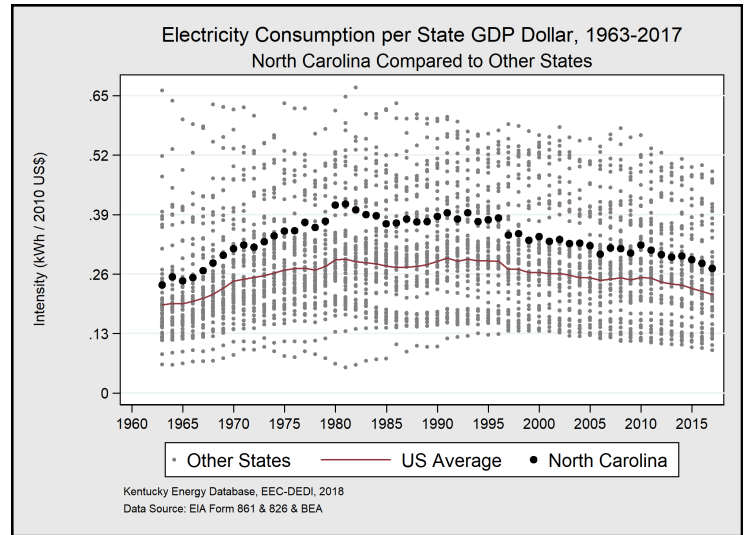
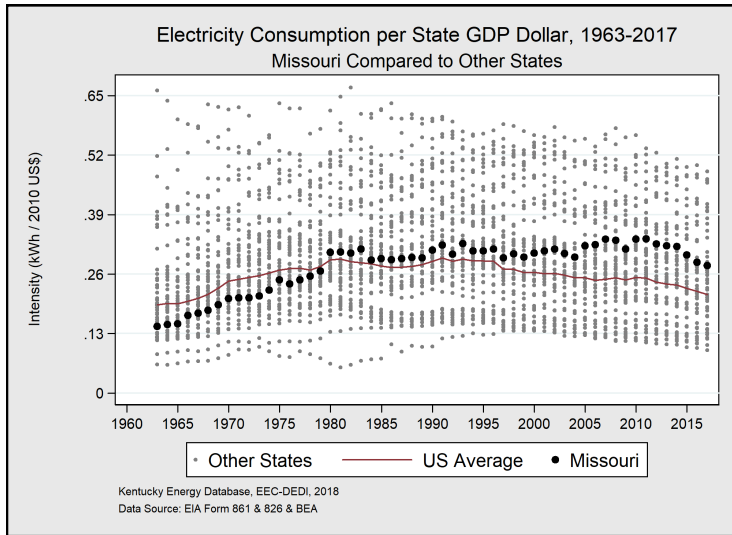
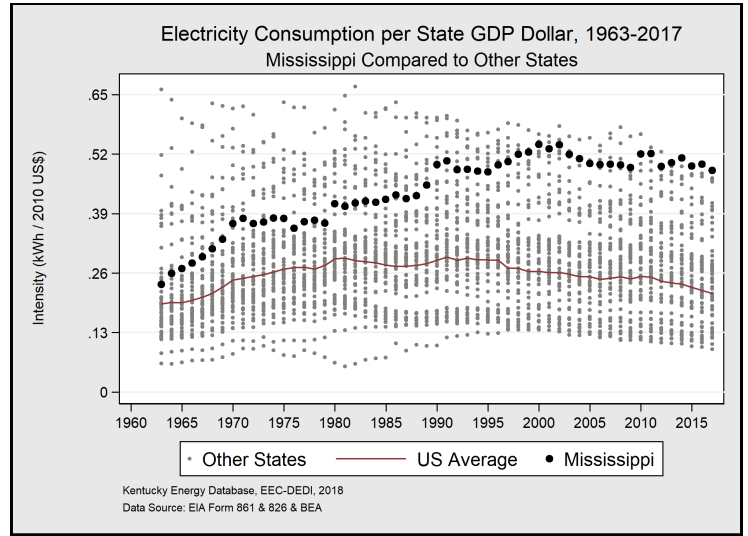
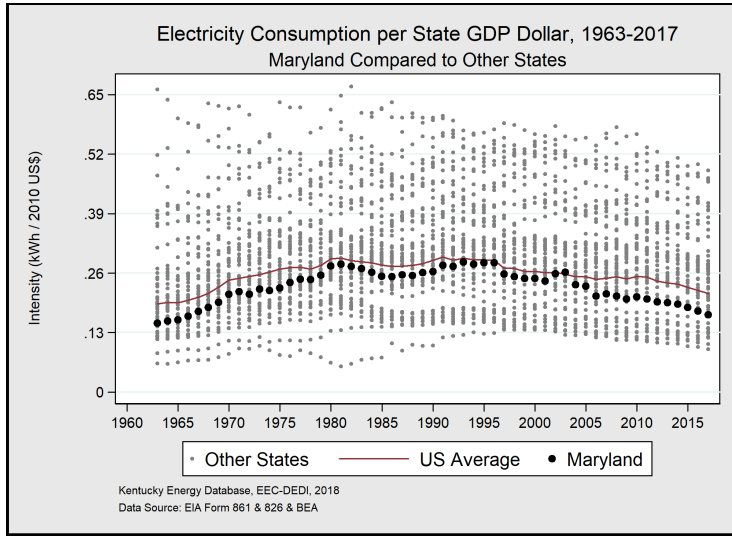


National Rank	State	kWh/ 2010 US\$
1	Mississippi	0.484
3	West Virginia	0.464
4	Alabama	0.459
5	Arkansas	0.413
6	Louisiana	0.405
7	South Carolina	0.398
8	Kentucky	0.397
11	Oklahoma	0.355
13	Tennessee	0.308
17	Missouri	0.278
21	North Carolina	0.272
22	Georgia	0.270
23	Florida	0.268
26	Texas	0.257
28	Virginia	0.245
41	Maryland	0.169

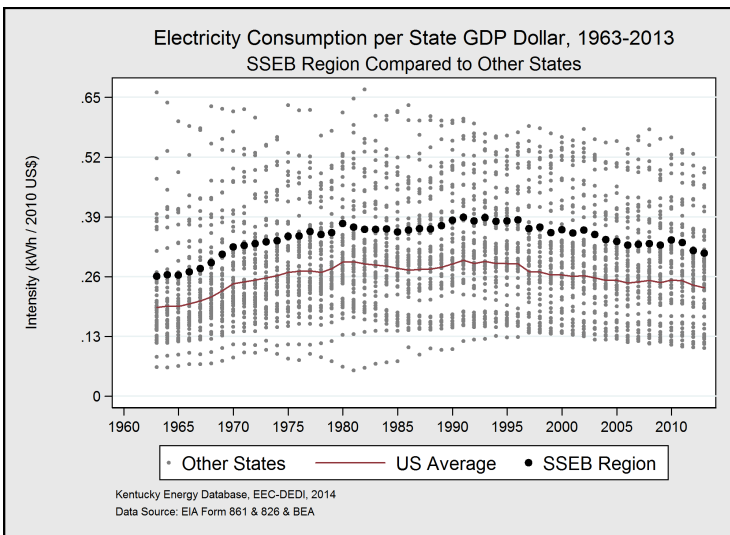
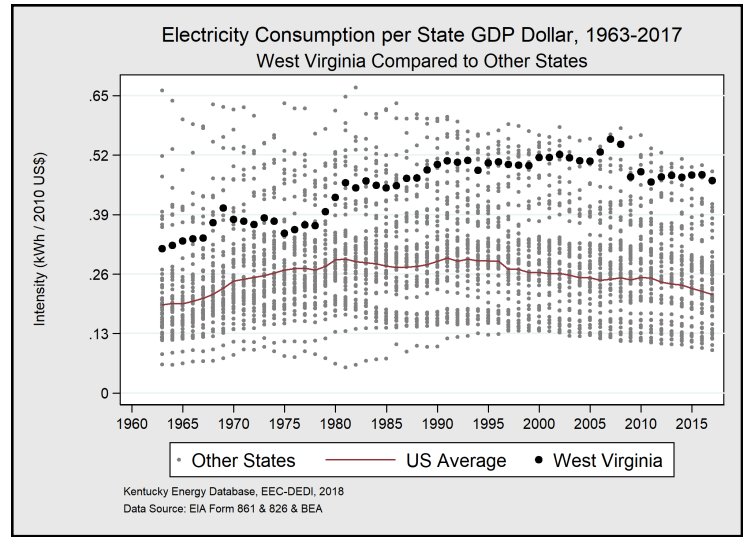
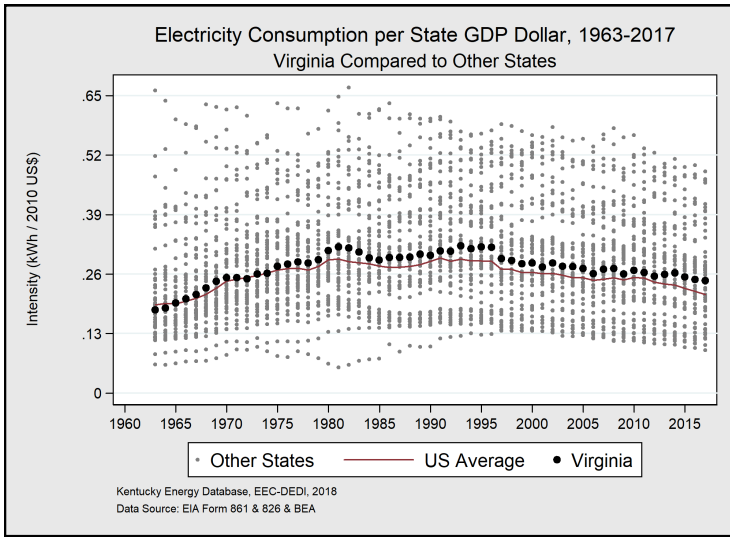
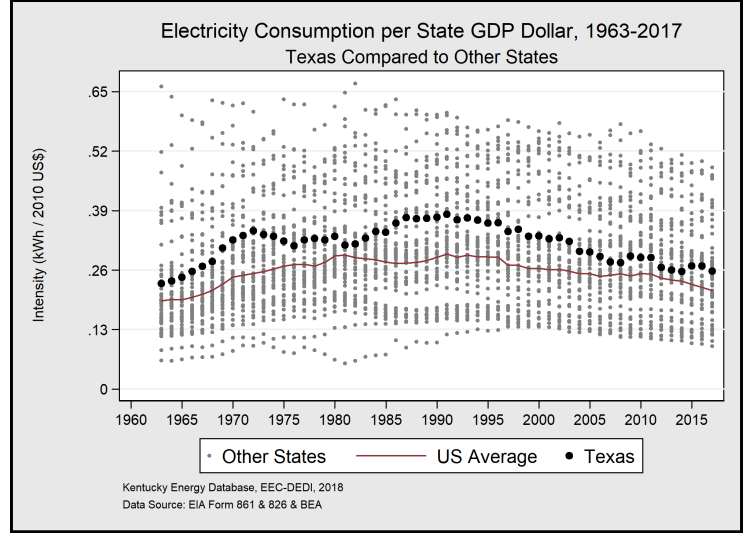
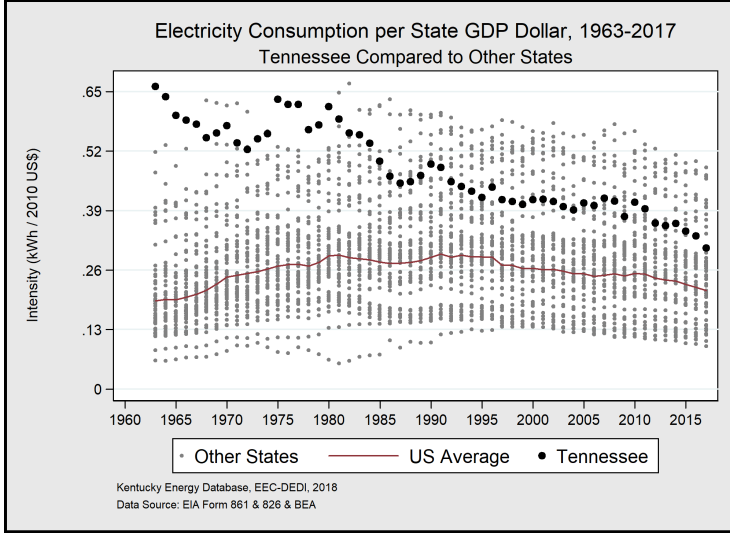
Historical Electricity Consumption per GDP Dollar



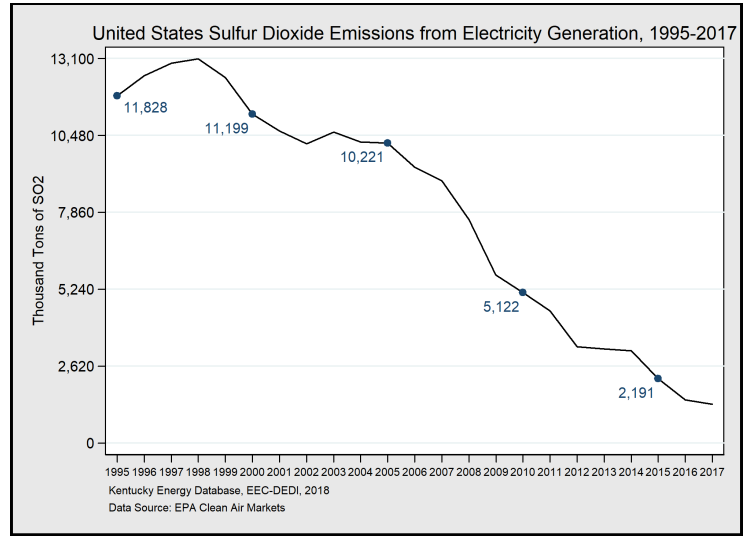
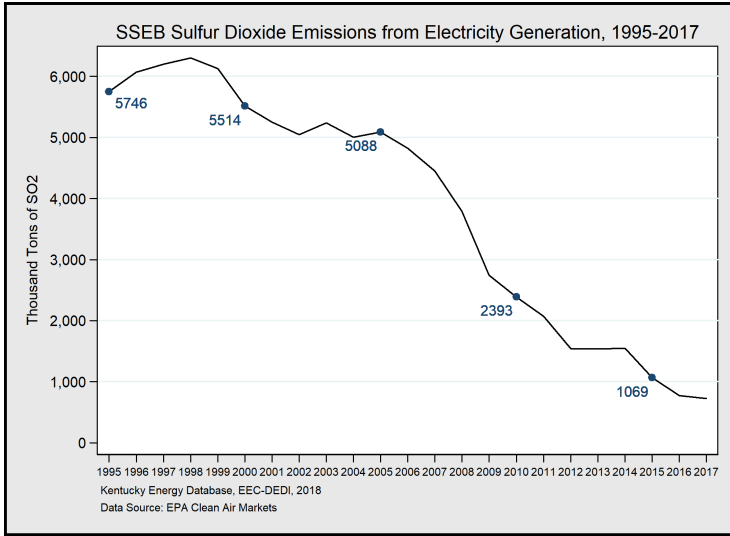
Historical Electricity Consumption per GDP Dollar



Historical Electricity Consumption per GDP Dollar



SSEB Region Electric Power Emissions



Emission	2017 Tons	Since 2005
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Sulfur Dioxide	726,925	-85.8%
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Emission	2017 Tons	Since 2005
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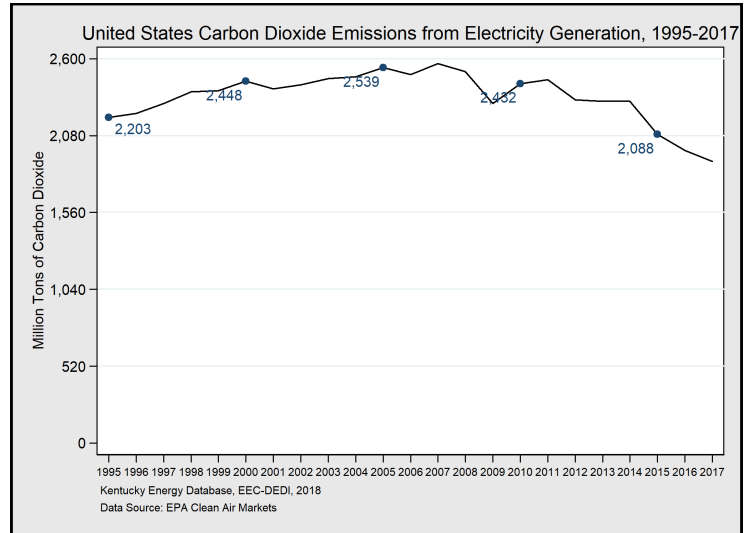
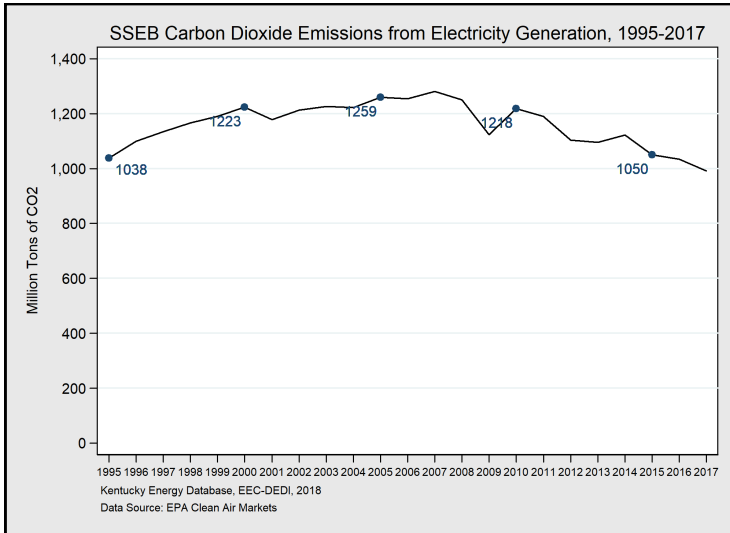
Sulfur Dioxide	1,319,076	-87.2%
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Emission	2017 Tons	Since 2005
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Carbon Dioxide	991,101,231	-20.7%
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Emission	2017 Tons	Since 2005
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Carbon Dioxide	1,904,600,962	-25.1%
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For the region as a whole, emissions from the electric power sector continue to decrease compared with 2005. Overall, most states in the region have had a decline in emissions since 2015. The region as a whole has had a drop in sulfur dioxide emissions of 32 percent since 2015.

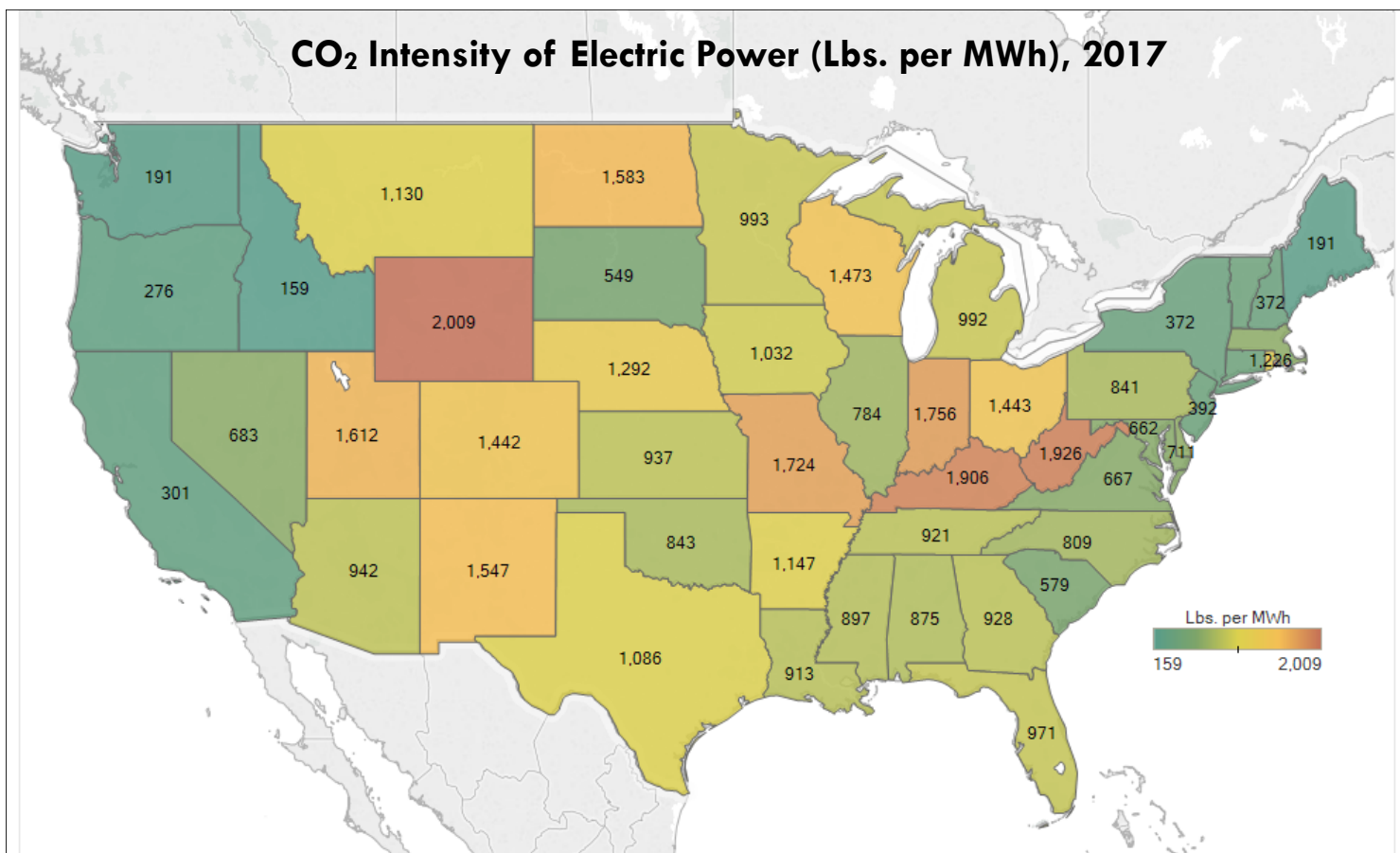
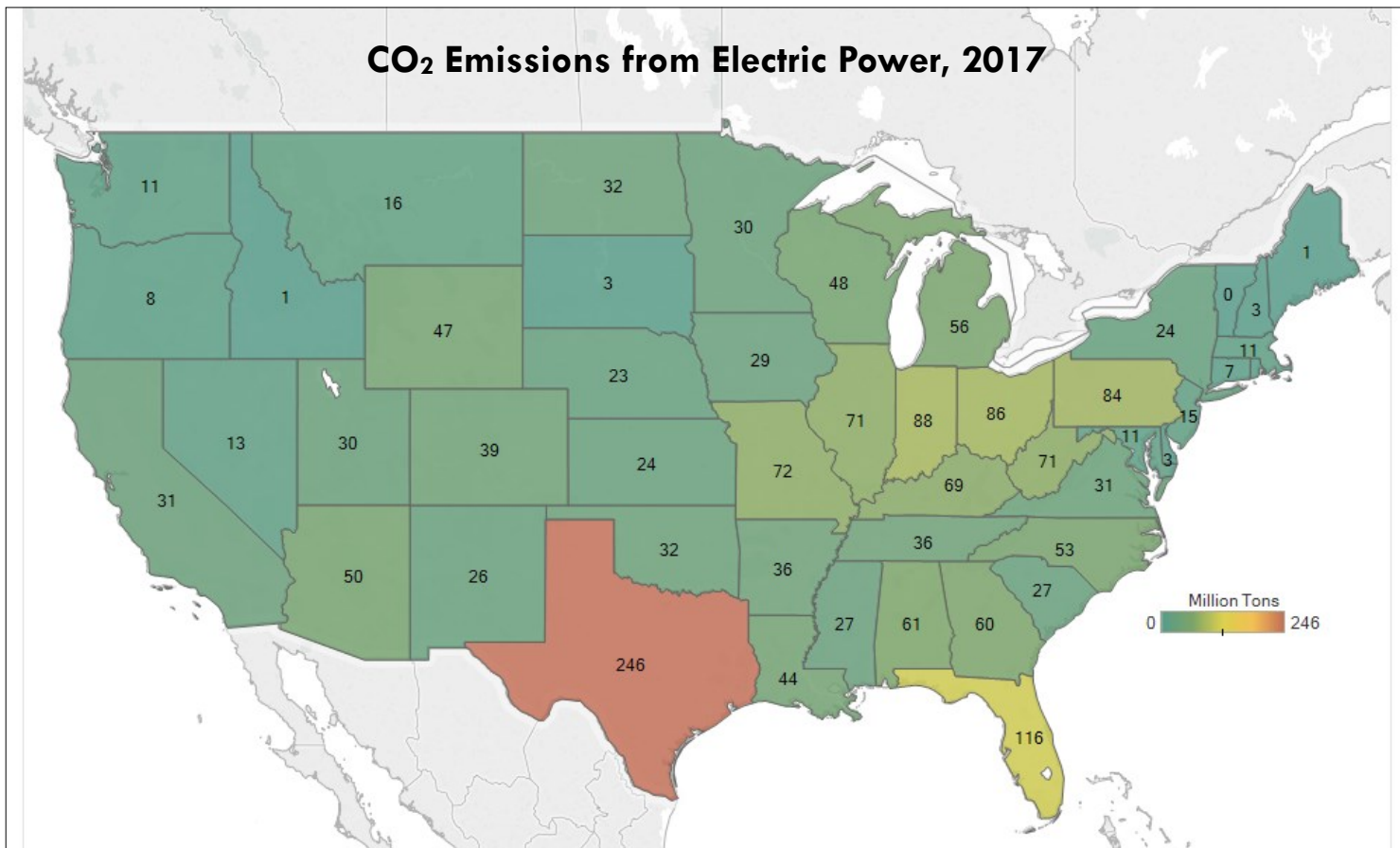
Nationally, power sector emissions reductions have continued at a slightly higher rate than those for the SSEB region. Sulfur dioxide emissions have declined 39 percent since 2015. As with the region, nationally, emissions have declined substantially since 2005, and have declined overall since 2015.

Electric Power Emissions by State, 2017

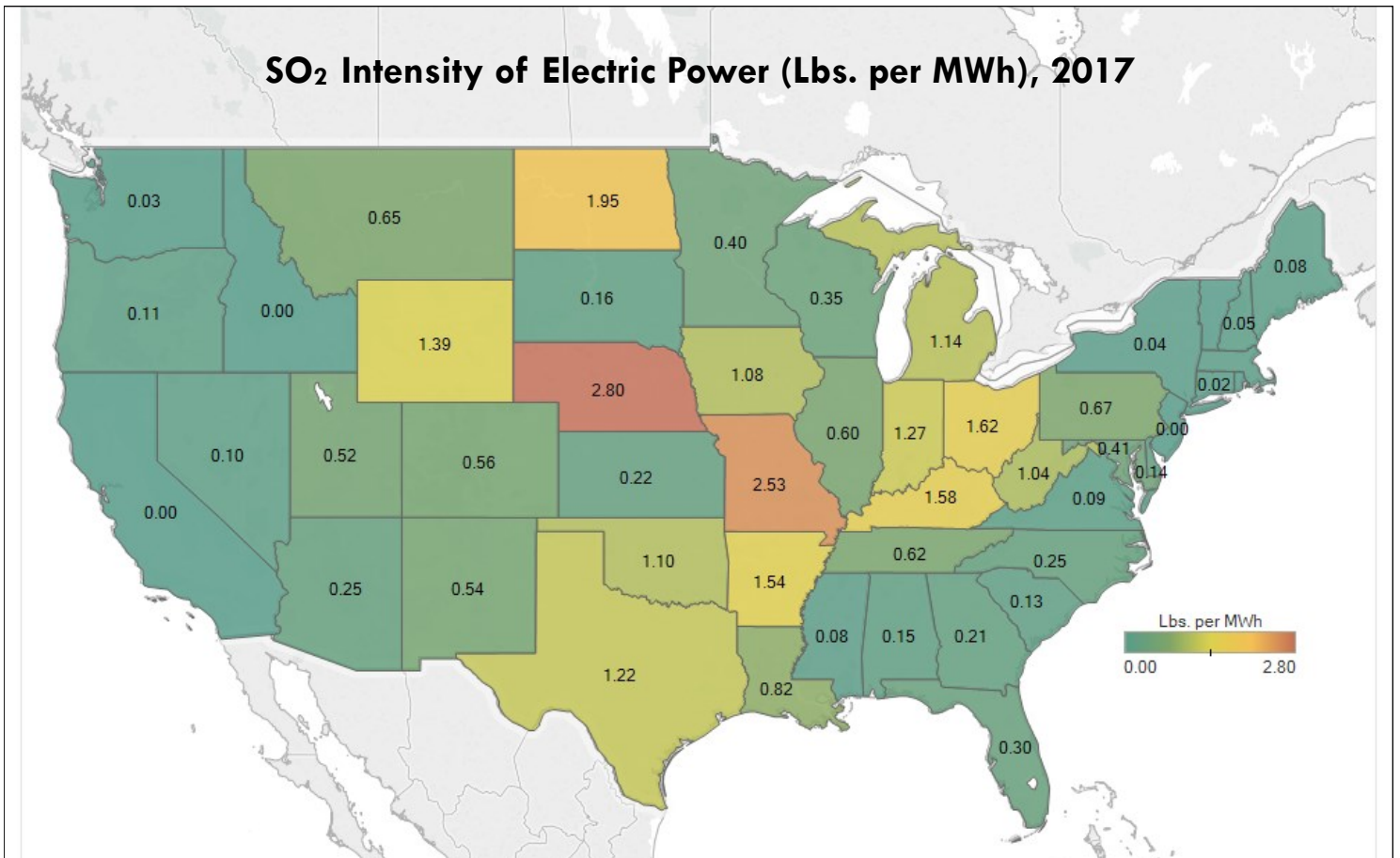
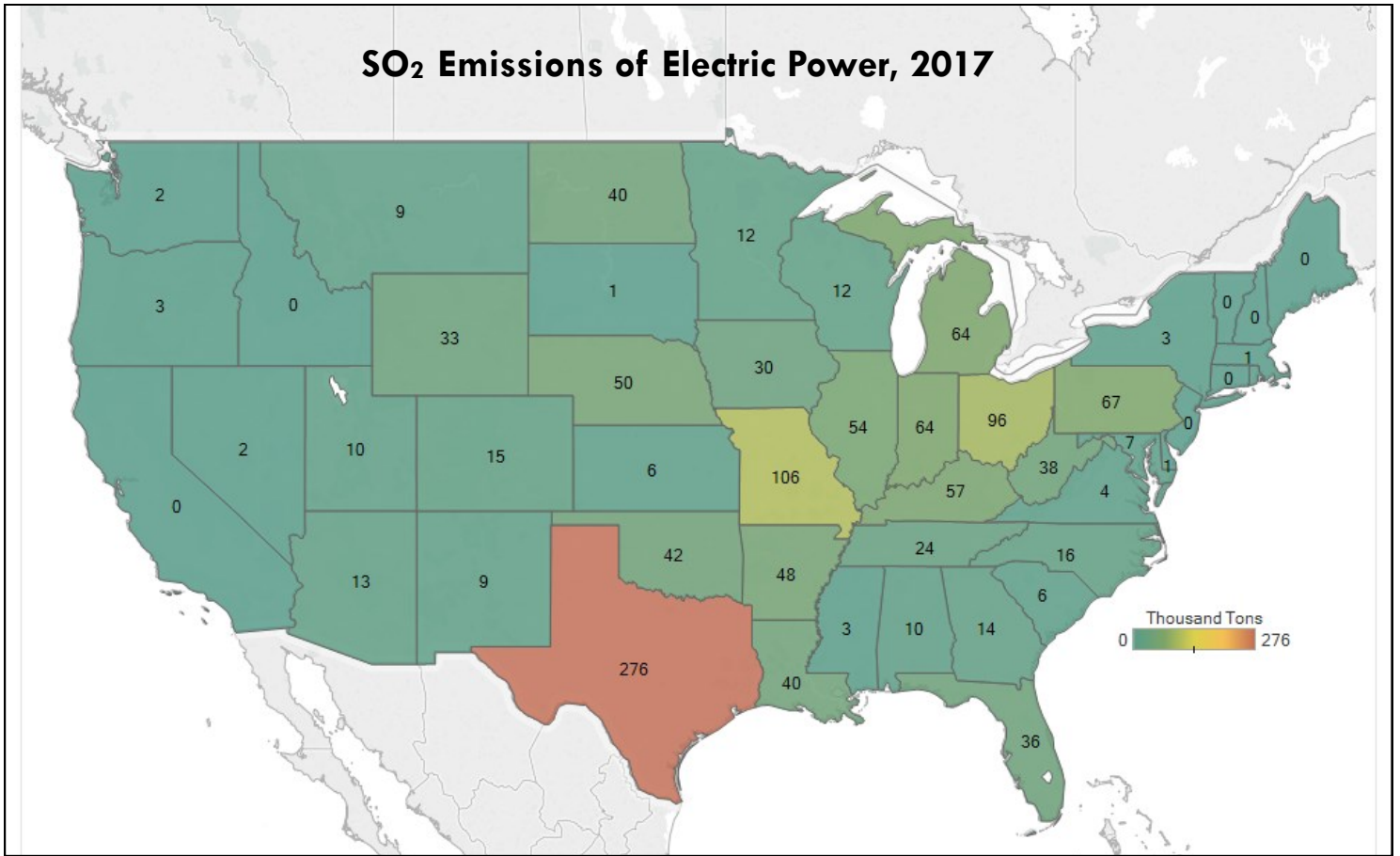
Rank	State*	CO ₂ Intensity (Lbs./MWh)	CO ₂ Emissions (Million Tons)	SO ₂ Intensity (Lbs./MWh)	SO ₂ Emissions (Tons)	NO _x Intensity (Lbs./MWh)	NO _x Emissions (Tons)
1	Idaho	159	1	0.001	6	0.02	166
2	Maine	191	1	0.079	444	0.05	263
3	Washington	191	11	0.030	1,740	0.12	6,697
4	Oregon	276	8	0.114	3,322	0.09	2,523
5	California	301	31	0.002	158	0.02	2,146
6	New Hampshire	372	3	0.054	473	0.12	1,070
7	New York	372	24	0.040	2,547	0.11	7,097
8	New Jersey	392	15	0.003	102	0.04	1,627
9	Connecticut	398	7	0.025	421	0.06	990
10	Vermont	401	0	0.001	1	0.13	139
11	South Dakota	549	3	0.162	848	0.22	1,135
12	South Carolina	579	27	0.130	6,072	0.22	10,172
13	Maryland	662	11	0.413	7,049	0.25	4,228
14	Virginia	667	31	0.089	4,141	0.27	12,647
15	Nevada	683	13	0.103	1,958	0.17	3,258
16	Massachusetts	697	11	0.069	1,083	0.12	1,925
17	Delaware	711	3	0.142	545	0.16	608
18	Illinois	784	71	0.599	54,480	0.32	29,407
19	North Carolina	809	53	0.248	16,221	0.49	32,197
20	Pennsylvania	841	84	0.669	66,992	0.34	34,479
21	Oklahoma	843	32	1.100	42,081	0.54	20,528
22	Alabama	875	61	0.150	10,469	0.31	21,272
23	Mississippi	897	27	0.085	2,569	0.40	12,133
24	Louisiana	913	44	0.819	39,699	0.58	28,011
25	Tennessee	921	36	0.622	24,293	0.40	15,517
26	Georgia	928	60	0.214	13,794	0.38	24,425
27	Kansas	937	24	0.216	5,554	0.50	12,881
28	Arizona	942	50	0.252	13,328	0.63	33,600
29	Florida	971	116	0.300	35,625	0.39	46,747
30	Michigan	992	56	1.137	63,903	0.58	32,363
31	Minnesota	993	30	0.404	12,073	0.53	15,911
32	Iowa	1,032	29	1.076	30,390	0.80	22,465
33	Texas	1,086	246	1.221	275,979	0.48	109,099
34	Montana	1,130	16	0.652	9,222	0.97	13,765
35	Arkansas	1,147	36	1.538	47,769	0.89	27,500
36	Rhode Island	1,226	3	0.007	18	0.18	470
37	Nebraska	1,292	23	2.798	50,271	1.09	19,554
38	Colorado	1,442	39	0.556	15,107	0.93	25,180
39	Ohio	1,443	86	1.617	96,186	0.94	56,018
40	Wisconsin	1,473	48	0.354	11,534	0.53	17,246
41	New Mexico	1,547	26	0.539	9,043	2.19	36,806
42	North Dakota	1,583	32	1.952	39,958	1.64	33,473
43	Utah	1,612	30	0.523	9,608	1.69	30,986
44	Missouri	1,724	72	2.529	105,986	1.18	49,489
45	Indiana	1,756	88	1.268	63,734	1.23	61,899
46	Kentucky	1,906	69	1.584	57,118	1.27	45,957
47	West Virginia	1,926	71	1.037	38,060	1.11	40,843
48	Wyoming	2,009	47	1.390	32,542	1.45	33,940

*Alaska, Hawaii, and Washington D.C. are omitted as they do not report emissions to the EPA's Clean Air Markets database.

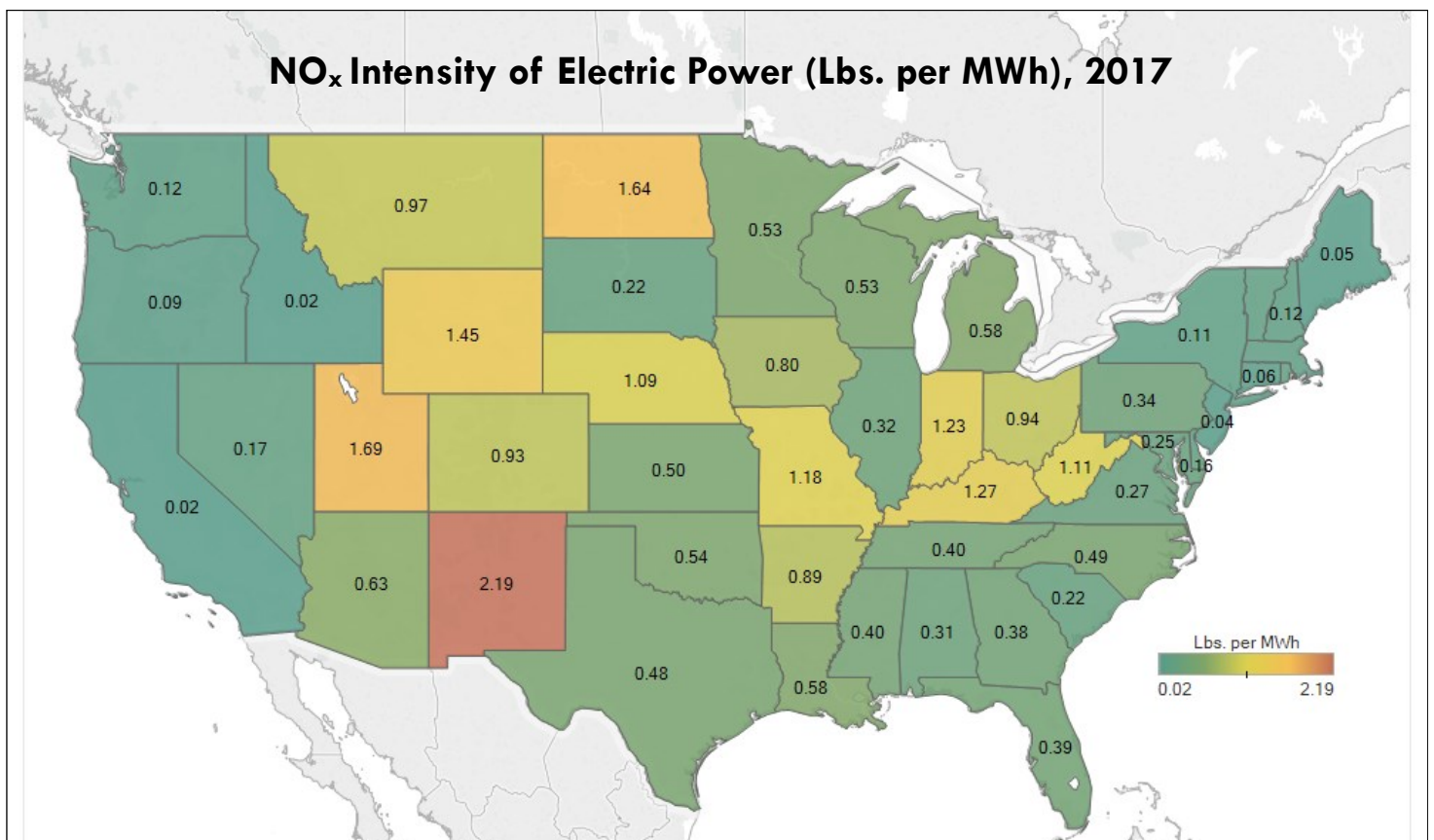
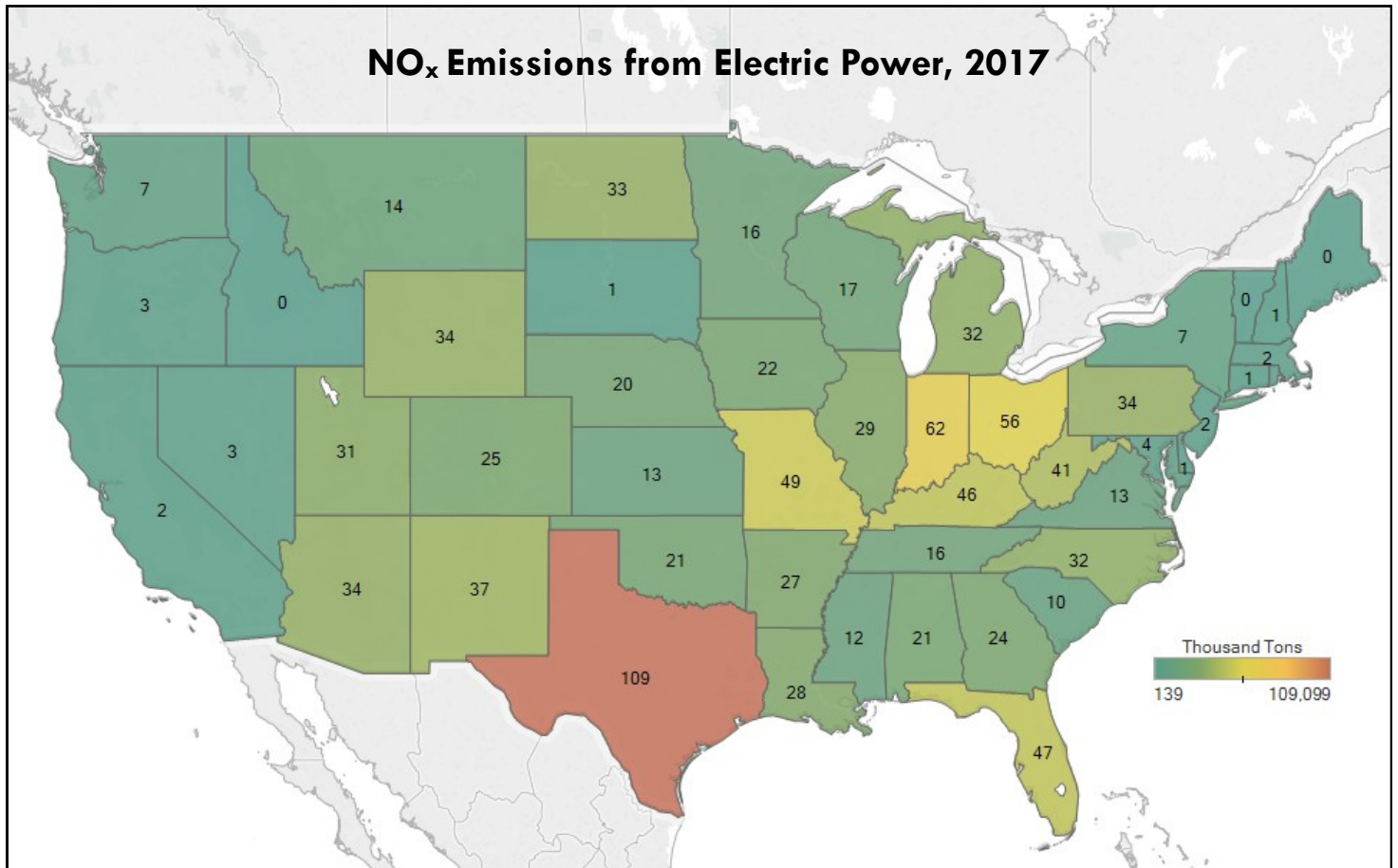
CO₂ Emissions by State



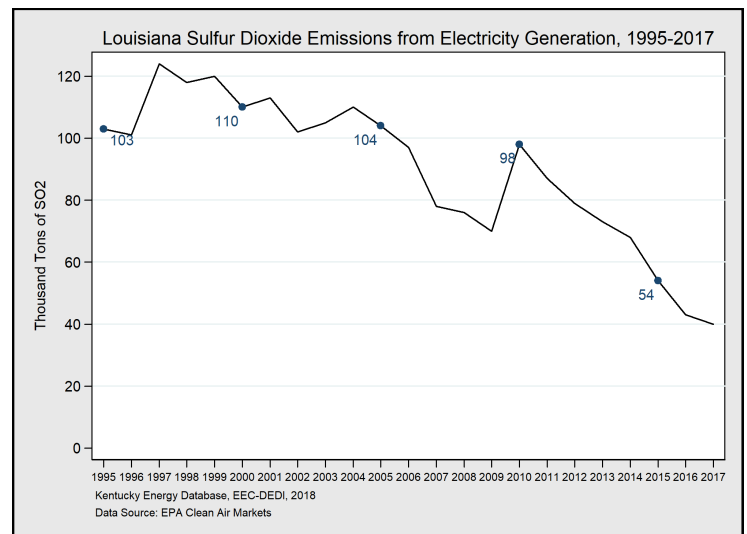
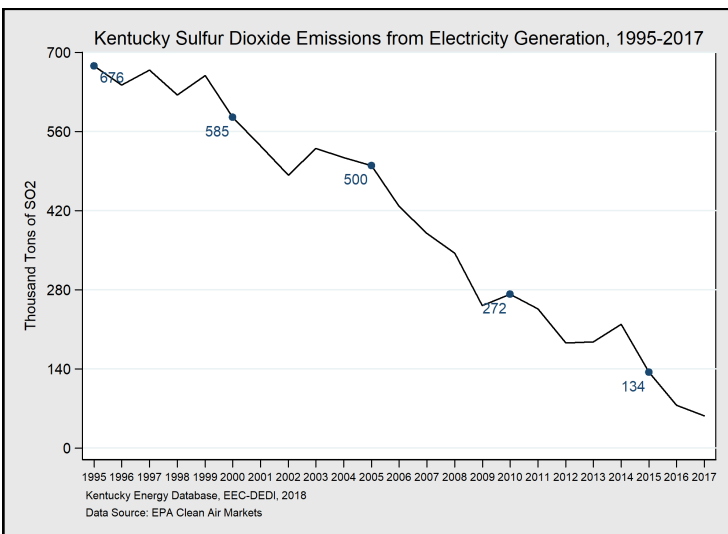
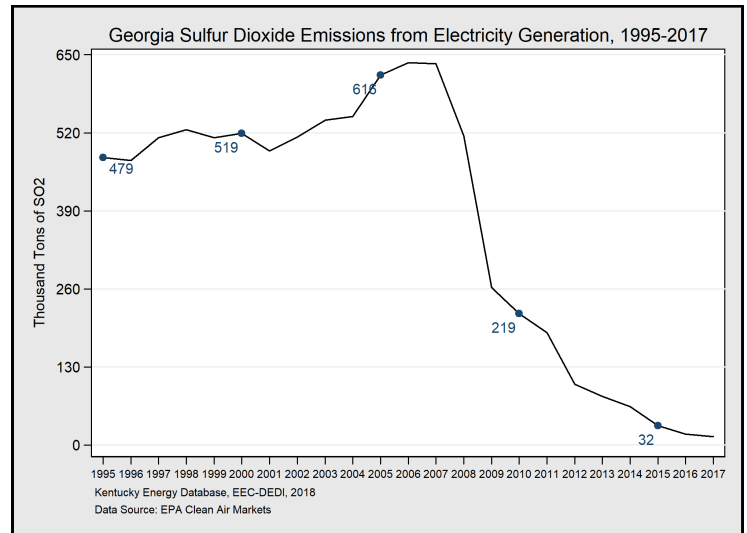
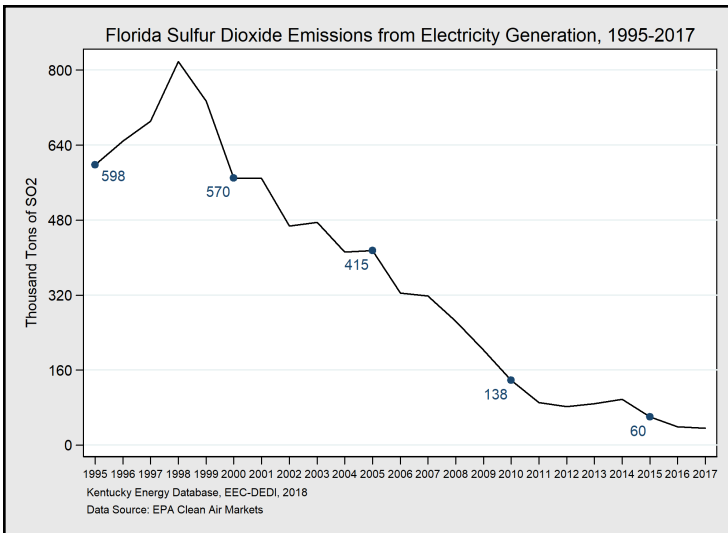
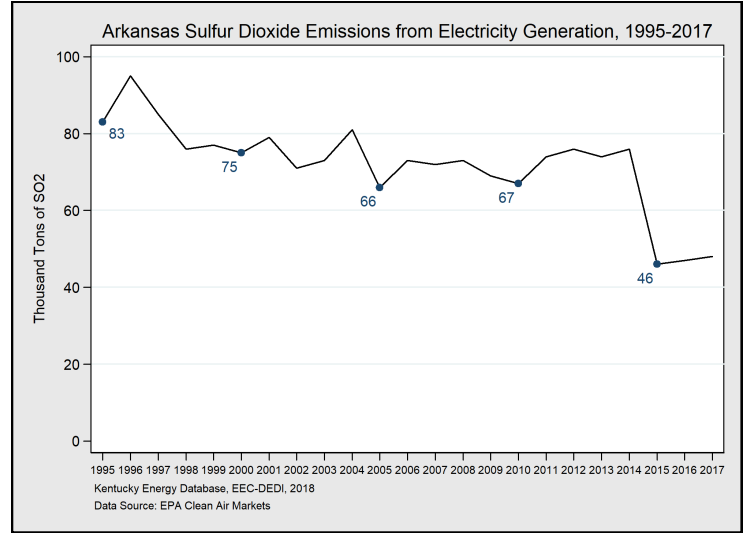
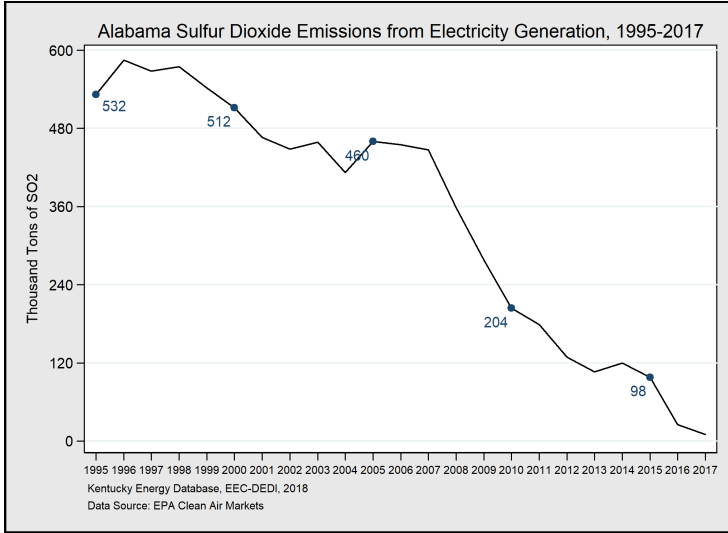
SO₂ Emissions by State



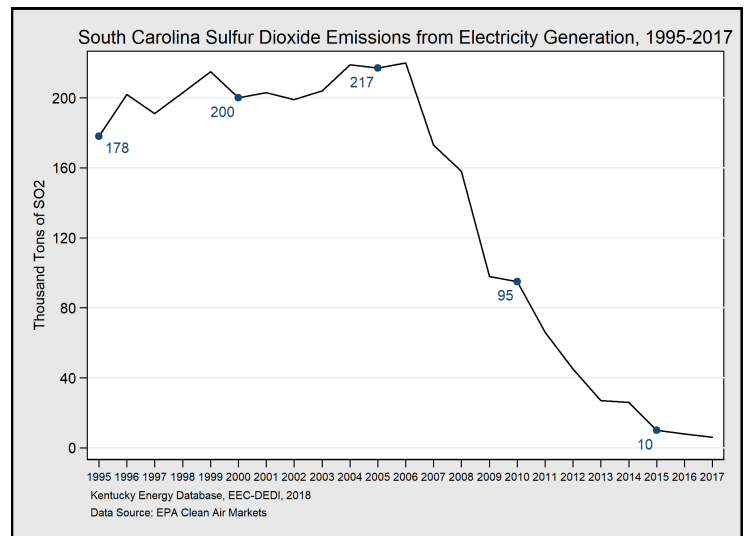
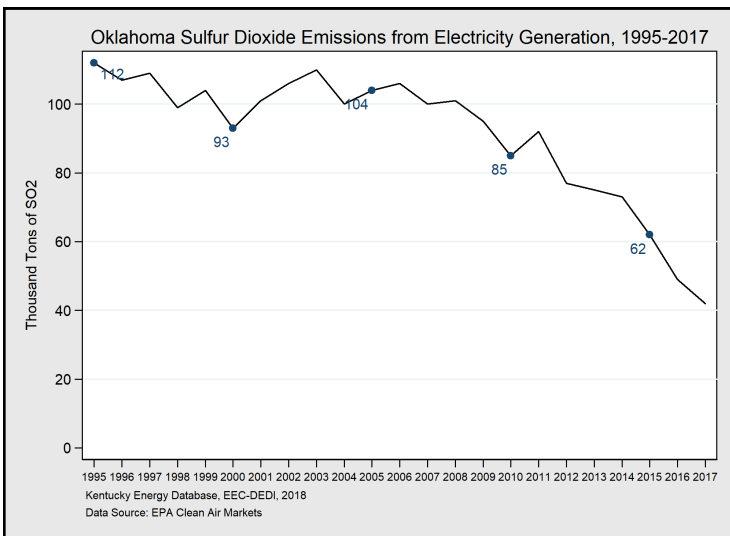
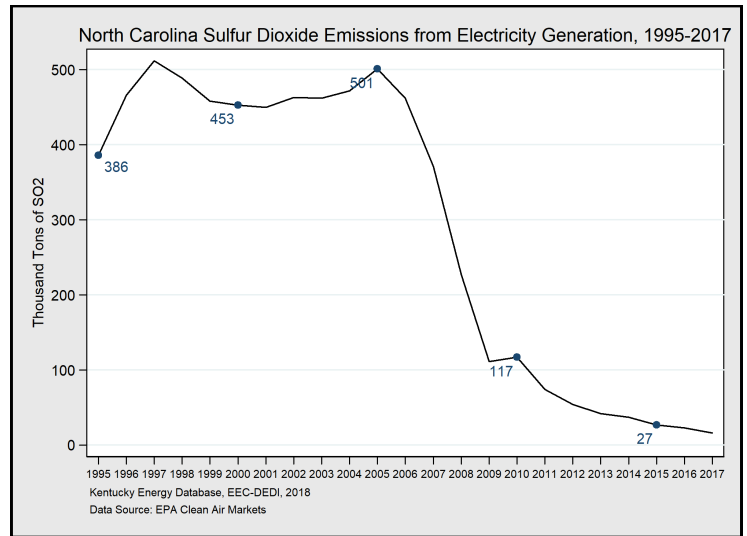
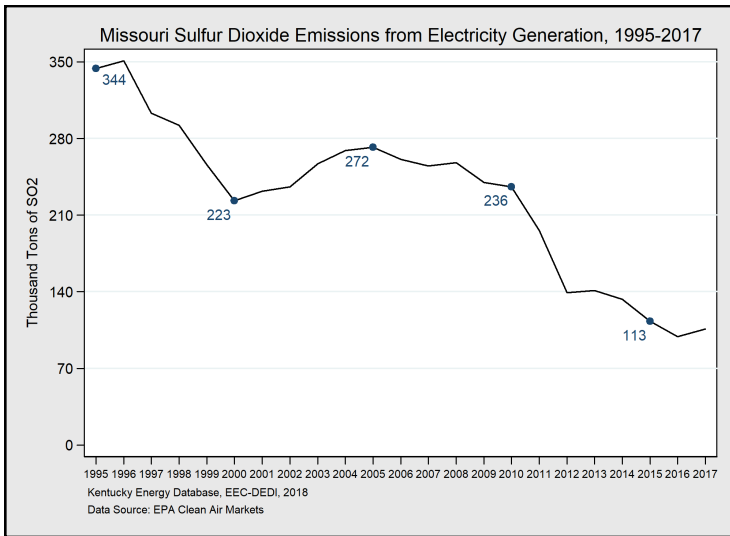
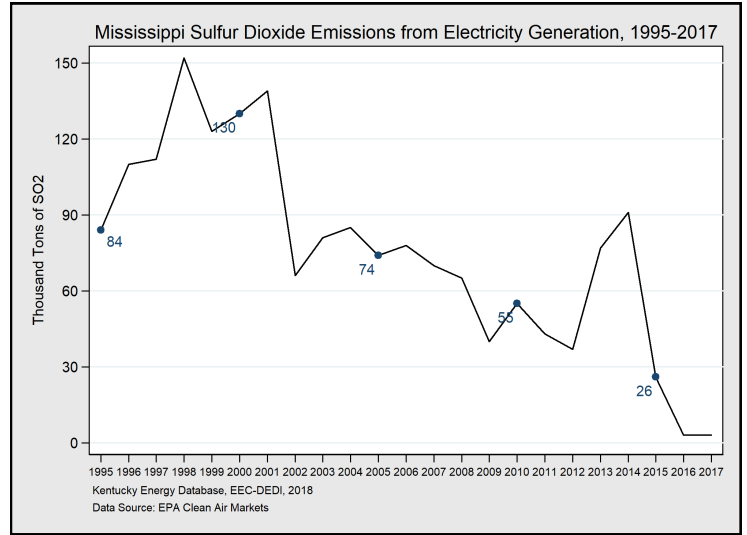
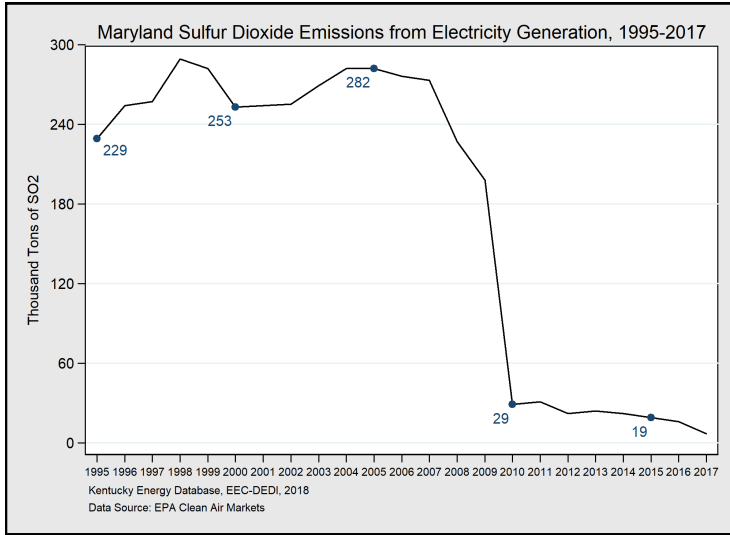
NO_x Emissions by State



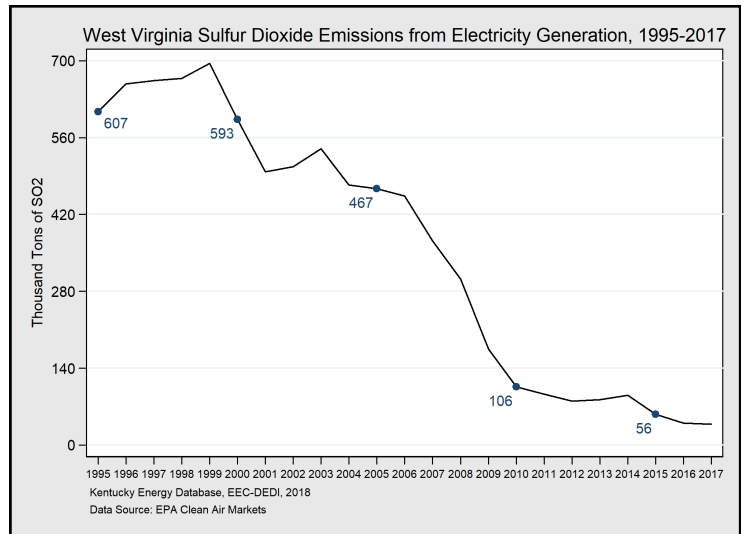
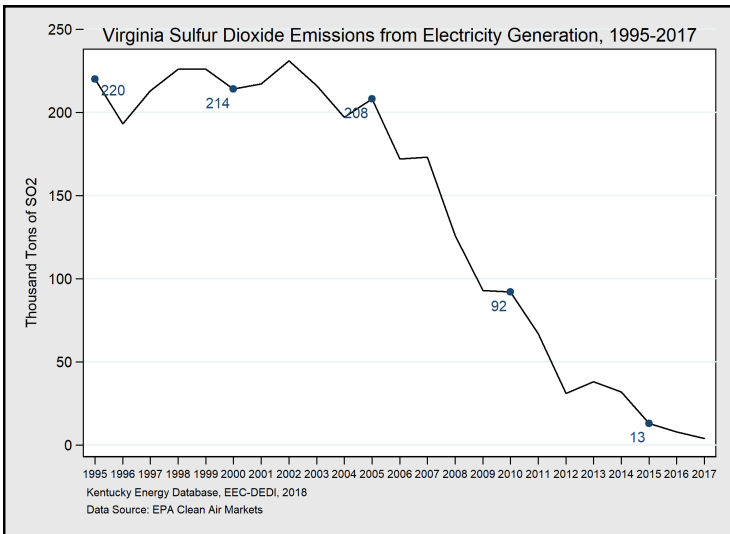
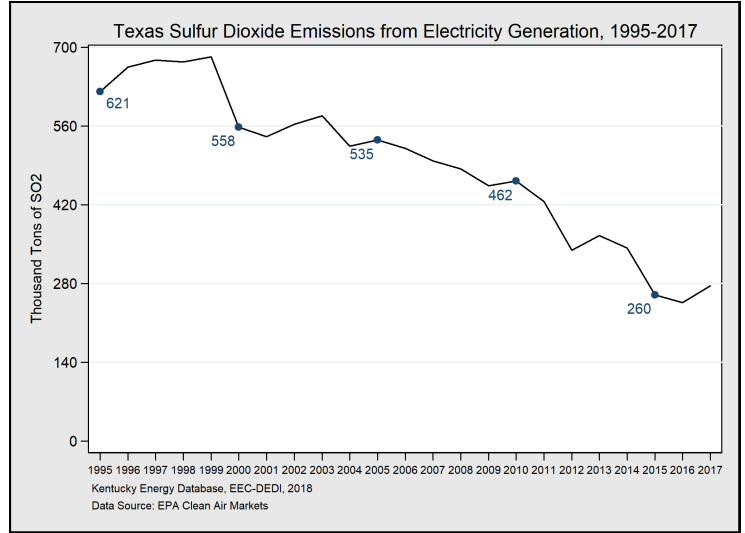
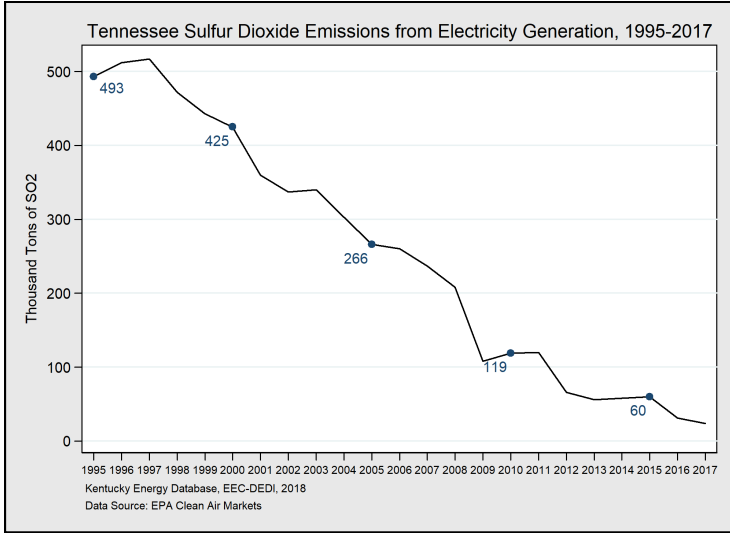
Historical Electric Power Emissions (SO₂)



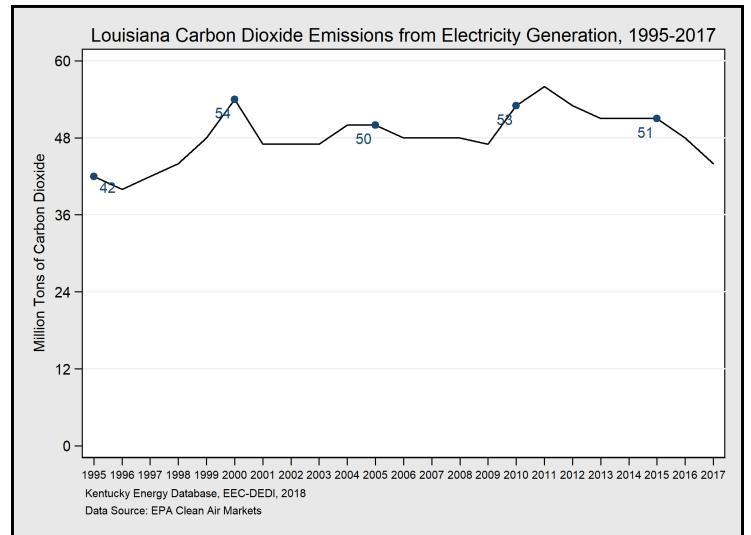
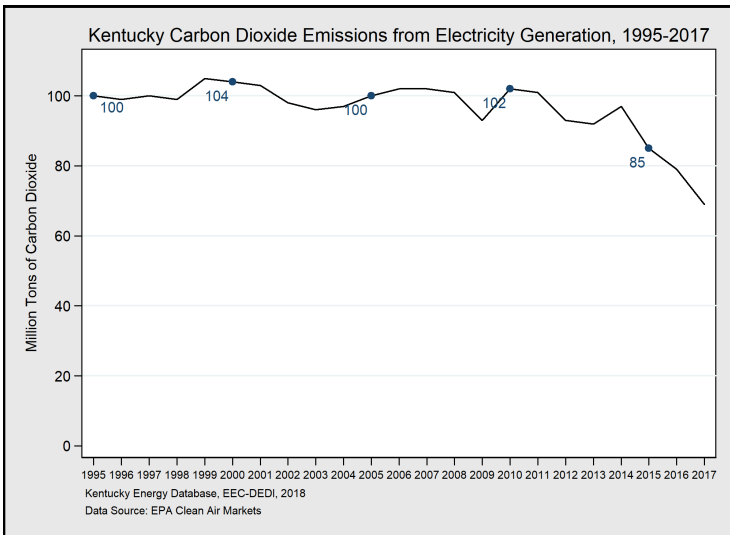
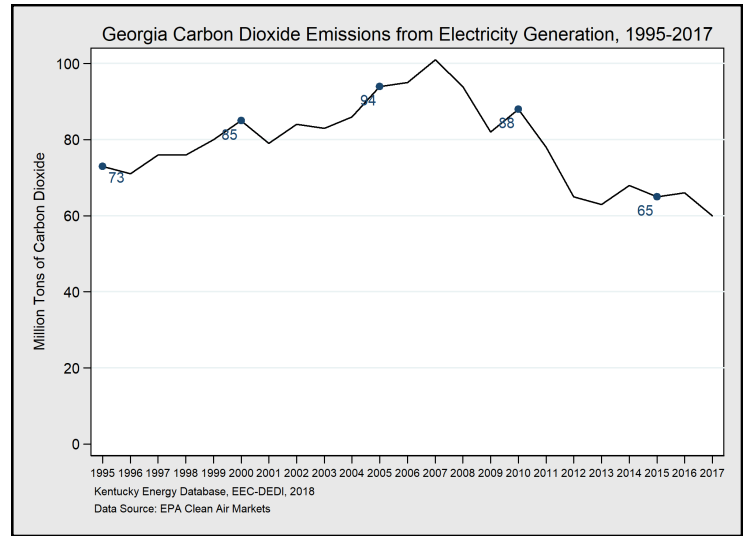
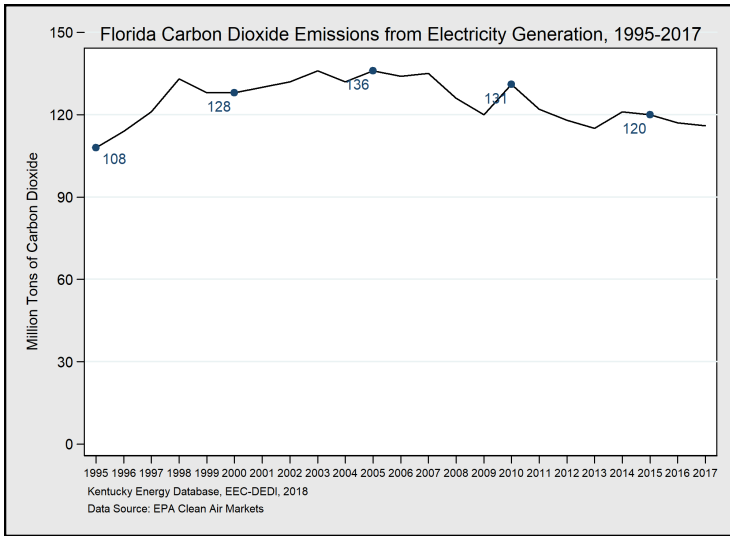
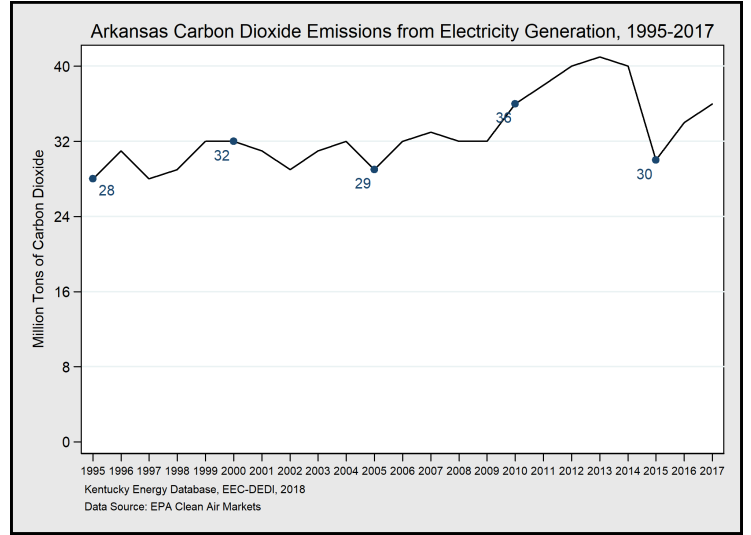
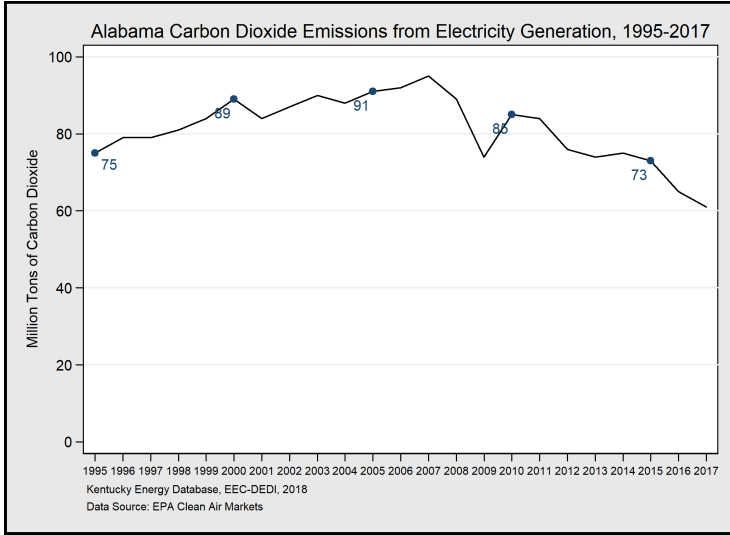
Historical Electric Power Emissions (SO₂)



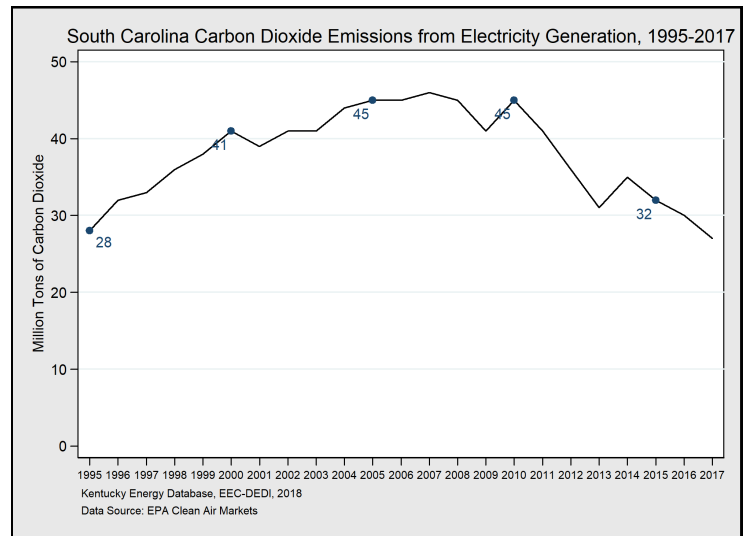
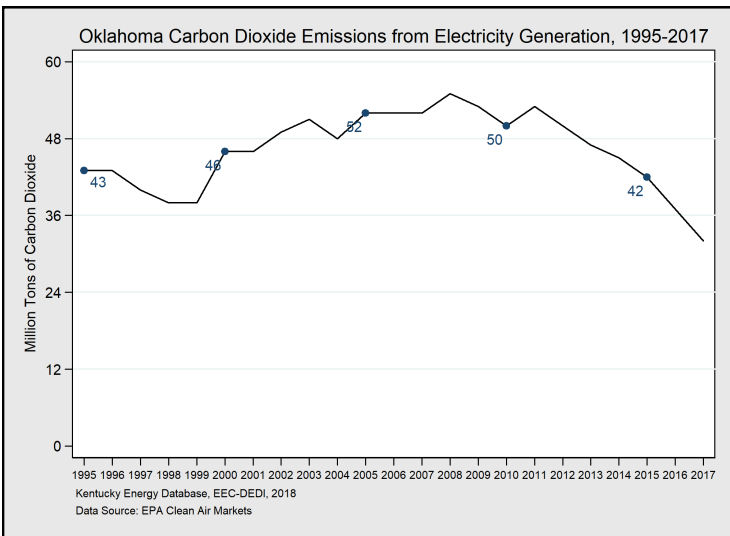
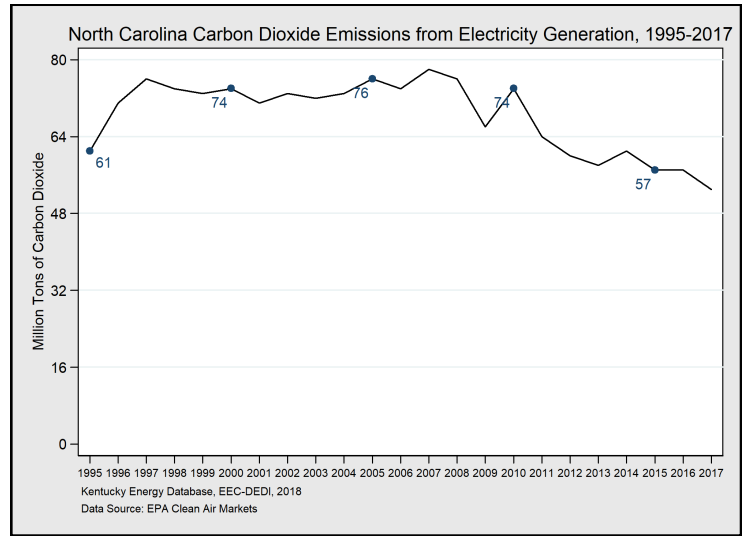
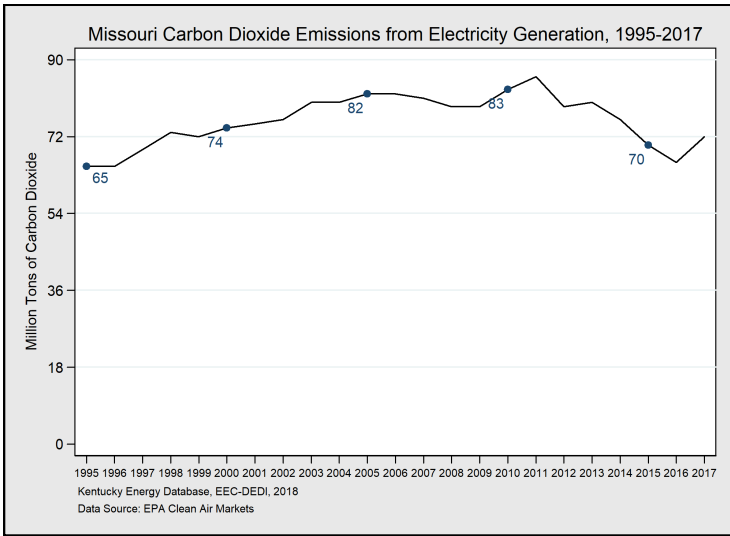
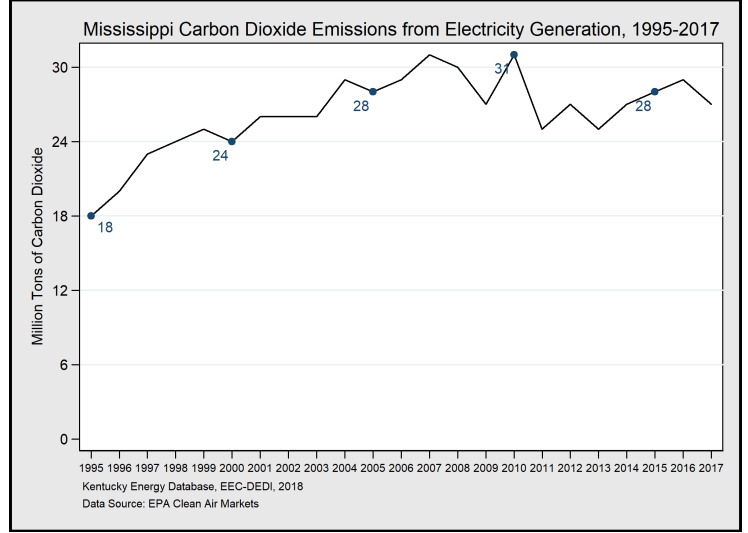
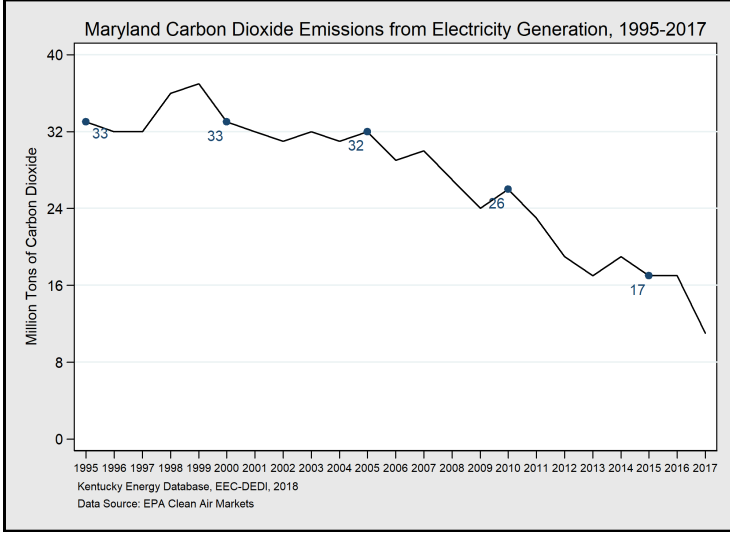
Historical Electric Power Emissions (SO₂)



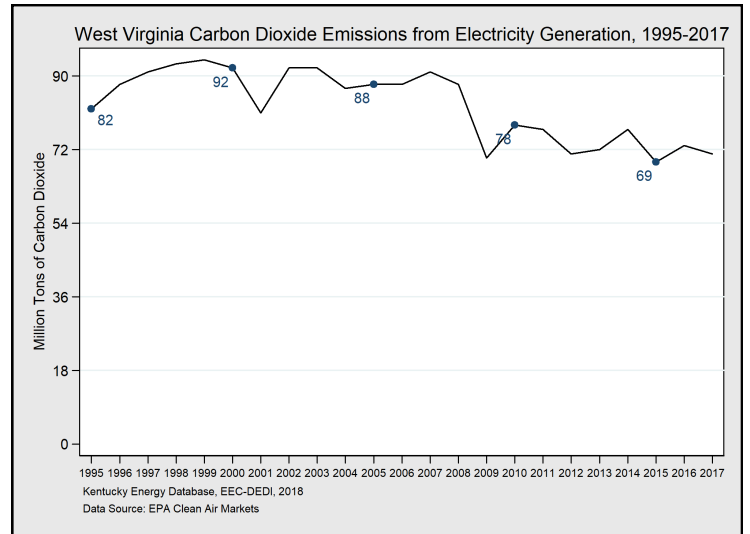
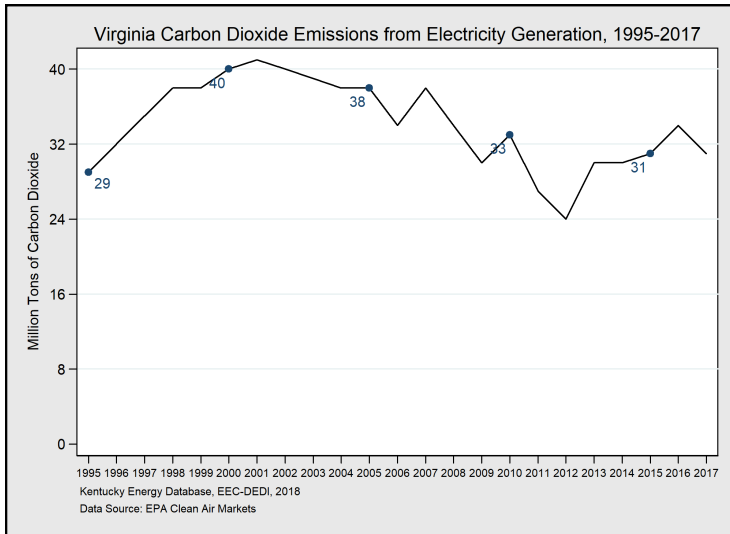
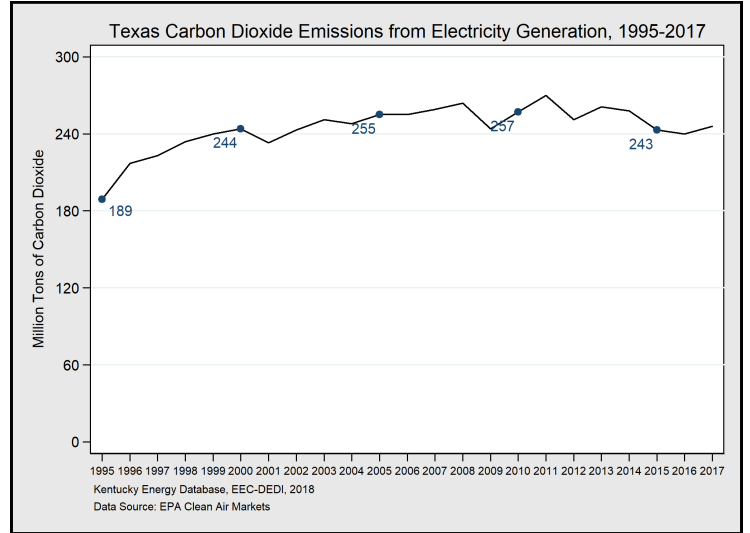
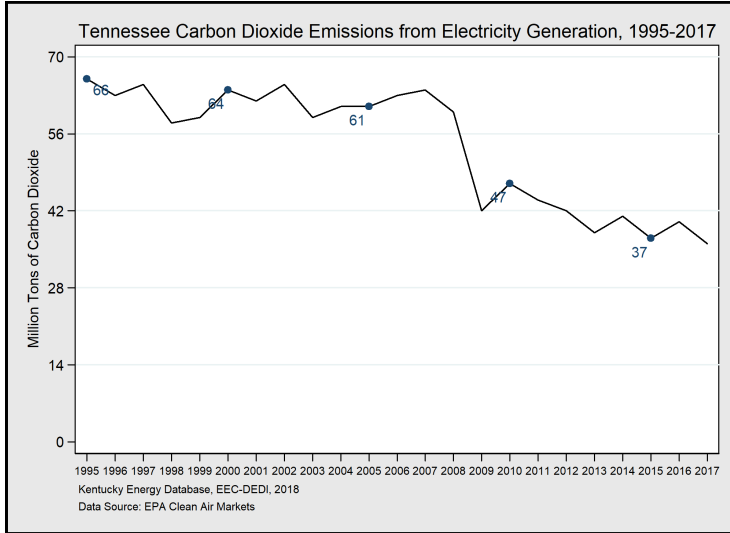
Historical Electric Power Emissions (CO₂)



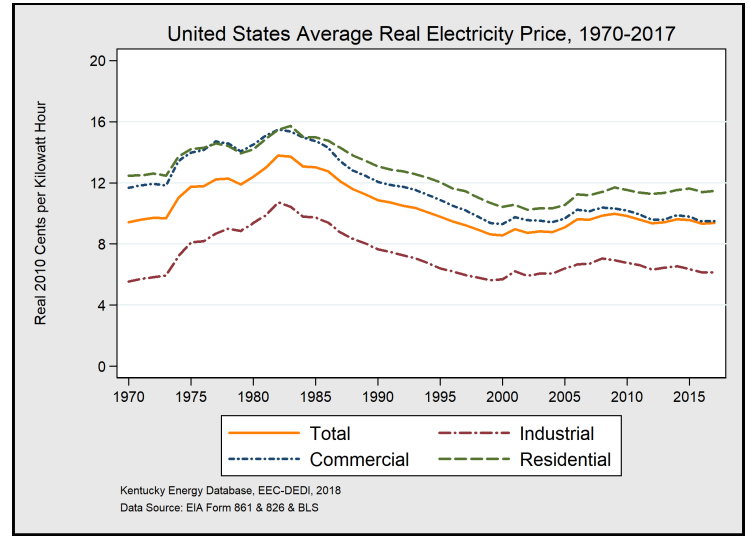
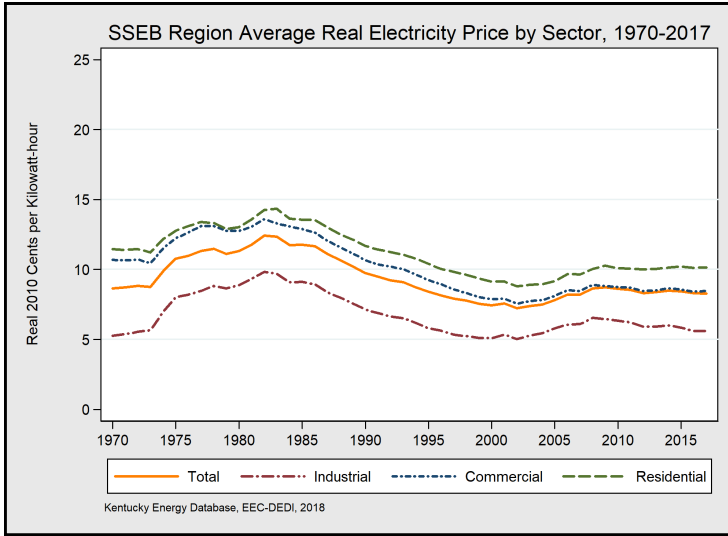
Historical Electric Power Emissions (CO₂)



Historical Electric Power Emissions (CO₂)



SSEB Region Real Price of Electricity, 2017



Sector	Real 2010 Cents / kWh	Inflation Adjusted Change Since 2005
Total	8.29	+6.28%
Residential	10.15	+10.6%
Commercial	8.46	+4.19%
Industrial	5.60	-3.45%

Sector	Real 2010 Cents / kWh	Inflation Adjusted Change Since 2005
Total	9.38	+3.2%
Residential	11.48	+8.8%
Commercial	9.5	-1.76%
Industrial	6.2	-3.9%

Electricity price is measured in terms of cents per kilowatt-hour of electricity consumed. While the price of electricity varies from state to state and from one utility to another, the above graphic illustrates the average price of electricity delivered to each economic sector.

After adjusting for inflation in the price of all consumer goods, relative electricity prices actually fell from 1983 to 2000, and have risen thereafter.

A number of factors can affect the price of electricity. In many utility territories, declining load has had an impact on prices as fixed utility costs are made up by a smaller share of sales. Other factors can include utility costs incurred to comply with environmental regulations (capital expenditures on pollution control technology at a power plant) and increased costs of providing service (inflation).

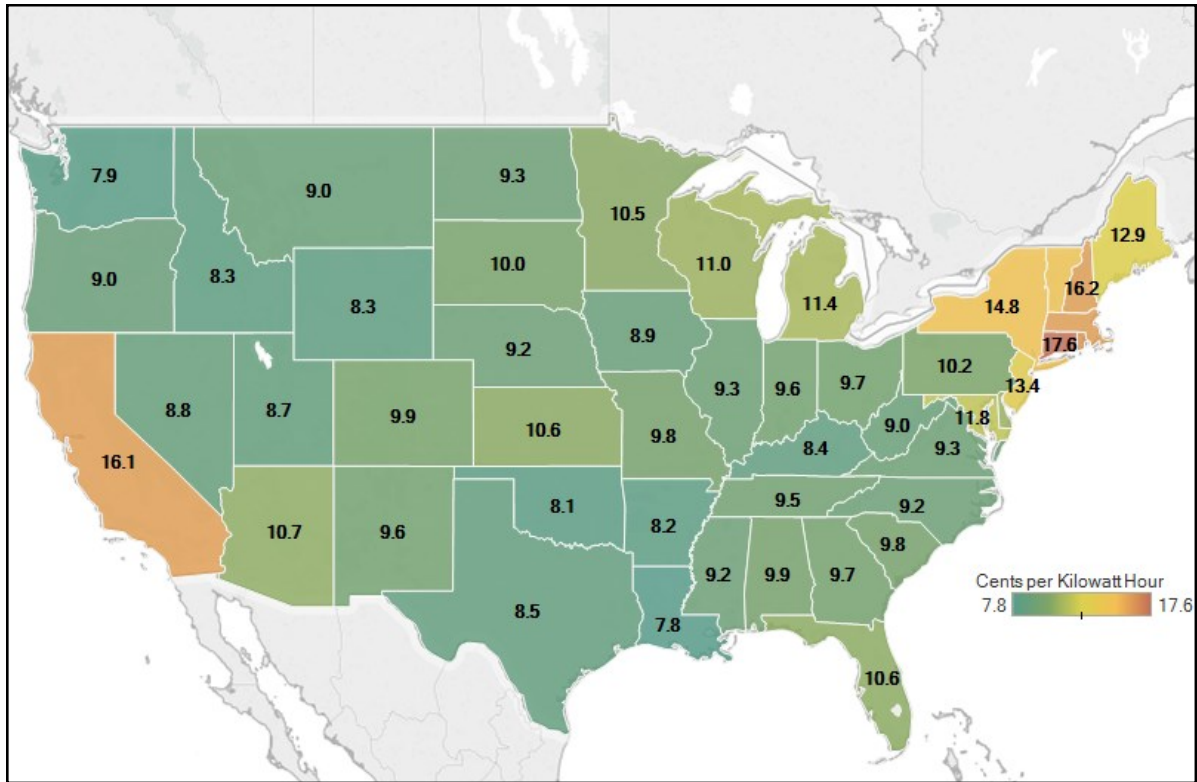
The SSEB region's average prices across all sectors are lower than the average national prices for all sectors. The gap between total national average prices and total SSEB region prices has lessened since 2015 from 1.17 cents/kWh to 1.09 cents/kWh.

Nominal electricity prices by state and economic sector are based on aggregated data from individual electric utilities derived from United States Form EIA-861 and Form EIA-826. To control for the changing value of the United States Dollar, nominal prices were converted to Real 2010 US\$ using the Bureau of Labor Statistics (BLS) Consumer Price Index (CPI). Pages 65 and 66 show nominal average prices, while the chart above and graphs on pages 67– 69 show real prices.

Electricity Price by State, 2017

Rank	State	Primary Source	Electricity Price (Cents per kWh)	Inflation Adjusted 1 Year Change	Inflation Adjusted 5 Year Change
1	Louisiana	Natural Gas	7.75	+1.71%	+5.23%
2	Washington	Hydroelectric	7.94	+1.16%	+7.10%
3	Oklahoma	Natural Gas	8.12	+1.59%	+0.87%
4	Arkansas	Coal	8.18	-1.44%	+0.55%
5	Wyoming	Coal	8.29	-0.86%	+7.97%
6	Idaho	Hydroelectric	8.30	+0.56%	+12.39%
7	Kentucky	Coal	8.44	-1.88%	+8.83%
8	Texas	Natural Gas	8.55	-0.65%	-6.35%
9	Utah	Coal	8.66	-2.74%	+3.48%
10	Nevada	Natural Gas	8.76	+2.35%	-8.27%
11	Iowa	Coal	8.92	+2.15%	+8.41%
12	Oregon	Hydroelectric	8.98	-0.41%	+2.48%
13	West Virginia	Coal	9.00	-1.83%	3.57%
14	Montana	Coal	9.02	-0.11%	2.37%
15	North Carolina	Nuclear	9.15	-2.57%	-6.32%
16	Nebraska	Coal	9.16	-0.83%	+2.55%
17	Mississippi	Natural Gas	9.19	3.80%	+0.12%
18	SSEB	Natural Gas	9.23	+1.97%	+6.5%
19	North Dakota	Coal	9.26	+1.39%	+10.72%
20	Virginia	Natural Gas	9.28	-0.10%	-4.18%
21	Illinois	Nuclear	9.33	-2.60%	+4.05%
22	Tennessee	Nuclear	9.54	1.25%	-3.57%
23	Indiana	Coal	9.61	+2.10%	+8.58%
24	New Mexico	Coal	9.64	+3.52%	+2.26%
25	Ohio	Coal	9.71	-3.43%	-0.28%
26	Georgia	Natural Gas	9.75	-0.46%	-2.58%
27	Missouri	Natural Gas	9.83	-1.21%	+7.96%
28	South Carolina	Nuclear	9.83	-1.62%	+1.22%
29	Alabama	Natural Gas	9.89	+1.31%	+0.95%
30	Colorado	Coal	9.94	-0.95%	-0.82%
31	South Dakota	Hydroelectric	9.98	-0.67%	+10.06%
32	Pennsylvania	Nuclear	10.16	-2.32%	-3.93%
33	Minnesota	Coal	10.53	+3.22%	+11.29%
34	United States	Natural Gas	10.54	+0.46%	+0.33%
35	Kansas	Coal	10.58	-1.26%	+6.24%
36	Florida	Natural Gas	10.65	+5.28%	-4.45%
37	Arizona	Nuclear	10.71	+1.48%	+2.22%
38	Delaware	Natural Gas	10.99	-2.98%	-6.91%
39	Wisconsin	Coal	11.05	+1.33%	+0.64%
40	Michigan	Coal	11.39	+0.89%	-2.88%
41	District of Columbi	Natural Gas	11.81	-1.42%	-6.65%
42	Maryland	Nuclear	12.00	-3.80%	-0.38%
43	Maine	Hydroelectric	12.94	-0.985	+2.65%
44	New Jersey	Natural Gas	13.38	-2.08%	-8.39%
45	Vermont	Hydroelectric	14.57	-1.39%	-4.05%
46	New York	Natural Gas	14.78	+0.02%	-8.61%
47	California	Natural Gas	16.14	+3.75%	+11.71%
48	Massachusetts	Natural Gas	16.14	-4.09%	+9.64%
49	New Hampshire	Nuclear	16.16	+1.04%	+6.64%
50	Rhode Island	Natural Gas	16.44	-1.10%	+20.9%
51	Connecticut	Nuclear	17.62	+0.06%	+6.21%
52	Alaska	Natural Gas	19.52	+6.61%	+11.96%
53	Hawaii	Petroleum	26.07	+6.94%	-28.27%

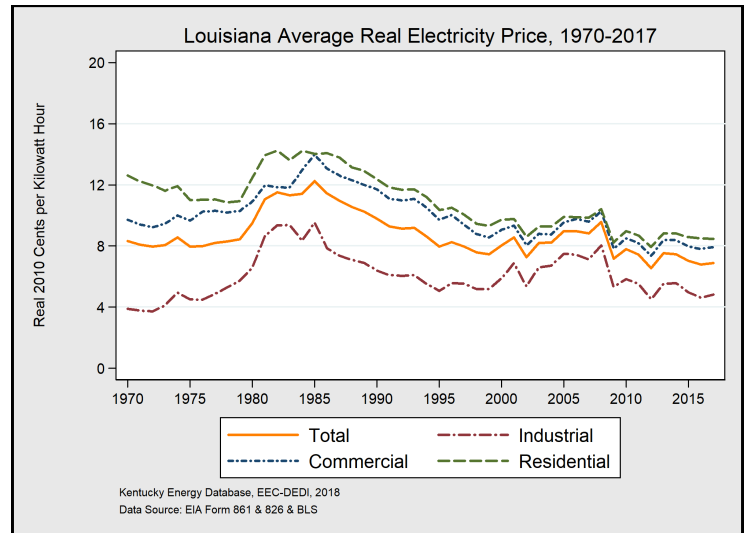
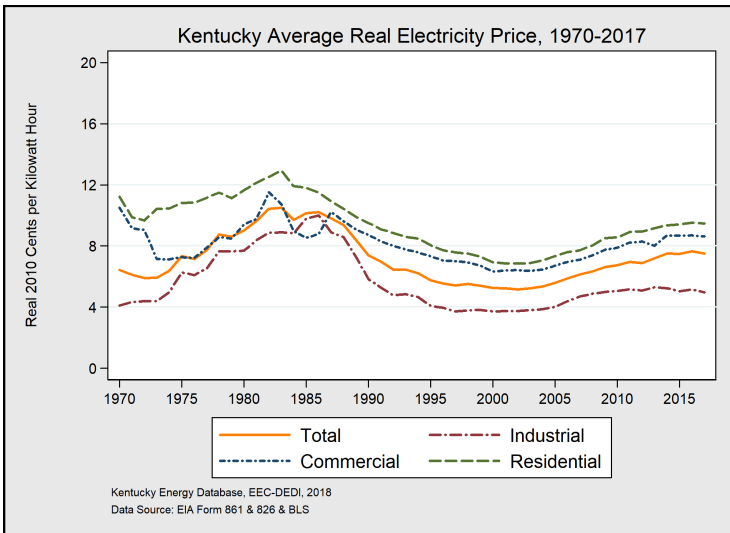
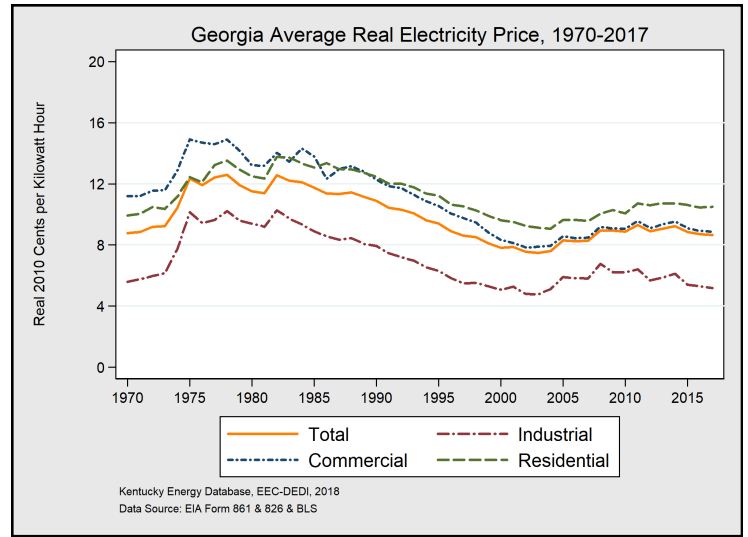
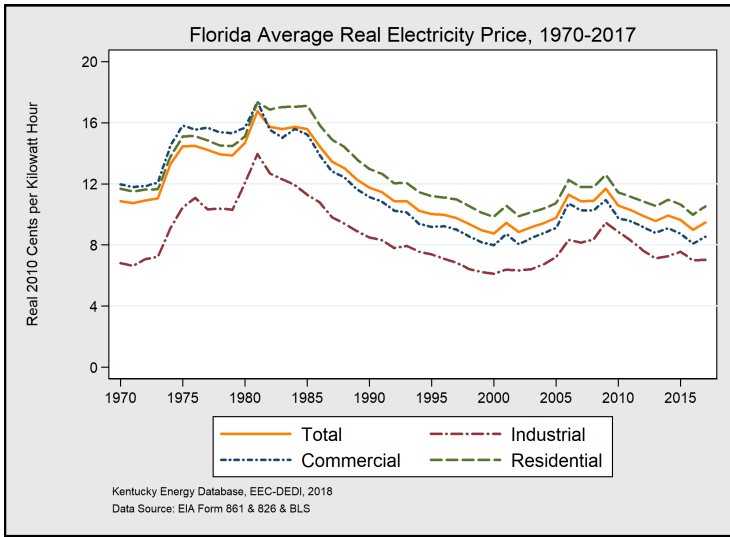
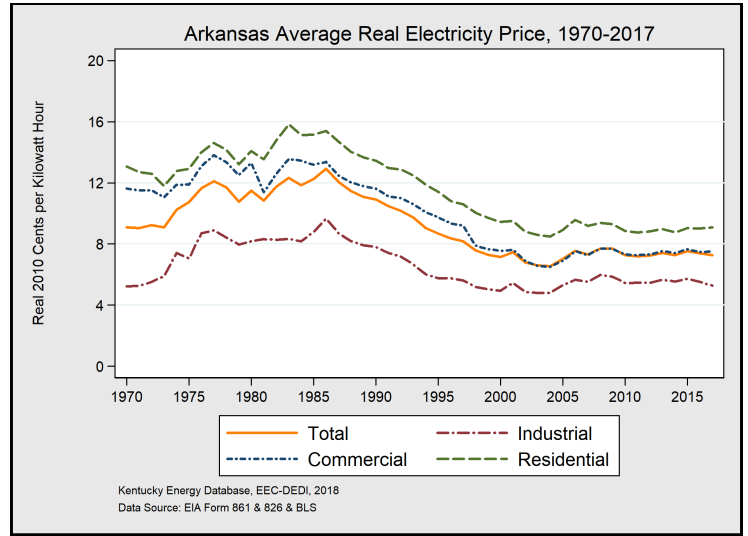
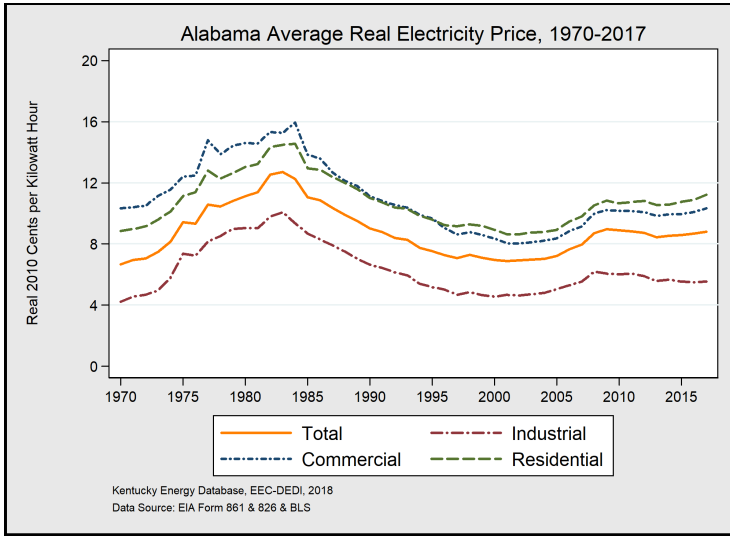
Average Electricity Price by Sector



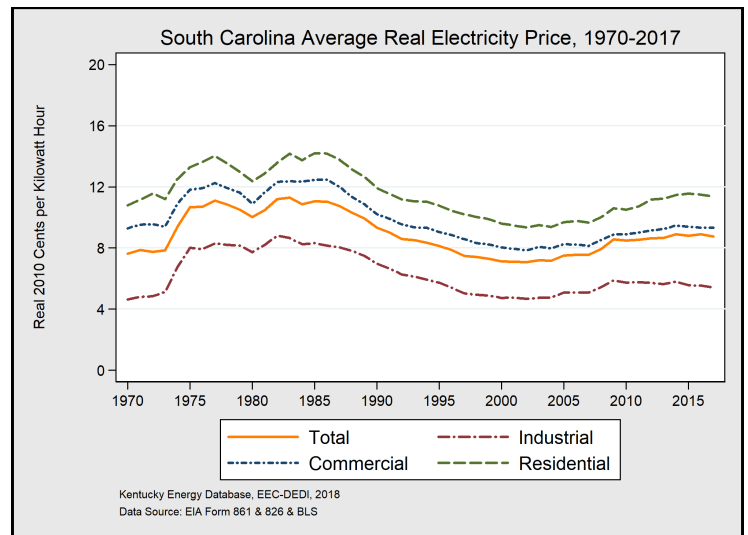
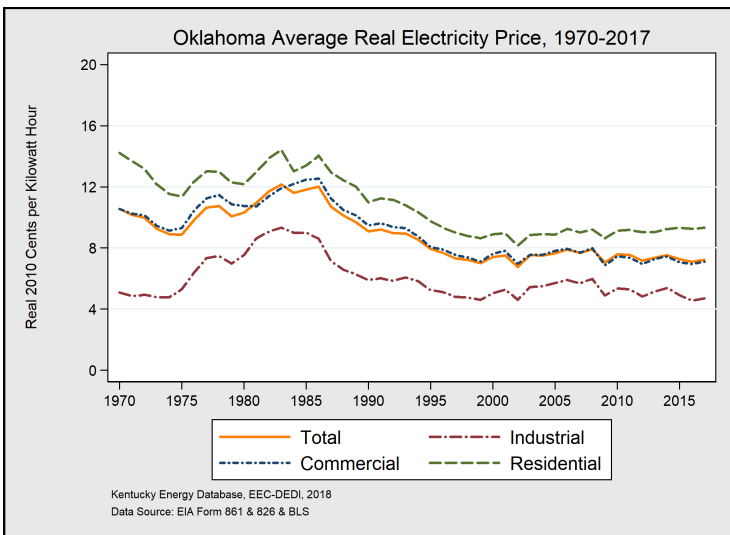
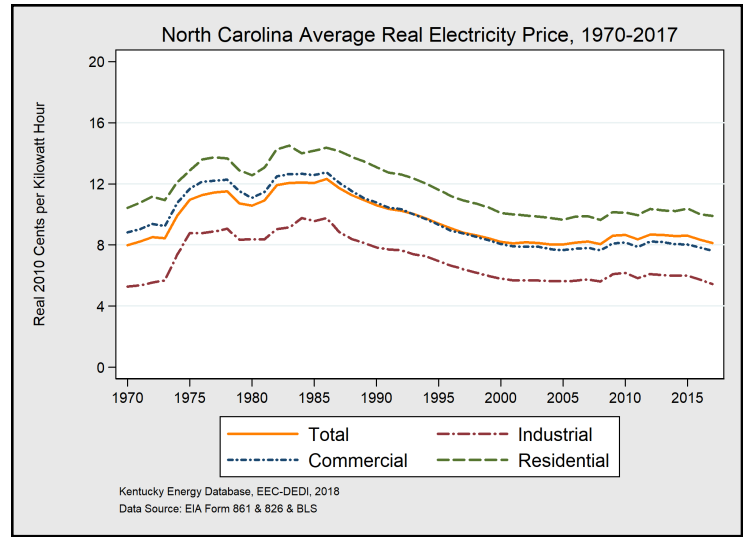
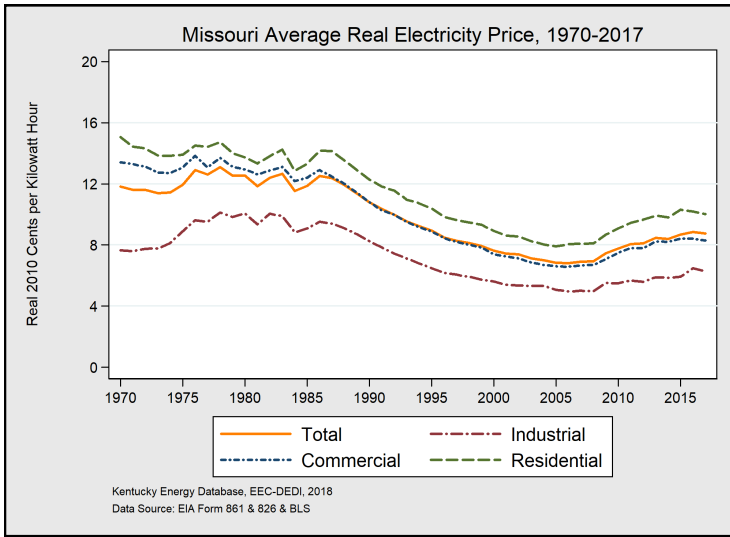
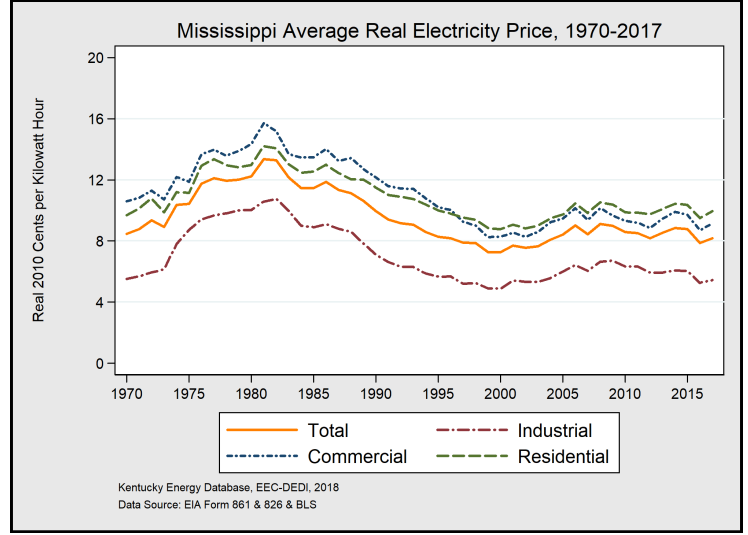
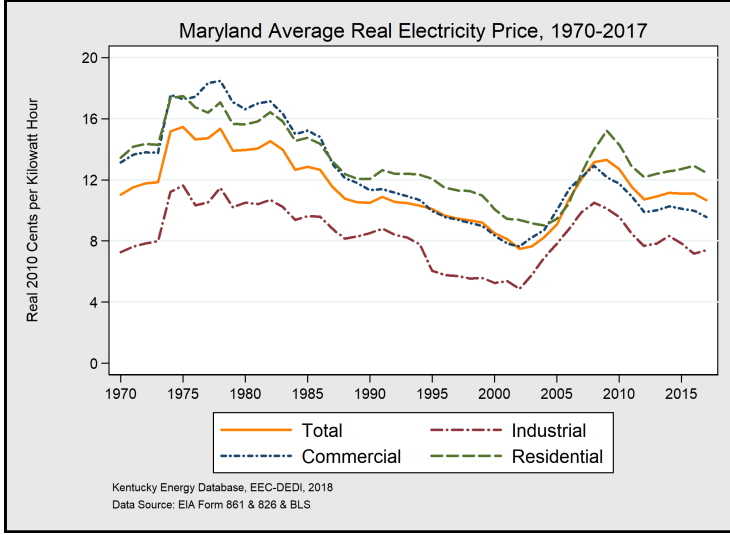
State	Residential	Commercial	Industrial	All Sectors
Alabama	12.61	11.62	6.23	9.89
Arkansas	10.22	8.44	5.93	8.18
Florida	11.85	9.61	7.90	10.65
Georgia	11.80	9.98	5.82	9.75
Kentucky	10.64	9.70	5.58	8.44
Louisiana	9.51	8.91	5.42	7.75
Maryland	13.99	10.76	8.32	12.00
Mississippi	11.19	10.30	6.12	9.19
Missouri	11.27	9.32	7.06	9.83
North Carolina	11.12	8.56	6.11	9.15
Oklahoma	10.48	7.97	5.27	8.12
South Carolina	12.78	10.49	6.09	9.83
Tennessee	10.65	10.50	6.03	9.54
Texas	11.18	8.31	5.49	8.55
Virginia	11.67	8.07	6.67	9.28
West Virginia	11.62	9.57	6.64	9.00

Nominal prices

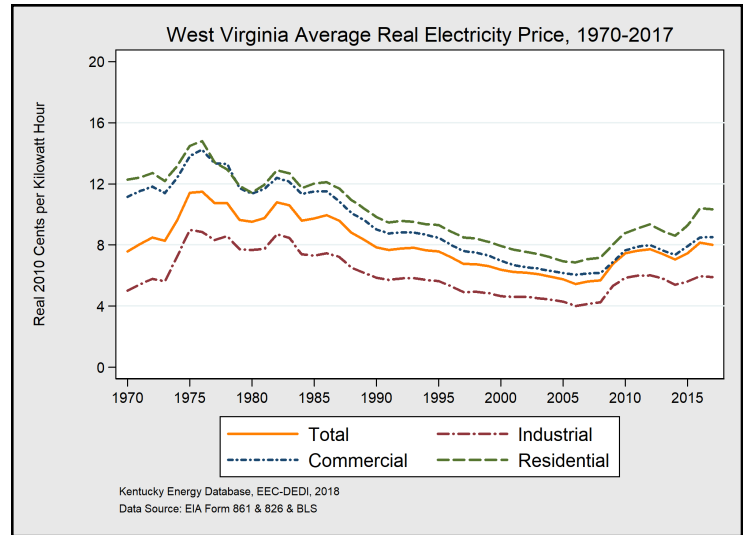
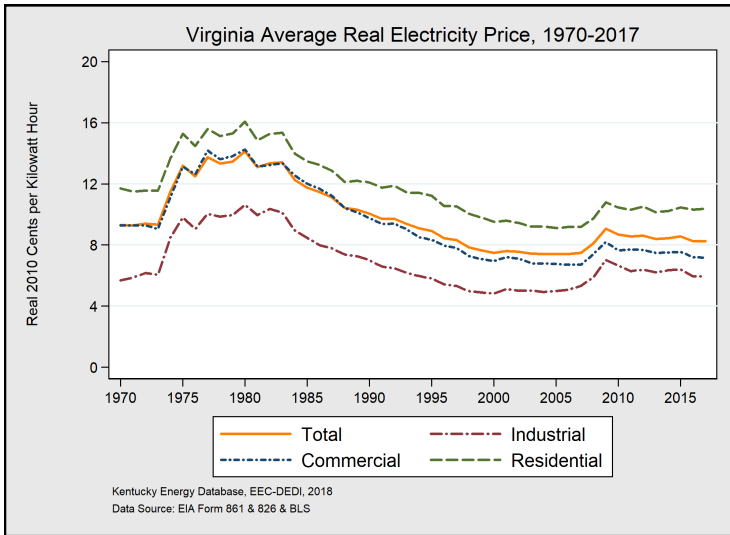
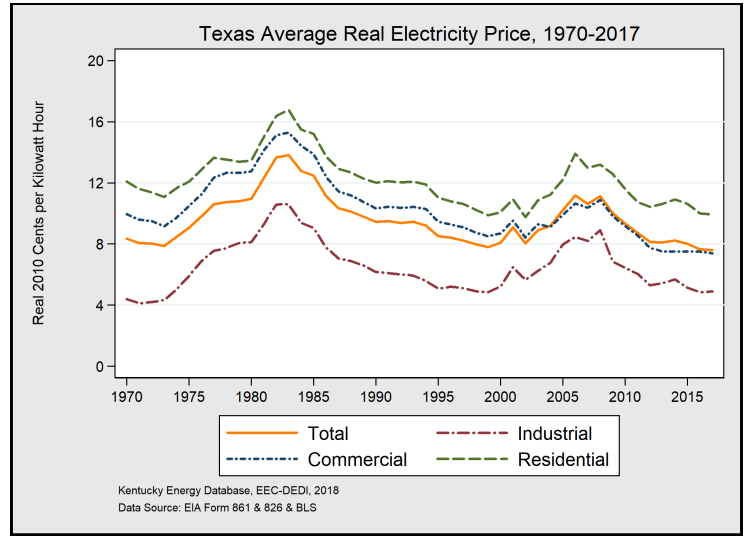
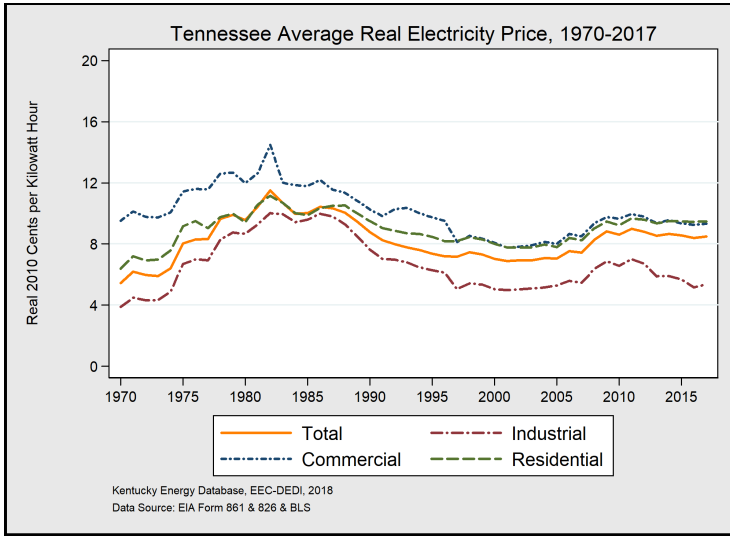
Historical Inflation Adjusted Price of Electricity



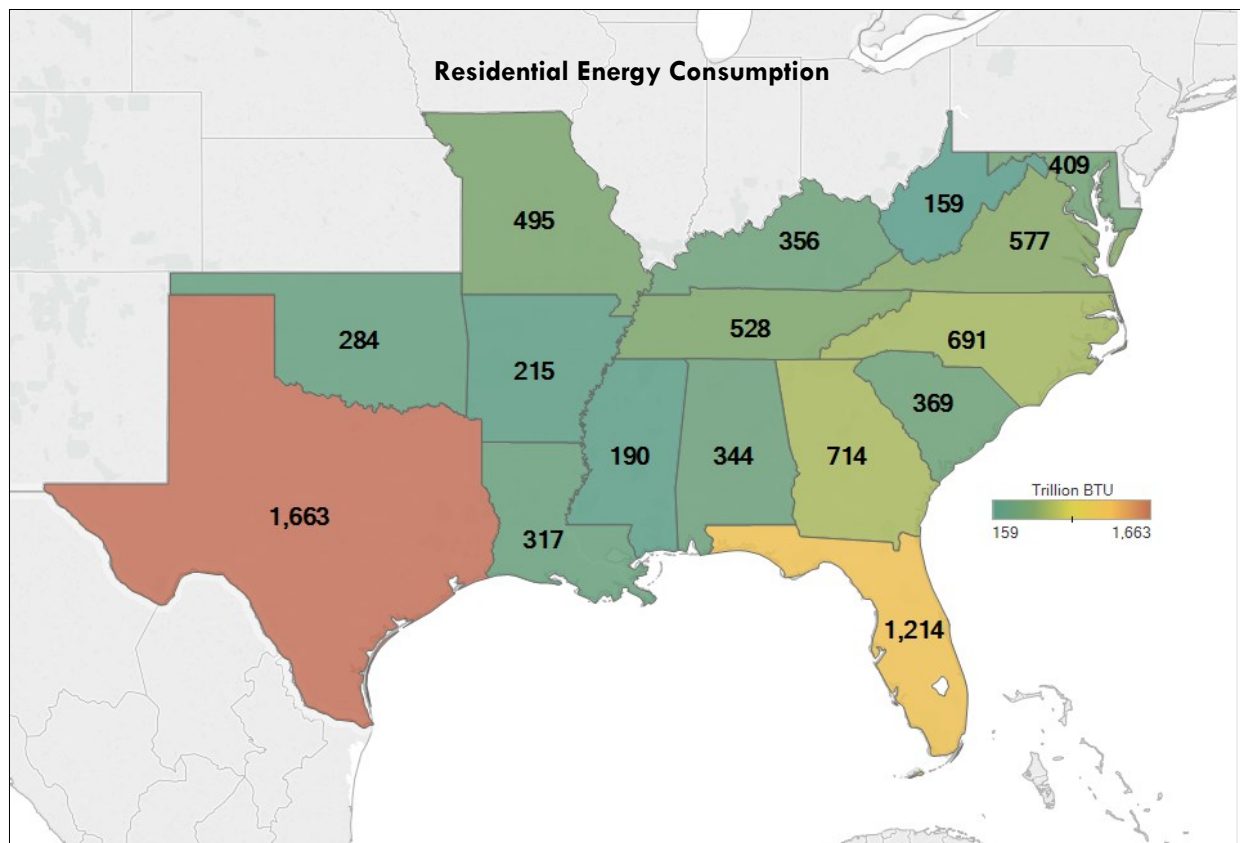
Historical Inflation Adjusted Price of Electricity



Historical Inflation Adjusted Price of Electricity

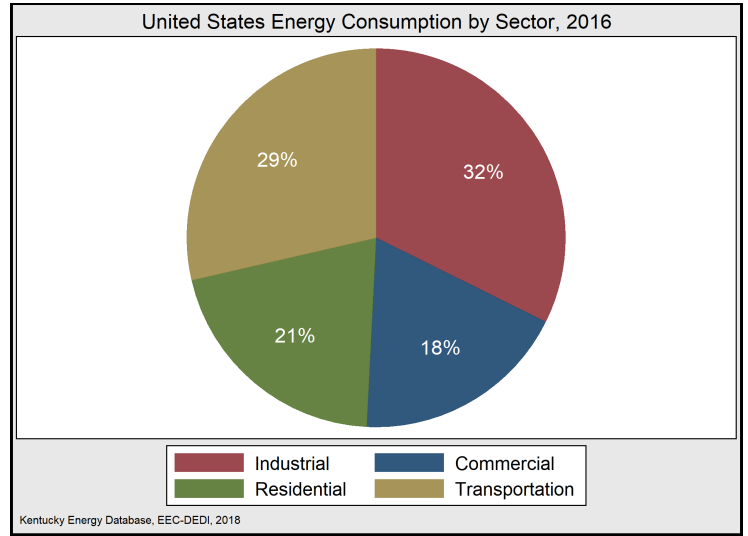
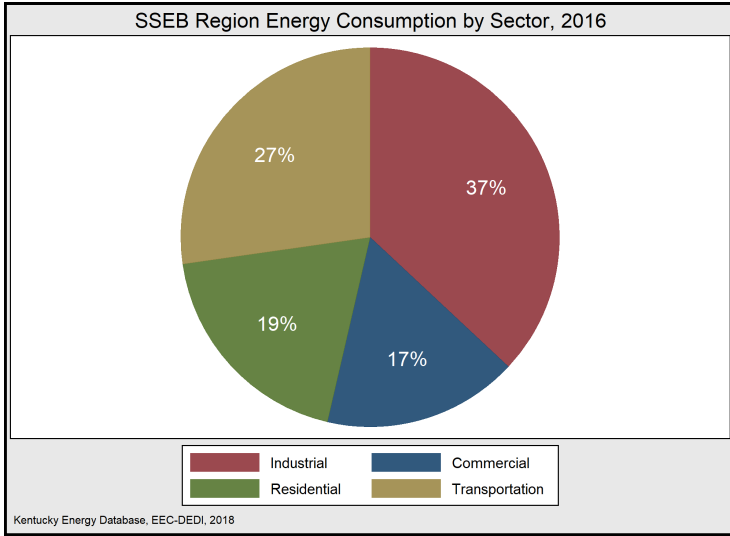


SSEB Region Energy Consumption



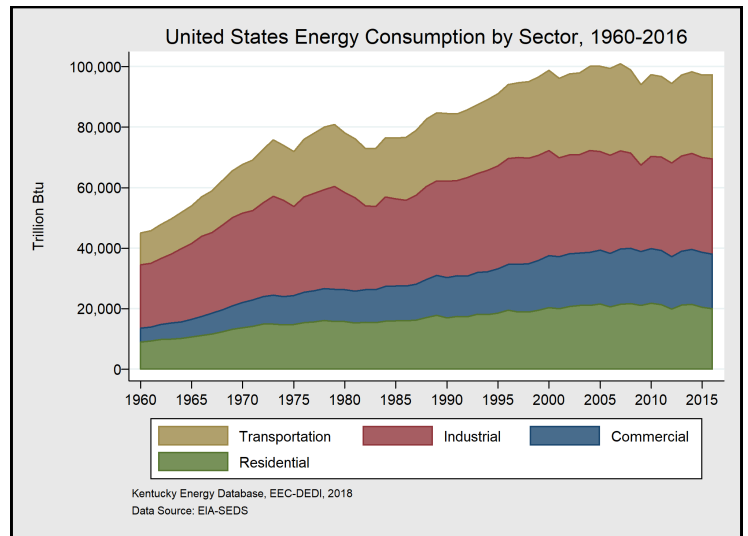
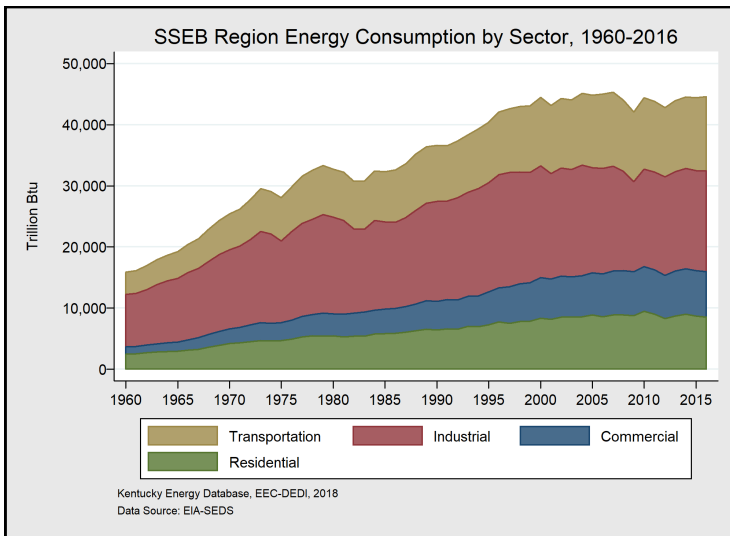
State	Residential	Commercial	Industrial	Transportation	Total
Alabama	344	263	813	513	1,934
Arkansas	215	176	381	285	1,056
Florida	1,214	1,015	492	1,518	4,240
Georgia	714	557	773	795	2,839
Kentucky	356	271	605	470	1,702
Louisiana	317	266	2,929	693	4,205
Maryland	409	423	110	417	1,359
Mississippi	190	154	385	437	1,166
Missouri	495	413	313	558	1,780
North Carolina	691	582	558	723	2,554
Oklahoma	284	253	616	483	1,636
South Carolina	369	280	527	477	1,653
Tennessee	528	453	591	639	2,211
Texas	1,663	1,608	6,642	3,270	13,183
Virginia	577	612	442	701	2,332
West Virginia	159	113	311	183	766
SSEB REGION TOTAL	8,527	7,440	16,487	12,164	44,618

SSEB Region Energy Consumption



Sector	Trillion Btu	1 Year Change
Total	44,618	+1.9%
Industrial	16,487	+0.7%
Transportation	12,164	+2.1%
Residential	8,527	-1.9%
Commercial	7,440	-0.1%

Sector	Trillion Btu	1 Year Change
Total	97,315	+0.9%
Industrial	31,453	+0.2%
Transportation	27,828	+2.1%
Residential	20,050	-2.1%
Commercial	17,983	-0.7%

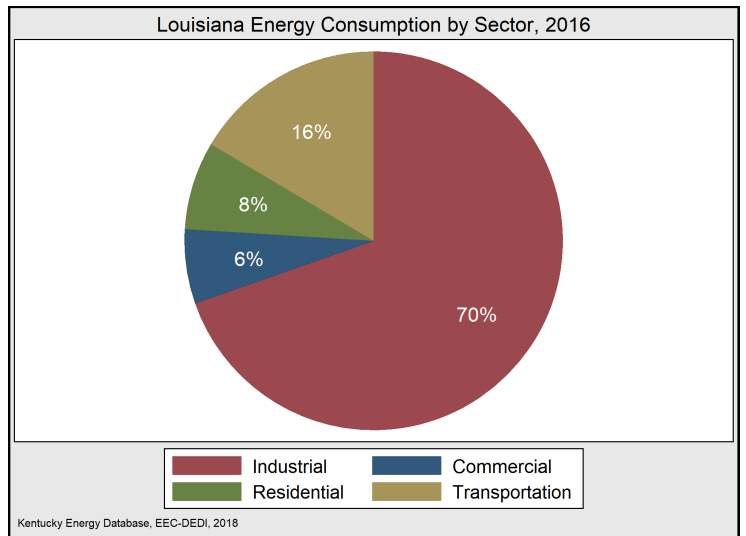
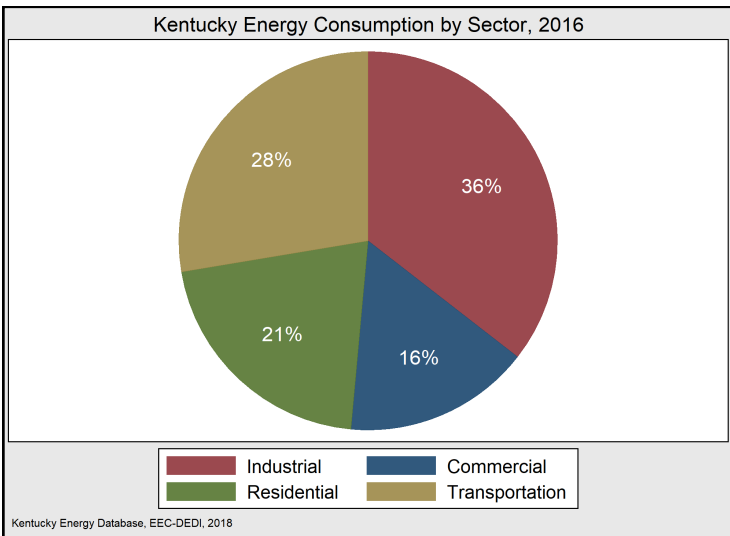
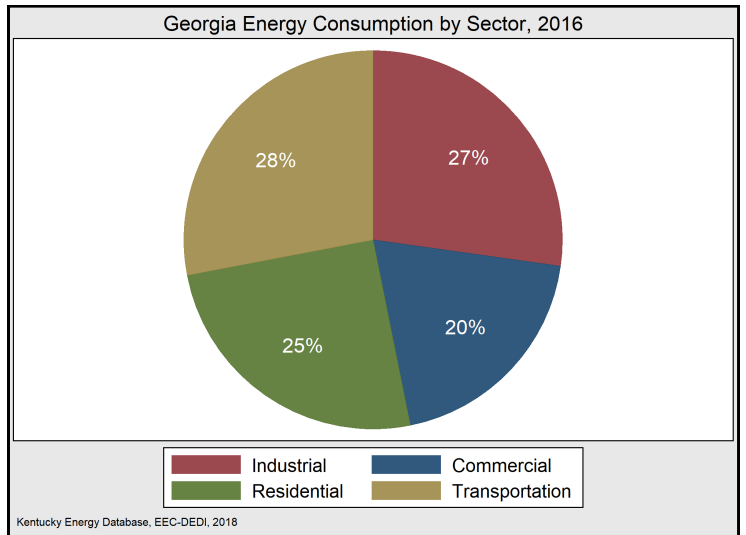
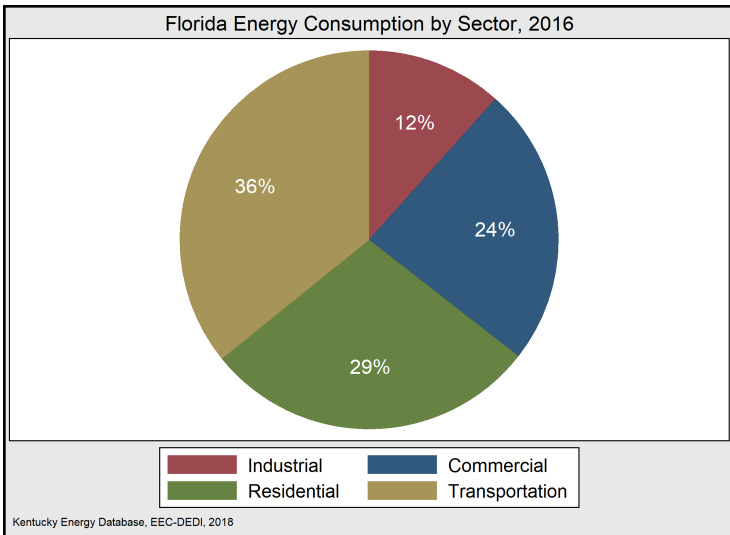
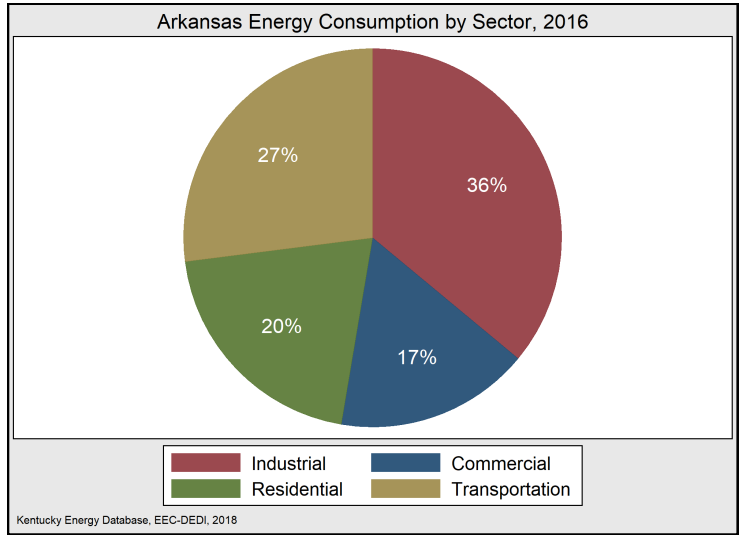
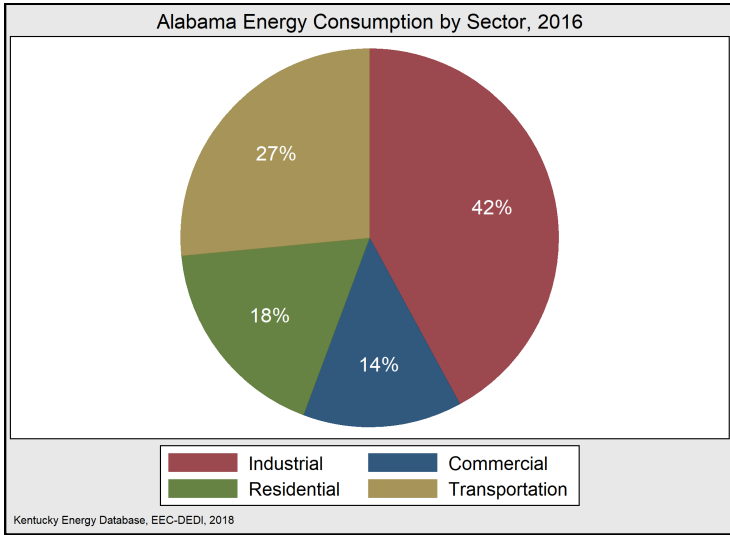


The relatively energy-intensive industrial and manufacturing processes in the SSEB region continue to consume more energy than other economic sectors. Energy consumption is not to be confused with electricity consumption. So, note that while electricity demand decreased in the industrial sector, energy consumption actually increased.

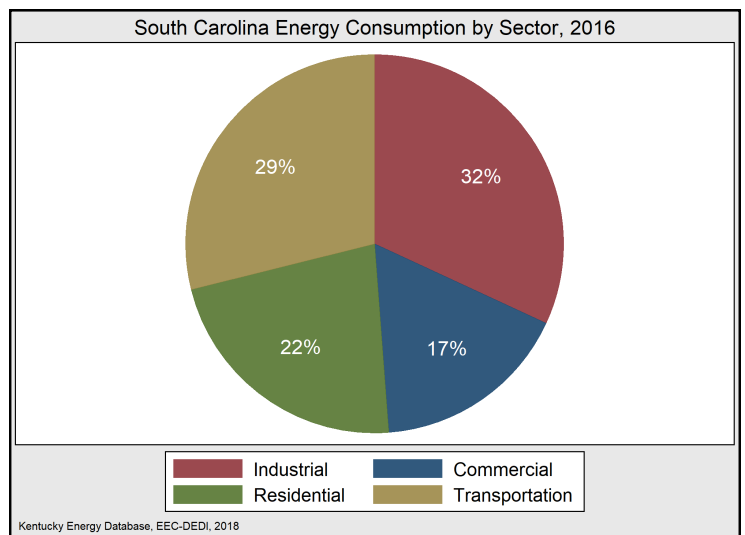
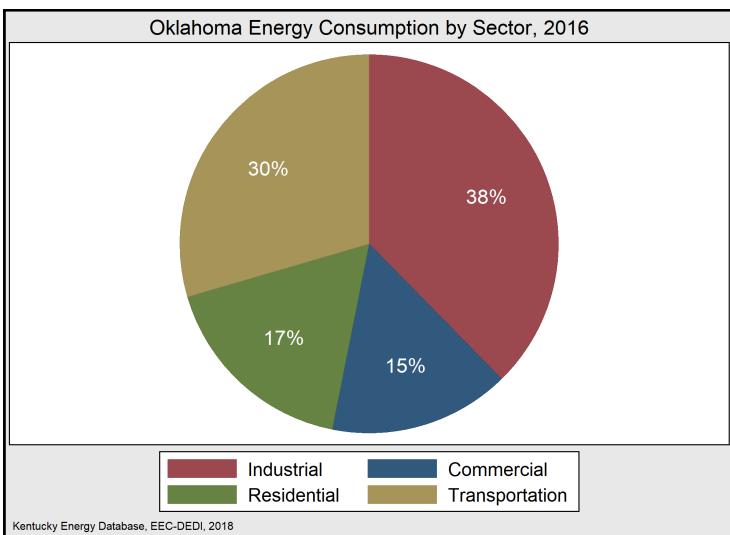
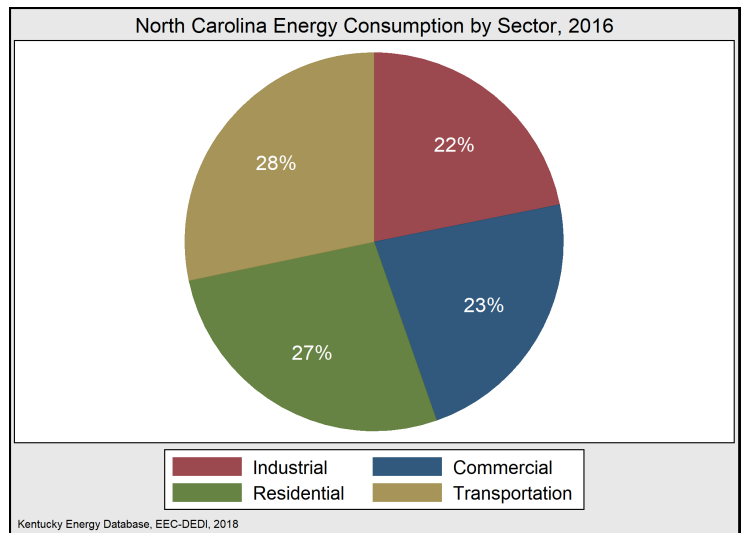
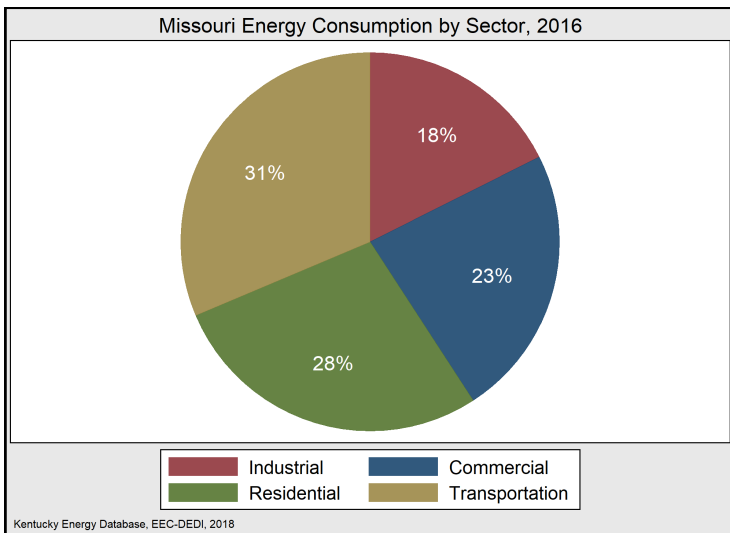
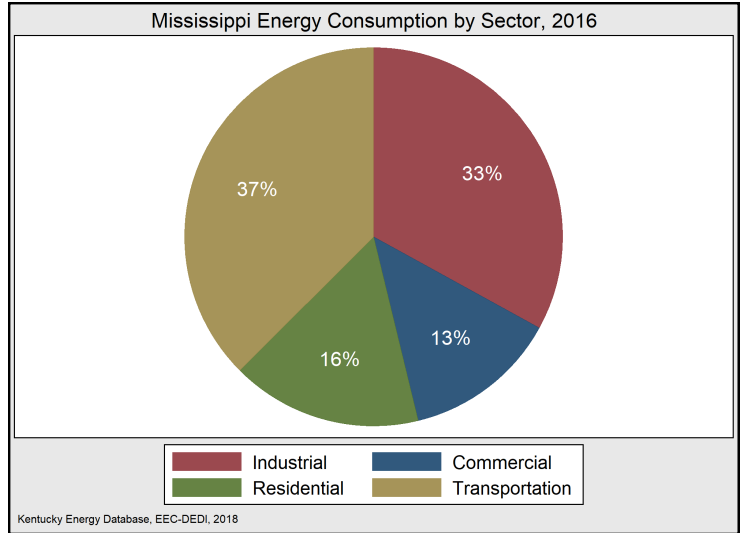
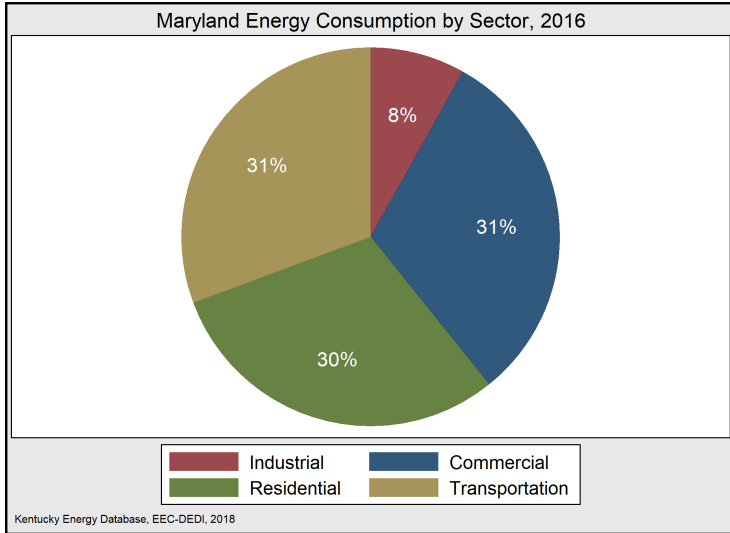
Note in the following pages the wide variation among the states in sector demand for energy.

Total energy consumption in the United States grew by about one percent in 2017, with the transportation sector accounting for most of the increase. As with the SSEB region, residential consumption declined the most. Although energy demand by industrial consumers nationally remains higher than other economic sectors, it is proportionally less than in the SSEB region.

Energy Consumption by Sector

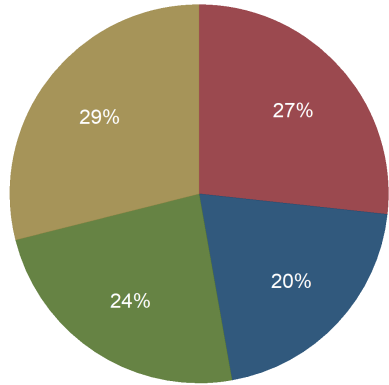


Energy Consumption by Sector



Energy Consumption by Sector

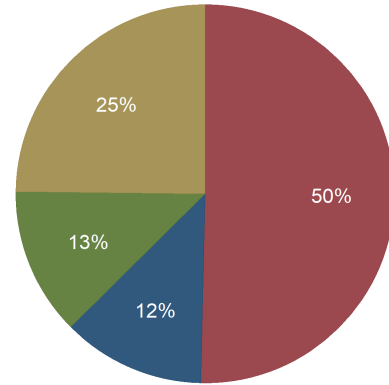
Tennessee Energy Consumption by Sector, 2016



Industrial Commercial
Residential Transportation

Kentucky Energy Database, EEC-DEDI, 2018

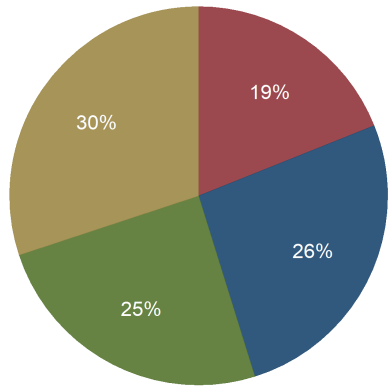
Texas Energy Consumption by Sector, 2016



Industrial Commercial
Residential Transportation

Kentucky Energy Database, EEC-DEDI, 2018

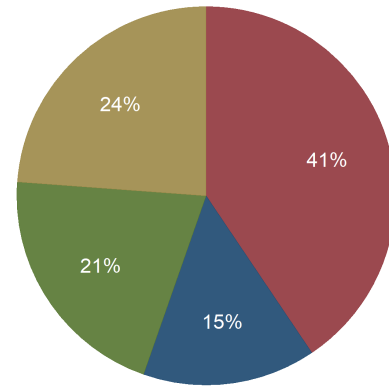
Virginia Energy Consumption by Sector, 2016



Industrial Commercial
Residential Transportation

Kentucky Energy Database, EEC-DEDI, 2018

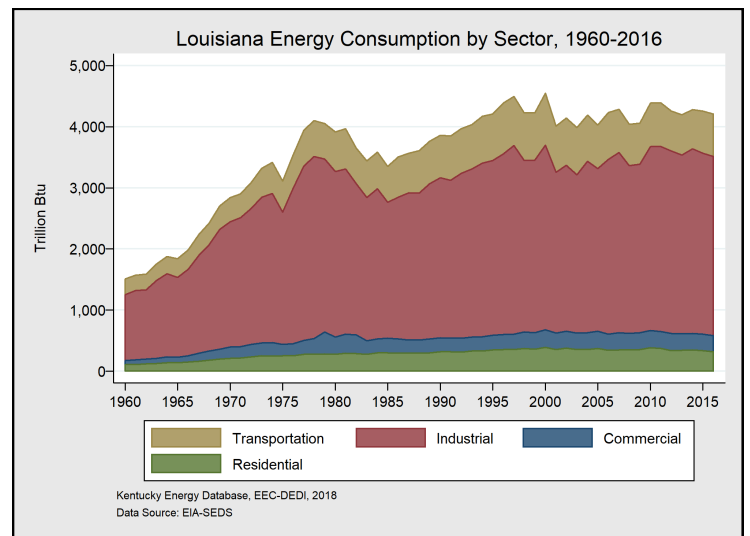
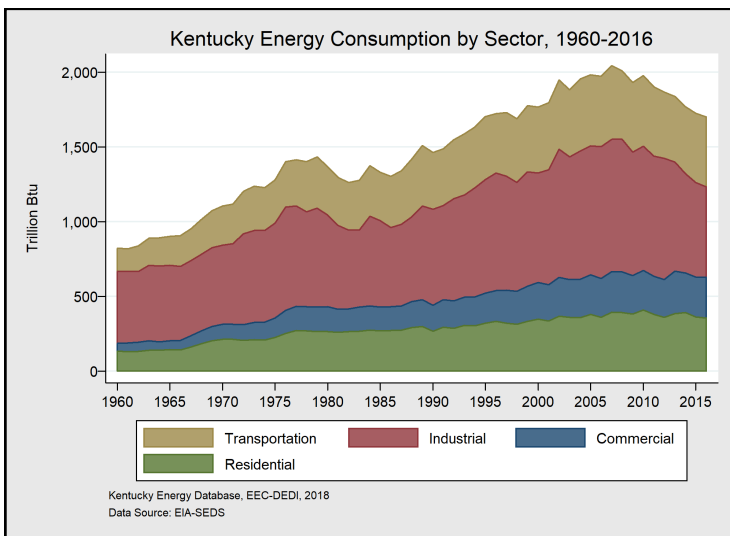
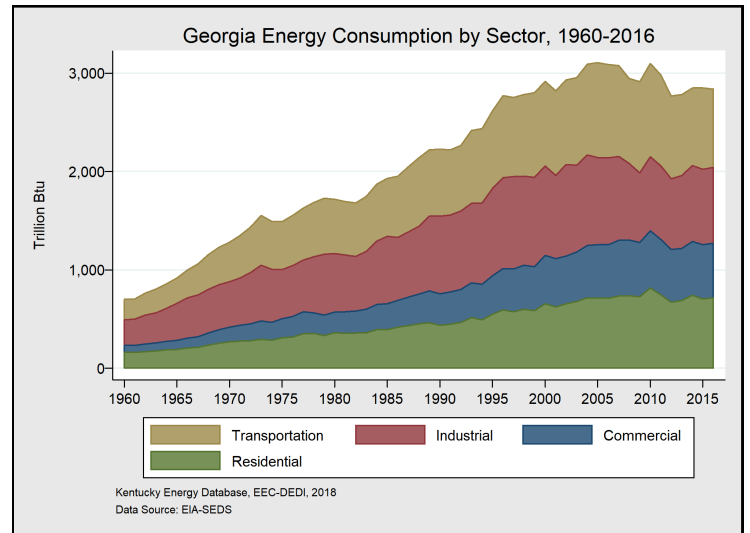
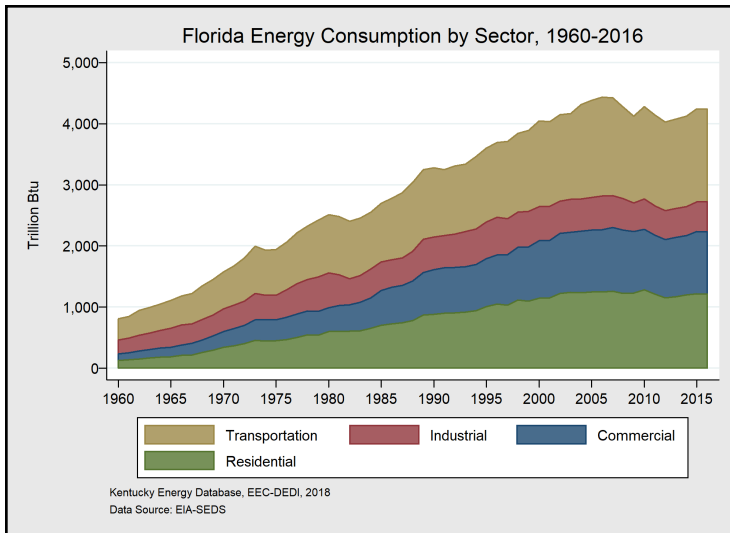
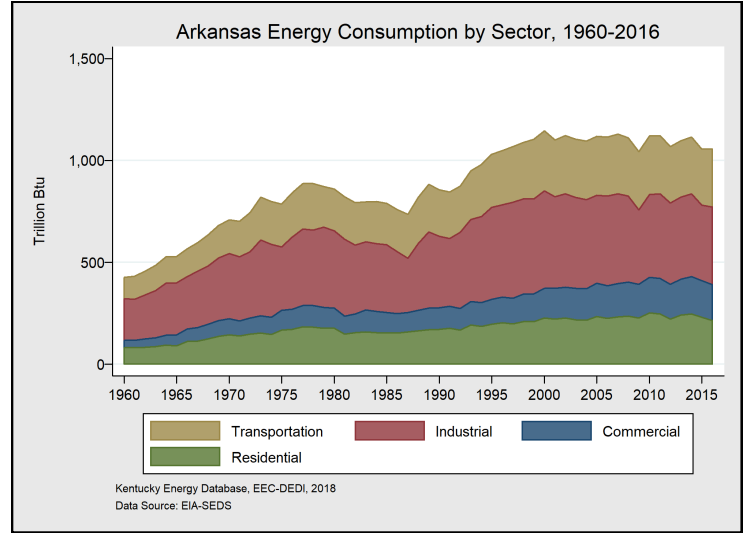
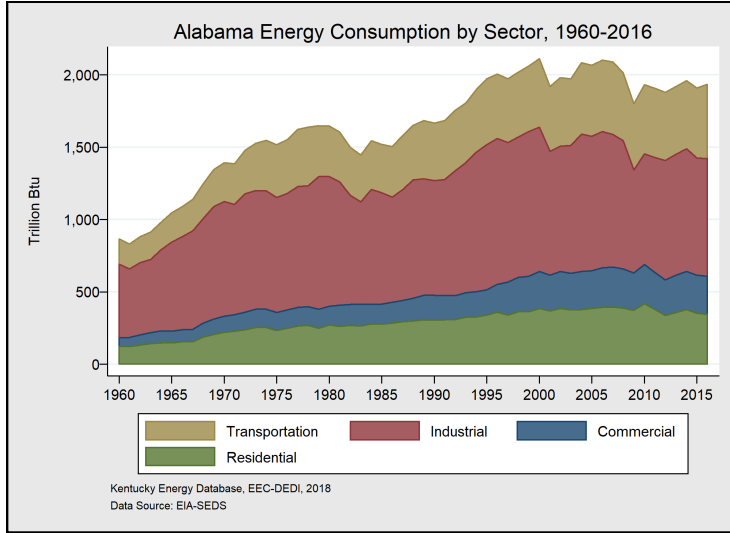
West Virginia Energy Consumption by Sector, 2016



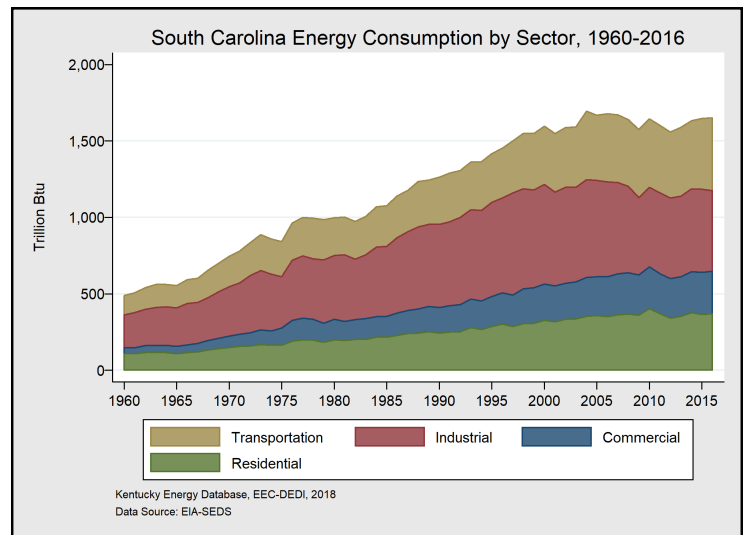
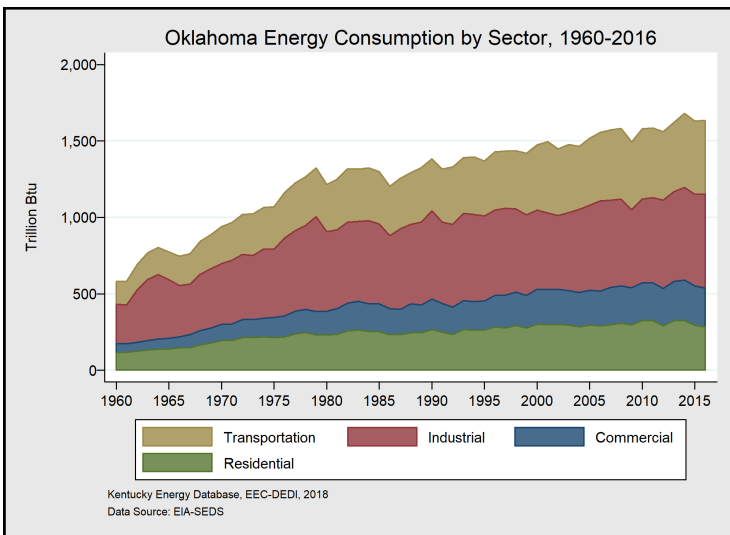
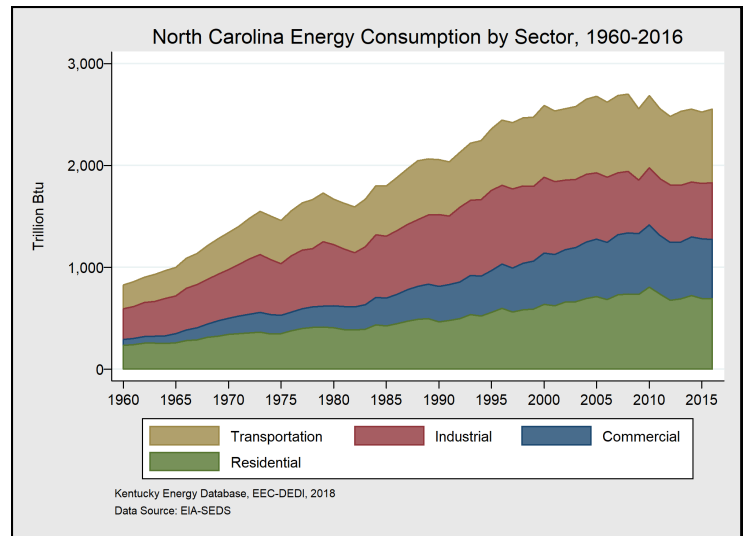
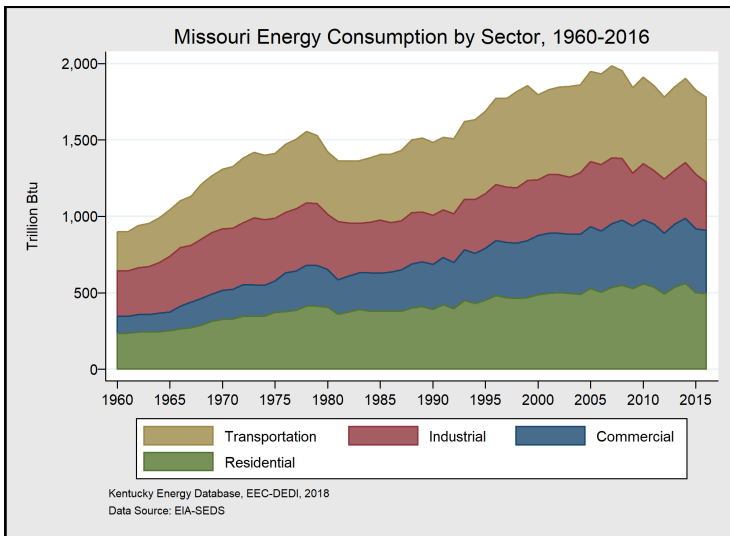
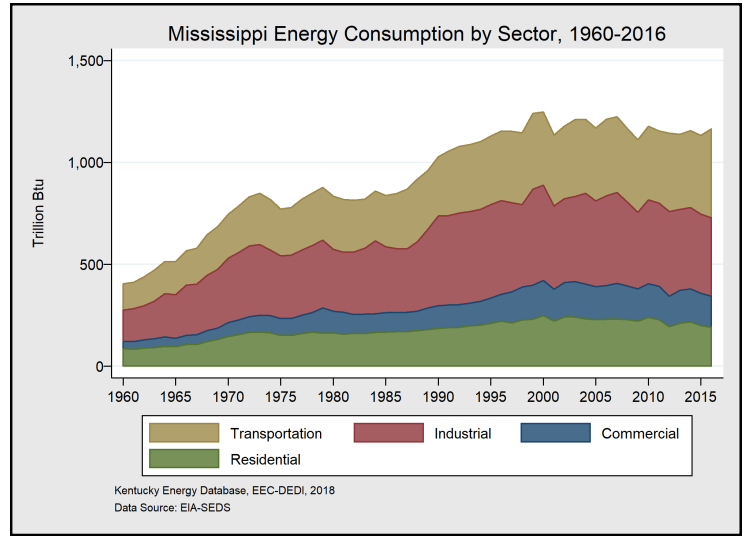
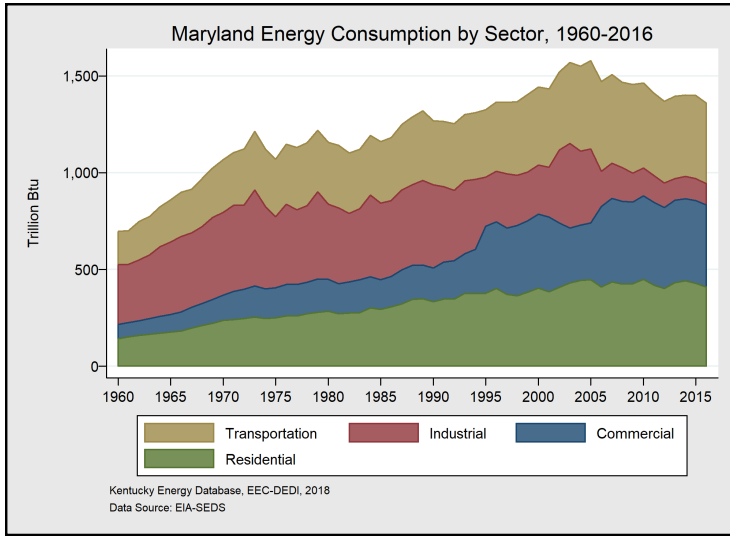
Industrial Commercial
Residential Transportation

Kentucky Energy Database, EEC-DEDI, 2018

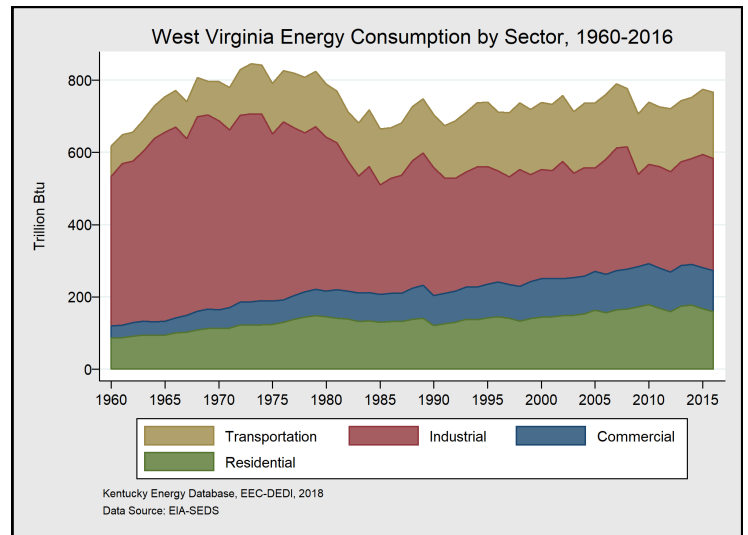
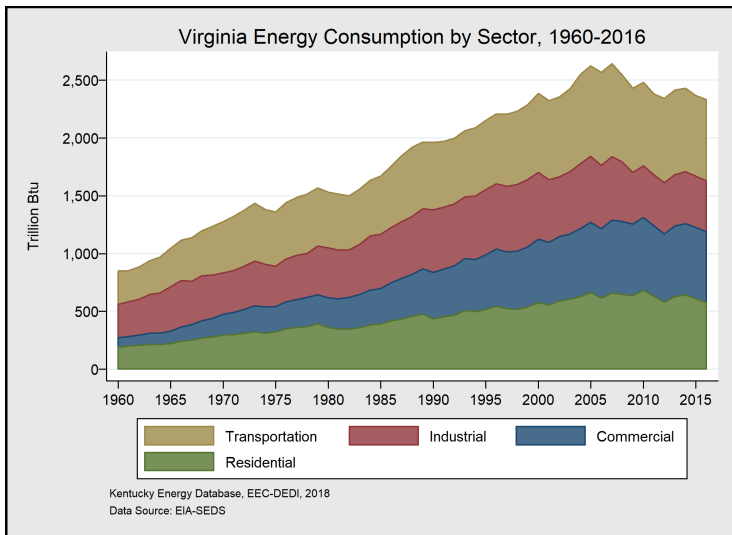
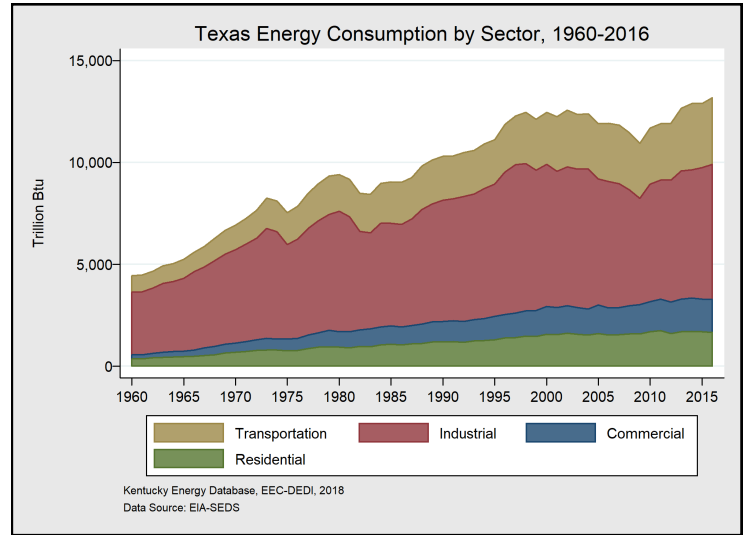
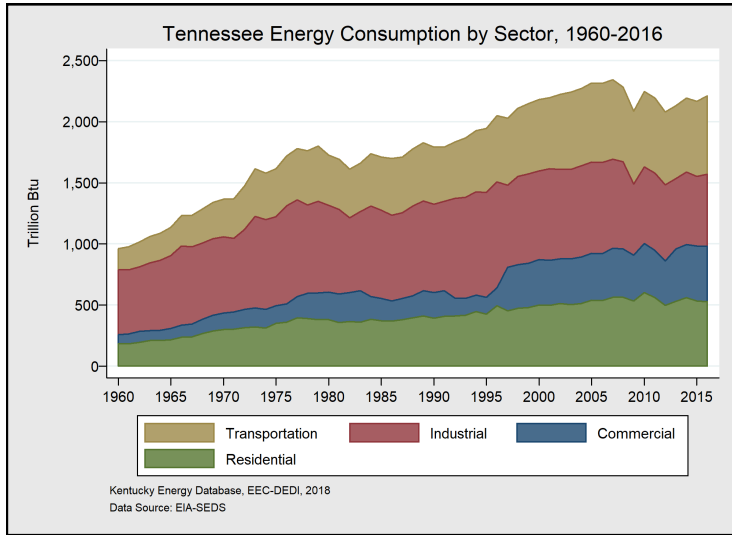
Historical Energy Consumption by Sector



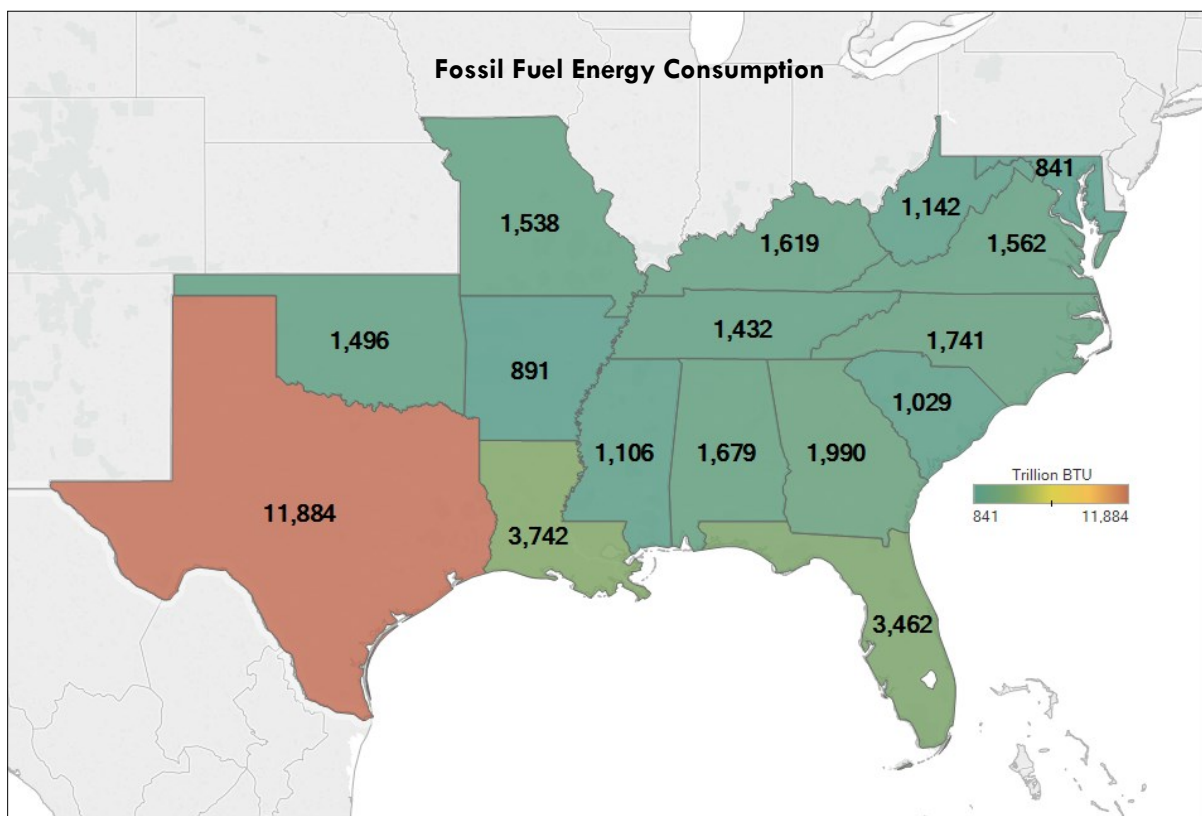
Historical Energy Consumption by Sector



Historical Energy Consumption by Sector



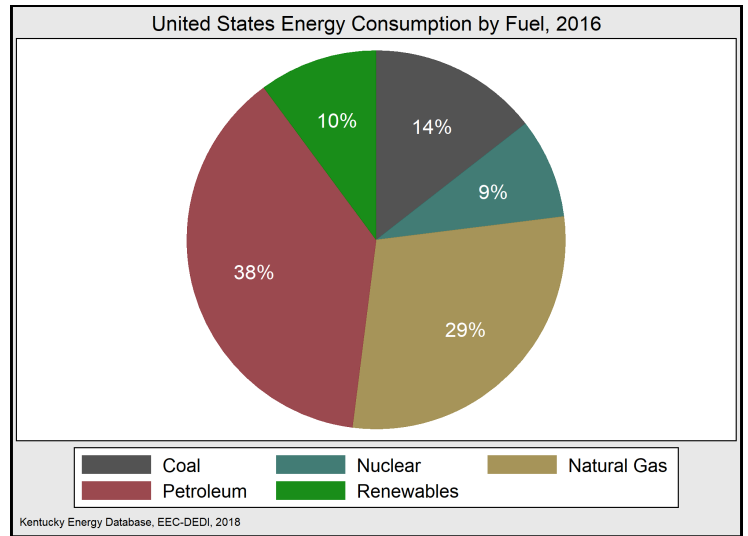
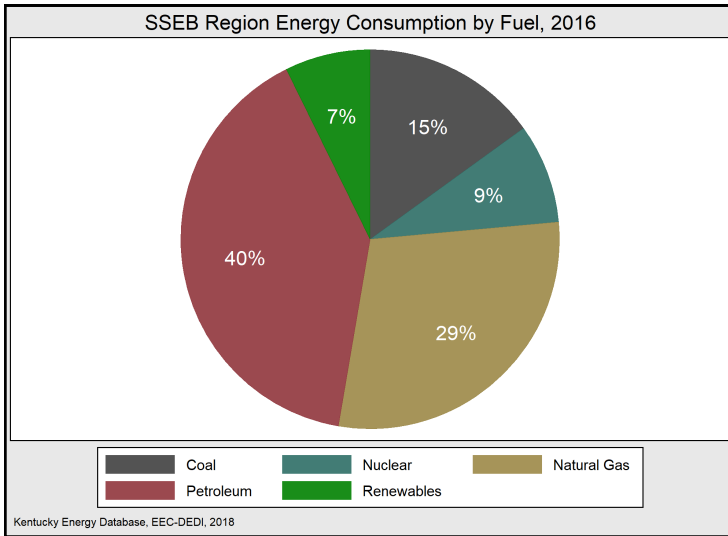
SSEB Region Energy Consumption by Source



State*	Coal	Natural Gas	Nuclear	Petroleum	Renewables
Alabama	410,168	715,685	417,334	576,988	256,090
Arkansas	246,437	315,664	140,370	341,566	125,096
Florida	426,188	1,414,097	306,658	1,691,394	294,128
Georgia	399,279	728,601	360,633	900,319	299,661
Kentucky	736,584	284,143	-	616,527	90,058
Louisiana	140,513	1,697,850	179,391	1,923,868	169,614
Maryland	162,931	230,285	154,377	471,462	74,385
Mississippi	61,219	563,395	61,680	496,893	75,207
Missouri	639,860	273,624	98,630	650,725	90,295
North Carolina	381,761	540,220	447,500	855,577	222,138
Oklahoma	221,842	738,435	-	551,332	255,672
South Carolina	221,865	284,186	583,883	545,113	148,719
Tennessee	379,775	339,273	309,357	739,362	165,880
Texas	1,323,111	4,155,627	440,109	6,527,250	787,898
Virginia	222,938	572,114	310,966	800,570	161,845
West Virginia	751,957	187,539	-	208,507	51,271
SSEB REGION TOTAL	6,726,428	13,040,738	3,810,888	17,897,453	3,267,957

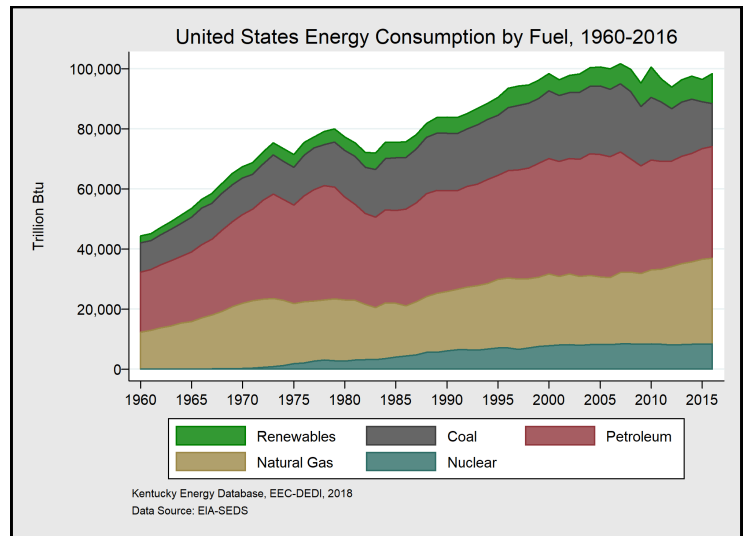
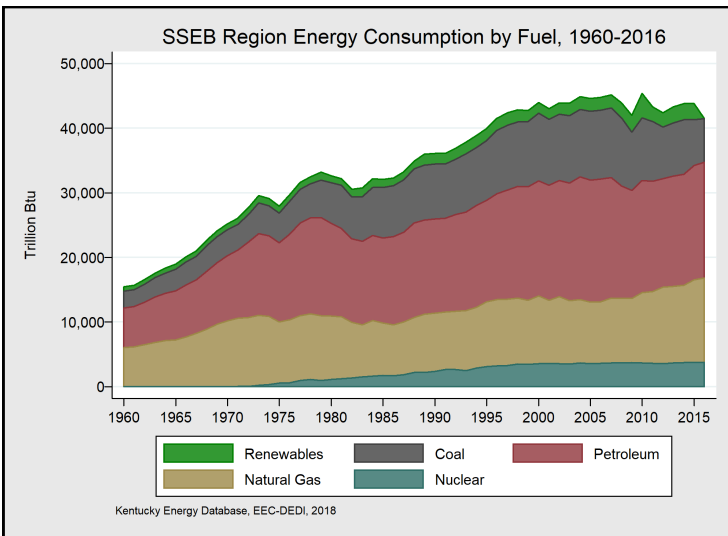
*All figures in the table above are reported in Billion Btus

SSEB Region Energy Consumption by Source



Source Type	Trillion Btu	1 Year Change
Total	44,618	+1.9%
Petroleum	17,897	+1.2%
Natural Gas	13,041	+2.0%
Coal	6,726	-5.1%
Nuclear	3,811	+1.9%
Renewables	3,268	+31.3%

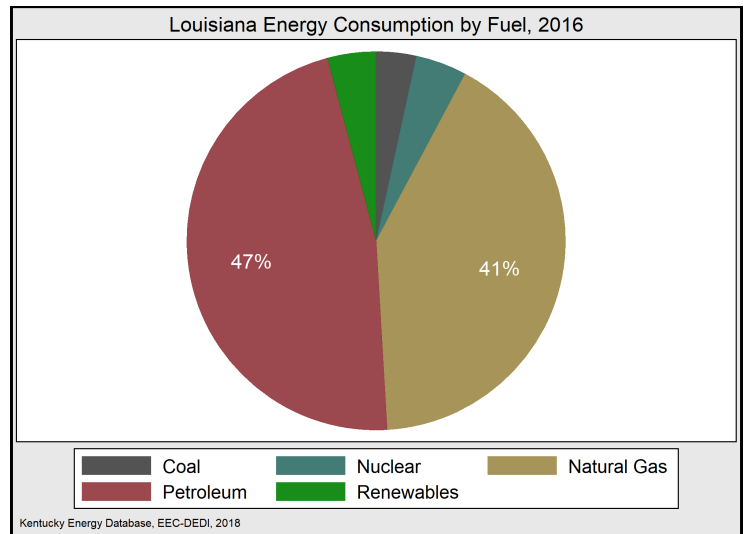
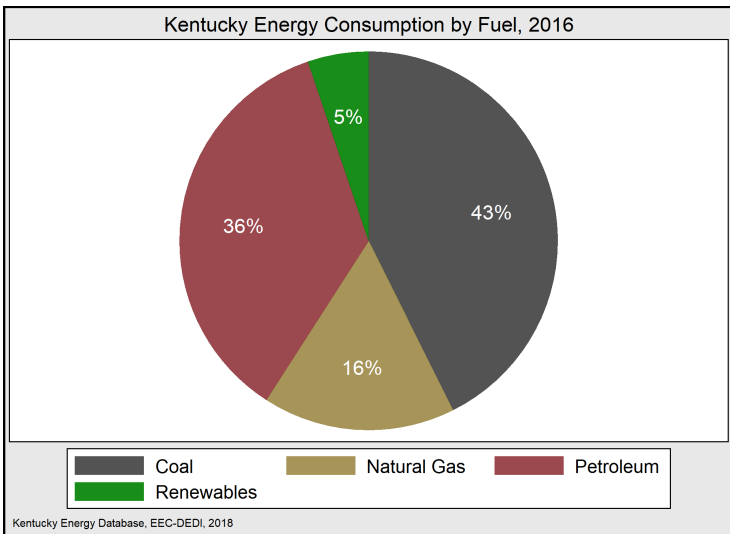
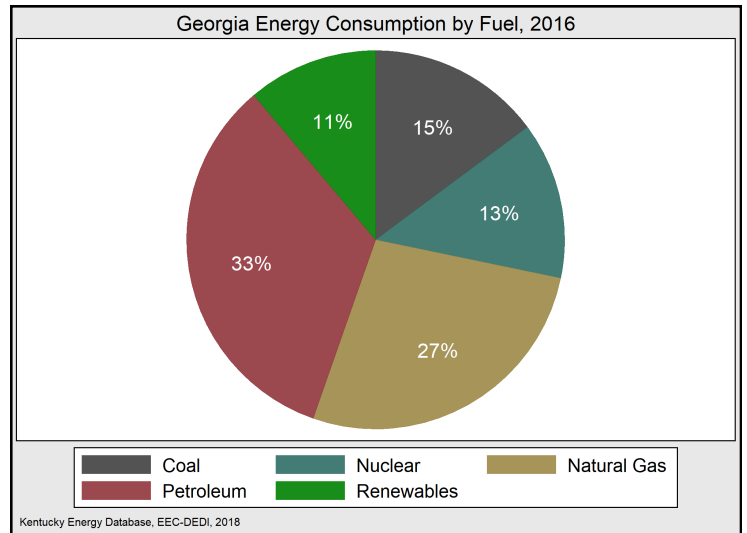
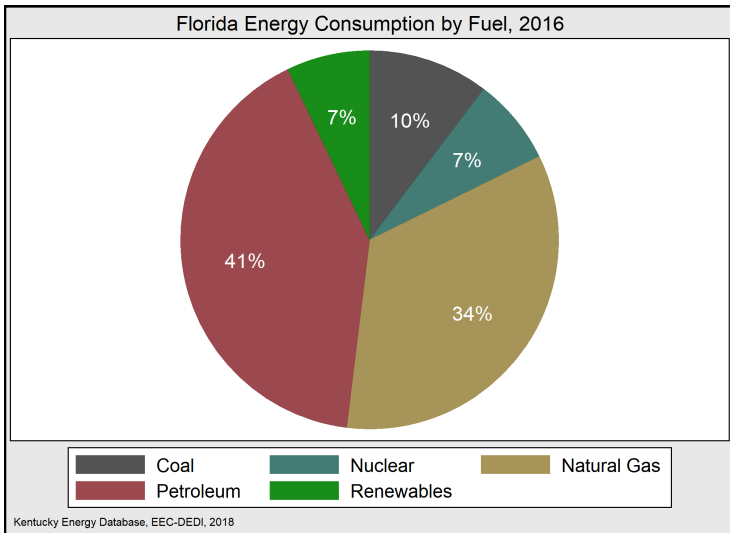
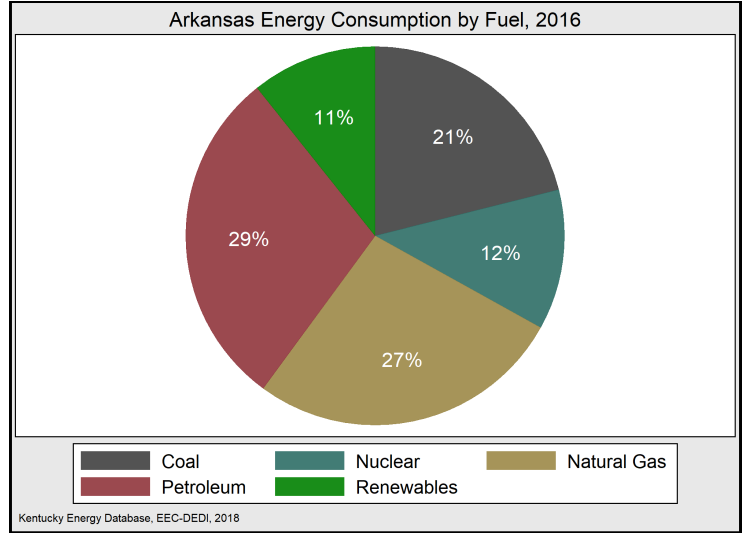
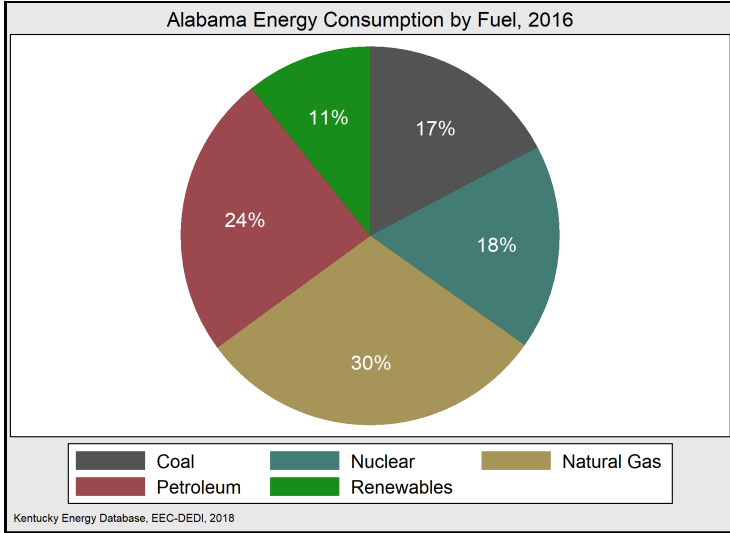
Source Type	Trillion Btu	1 Year Change
Total	97,315	+0.9%
Petroleum	37,257	+1.0%
Natural Gas	28,499	+0.9%
Coal	14,227	-8.5%
Renewables	8,427	+1.1%
Nuclear	9,966	+33.3%



Total energy consumption in the SSEB region grew slightly in 2016, but has actually declined from 44.7 quadrillion Btu from 2014. Total energy demand has decreased since peaking in 2007. Renewable resources have risen to 7 percent of all energy consumed in the SSEB region in 2016 and also grew the largest amount for the year.

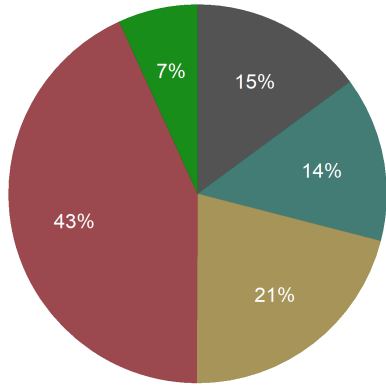
As with the region, U.S. energy consumption peaked in 2007 and while it grew in 2016, has declined from 2014. The use of petroleum products continues to be the primary energy resource in both the SSEB region and the United States as a whole at 40 percent and 38 percent, respectively, in 2016, and is used primarily for transportation. Renewable energy consumption now accounts for 10 percent of all energy consumed nationally.

Energy Consumption by Source



Energy Consumption by Source

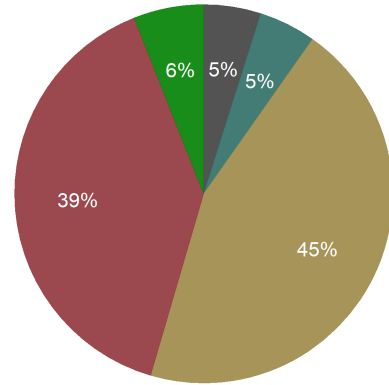
Maryland Energy Consumption by Fuel, 2016



Coal Nuclear Natural Gas
Petroleum Renewables

Kentucky Energy Database, EEC-DEDI, 2018

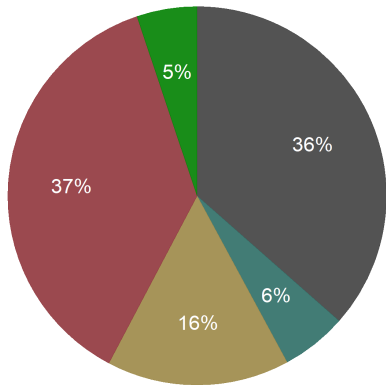
Mississippi Energy Consumption by Fuel, 2016



Coal Nuclear Natural Gas
Petroleum Renewables

Kentucky Energy Database, EEC-DEDI, 2018

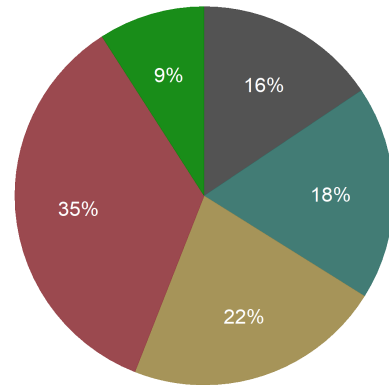
Missouri Energy Consumption by Fuel, 2016



Coal Nuclear Natural Gas
Petroleum Renewables

Kentucky Energy Database, EEC-DEDI, 2018

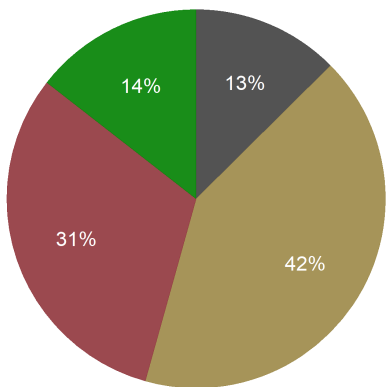
North Carolina Energy Consumption by Fuel, 2016



Coal Nuclear Natural Gas
Petroleum Renewables

Kentucky Energy Database, EEC-DEDI, 2018

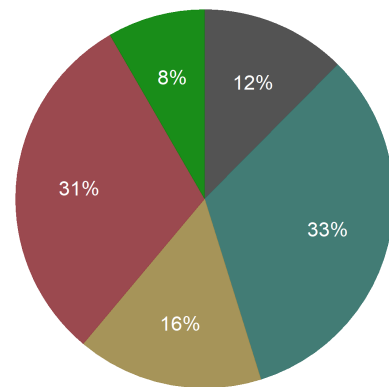
Oklahoma Energy Consumption by Fuel, 2016



Coal Nuclear Natural Gas
Petroleum Renewables

Kentucky Energy Database, EEC-DEDI, 2018

South Carolina Energy Consumption by Fuel, 2016

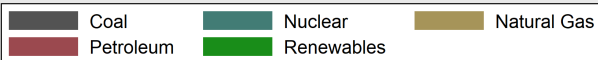
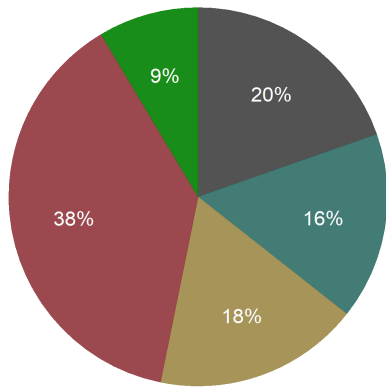


Coal Nuclear Natural Gas
Petroleum Renewables

Kentucky Energy Database, EEC-DEDI, 2018

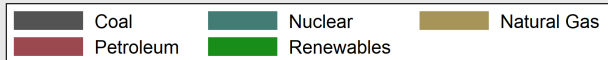
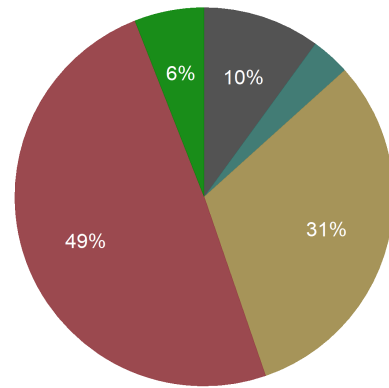
Energy Consumption by Source

Tennessee Energy Consumption by Fuel, 2016



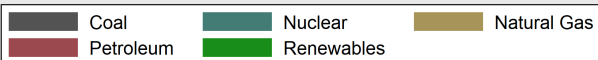
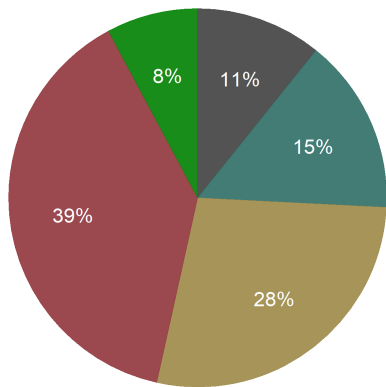
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Texas Energy Consumption by Fuel, 2016



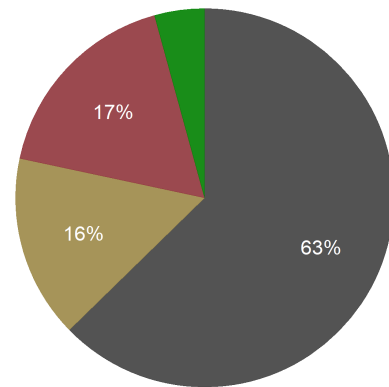
Kentucky Energy Database, EEC-DEDI, 2016

Virginia Energy Consumption by Fuel, 2016



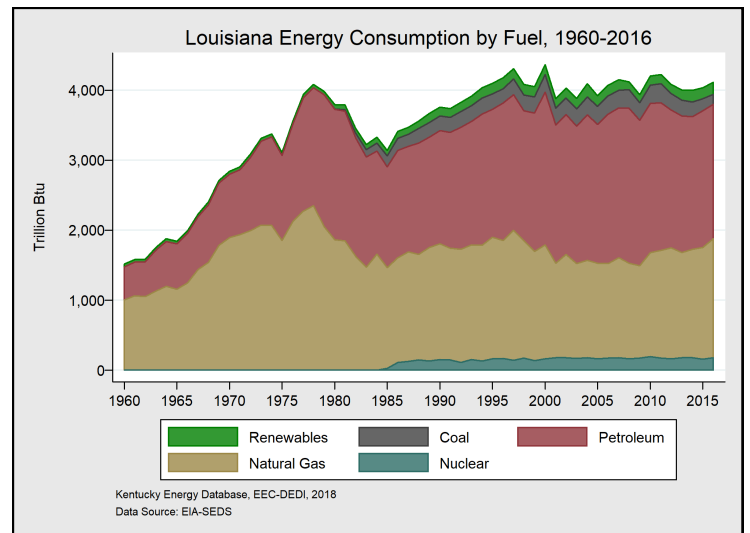
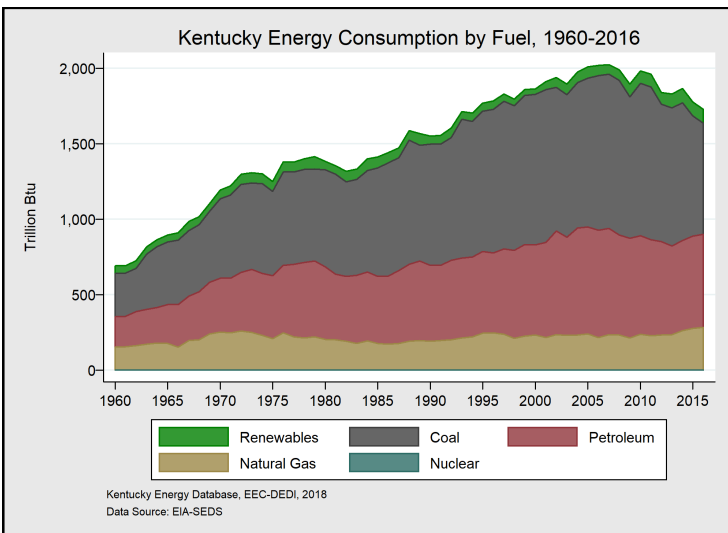
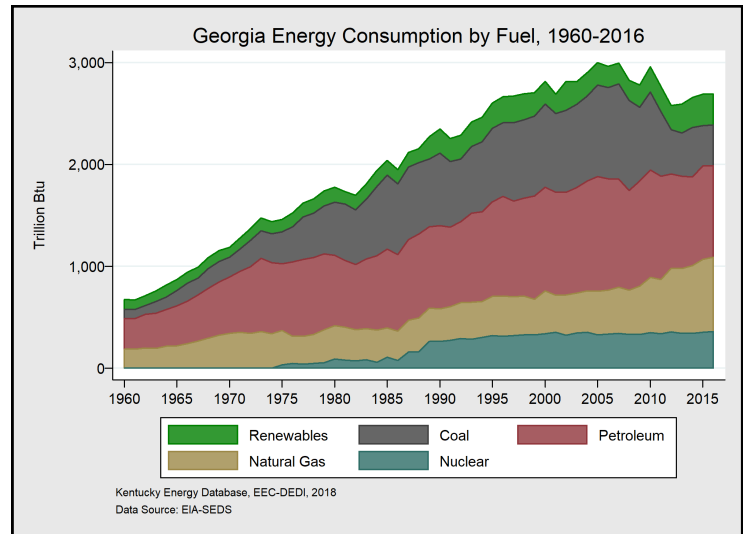
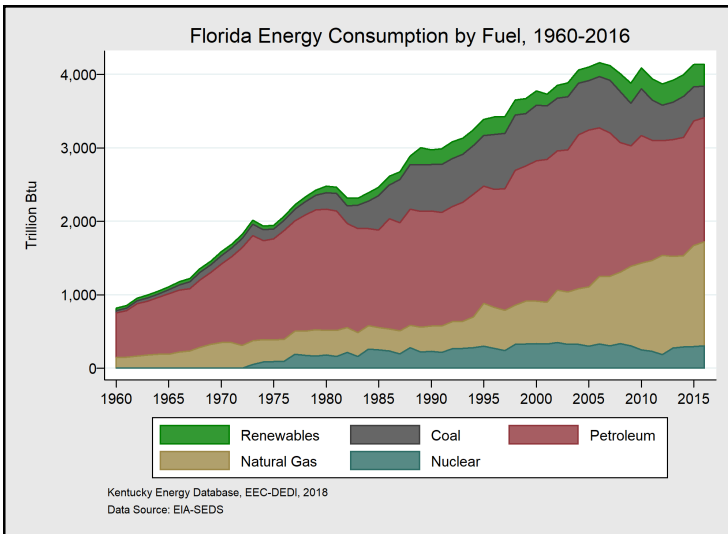
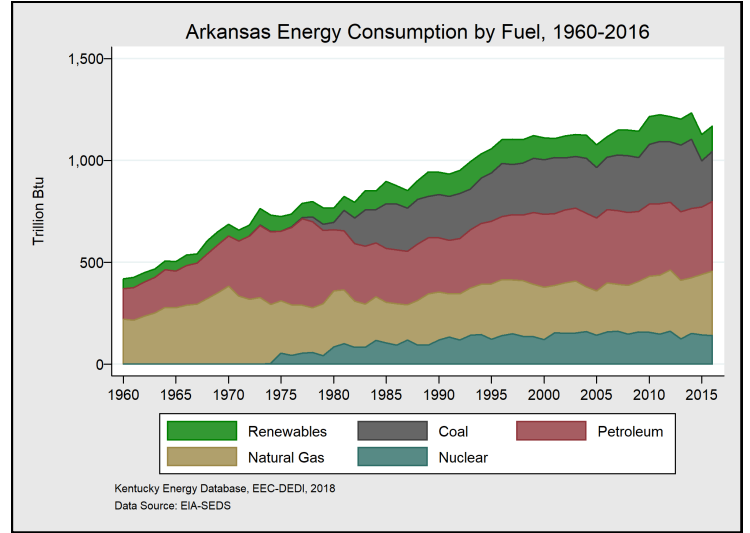
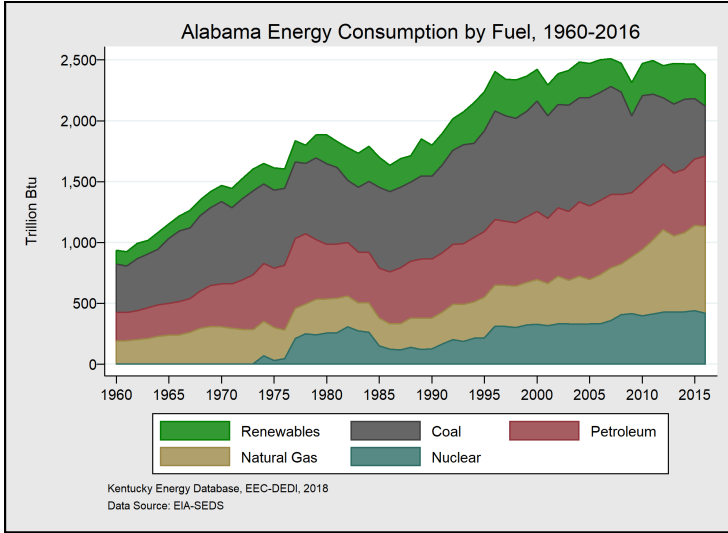
Kentucky Energy Database, EEC-DEDI, 2016

West Virginia Energy Consumption by Fuel, 2016

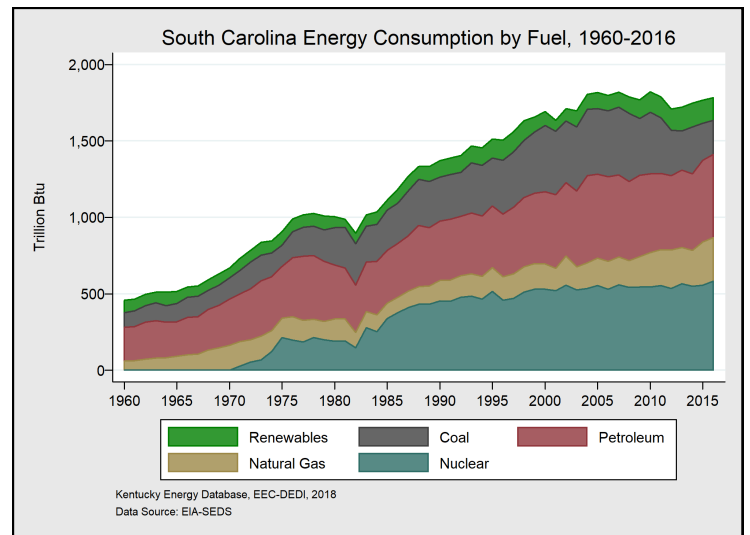
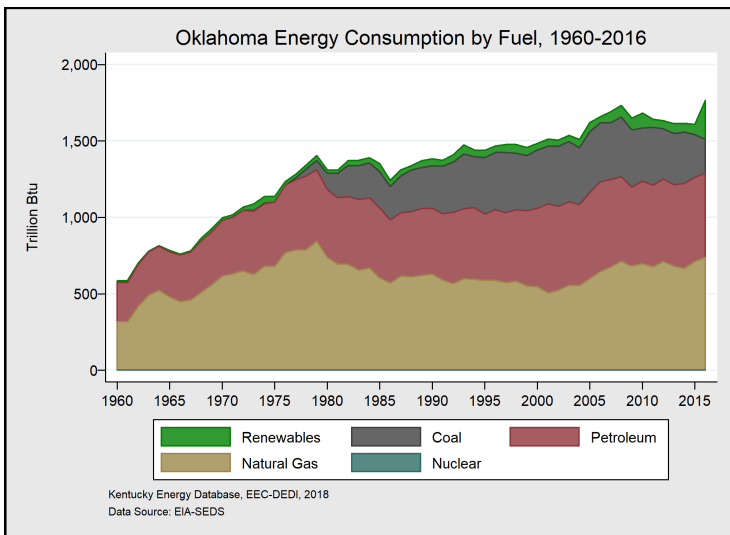
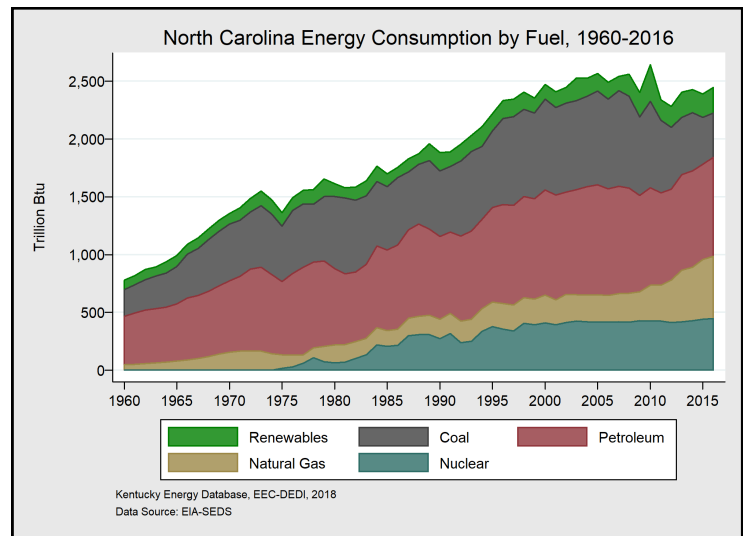
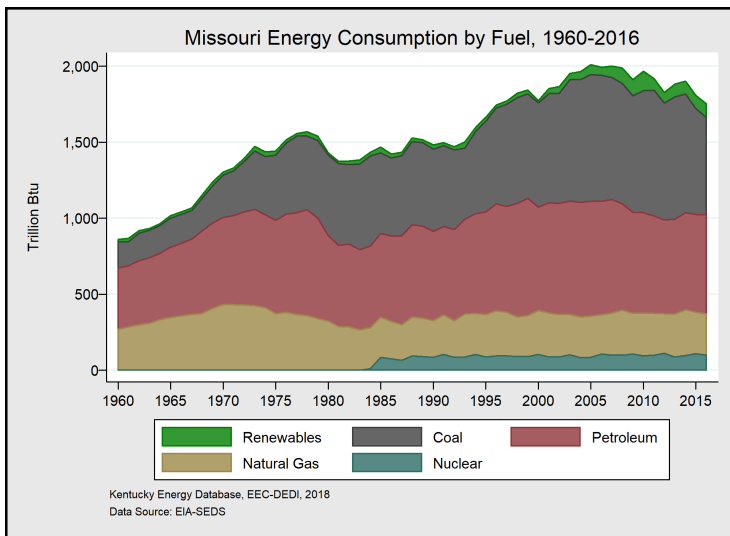
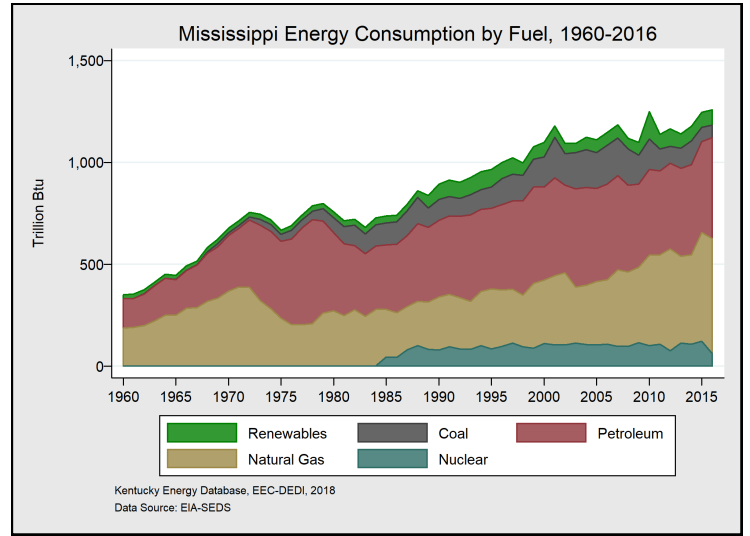
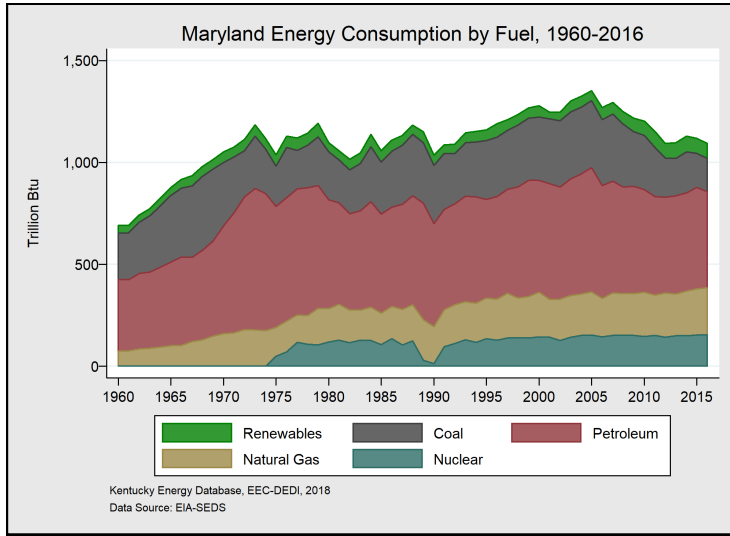


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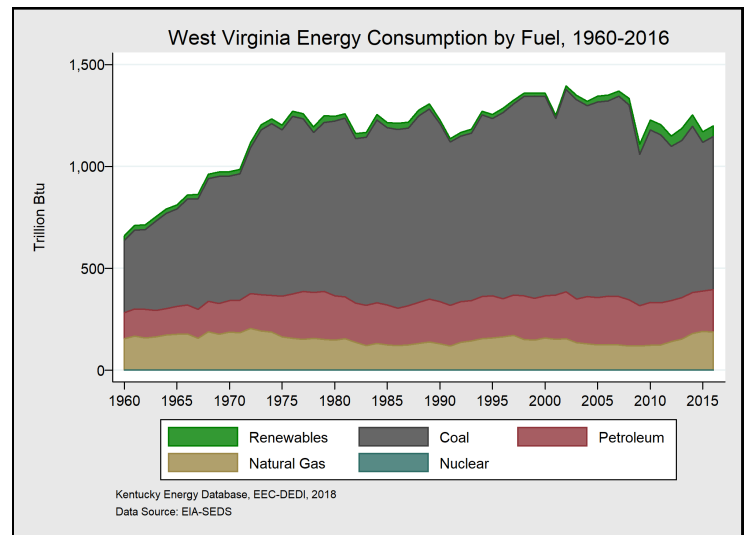
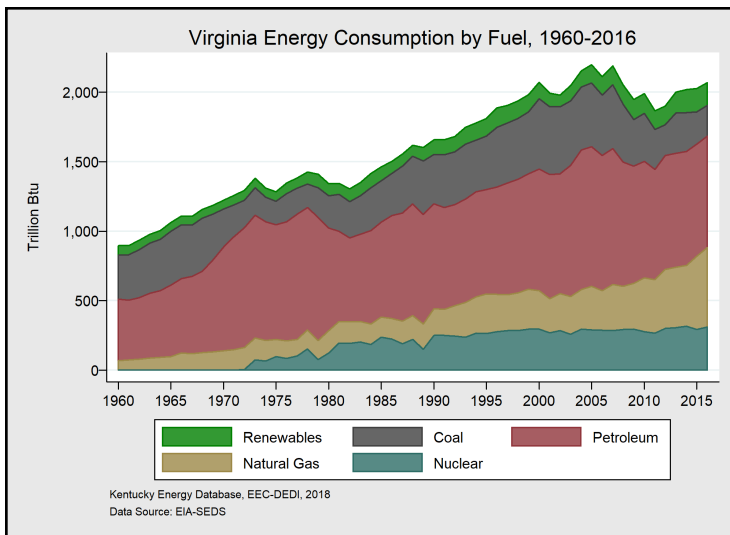
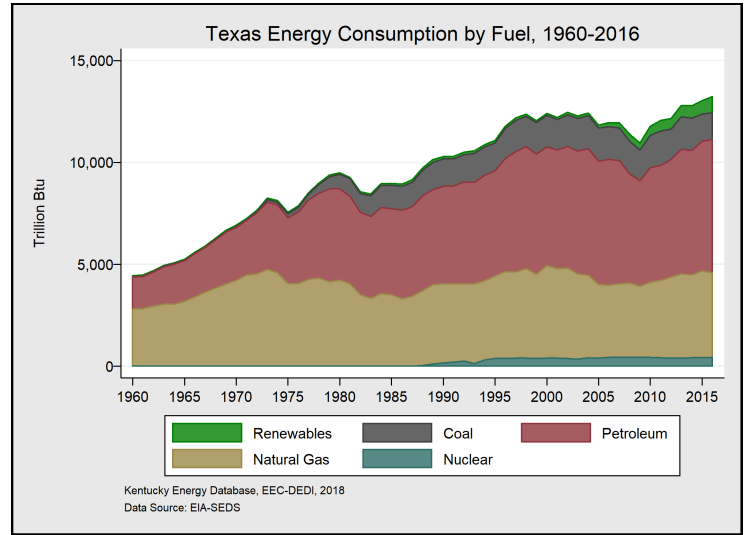
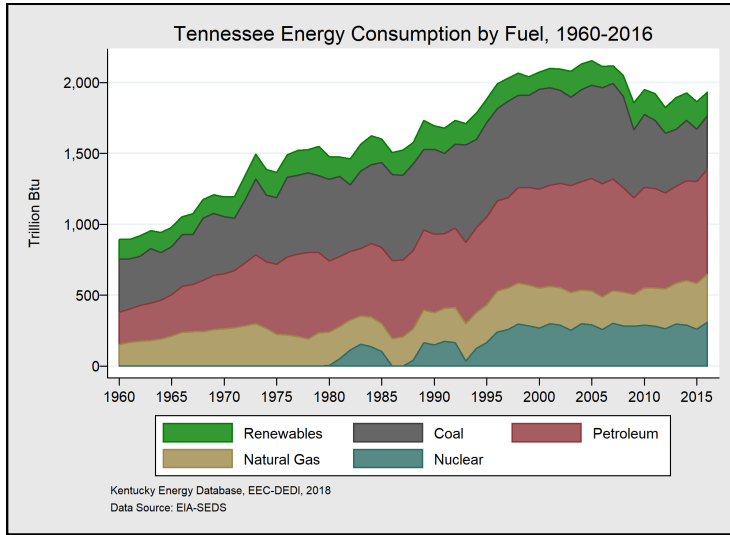
Historical Energy Consumption by Source



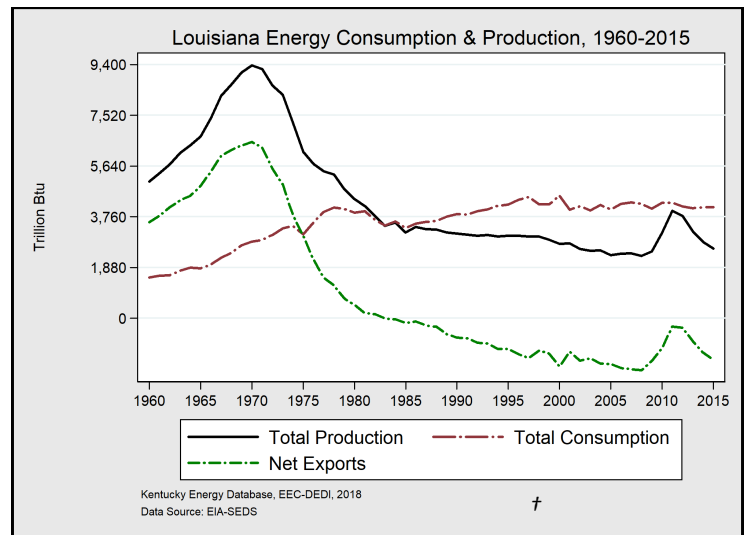
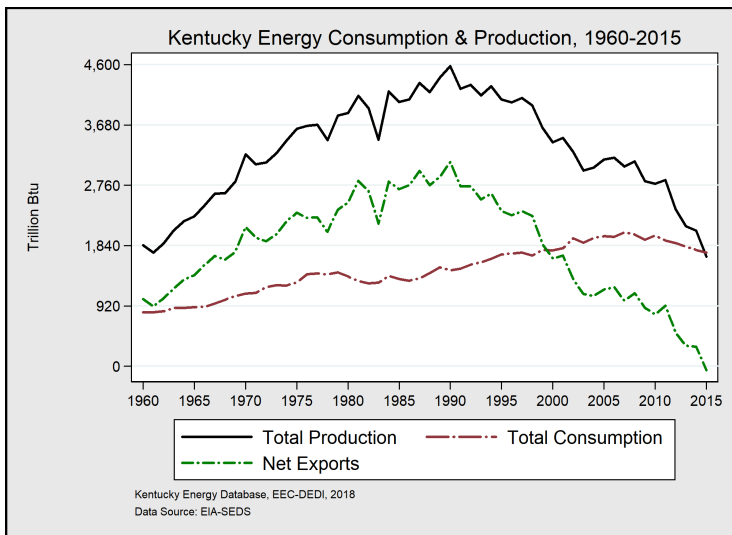
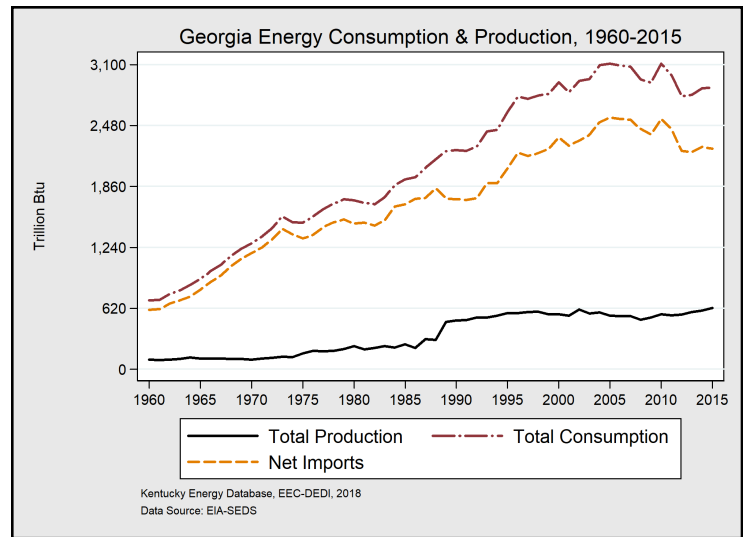
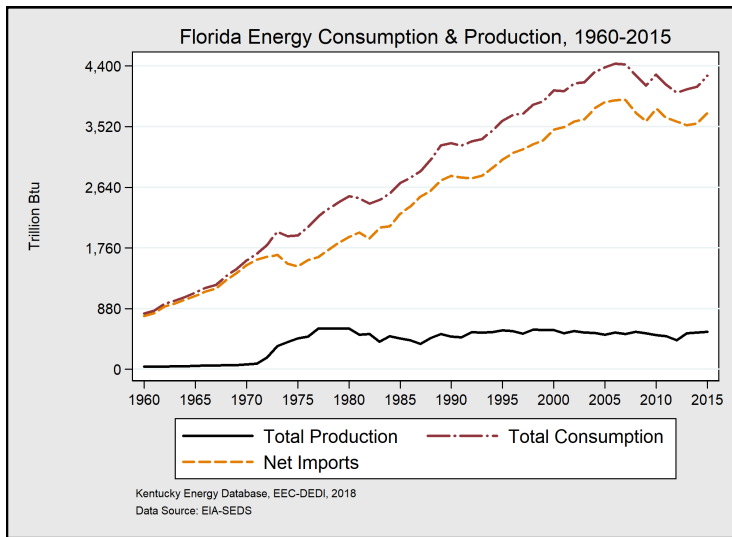
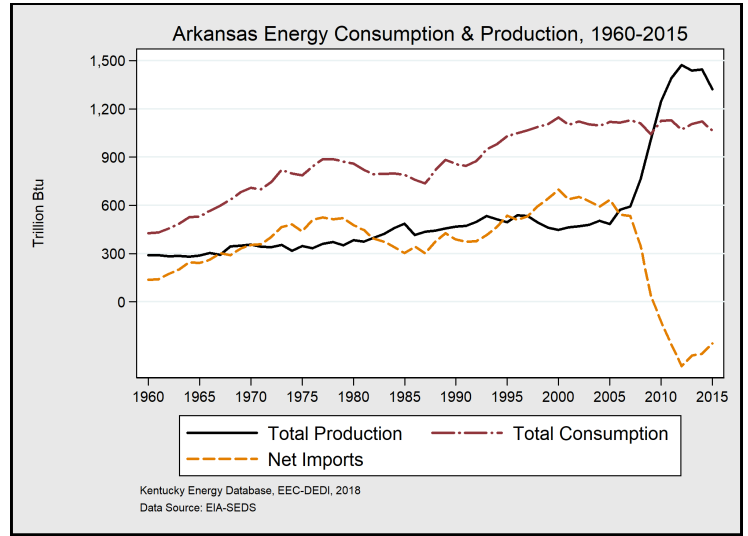
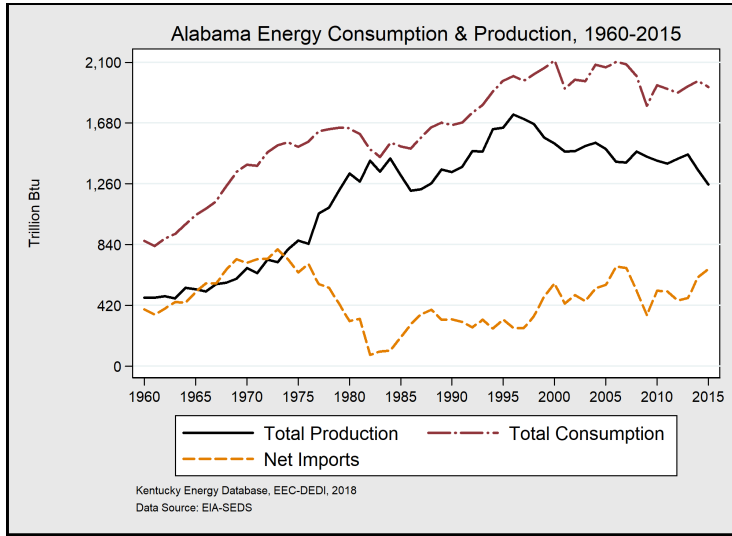
Historical Energy Consumption by Source



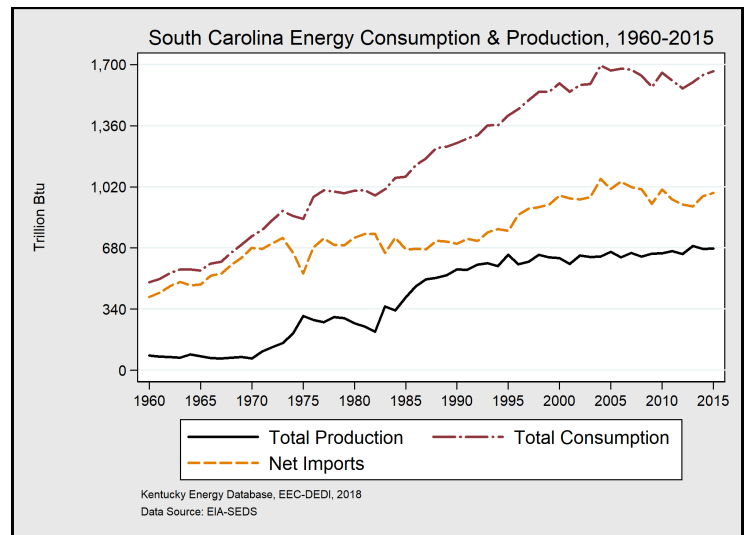
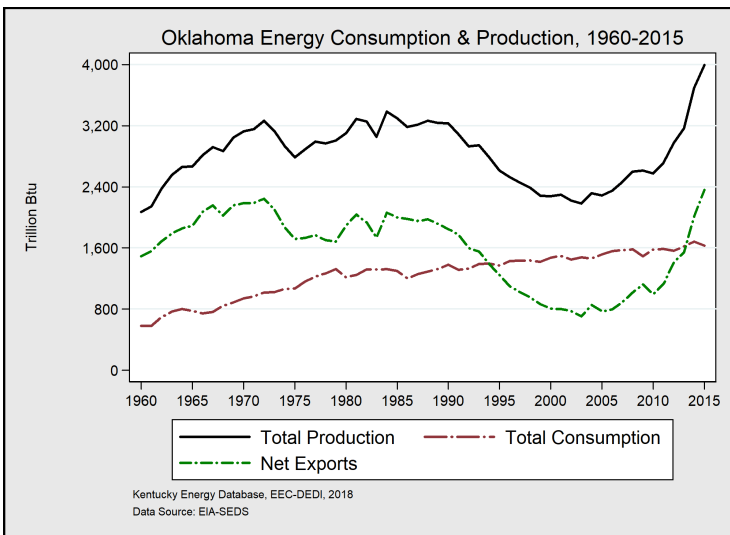
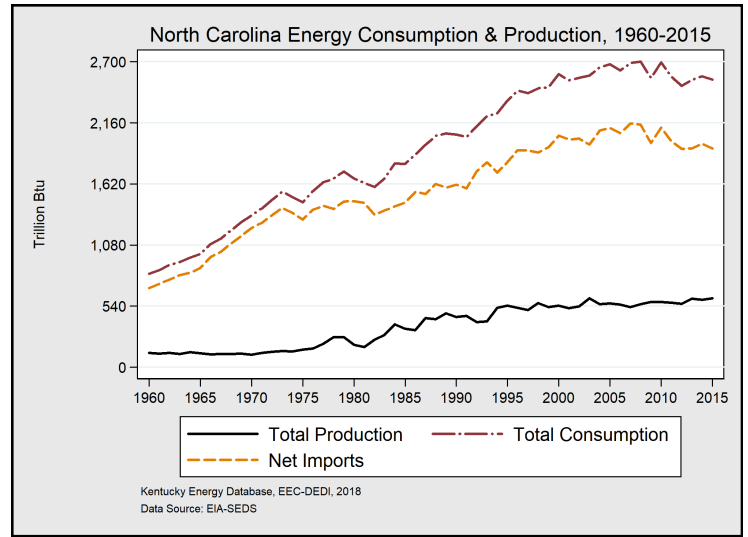
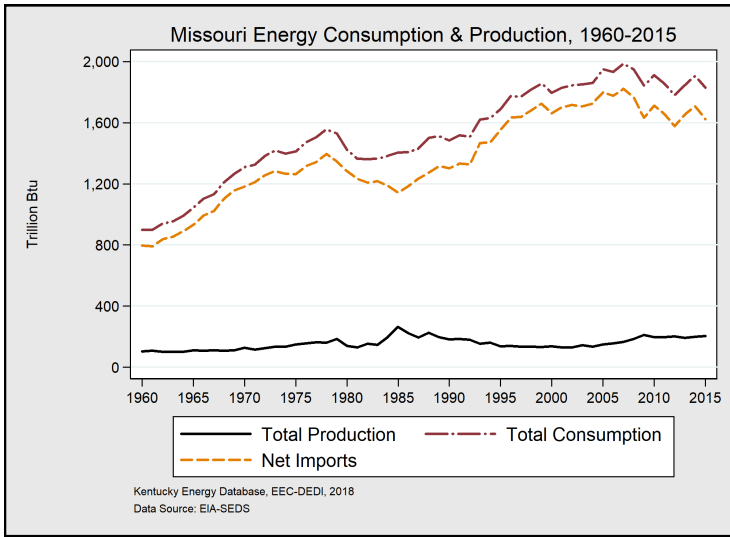
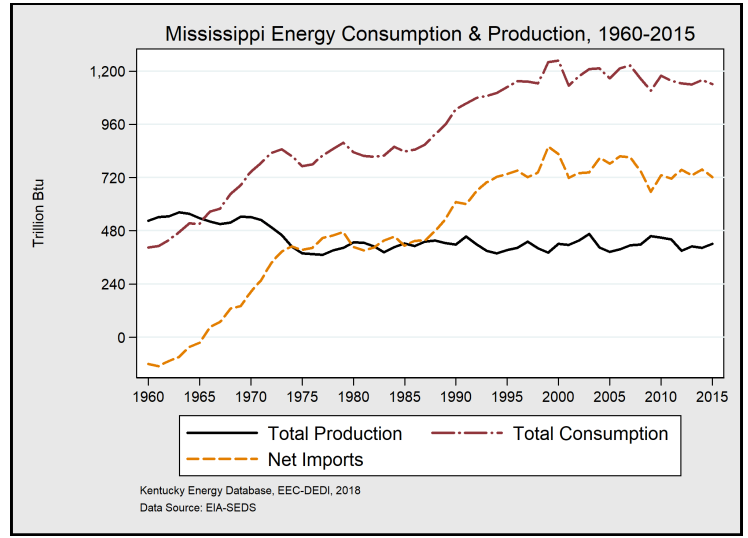
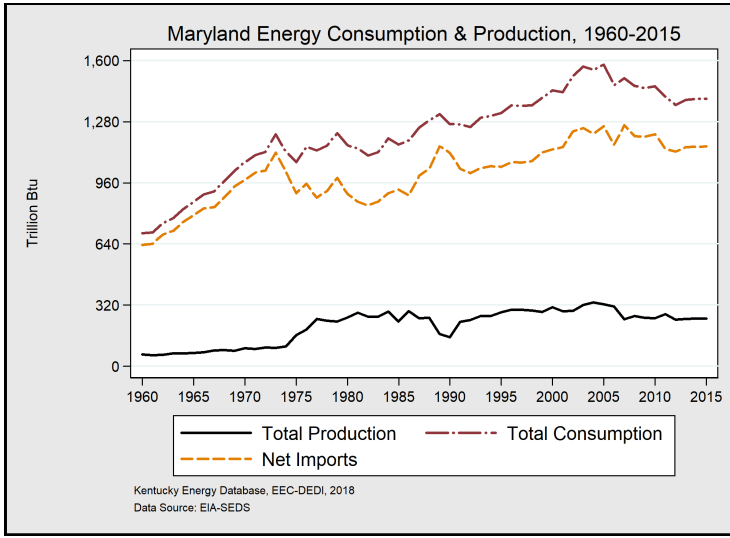
Historical Energy Consumption by Source



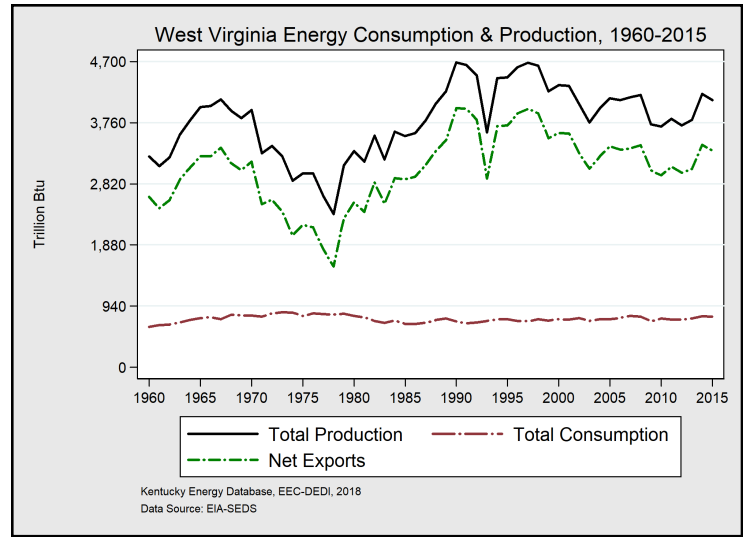
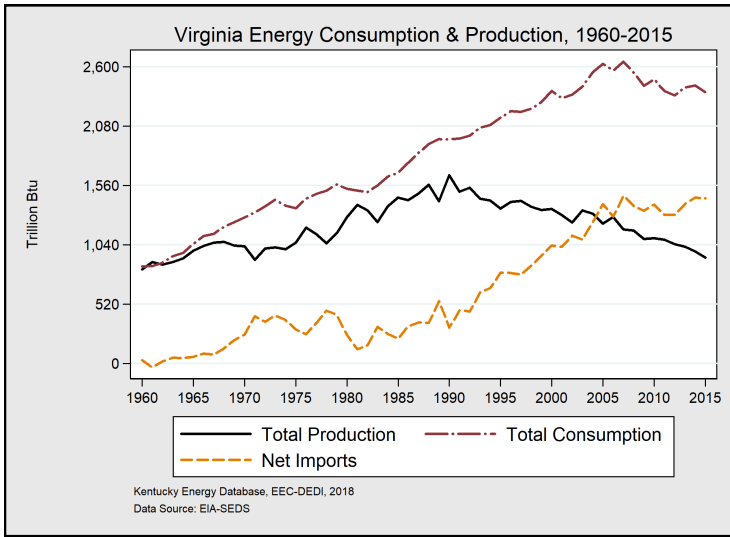
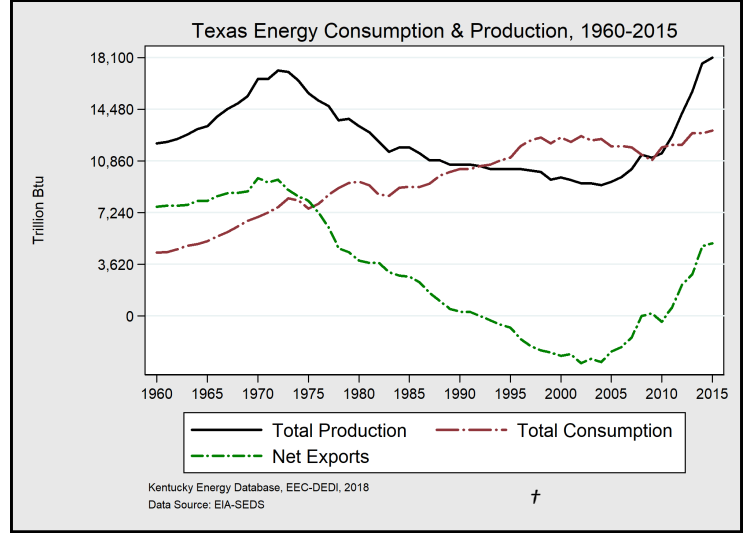
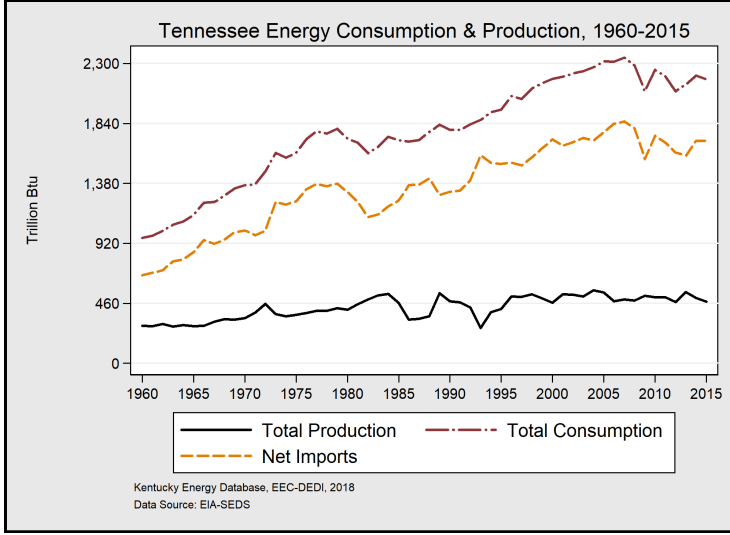
Historical Net Energy Exports



Historical Net Energy Exports



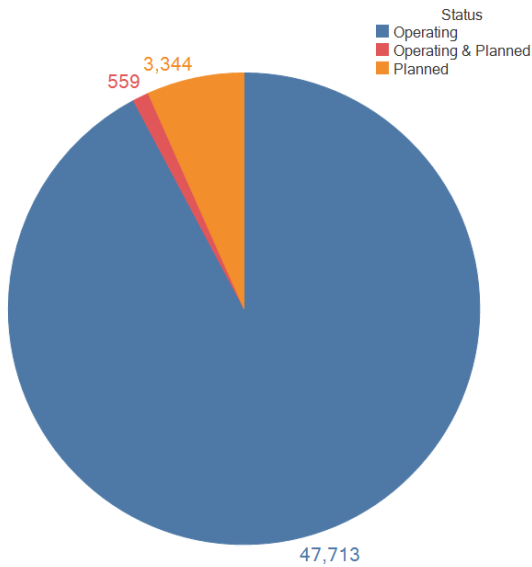
Historical Net Energy Exports



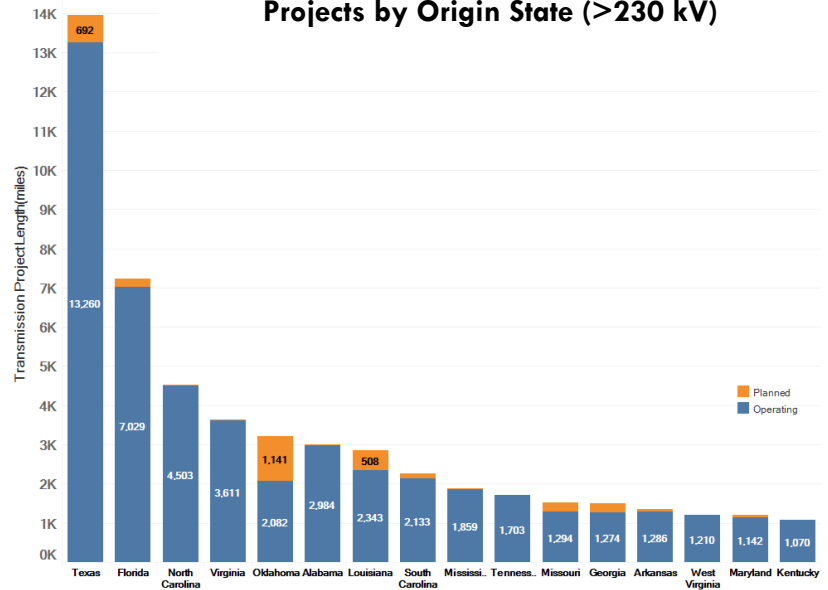
† Louisiana and Texas show substantial fluctuation in energy consumption and production due to the reclassification of offshore energy extraction during this time series.

SSEB Region Utility Metrics

Miles of Transmission for SSEB Region (>230 kV)

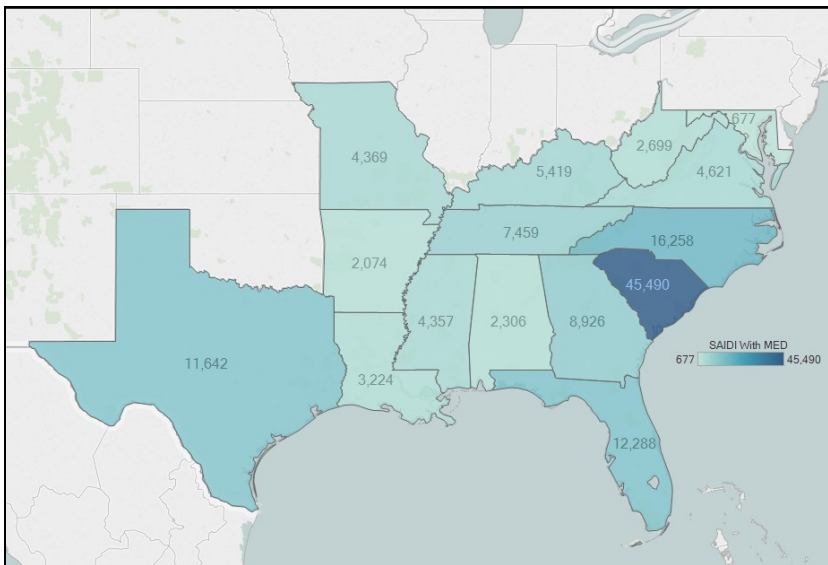


Miles of Planned and Operating Transmission Projects by Origin State (>230 kV)



The electric transmission infrastructure provides the backbone of the bulk power system. State differences in transmission infrastructure development reflect variations in wholesale market participation, geography, economic development, and new generation capacity construction.

System Average Interruption Duration (SAIDI) index, with Major Event Days (with MED), Minutes per Customer

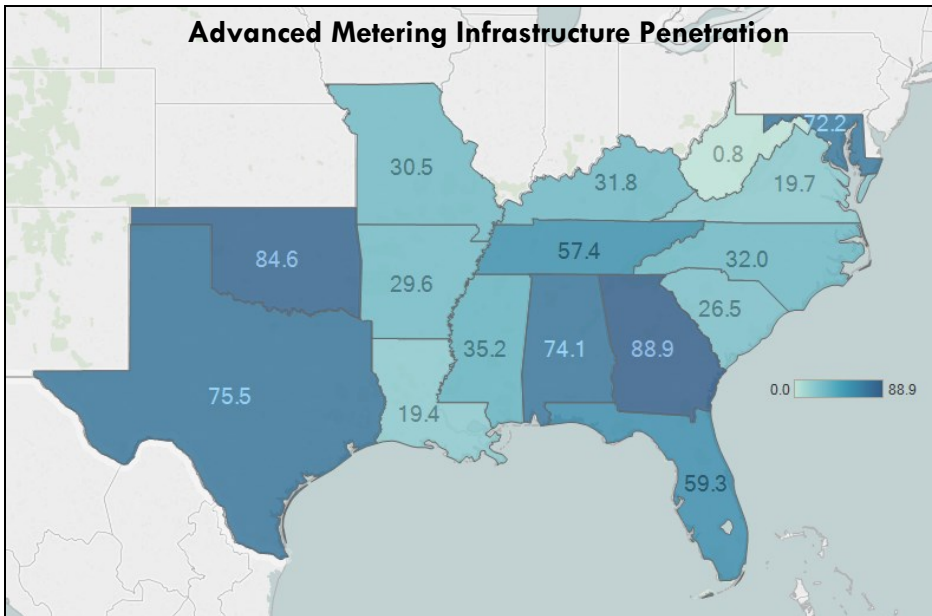


Reliability is “the ability of the system or its components to withstand instability, uncontrolled events, cascading failures, or unanticipated loss of system components (DOE).” The North American Electric Reliability Corporation (NERC) oversees and regulates the reliability of the North American electrical grids. The Federal Energy Regulatory Commission (FERC) certifies NERC and oversees its various activities. Traditional metrics for reliability include System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI). **SAIDI measures the total duration of an interruption for the average customer given a defined time period (usually minutes).** SAIFI measures the average number of times that a customer experiences an outage during the year. Customer Average Interruption Duration Index (CAIDI) is yet another measure of how long it takes to restore the system once an outage occurs. These metrics are also reported with or without including **Major Event Days (MED)**.

States may exhibit significant variability of reliability performance year to year or month to month. Reliability performance is a function of generation, transmission, and distribution with the majority of reliability issues occurring at the distribution level. Several factors can influence reliability, including regional differences, varying regulatory standards, system configuration, customer density, hazard exposure, and major weather events.

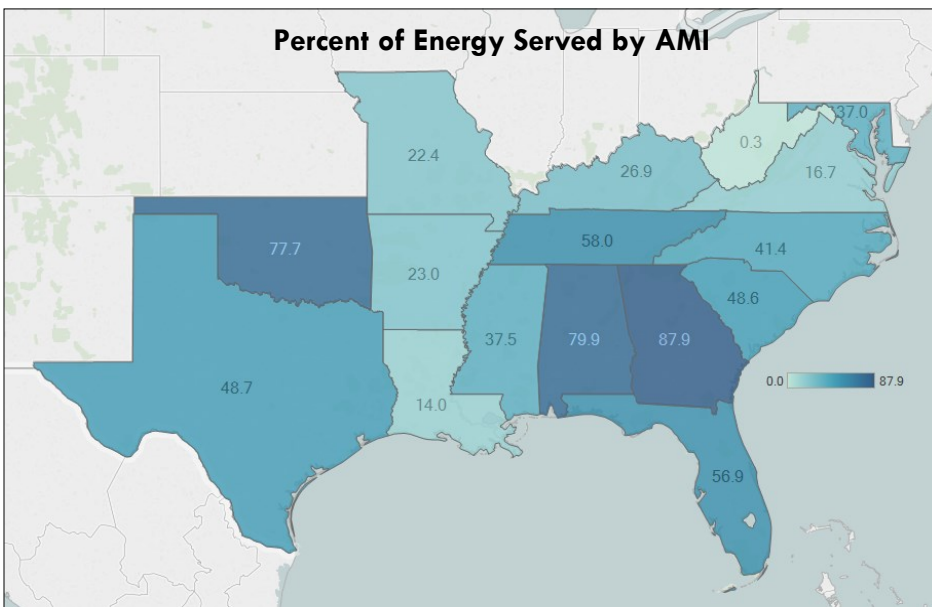
Data for reliability is sourced from Form EIA-861 for 2016.

Advanced Metering Infrastructure, 2016

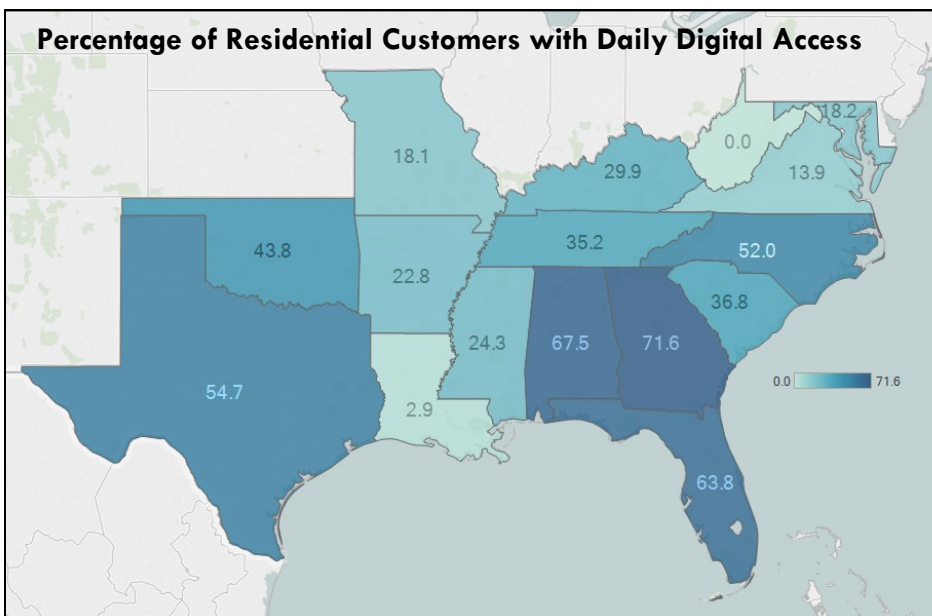


U.S. DOE defines Advanced Metering Infrastructure (AMI) as an integrated system of smart meters, communications networks, and data management systems that enables two-way communication between the utilities and customers.

The first map depicts the percentage of all utility customer meters that are AMI. AMI offers the utility additional functionality such as the ability to automatically and remotely measure electricity use, connect and disconnect service, detect tampering, identify and isolate outages, and monitor voltage. Customer opportunities may also be expanded with AMI to include in-home displays of energy usage, programmable thermostats, and new time-varying rate programs.



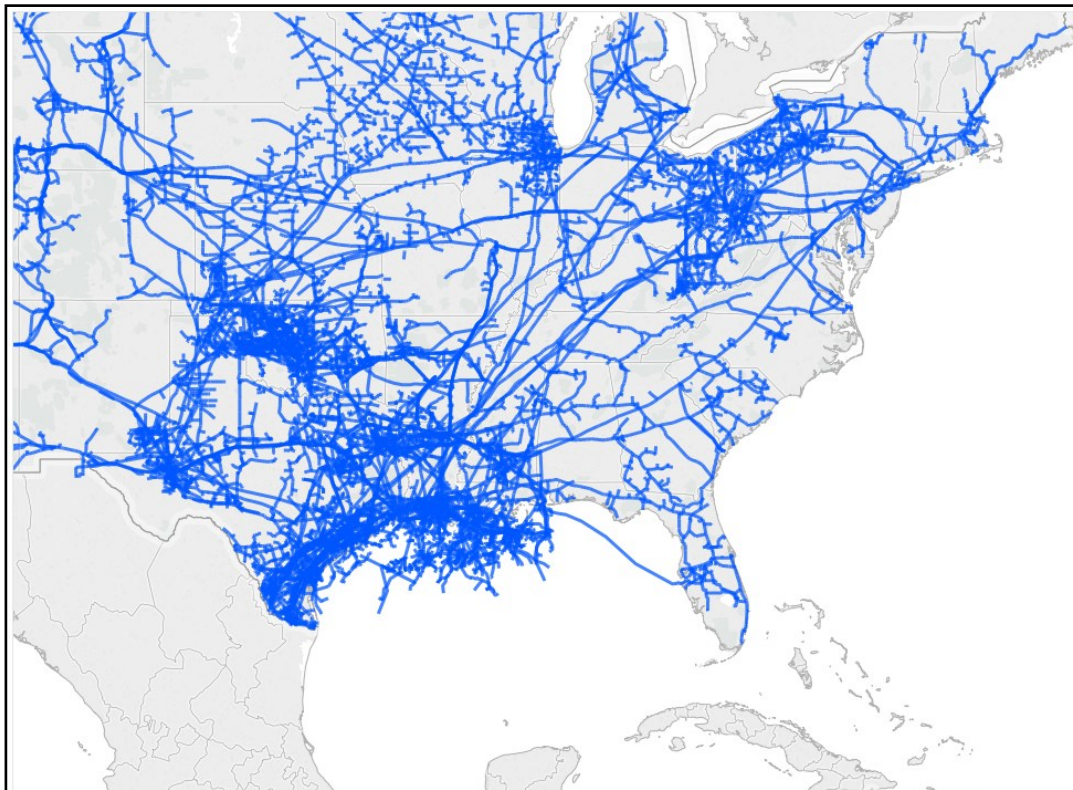
The bottom map depicts the percentage of customers with daily digital access to their meter data as compared to the percentage of AMI deployed. This metric illustrates the specific functionality deployed with the AMI meter by the utility. The percentage is not an indication of whether those customers utilize the meter data but that they have access to the data.



Data for AMI is sourced from Form EIA-861 for 2016. The Form EIA-861 and Form EIA-861S (Short Form) data files include information such as peak load, generation, electric purchases, sales, revenues, customer counts and demand-side management programs, green pricing and net metering programs, and distributed generation capacity.

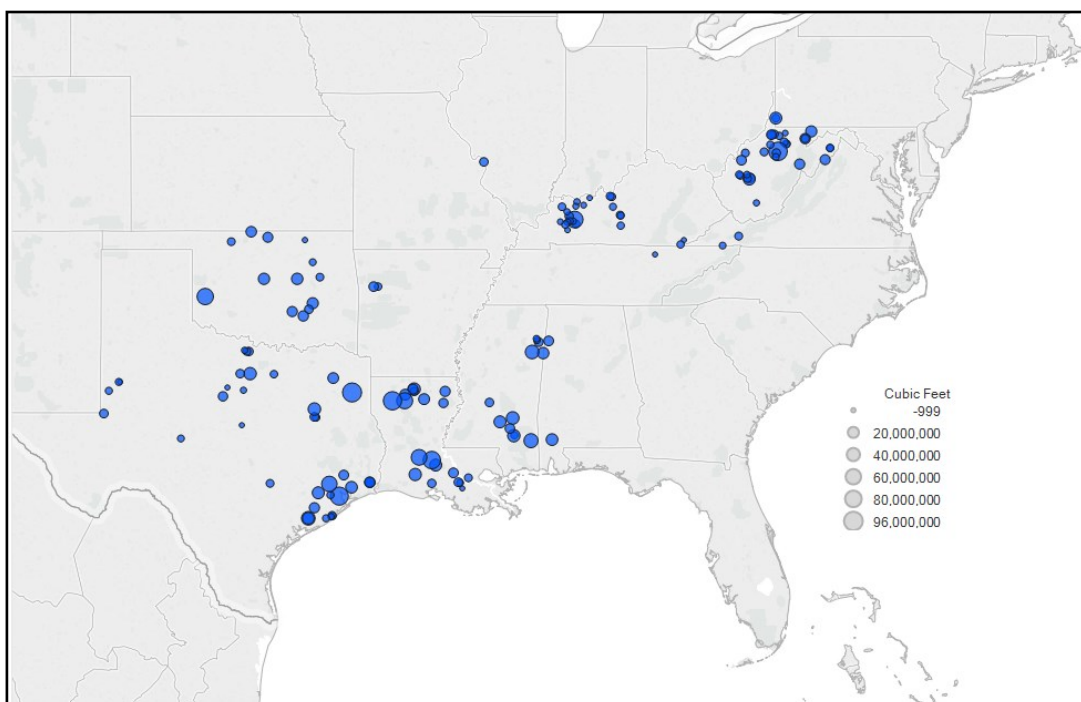
SSEB Region Natural Gas Infrastructure

Natural Gas Pipelines



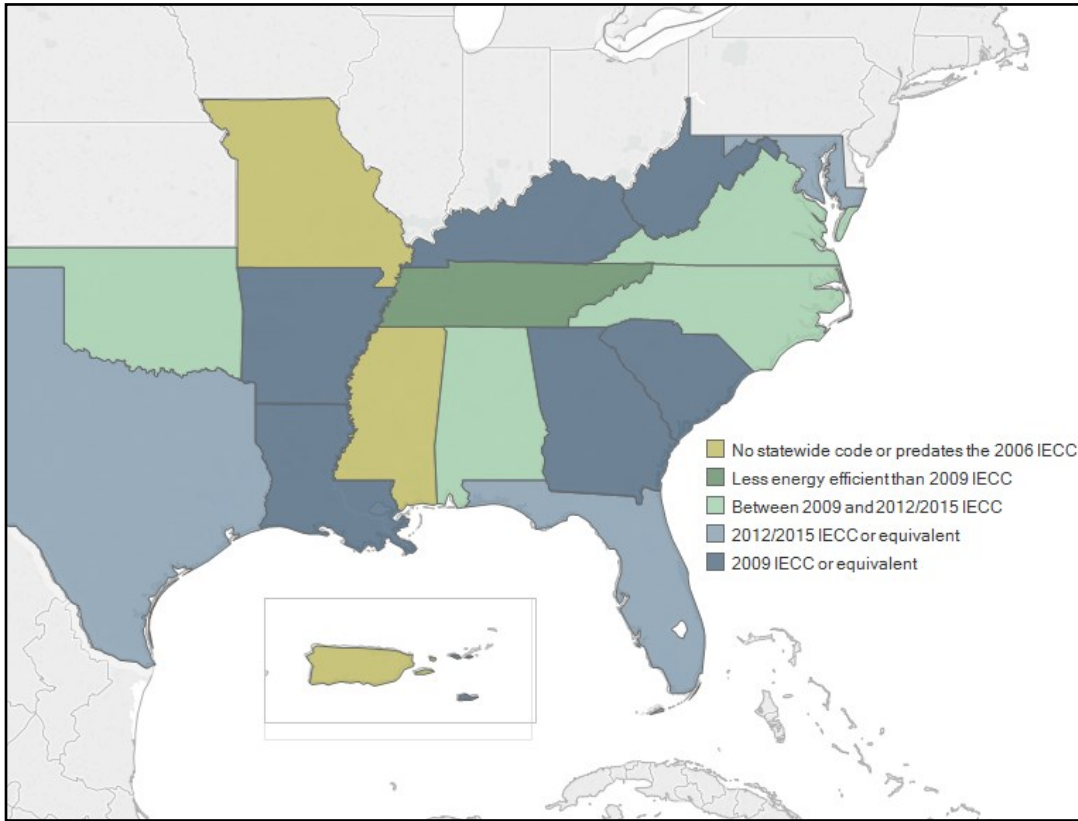
Natural gas infrastructure refers to the pipelines used to gather, transport and distribute natural gas to the facilities used to compress, store, and process the natural gas. The U.S. natural gas industry has experienced unprecedented growth resulting in increased infrastructure demands. Production has shifted from traditional regions, such as the Gulf of Mexico, toward onshore shale gas regions. Natural gas infrastructure data is sourced from the Department of Homeland Security's Homeland Infrastructure Foundation-Level Data. In addition, the U.S. Energy Information Administration offers the interactive U.S. Energy Mapping System.

Working Capacity of Natural Gas Storage Facilities



SSEB Region Building Energy Codes

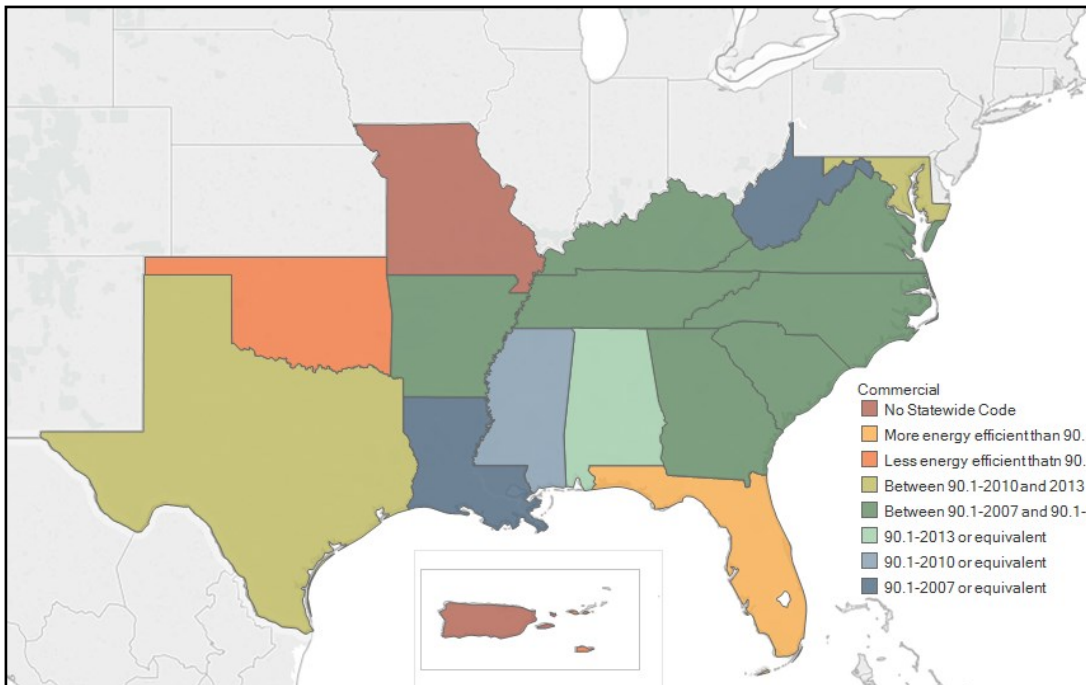
Residential Energy Codes



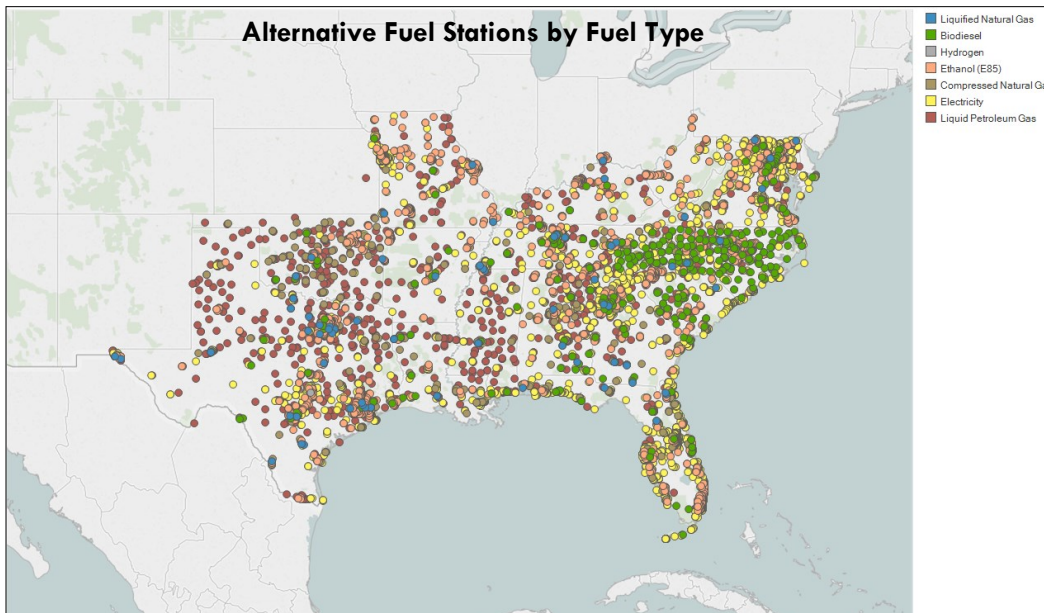
Status of State Energy Code Adoption

Information on state energy code adoption is from the U.S. Department of Energy's Building Energy Codes Program. Energy codes are adopted at the state and local jurisdiction levels and, in most cases, are part of a broader set of codes addressing building, fire, electrical and many other aspects of the built environment. Adoption can occur directly by legislative action, or through regulatory agencies authorized by the authoritative legislative body. Once adopted through regulation, the code becomes law within the particular state or local jurisdiction (DOE). As of September 2016, adoption is assessed by DOE based on a quantitative analysis of energy savings impacts within a given state. This provides a greater level of accuracy and replaces the previous approach, which was comprised of a simpler qualitative review of state code titles and provisions (energycodes.gov).

Commercial Energy Codes



Transportation in the SSEB Region

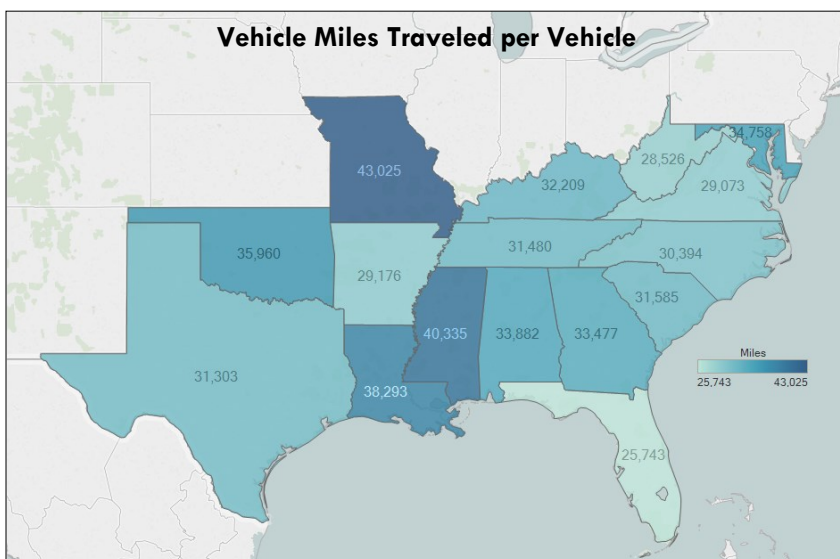
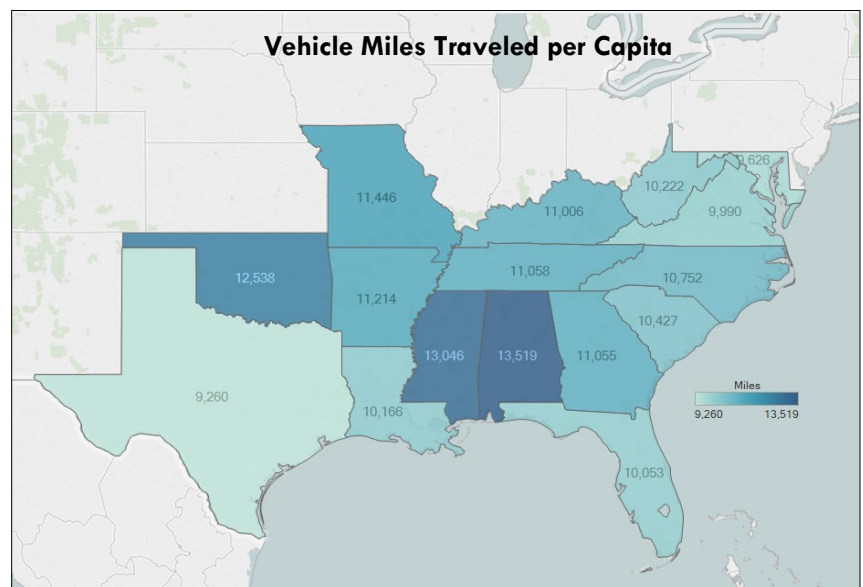


The map to the left depicts alternative fueling stations by fuel type within the SSEB Region. The development of alternative fuel stations depends on both federal and state policies along with fuel availability, which varies geographically.

Source data: Alternative Fuels Data Center (AFDC)

The map to the right depicts vehicle miles traveled (VMT) per capita for the 16 states in the SSEB region. VMT is calculated as the total annual miles of vehicle travel divided by the total population in a state or in an urbanized area. Variations on VMT per capita reflect a variety of factors such as land use policies, active transportation infrastructure and encouragement, economic factors, and other strategies to reduce car-dependence.

Source data: Federal Highway Administration (FHWA) 2011 Highway Statistics and is available from the U.S. Department of Transportation's Bureau of Transportation Statistics.



The map to the left depicts vehicle miles traveled (VMT) per personal vehicle in the 16 SSEB region states and reflects the average annual miles traveled by a personal vehicle. The variation across the region represents differences such as vehicle types, driving patterns, state highway geographies, population density, and transportation infrastructure.

Source data: Federal Highway Administration (FHWA) 2011 Highway Statistics and is available from the U.S. Department of Transportation's Bureau of Transportation Statistics.

Glossary

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

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

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

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

Coal: A naturally occurring, combustible, sedimentary rock containing at least 50 percent by weight organic matter, a solid “fossil” fuel.

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

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

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

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

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

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

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

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

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

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

Ethanol: A clear, colorless, flammable alcohol. Ethanol is typically produced biologically from biomass feedstocks such as agricultural crops and cellulosic residues from agricultural crops or wood.

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

Geothermal Energy: Hot water or steam extracted from Geothermal reservoirs in the earth's crust. Also, a subterranean energy source utilized by residential heat pumps and air conditioning units.

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Nuclear Power: Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

Nuclear Fuel: Fissionable materials that have been enriched to such a composition that, when placed in a nuclear reactor, will support a self-sustaining fission chain reaction, producing heat in a controlled manner for process use.

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

Renewable Energy: There is no formal, universally accepted definition for this term. Typical usage may define renewable energy as: Energy resources that are naturally replenishing but flow-limited. Such resources are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time.

Glossary

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

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

Terawatt: A measure of electrical energy defined as a unit of work, One Terawatt is 1,000,000,000,000 Watts or 10^{12} Watts

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

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

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

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

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