SOUTHERN STATES ENERGY BOARD

Transcending Boundaries

Energy Mix in the South – It's a Brave New World

2018 Briefing Southern Legislative Conference

Ken Nemeth, Southern States Energy Board

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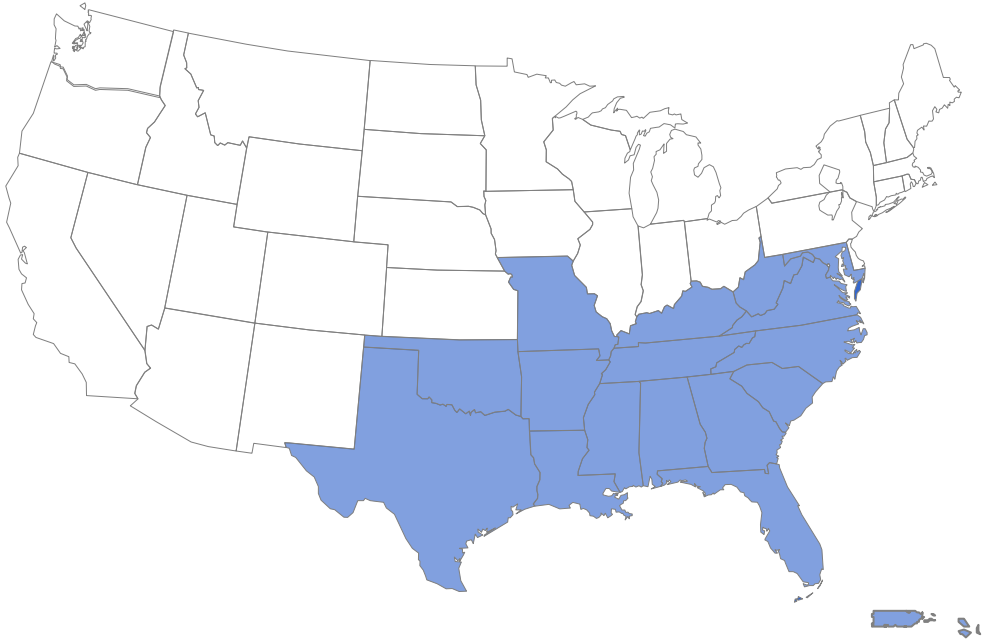
MISSION STATEMENT

Through innovations in energy and environmental policies, programs, and technologies, the **Southern States Energy Board** enhances economic development and the quality of life in the South.

SSEB Overview

- Established 1960 and expanded in 1978
- 16 U.S. States and Two Territories
- Each jurisdiction represented by the governor, a legislator from the House and Senate, and a governor's alternate
- Federal Representative Appointed by U.S. President



It's a brave new world!

- 2017 – Renewables generated 11% of U.S. energy
- Coal plants slide from 40% to 31% of U.S. power
- Natural gas – new champ – 40% of U.S. electricity
- Nuclear hovers at 20%
- America sheds load through energy efficiency

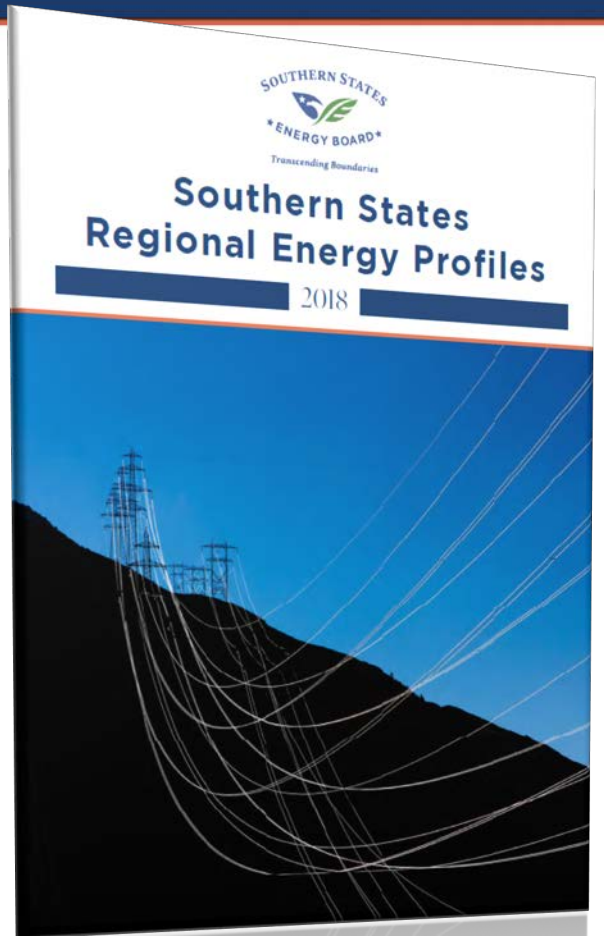
It's a brave new world!

- Today – *CHANGE* is the new normal
- Electric & autonomous vehicles are upon us
- ISO's and RTO's – competing technologies on an hourly basis
- U.S. power grid
  - 7,000+ power plants
  - 5 million miles – transmission lines
  - 3,300 utilities
  - 150 million customers
  - **Total Value: $876 Billion**

Be brave, because…

- Current power grid – WWII vintage
- Grid loses power 285% more than in 1984
- Cost to American business = $150 billion per year
- July 7-8, California lost power to 80K customers
- Texas is next…….
- Imminent need – critical U.S. energy infrastructure

Southern States Regional Energy Profiles



- Released July 8, 2018, 4th Edition
- Published every ~2 years
- Developed by Kentucky Energy & Environment Cabinet and SSEB
- Energy/electricity data comparisons - SSEB region and the United States.

U. S. Electric Utility Resource Mix

- Demand is flat or declining
- Natural gas and oil prices are low
- Aging fleet of coal-fired generating capacity
- Environmental requirements for generation - uncertainty on carbon limits
- Costs of renewables decreasing and operational flexibility increasing
- Consumers are demanding renewable resources
  - Blackrock Investments for ExxonMobil to consider carbon emissions, Apple, Facebook, WalMart
- Nuclear construction quagmire – Plant Vogtle, Plant Summer
- 2018 Budgets for utility resource R&D uncertain

Coming Electricity Sector Trends!

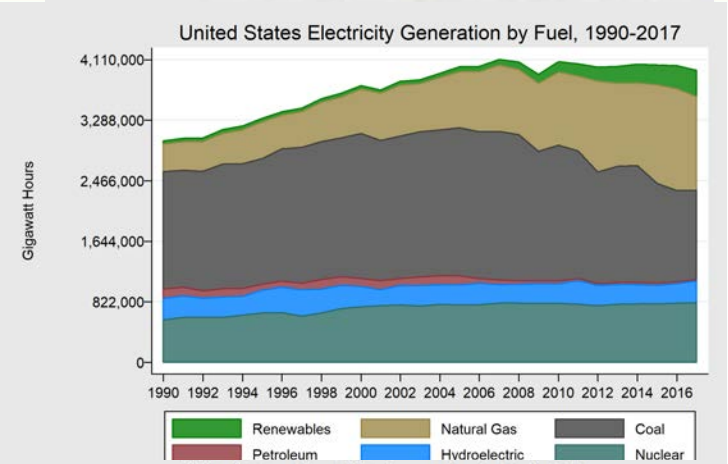
- Natural gas and renewables dominate new capacity
- Distributed Energy Resources (DER) increase
- Electric Vehicles (EV) are here
- Generation more diverse, decentralized network
- Future grid, self-healing network
- Utilities digitally enabled

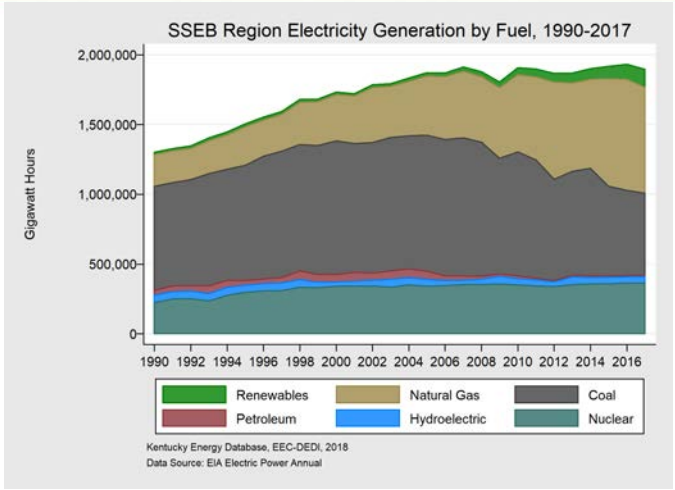
**2018 Outlook on Power & Utilities, Deloitte Center for Energy Solutions*

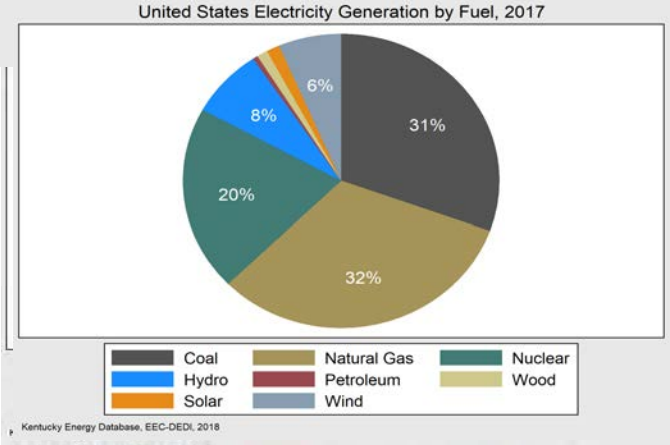
Trending Energy Issues

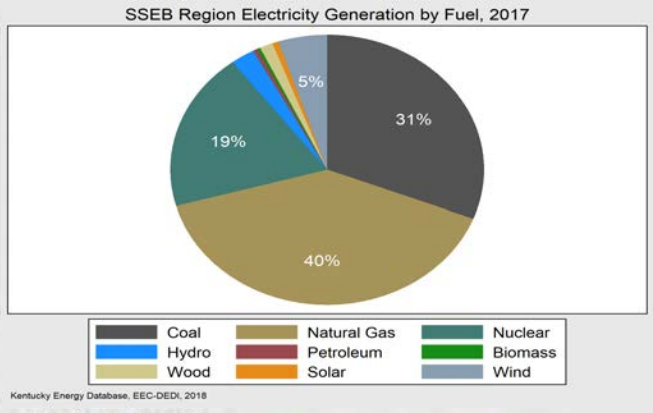
- DOE federal price support for coal/nuclear
- Energy Storage - need to balance intermittency of renewables
- States considering carbon pricing, e.g., VA joining RGGI
- NERC Summer Reliability Assessment inadequate reserve margins in ERCOT

SSEB Region and U.S. Generation Mix By Fuel Type 1990 – 2017









Electric Generating Resources Nationwide Selected States (2017) and Electricity Prices

Predominantly Coal

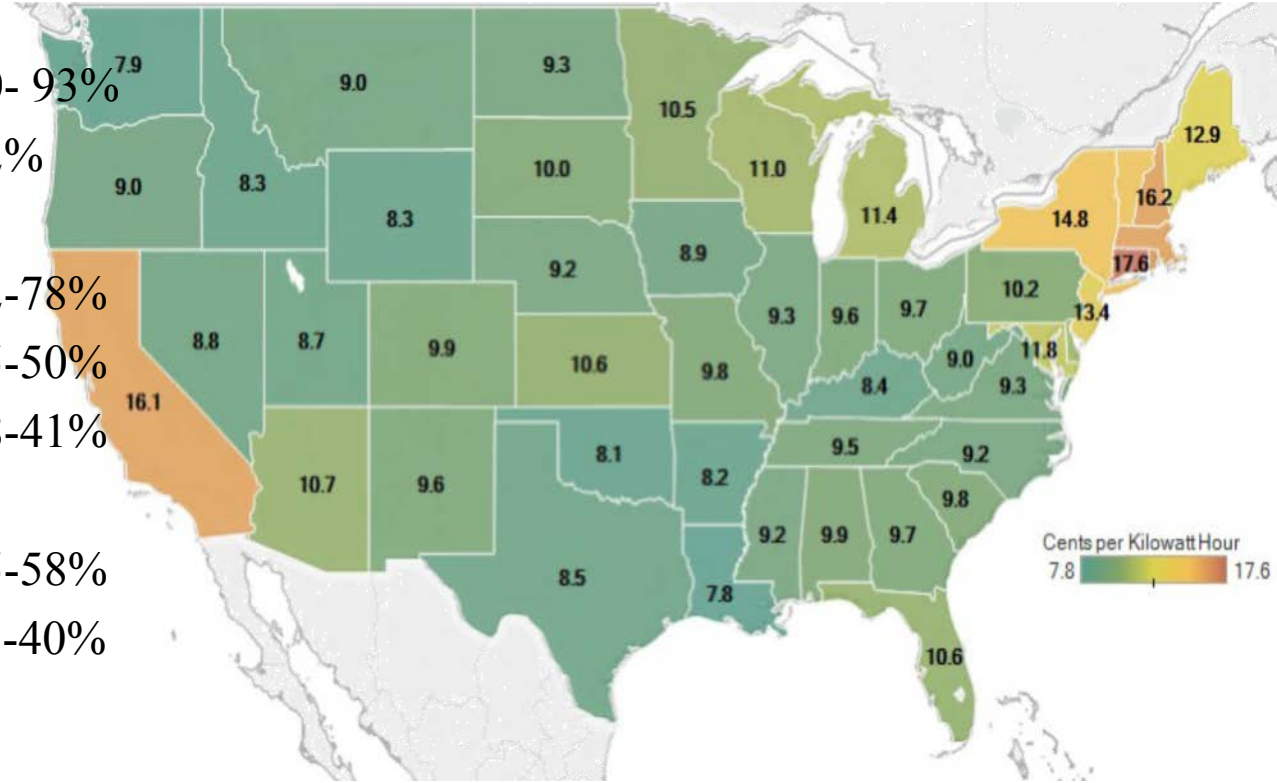
- KY, WV, MO 80- 93%
- AR 42%

Predominantly Natural Gas

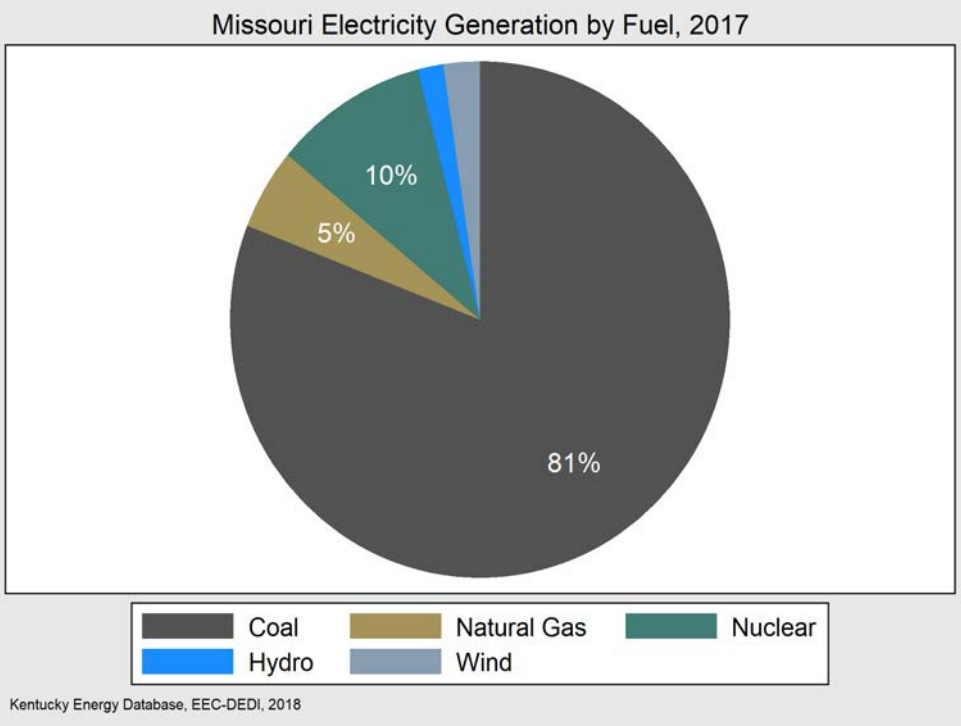
- MS, FL, LA 62-78%
- TX, VA 45-50%
- OK, GA, AL 38-41%

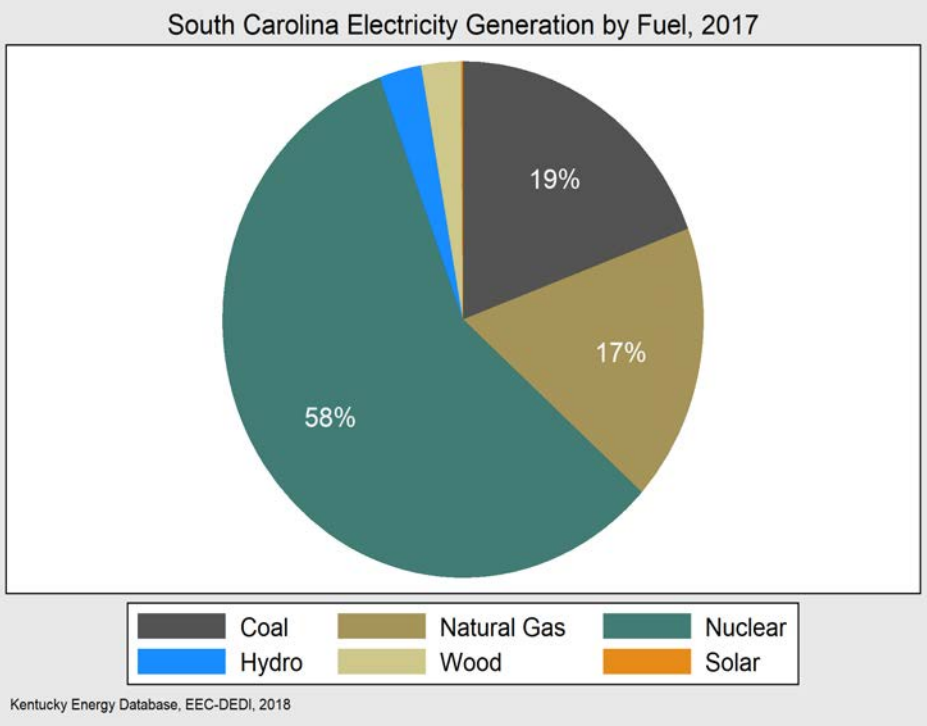
Predominantly Nuclear

- SC , MD 45-58%
- TN, NC 33-40%

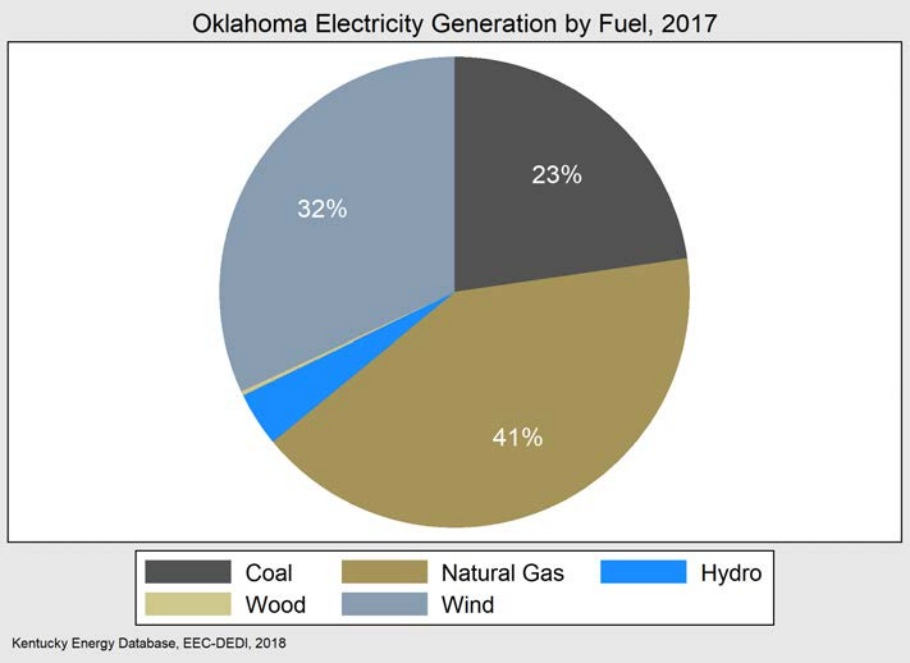


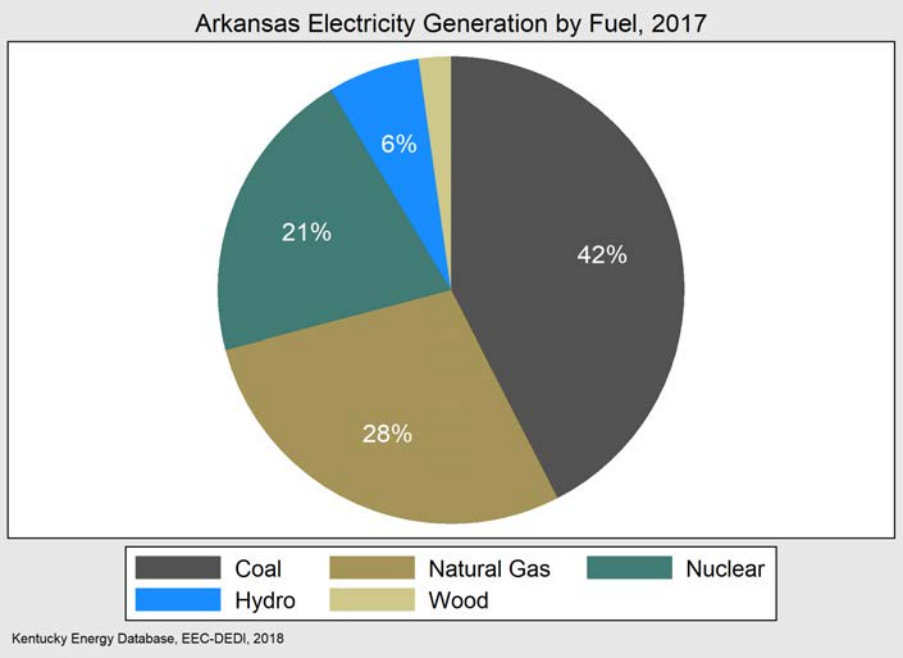
Electricity Generation Mix 2017
Missouri v South Carolina



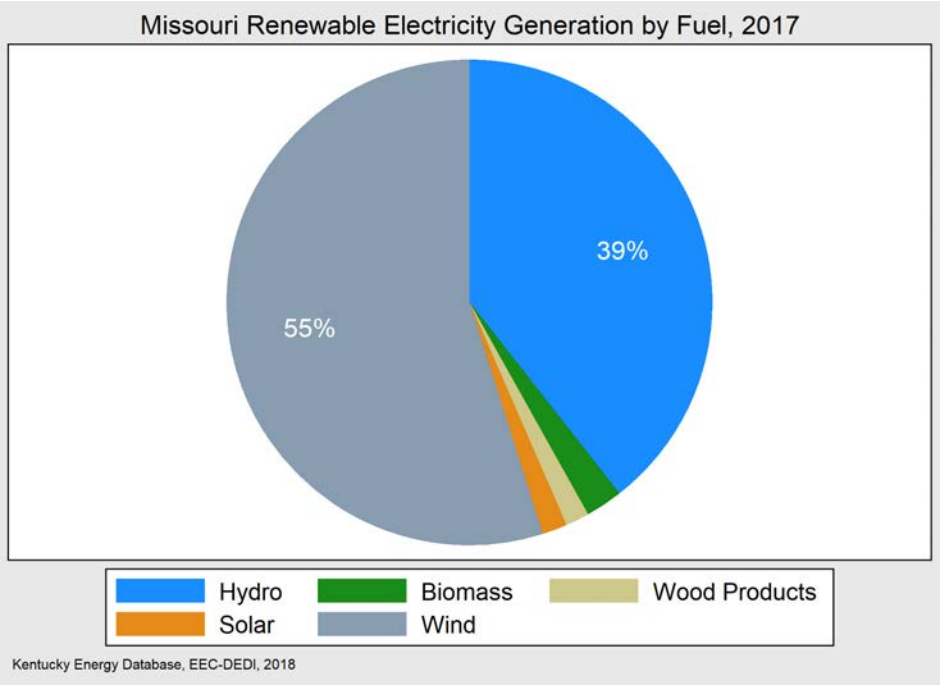


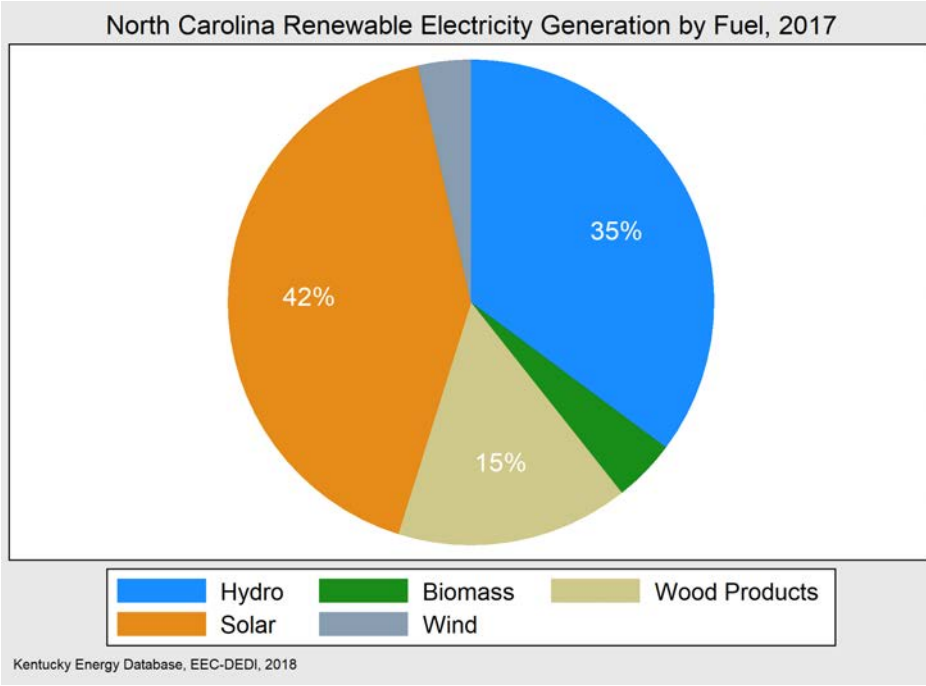
Electricity Generation Mix 2017
Oklahoma v Arkansas



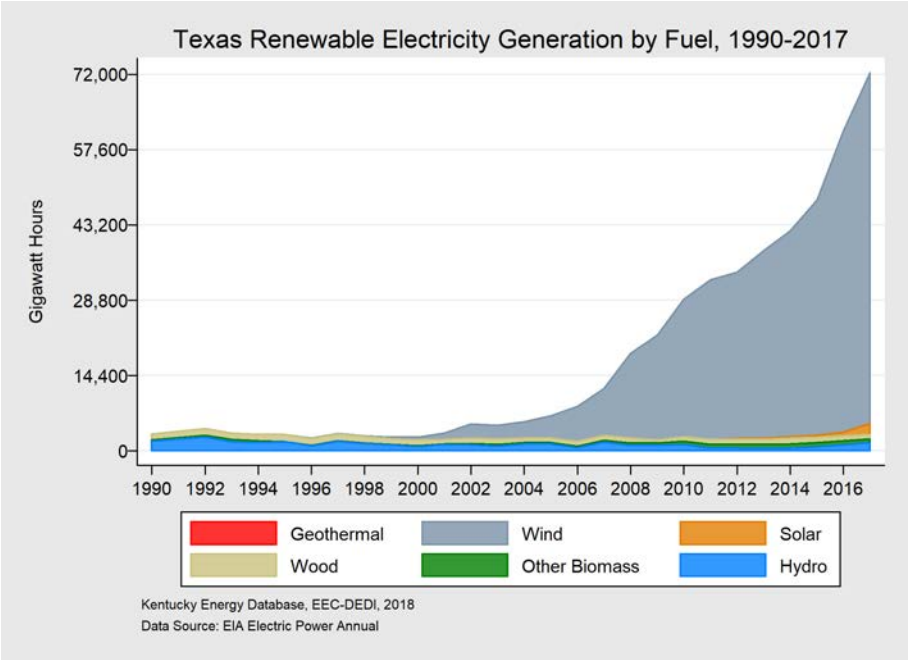


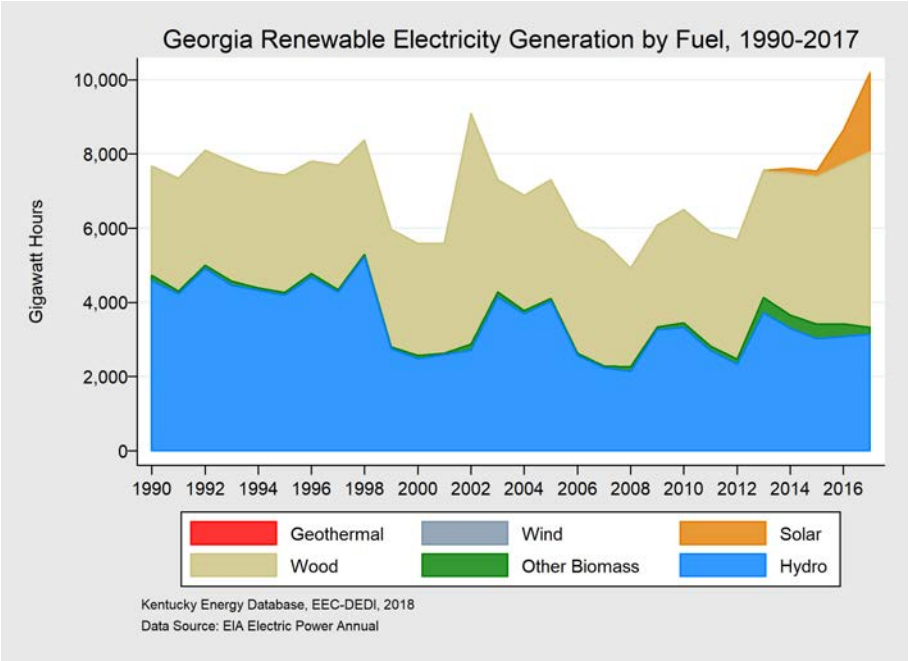
Renewable Generation Mix 2017
Missouri v North Carolina



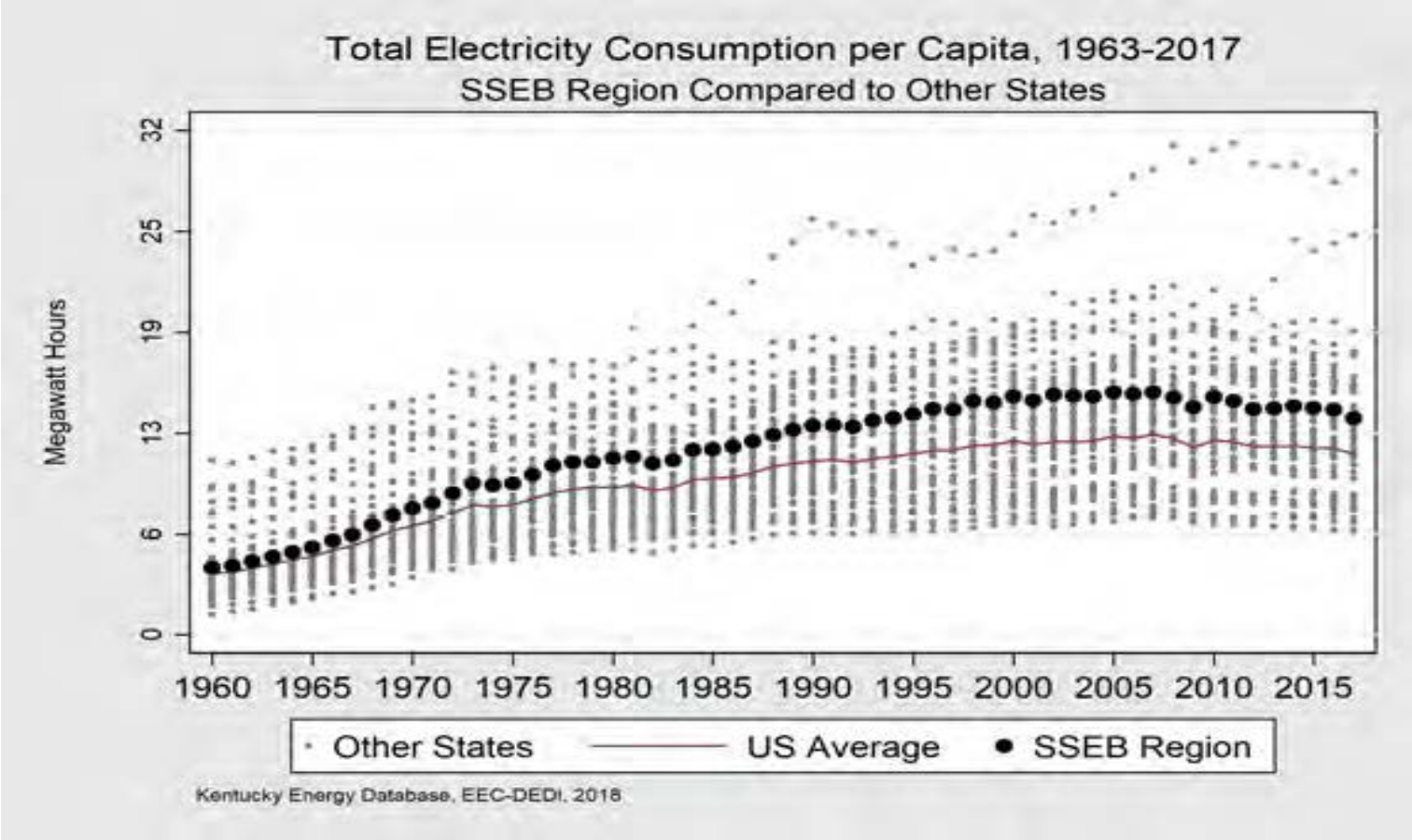


Renewable Generation 1990-2017
Texas v Georgia

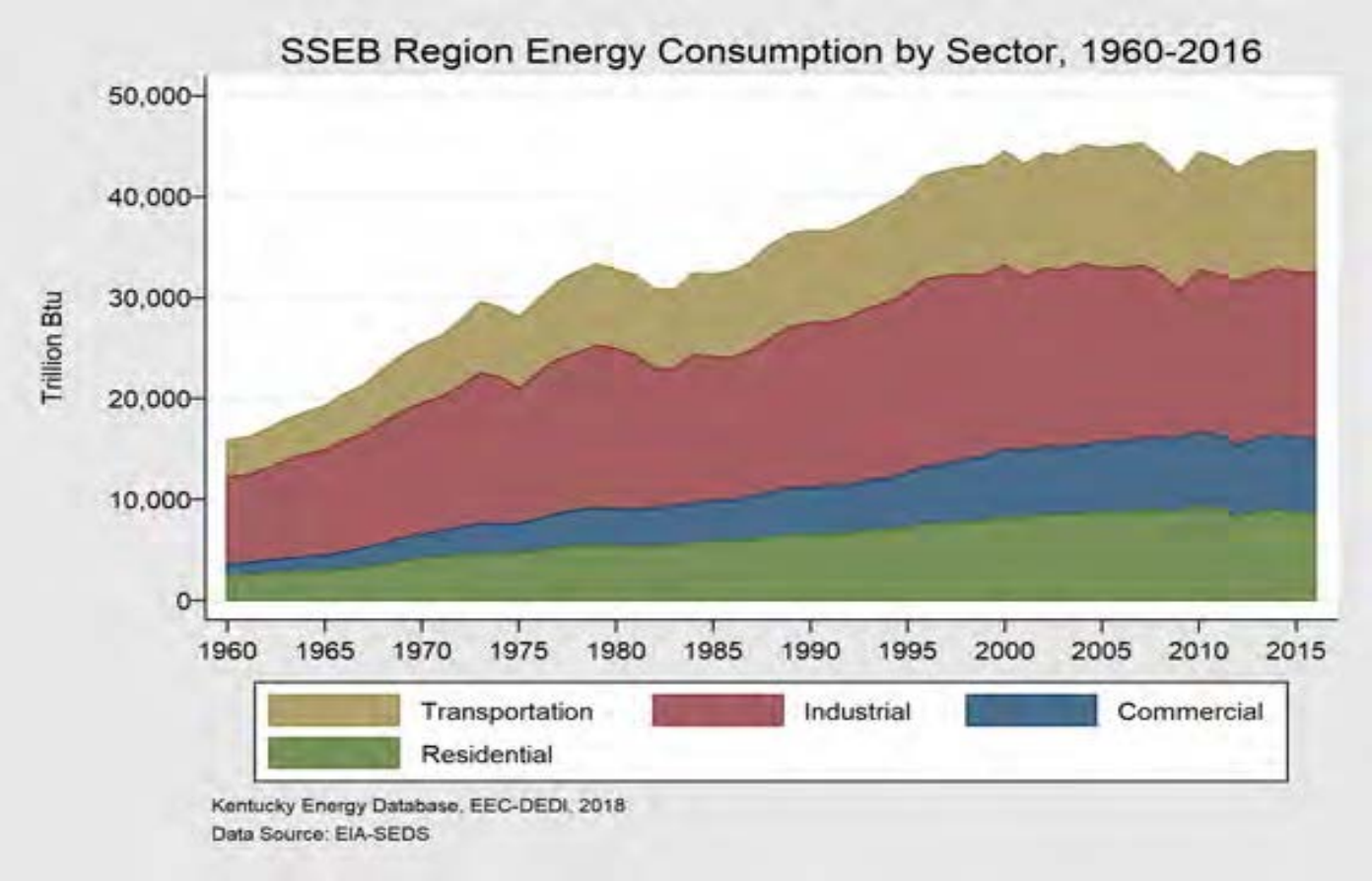




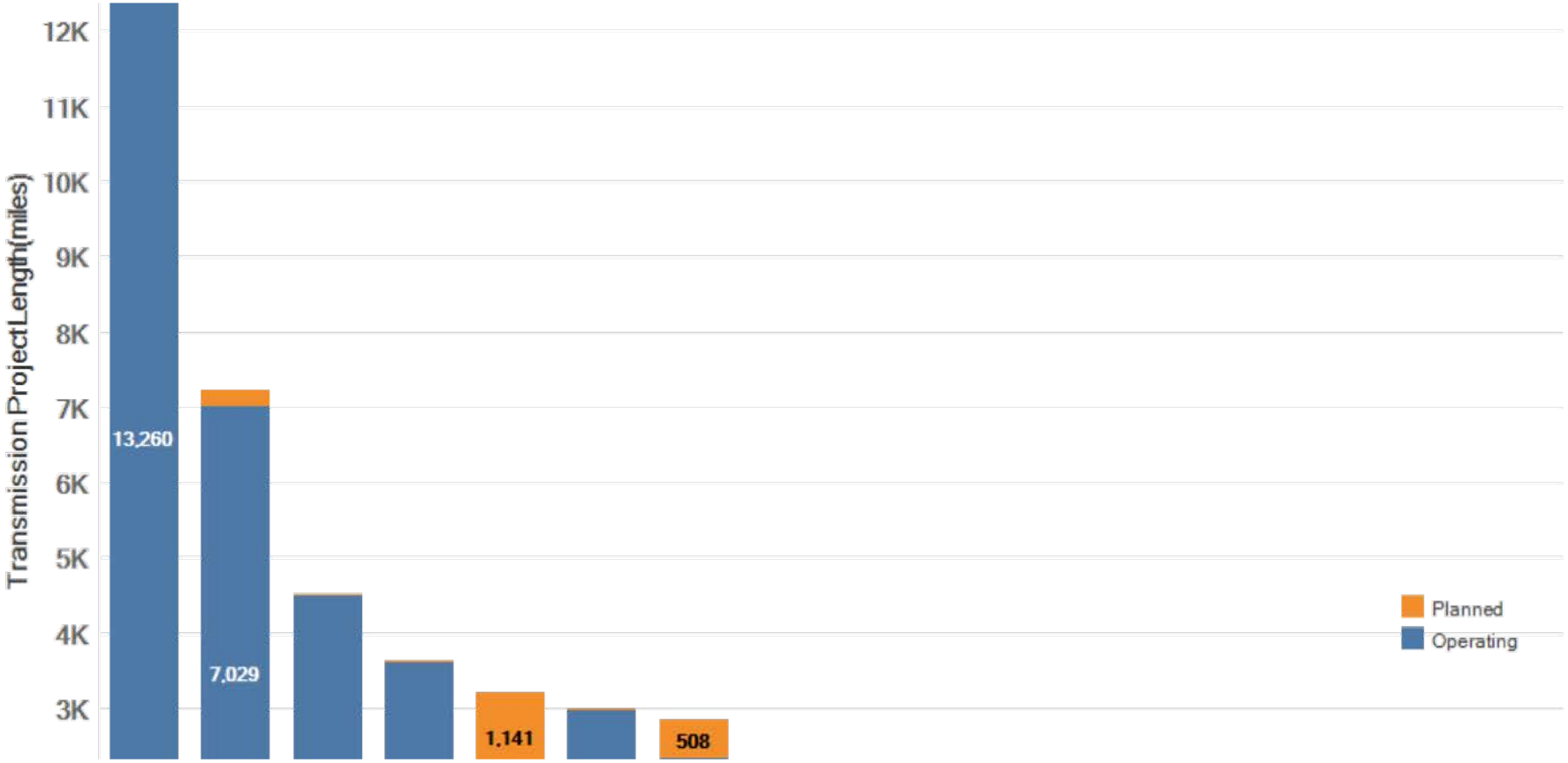
Total Electricity Consumption
SSEB v U.S. Average



Energy Consumption by Sector
SSEB Region



Transmission Infrastructure
SSEB Region



In summary…

- Building next generation energy infrastructure is critical
- By 2050, energy consumption in U.S. grows 75%
- Renewables – largest growth in energy industry currently
- Natural gas – expanding markets; exports to allies
- Infrastructure/grid risks
  - Terrorism, vandalism, and extreme weather events
- Cybersecurity – who has the best AI to counterattack?
- Public/private partnerships – THE FUTURE
- Affordable, reliable, resilient, and sustainable energy & electricity
- Even when regulations are repealed, market forces impact coal and nuclear

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