

TRACKING DECARBONIZATION IN THE SOUTHEAST

GENERATION + CO₂ EMISSIONS REPORT

ABOUT SACE



The Southern Alliance for Clean Energy (SACE) is a nonprofit organization that promotes responsible and equitable energy choices to ensure clean, safe, and healthy communities throughout the Southeast. As a leading voice for energy policy in our region, SACE is focused on transforming the way we produce and consume energy in the Southeast.

INTRODUCTION

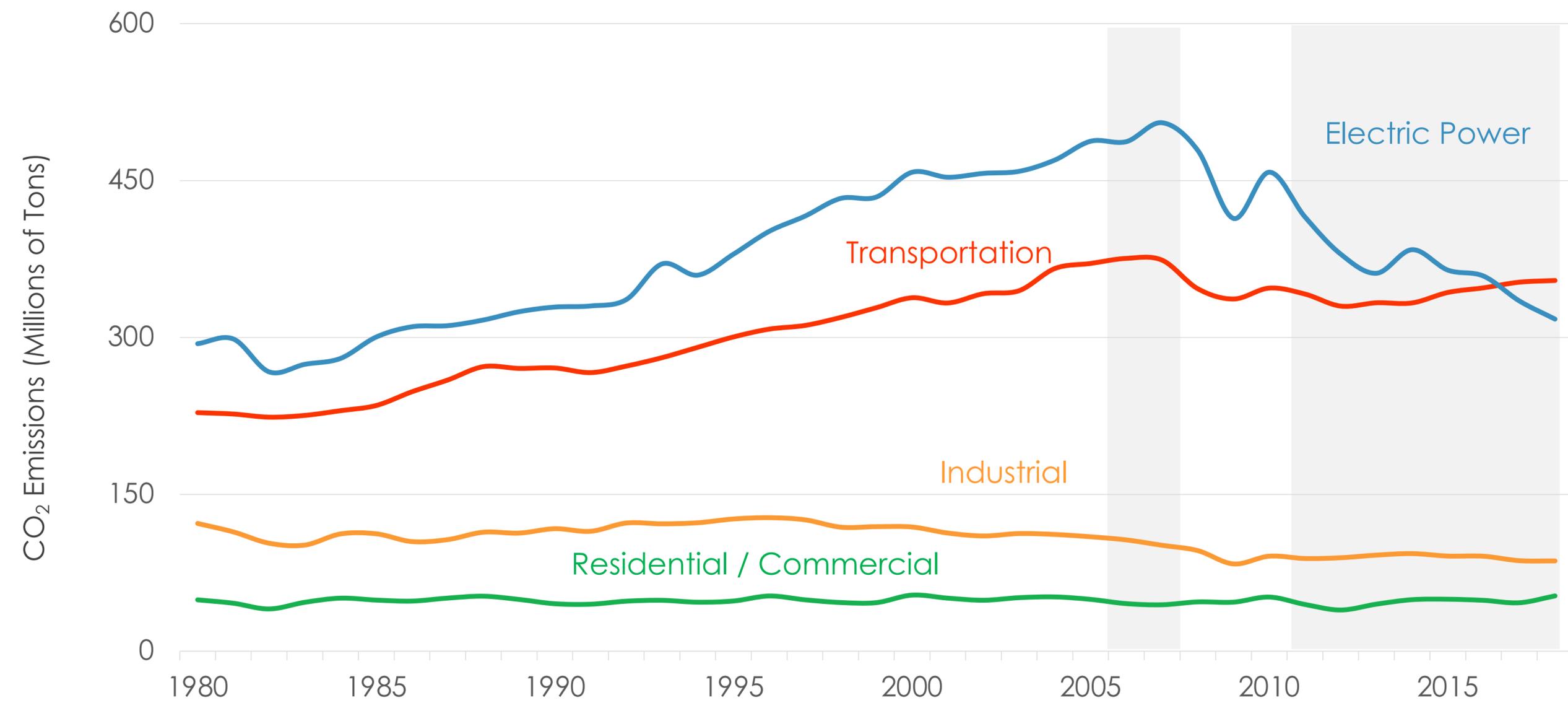
REPORT SCOPE

Review regional CO₂ emission and generation trends in the **electric power sector in the Southeast**. We will identify what current resource plans (IRPs) tell us about the region's resource mix, future carbon emissions, and the rate of decarbonization.

SACE analysis covers historical period of 2010-2019, and a forecast based on electric utility resource plans, or integrated resource plans (IRPs). Topics not included: analysis of sectors other than electric power, financial / cost figures for generation, detailed plans or pathways for decarbonization, and impacts of climate change.

POWER SECTOR EMISSIONS IN CONTEXT

SOUTHEAST ANNUAL CO₂ EMISSIONS BY SECTOR

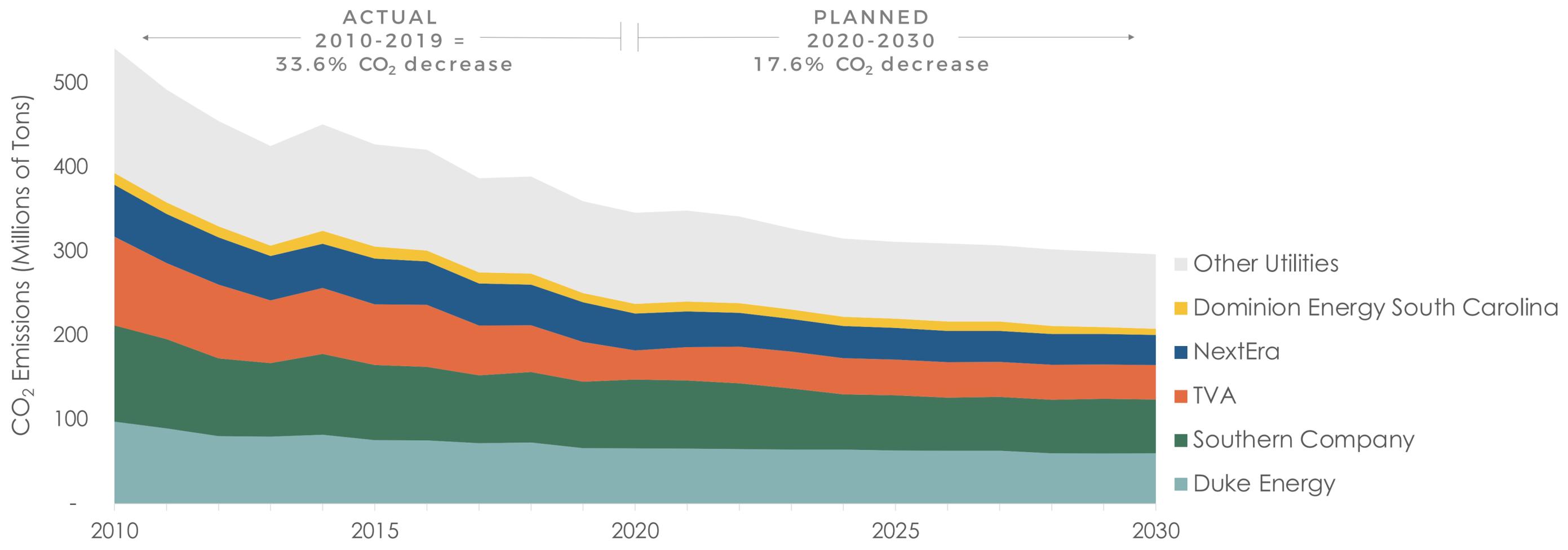


Source: U.S. Energy Information Administration (EIA) – [State Carbon Dioxide Emissions](#) for AL, FL, GA, MS, NC, SC, TN (1980-2018).

KEY TAKEAWAYS: Transportation is now the largest contributor to CO₂, closely followed by electric power. Power sector CO₂ peaked in 2007, and many decarbonization goals use 2005-2007 as baseline. Focus of the report is from 2010 to latest year data available.



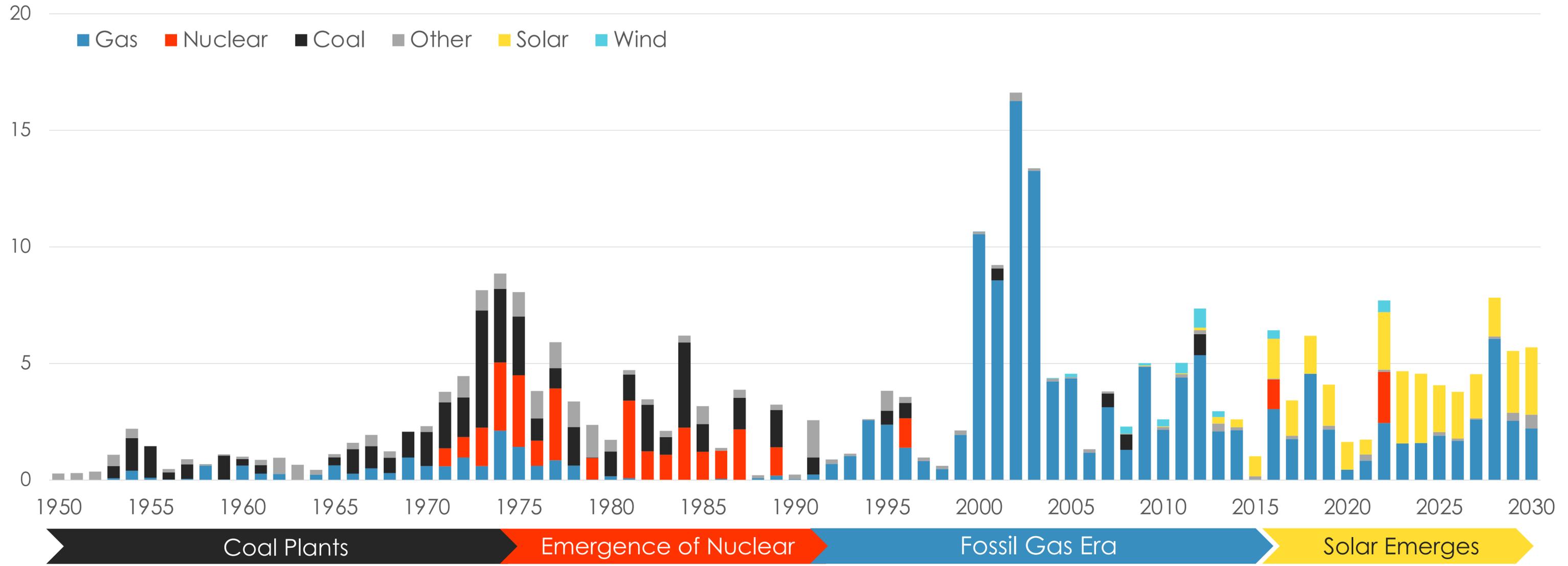
EMISSIONS FORECAST FOR UTILITIES



KEY TAKEAWAYS: Four major utility systems make up over 70% of total utility emissions for the Southeast. Carbon emissions have declined significantly over the past decade. Emission reductions are expected to slow in the future, falling ~18% from current levels by 2030, whereas historical reductions were about 2x that at ~34%.

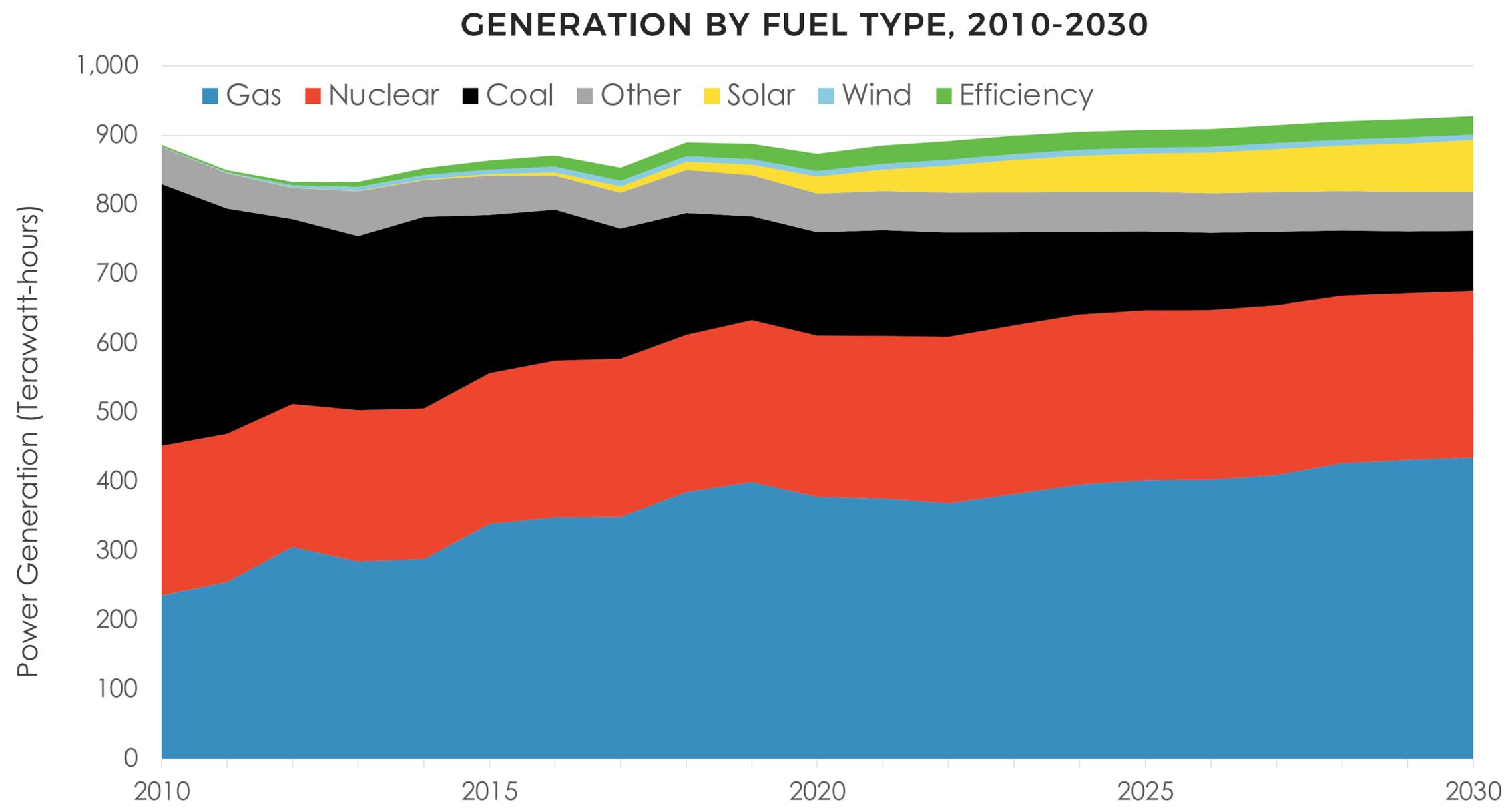
OPERATING & PLANNED CAPACITY BY YEAR BUILT

POWER PLANT CAPACITY (GIGAWATTS)



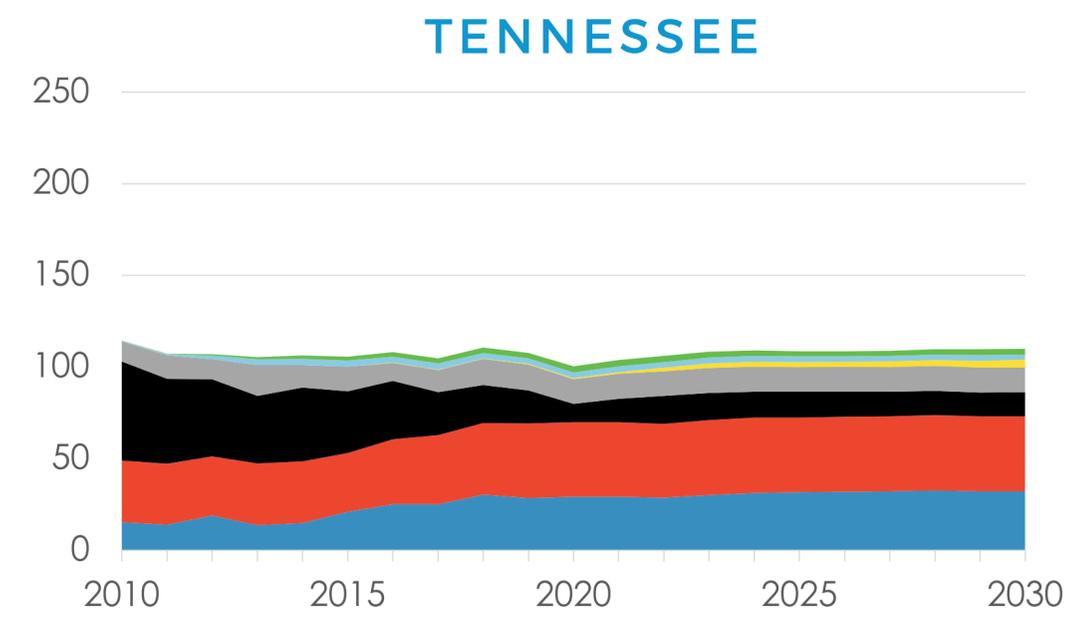
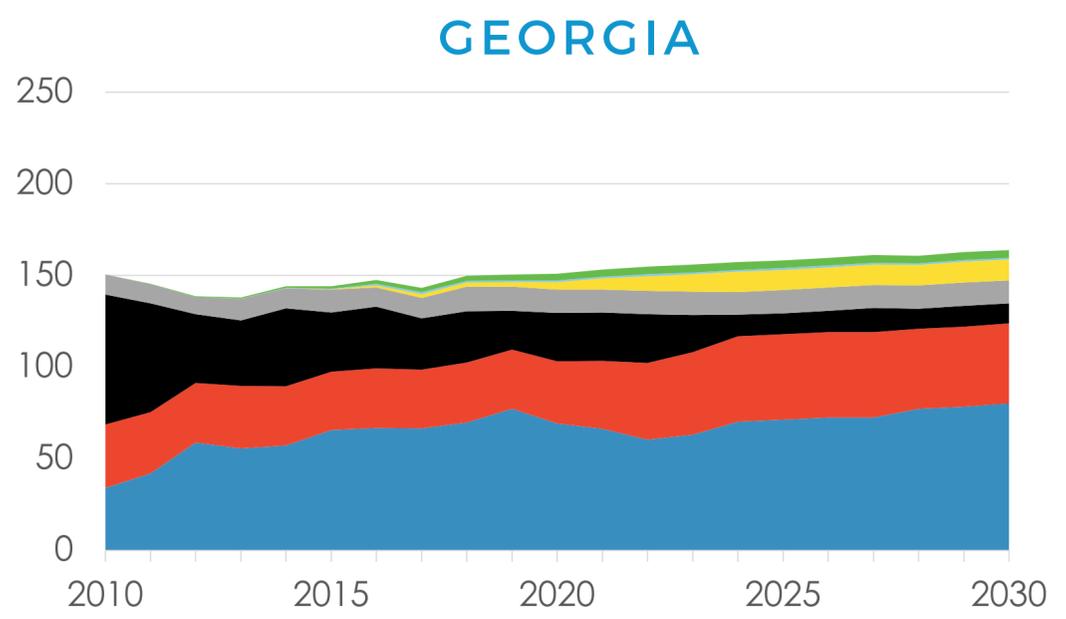
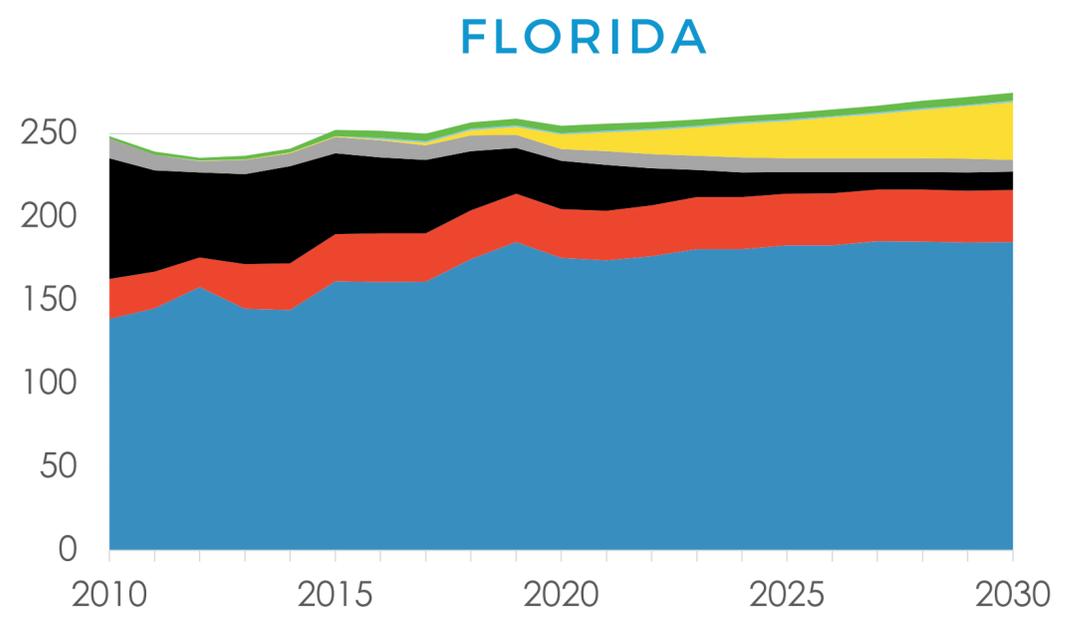
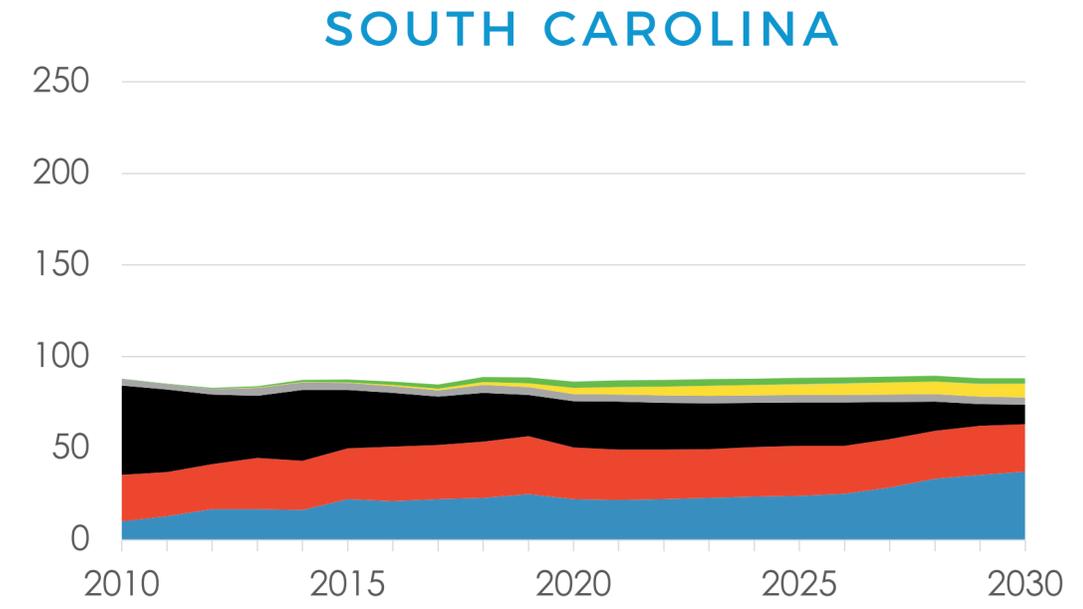
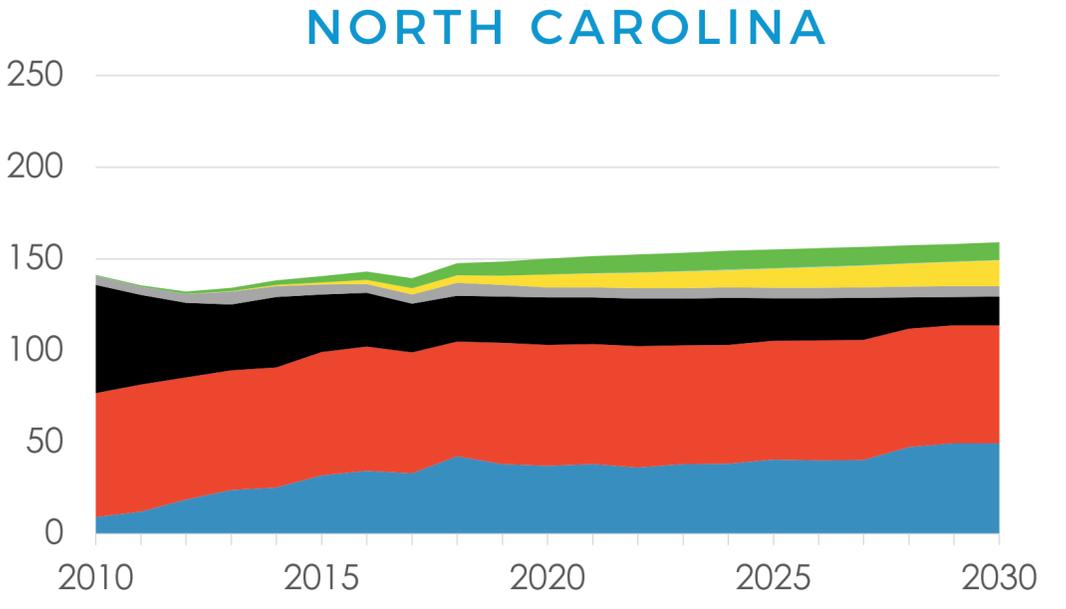
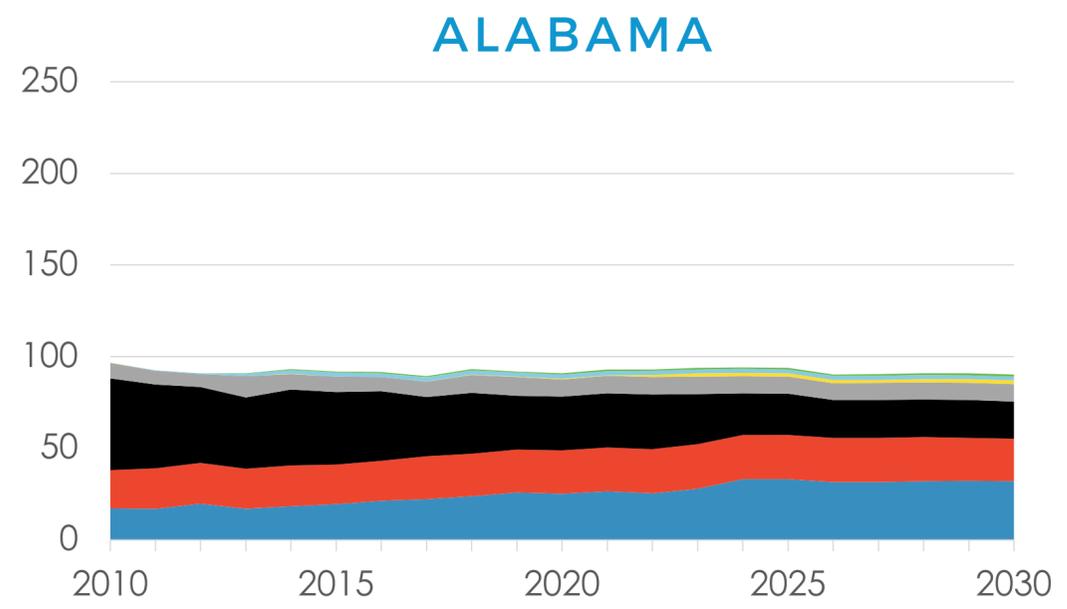
KEY TAKEAWAYS: Fossil gas is still largely the go-to resource for new capacity for utilities in the Southeast, although the favorite resource for utilities has been shown to change over time.

SOUTHEAST GENERATION FORECAST



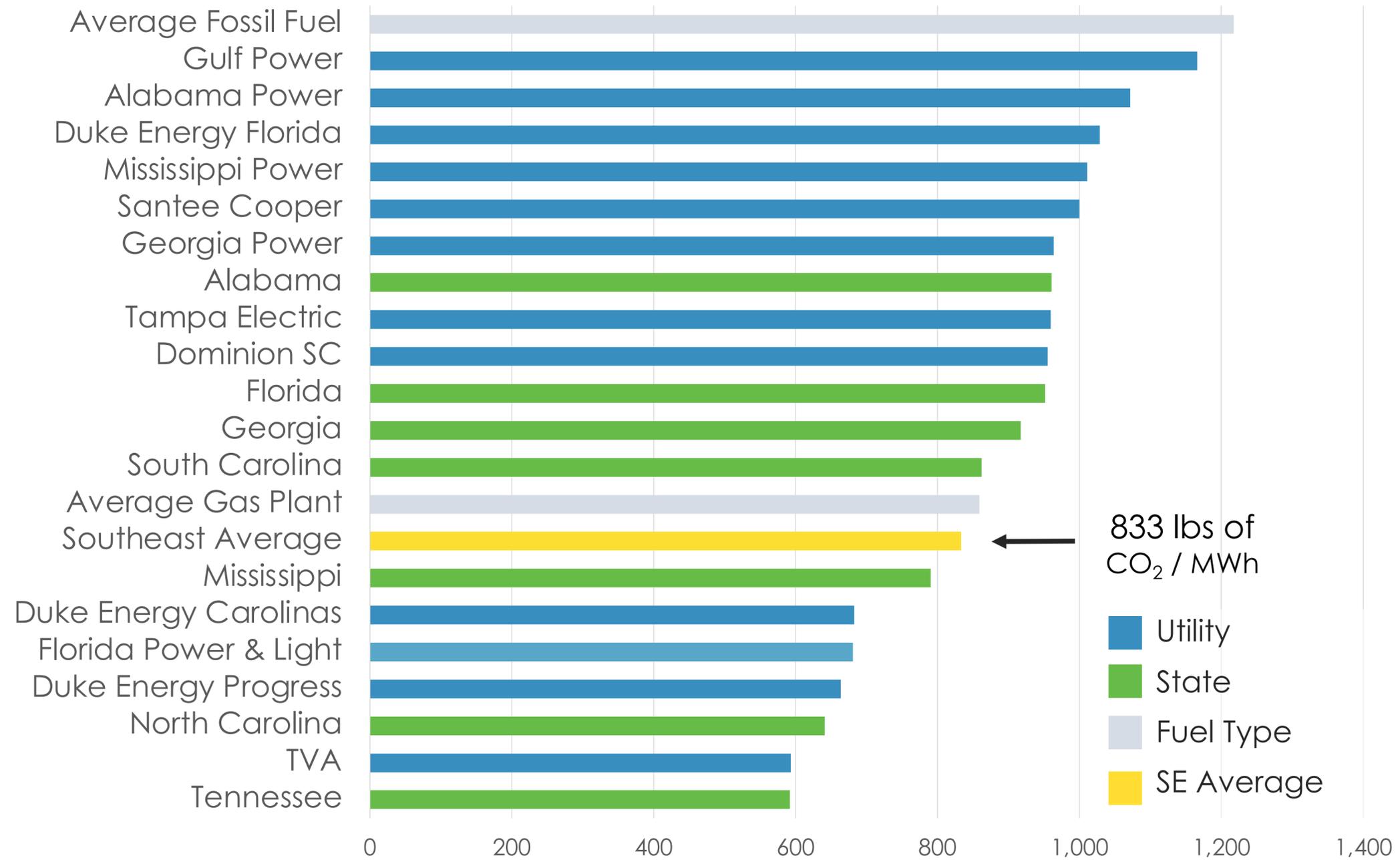
KEY TAKEAWAYS: Under current utility plans dependence on fossil gas will grow even with continued utility investments in solar. Many utilities have yet to announce retirement dates for coal plants, so current plans show significant coal generation through at least 2030.

SOUTHEAST GENERATION FORECAST BY STATE



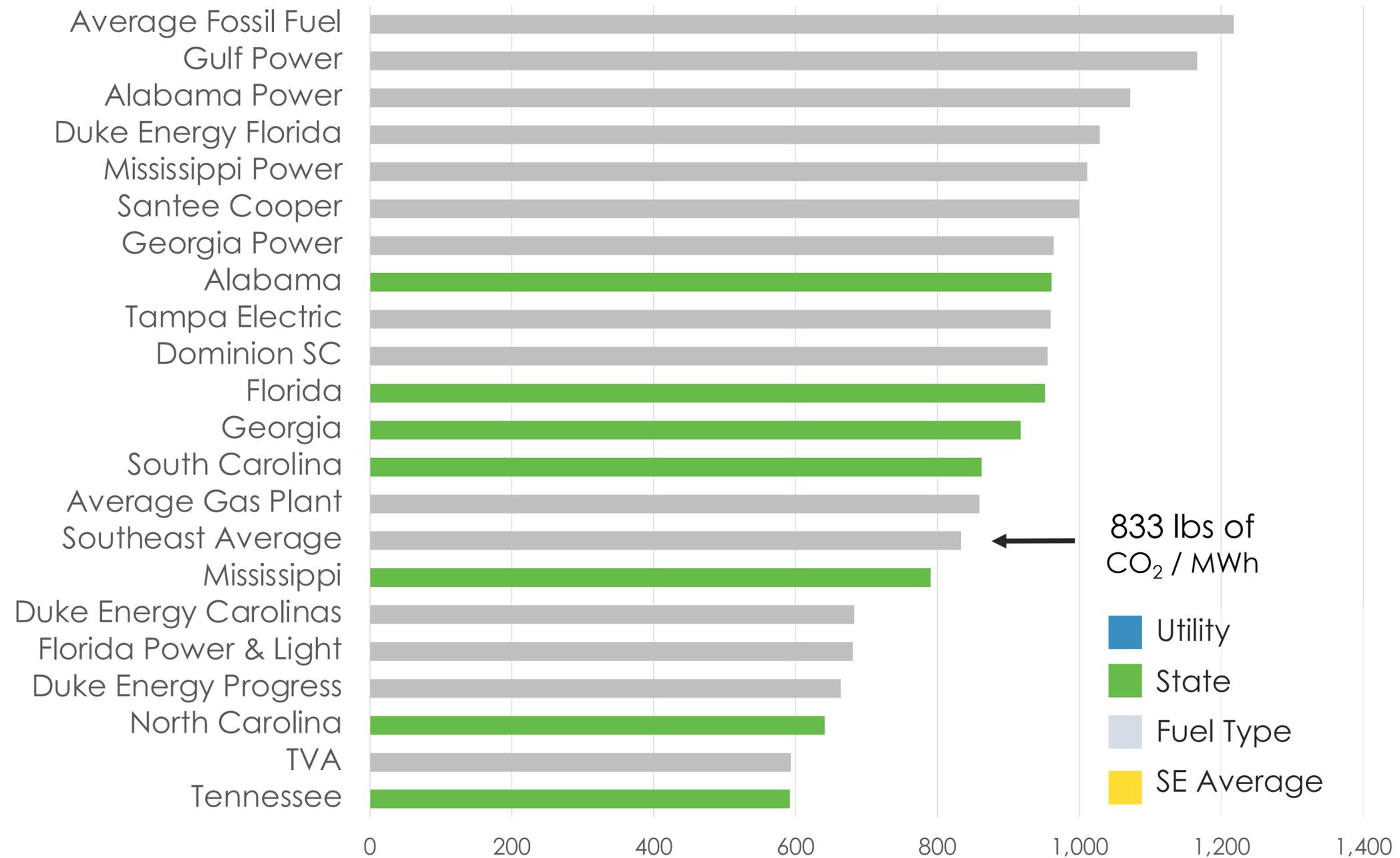
CO₂ INTENSITY OF POWER SUPPLY

CO₂ EMISSIONS INTENSITY IN 2019 (lbs of CO₂/MWh)



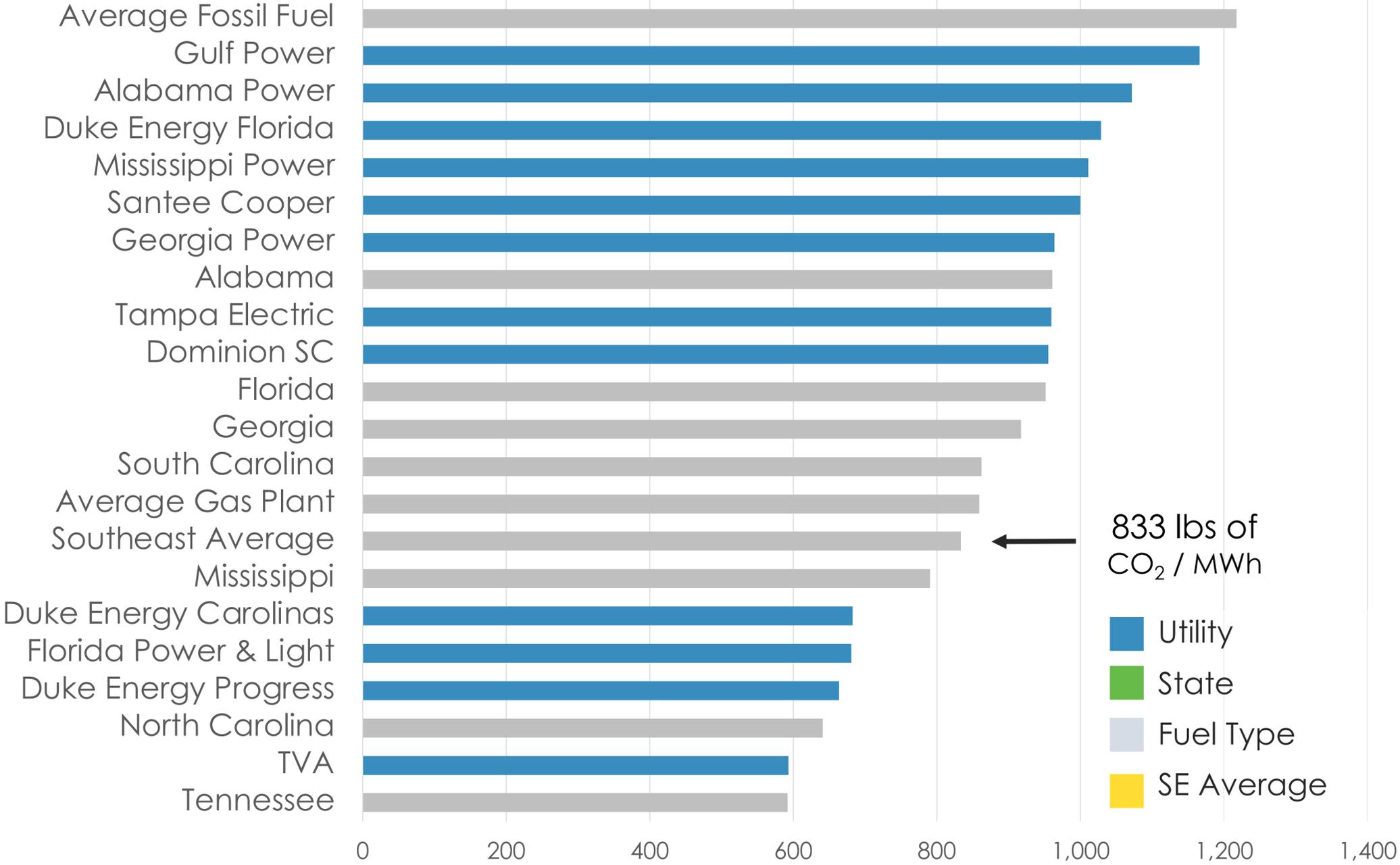
CO₂ INTENSITY OF POWER SUPPLY - STATES

CO₂ EMISSIONS INTENSITY IN 2019 (lbs of CO₂/MWh)



CO₂ INTENSITY OF POWER SUPPLY - UTILITIES

CO₂ EMISSIONS INTENSITY IN 2019 (lbs of CO₂/MWh)



ELECTRIC UTILITY CARBON GOALS

DECARBONIZATION FACES MANY CHALLENGES

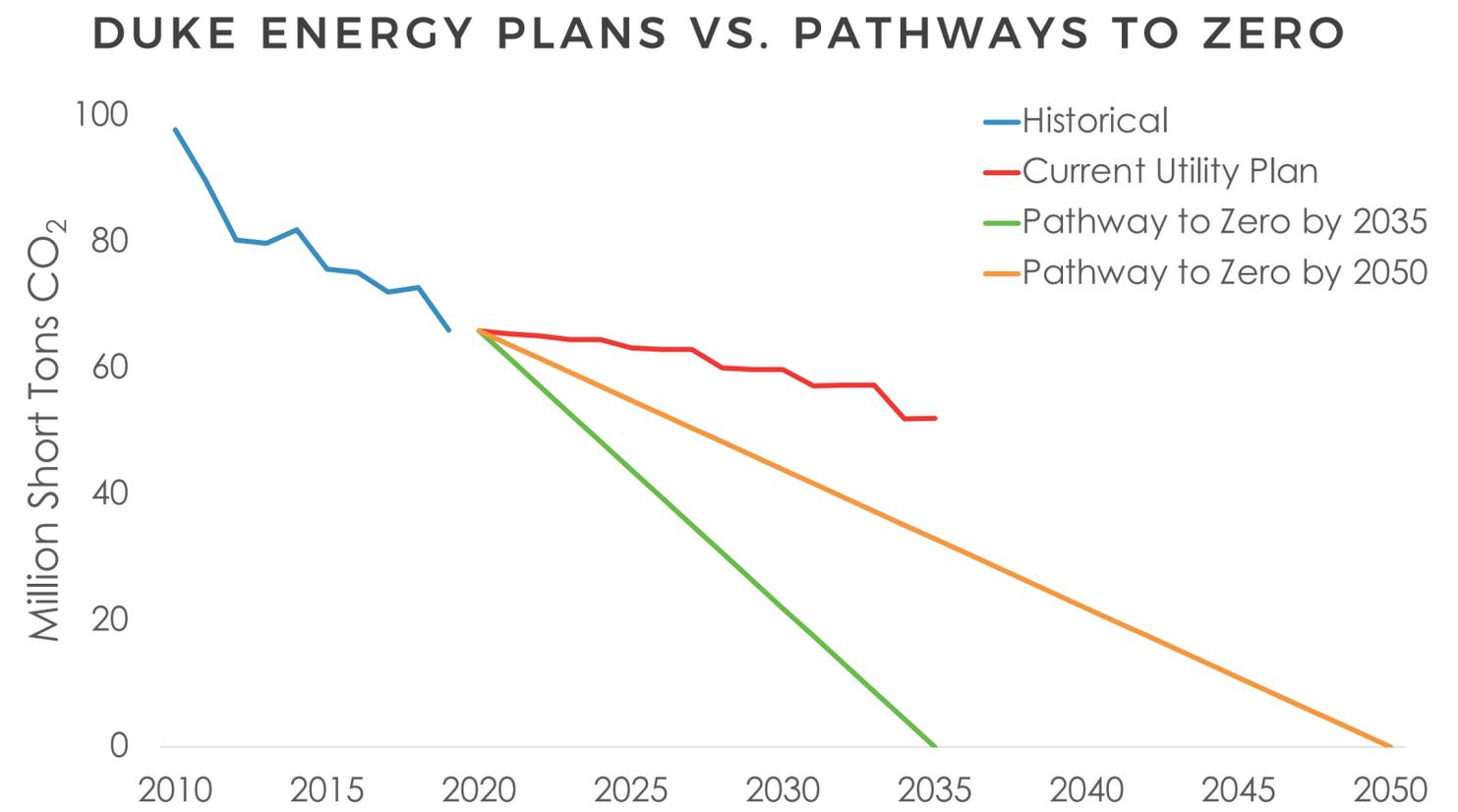
A growing number of electric utilities and cities in the Southeast have set goals to decarbonize by 2040-2050. Reaching these goals and decarbonizing at the rate needed to address climate change will be a challenge.

- Inconsistency between goals and actual plans (IRPs)
- Near-term vs. long-term goals need to align with science
- Focus needs to include total CO₂ reduction not just emissions rate
- Goals need to account for power purchases, municipality agreements

| Utility Group | Publicized Reductions | Announced Goal | Zero or Net-Zero Goal | Scenario in IRP | On Track to Decarbonize by 2050 | Years to Zero at 2020-2030 Pace |
|----------------------------|-----------------------|----------------|-----------------------|-----------------|---------------------------------|---------------------------------|
| Duke Energy | Yes | Yes | Yes | Yes | No | Past 2100 |
| Southern Company | Yes | Yes | Yes | No | No | 2086 |
| NextEra Energy | Yes | Yes | No | No | No | 2071 |
| Tennessee Valley Authority | Yes | No | No | No | No | Past 2100 |

HIGHLIGHT: DUKE ENERGY

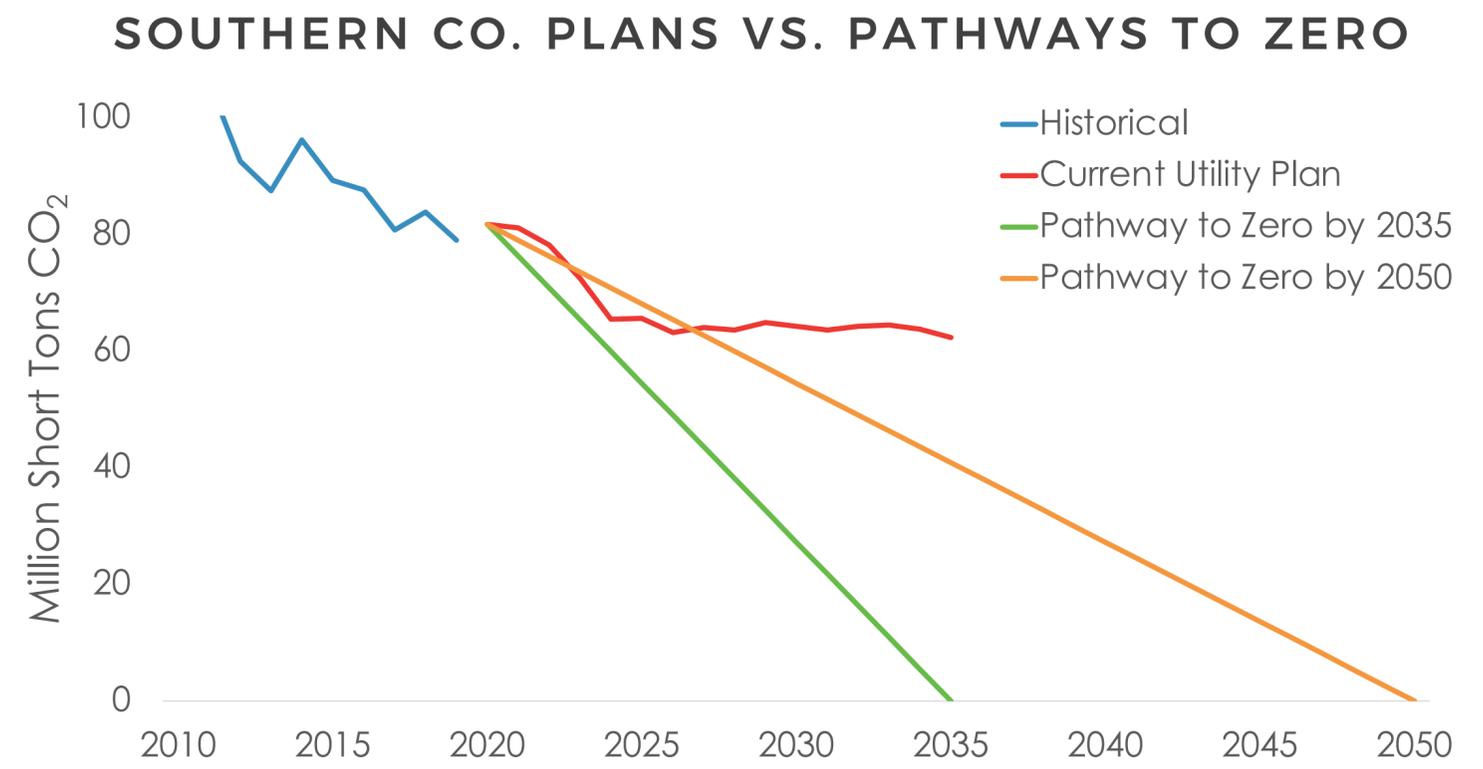
| Utility System / Operating Company | % Decarb / Year | |
|--|-----------------|------------------|
| | 2010-2019 | 2020-2030 |
| Duke Energy | -4.2% | -0.9% |
| Duke Energy Carolinas | -3.3% | -0.7% |
| Duke Energy Progress | -6.2% | -3.7% |
| Duke Energy Florida | -3.2% | 0.1% |
| Estimated year utility will approach zero based on decarbonization rate | 2054 | Past 2100 |



KEY TAKEAWAYS: Duke improved its decarbonization goal by targeting net-zero goal by 2050 and increasing its interim goal from 40% to 50% by 2030. It is on track to meet its 2030 goal, but is behind on its net-zero goal due, at least in part, to gas-heavy generation in Florida and remaining coal in the Carolinas.

HIGHLIGHT: SOUTHERN COMPANY

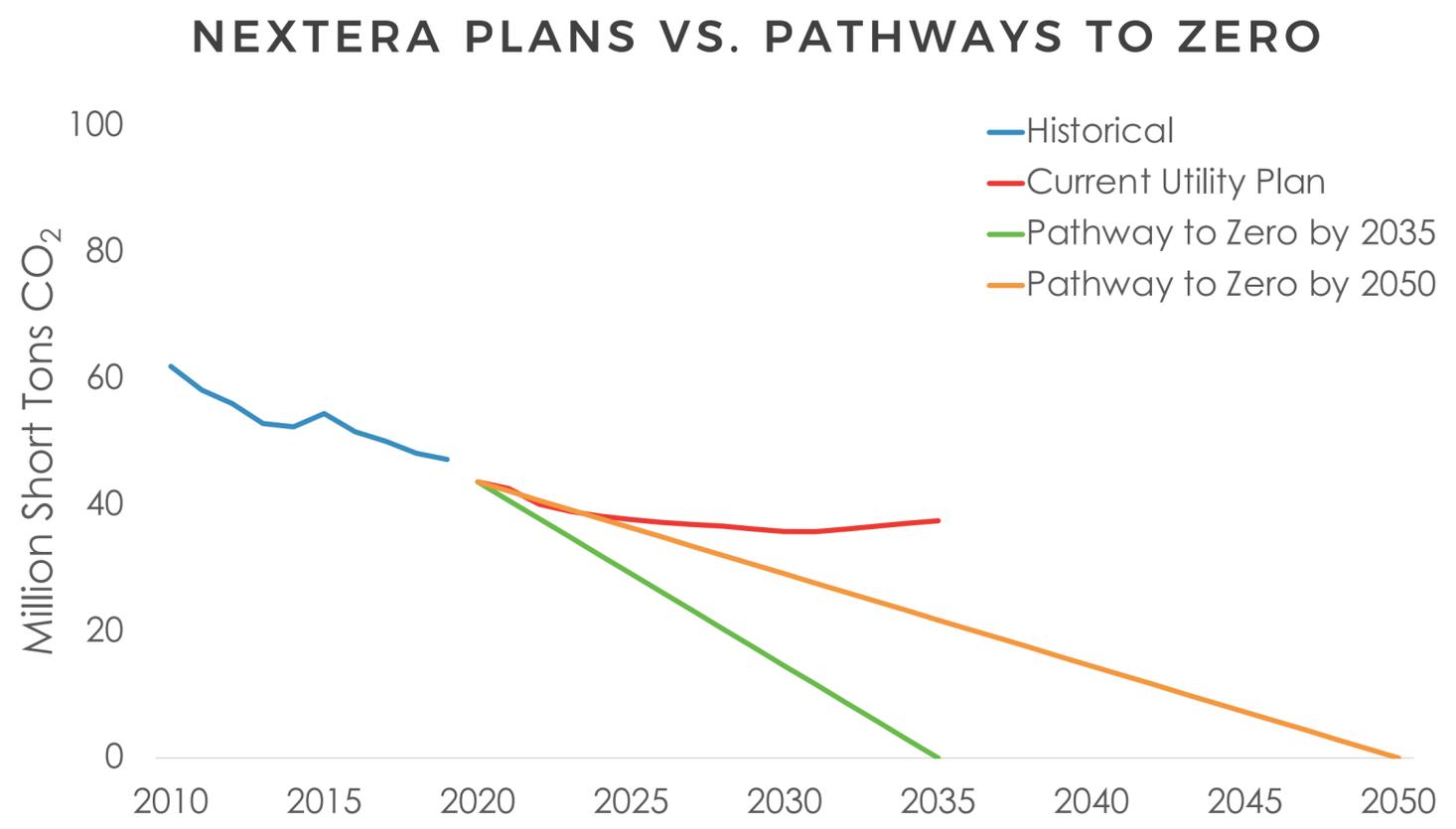
| Utility System / Operating Company | % Decarb / Year | |
|--|-----------------|-------------|
| | 2010-2019 | 2020-2030 |
| Southern Company | -3.8% | -1.8% |
| Georgia Power | -4.3% | -2.3% |
| Mississippi Power | -4.1% | 0.4% |
| Alabama Power | -2.8% | -1.4% |
| Estimated year utility will approach zero based on decarbonization rate | 2056 | 2086 |



KEY TAKEAWAYS: Southern Company is also on track to meet interim goals, but is not on a trajectory to reach net-zero by 2050. It also calculates emissions levels using a 2007 baseline, which is the highest point for utilities in the past 40 years. Coal usage is on the decline in Georgia, though remains a major roadblock for all of Southern’s operating companies.

HIGHLIGHT: NEXTERA ENERGY

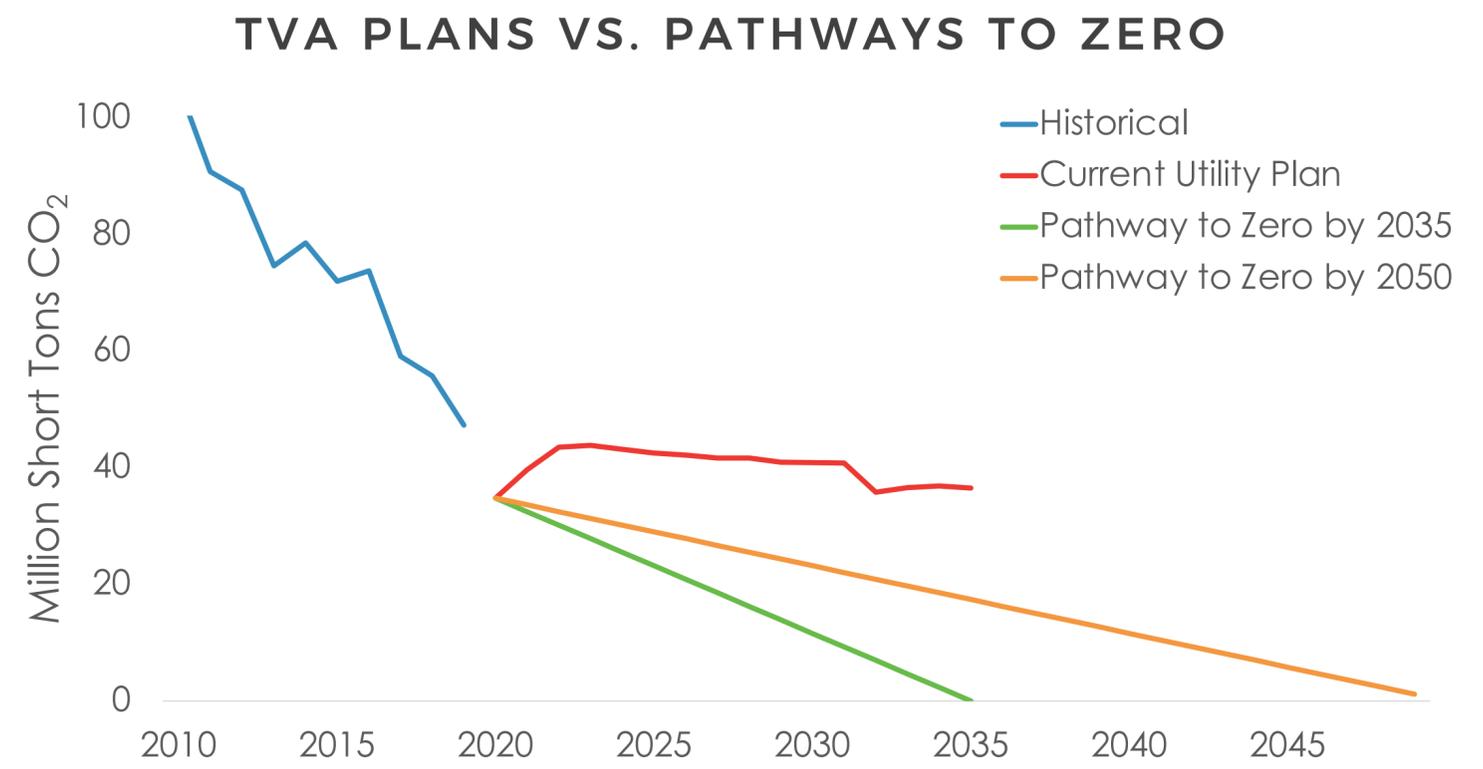
| Utility System / Operating Company | % Decarb / Year | |
|--|-----------------|-------------|
| | 2010-2019 | 2020-2030 |
| NextEra Energy | -2.9% | -2.5% |
| Florida Power & Light | -2.5% | -2.2% |
| Gulf Power | -4.5% | -4.1% |
| Estimated year utility will approach zero based on decarbonization rate | 2064 | 2071 |



KEY TAKEAWAYS: NextEra energy set a near-term targets to reduce its CO₂ emissions rates (lbs / MWh) rather than total carbon emissions. Because NextEra is expanding its geographic footprint with the addition of Gulf Power, this carries the possibility of continued emissions if demand increases.

HIGHLIGHT: TENNESSEE VALLEY AUTHORITY

| Utility System | % Decarb / Year | |
|---|-----------------|-----------|
| | 2010-2019 | 2020-2030 |
| TVA | -8.2% | -0.8% |
| Estimated year utility will approach zero based on decarbonization rate | 2064 | 2071 |



KEY TAKEAWAYS: TVA has not announced a decarbonization goal. The public utility has achieved significant reductions during the past decade due to coal retirements and lower load forecasts, though current plans do not reflect a continuation of emission reductions.

DECARBONIZATION OPPORTUNITIES



Electrification

- Decarbonization of the power sector can reduce emissions in *all* sectors through electrification.
- Electric vehicles (EVs) in the Southeast can drive 92 miles with an equivalent emissions impact of one gallon of gas.



Just Transition

- Transitioning away from fossil fuels comes with the potential to reduce the systematic racial, economic, and class disparities exacerbated by the climate crisis.
- A transition should seek equitable distribution of benefits to those impacted by the transition.



Resource Planning

- Resource planning, where utilities make resources investment decisions, is a key opportunity for utilities to make good on decarbonization goals.
- Each state sets rules resource planning rules.



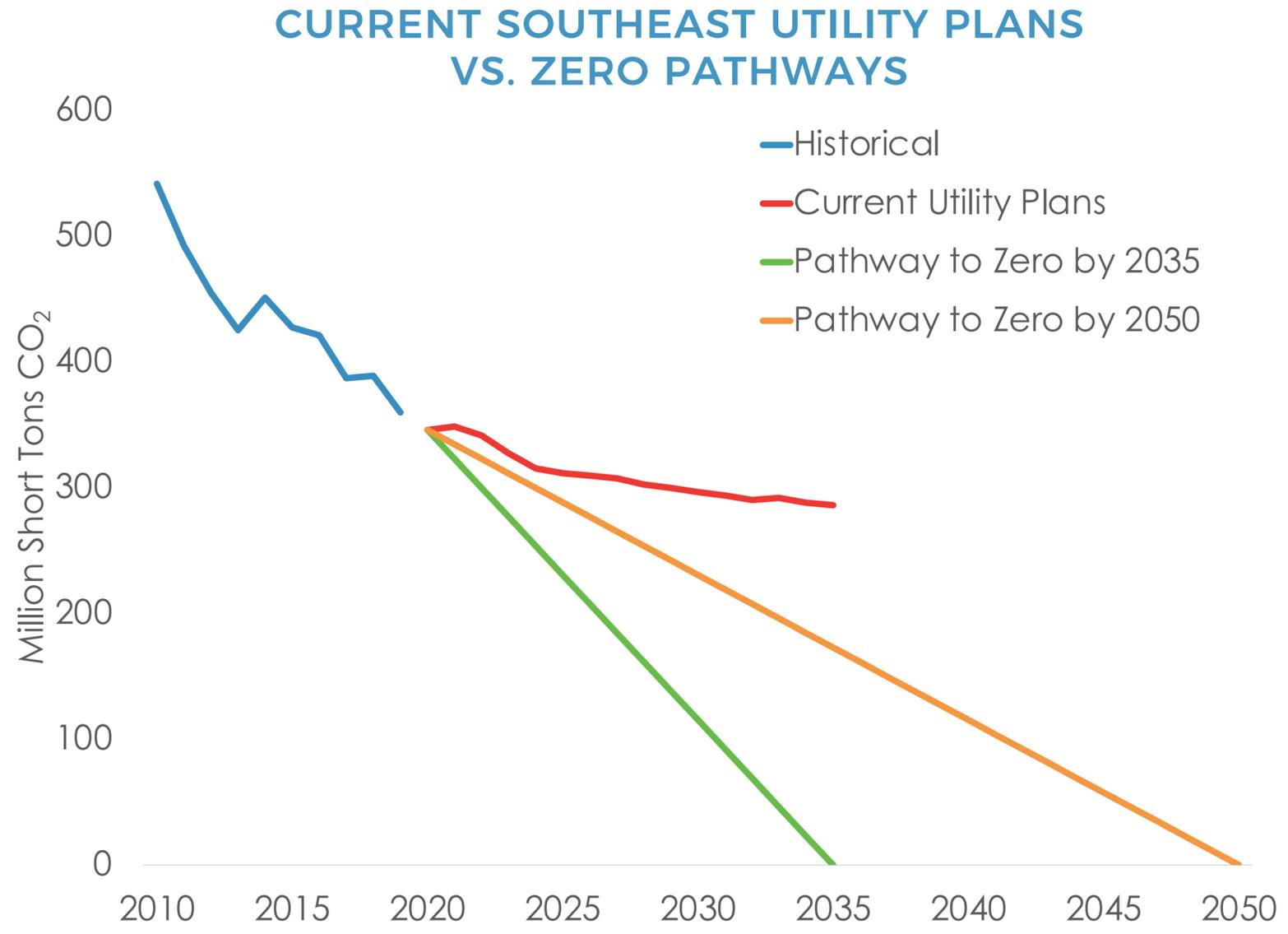
Federal Policy

- The Southeast lacks a competitive electric market and state renewable or efficiency standards.
- A federal Clean Electricity Standard could have an outsized impact on the fuel mix in the region.

EMISSION TRENDS AND THE CLIMATE CRISIS

**GLOBAL GREENHOUSE GAS
EMISSIONS MUST
REACH NET-ZERO
BETWEEN 2040 & 2055
TO LIMIT GLOBAL TEMPERATURE RISE TO 1.5°C**

~IPCC SPECIAL REPORT, OCTOBER 2018



Scientific guidance is to limit global temperature rise to 1.5°C to avoid the worst of the climate crisis. The Biden Administration has a stated goal for the power sector to be carbon-free by 2035 in order to accommodate the decarbonization of other sectors.

Unless utilities change current plans, the Southeast will not be able to stand with the rest of the world in preventing the climate crisis.



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