TRACKING DECARBONIZATION IN THE SOUTHEAST

GENERATION + CO_2 EMISSIONS REPORT

Southern Alliance for Clean Energy
P.O. Box 1842 | Knoxville, TN 37901 | 865.637.6055

cleanenergy.org
Southern Alliance for Clean Energy

INTRODUCTION

Power generation in the Southeast is changing: carbon dioxide (CO_2) emissions are falling, and solar is being deployed at increasing scale. Electricity demand is declining and the economics of clean energy continue to improve. Some utilities are setting long-term goals such as transitioning away from fossil fuels and lowering greenhouse gas emissions. While emission reduction opportunities exist in many sectors, this report will discuss decarbonizing emissions from utility generation in the electric power sector.

SACE has compiled historical data for 2010-2018 and forecasts of power generation for Southeast utilities. By examining the mix of fuels used to meet the region's power needs, we can describe how generation and demand relate to regional carbon emissions. Generation and emission figures given in this report are tied to the utility or state in which the power is ultimately consumed, not generated or emitted.

The purpose of this report is to review regional emissions and generation trends in the electric power sector in the Southeast. We will identify what current supply and demand forecasts tell us about the region's resource mix and future carbon emissions.

ABOUT SACE

The Southern Alliance for Clean Energy (SACE) is a nonprofit organization that promotes responsible 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.

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EXECUTIVE SUMMARY

Changes in power generation have driven carbon ($CO_{2)}$ emissions from electric utilities in the Southeast down for over a decade. Despite the deployment of new solar generation, these emissions flatten out under current utility plans. This flat trend falls far short of the trajectories recommended by scientists as needed to avoid the worst of the climate crisis, prompting questions and observations:

DECARBONIZATION GOALS ARE BECOMING THE NEW NORM

Decarbonization is the transition of our power supply to sources that emit lower CO_2 emissions. A growing number of electric utilities and cities in the Southeast have set goals to decarbonize by 2040-2050, including Duke Energy and Southern Company, two of the largest utility systems in the country. However, other notable utility systems like NextEra have only announced short-term goals and the Tennessee Valley Authority (TVA) has declined to formalize any carbon reduction goal. In order to avoid the worst impacts of the climate crisis, cities and utilities must work towards a long-term carbon reduction goal.

UTILITY PLANS MISS THE MARK

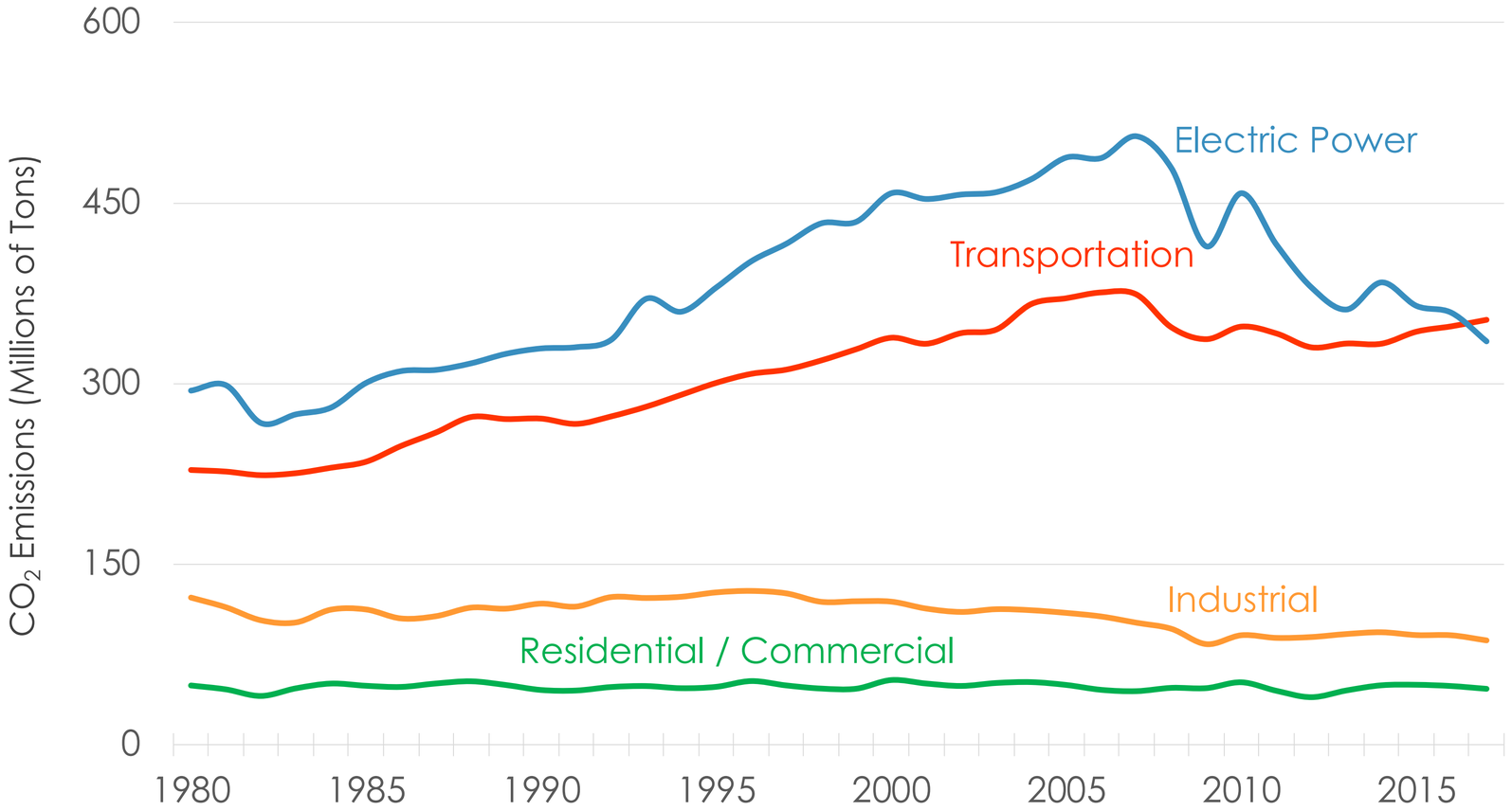
Continued cost reductions and technology improvements have put zero-emission solar on par with new fossil gas-fueled plants, but under current utility plans, utilities are missing key opportunities to add more solar, wind, and efficiency to the resource mix. Instead, integrated resource plans (IRP) frequently result in new fossil gas capacity. Because fossil gas has approximately half the emission rate of coal generation, historical CO_2 reductions have been dramatic. But continued investment in fossil gas infrastructure hinders the ability to reach net-zero carbon emissions, and creates additional "fugitive emissions" of methane from leakage, which are more difficult to track and prevent.

SHOULD THE TRANSPORTATION SECTOR LOOK TO UTILITIES FOR LEADERSHIP?

Historical drops in utility emissions and increased vehicle travel mean the transportation sector is now the largest source of CO_2 in the country and Southeast region. This does not diminish the need for action in the power sector. In fact, decarbonizing remains as crucial as ever. Simultaneously, the transportation sector is electrifying, as many consumers are taking advantage of the public health, economic, and environmental benefits of by switching to electric vehicles (EVs). The cleaner the electricity, the cleaner the EV, therefore emission reductions in electricity help the transportation sector decarbonize as well.

HISTORICAL EMISSIONS TRENDS BY SECTOR

SOUTHEAST ANNUAL CO_2 EMISSIONS BY SECTOR



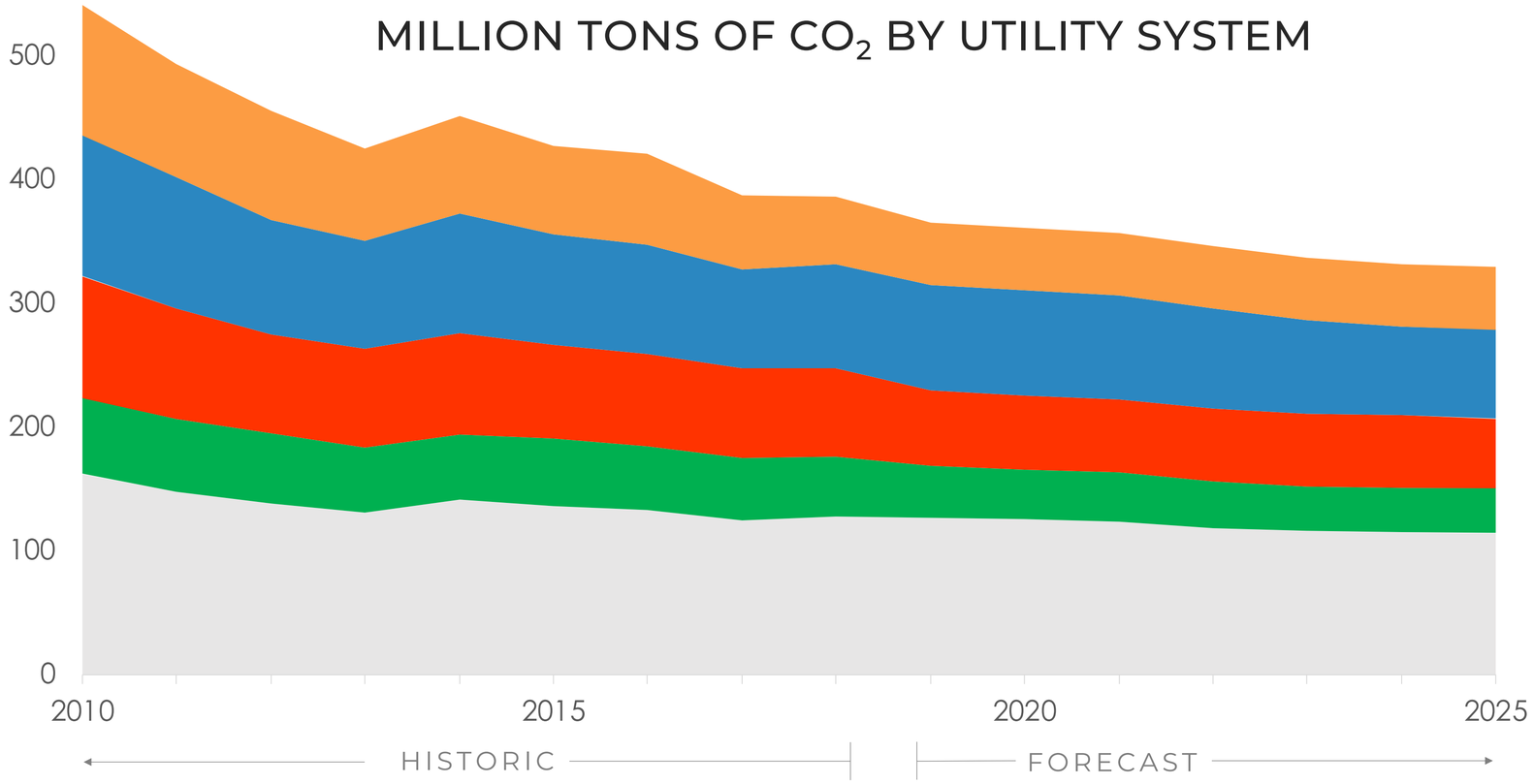
Source: U.S. Energy Information Administration (EIA) – State Carbon Dioxide Emissions for AL, FL, GA, MS, NC, SC, TN (1980-2017).

WHY THE POWER SECTOR?

CO_2 emissions are reported by sector to measure how consumption of fossil fuels, such as coal and fossil gas, contributes to greenhouse gas emissions.

Globally, emissions are on the rise. But on a national and regional level, reported annual CO_2 emissions are beginning to drop. The primary driver for this sharp decrease is observed in the **electric power sector**, which is the focus of this report. A notable result of falling emissions in the power sector from their peak in 2007 is that the transportation sector recently surpassed the electric power sector as the largest regional source of CO_2 because utilities are decarbonizing faster than transportation is growing.

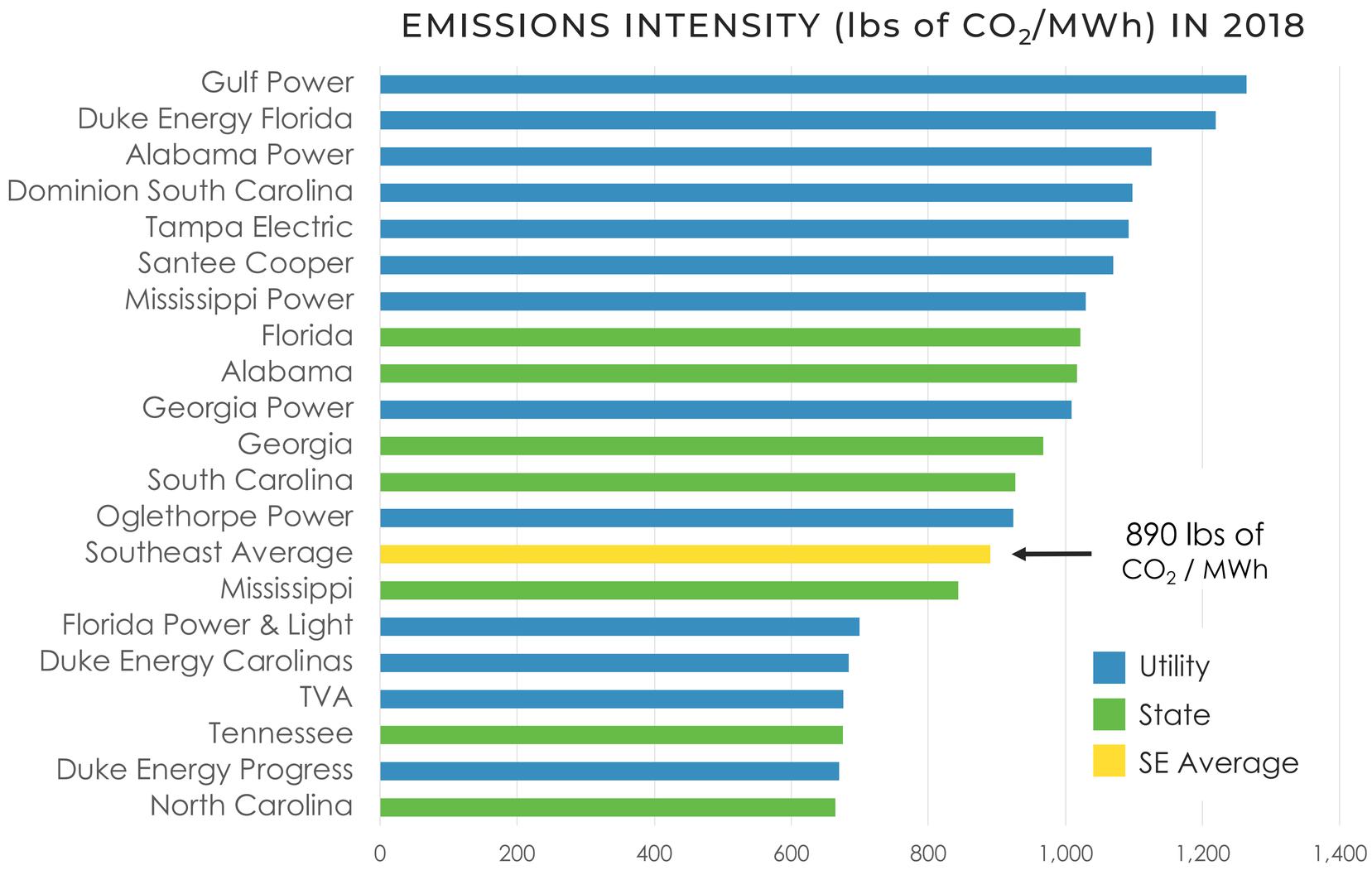
EMISSIONS FORECAST FOR UTILITIES



CO_2 millions of tons	2018	2025
Southeast Utilities Total	*387*	*329*
Tennessee Valley Authority	55	51
Southern Company	84	72
Duke Energy	71	56
NextEra	48	36
All Other Utilities	128	115

Four major utility systems make up approximately nearly 70% of regional CO_2 emissions. The top two CO2 emitters, Duke Energy and Southern Company, have both set goals to reach net-zero emissions by 2050. NextEra and TVA have both announced 70-80% reductions in the emissions rate, although TVA has not characterized it as a goal or commitment. Total regional emissions are expected to fall 15% from current levels by 2025, with most of those reduction occurring over the next two-three years.

EMISSIONS CO_2 INTENSITY OF POWER SUPPLY



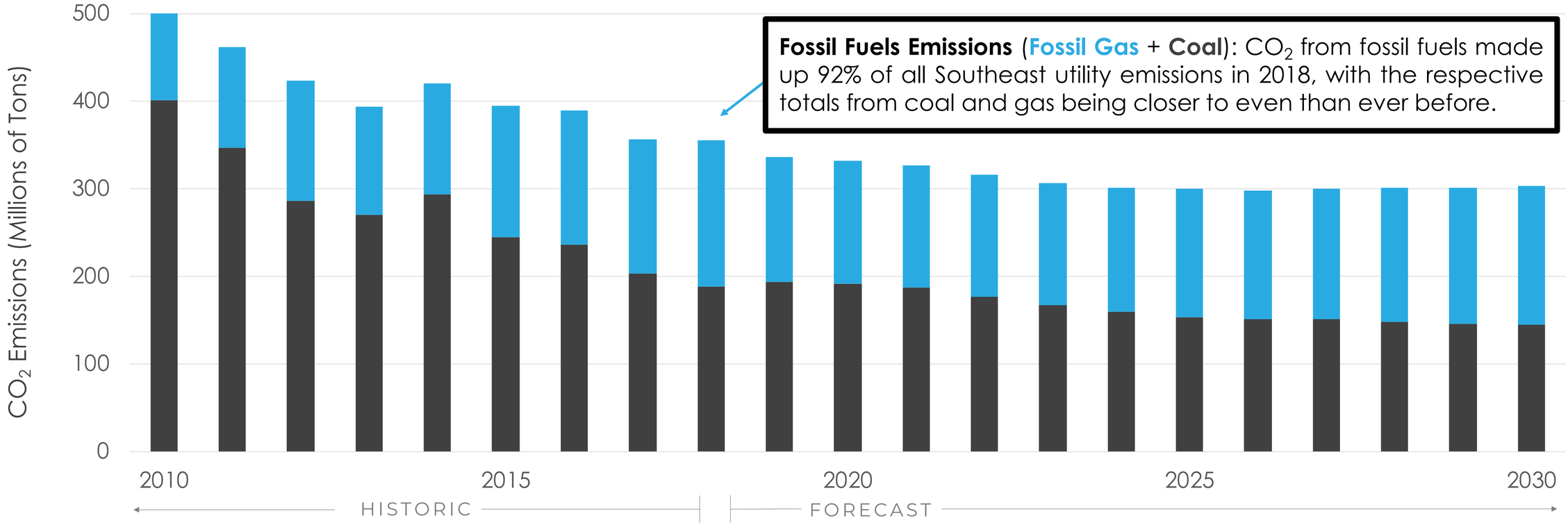
CARBON INTENSITY VARIES THROUGHOUT THE REGION

The climate impact of the power supply can be measured by its **carbon intensity.** When consumed, different fuels emit different amounts of carbon for each megawatt hour (MWh) of electricity produced. Lower emissions intensity = cleaner electricity.

Currently, the regional average is 890 lbs/MWh close to what of an average fossil gas plant emits using the same measure. North Carolina remains the "cleanest" state, but in 2018 Tennessee came much closer to tying for that spot than last year.

Also notable, Florida utilities still remain among the most emissions-intense in the region. This is due to high reliance on fossil gas, with some coal usage still lingering.

FOSSIL FUEL EMISSIONS TRENDS



While further coal retirements are expected to drive regional CO_2 emissions downwards, rising fossil gas consumption remains a roadblock to reaching long-term carbon goals. The process of drilling for and delivering fossil gas to the Southeast region also causes high methane emissions due to leaks in the gas transmission system. Emissions from this leakage are referred to as "fugitive emissions", and many utility systems are beginning to track them due to aging fossil gas pipelines and infrastructure.

EMISSIONS FROM COAL GENERATION

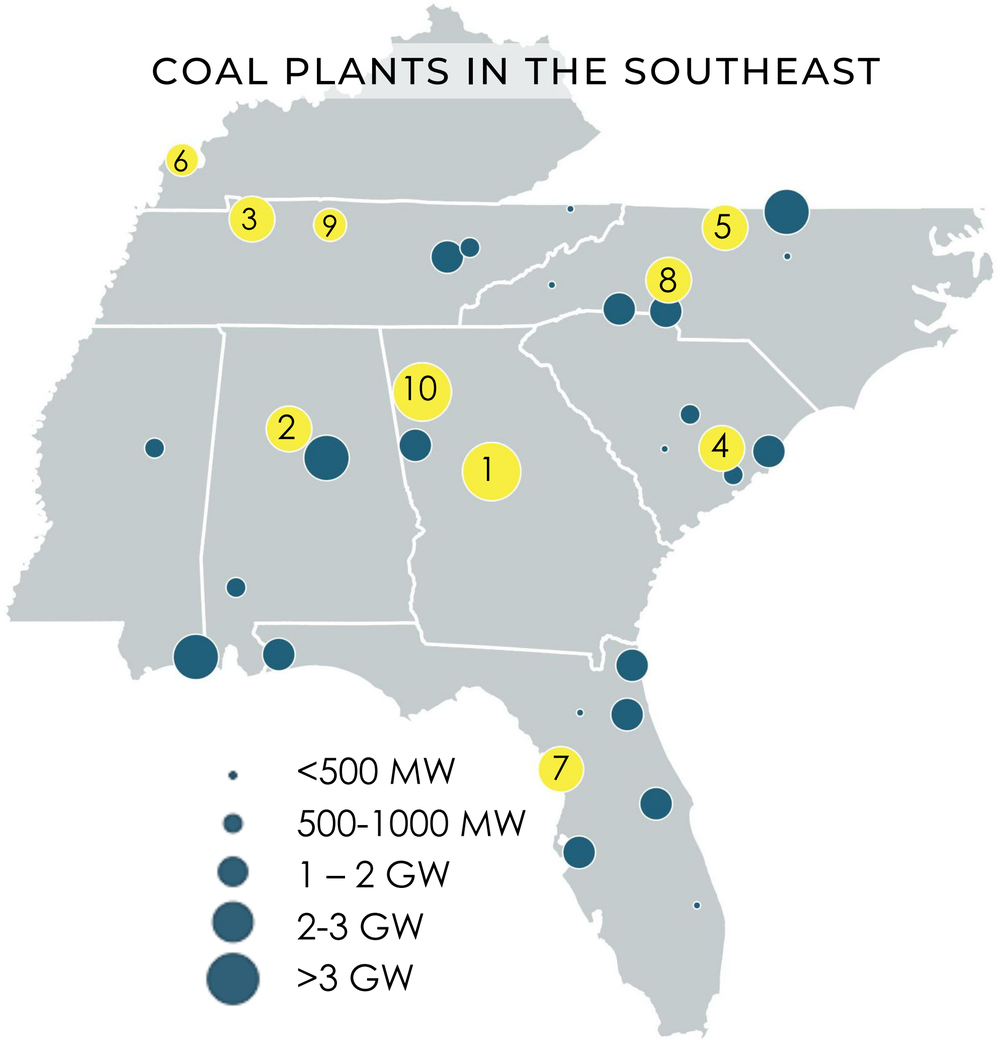
COAL PLANTS ARE DWINDLING

Following a wave of expected retirements, just a few coal plants will remain in the region by 2030. The top ten coal plans represent over 94 million tons of CO_2 per year, just under one third of the region's total CO_2 emissions. Coal plants are usually owned and operated primarily by one utility, but some, like Scherer, sell power to two or even three other utilities across state lines, meaning retirement decisions can be impacted by multiple utility plans.

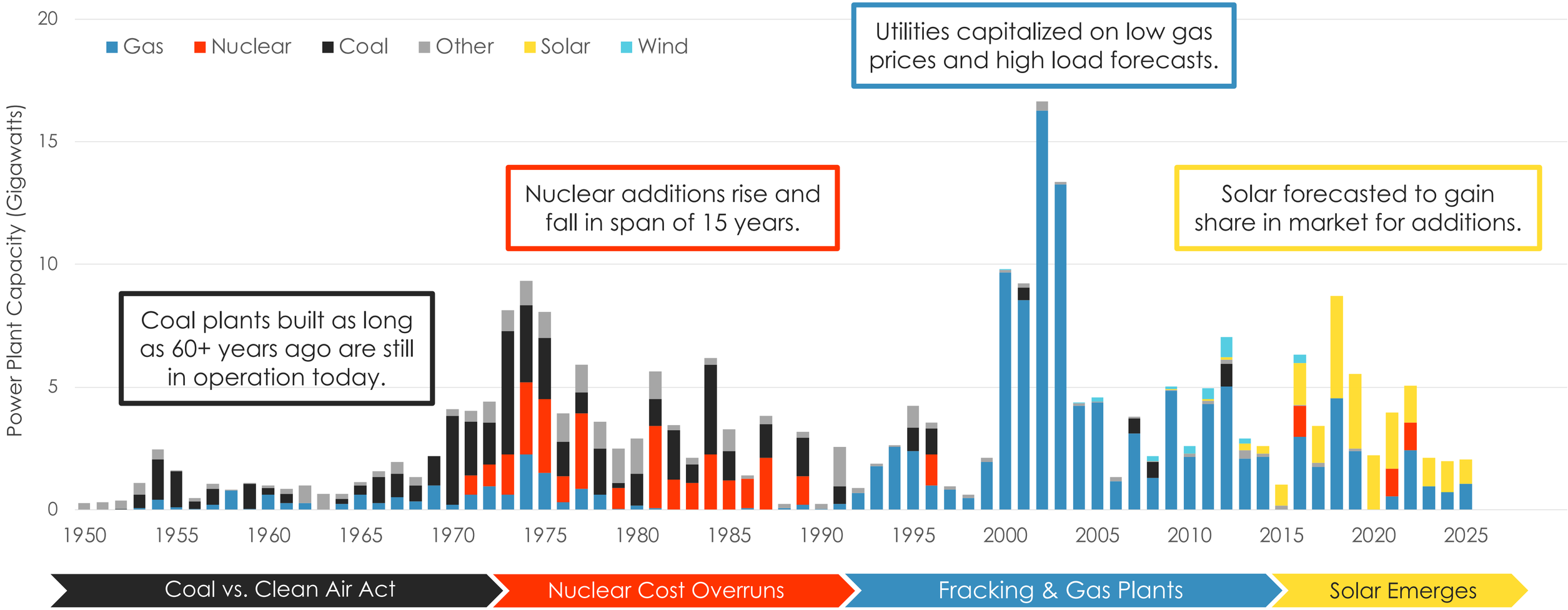
TOP COAL PLANT BY CO_2 IN 2030

Rank	Plant Name	Utility	CO_2 (m)	CO_2/ MWh
1	Scherer	Georgia Power	**19.0**	2,254
2	James Miller Jr	Alabama Power	**12.7**	2,184
3	Cumberland	TVA	**12.3**	2,165
4	Cross	Santee Cooper	**9.1**	1,893
5	Belews Creek	DEC	**8.9**	1,890
6	Shawnee	TVA	**7.0**	2,418
7	Crystal River	DEF	**6.8**	2,099
8	Marshall (NC)	DEC	**6.2**	1,935
9	Gallatin (TN)	TVA	**6.1**	2,237
10	Bowen	Georgia Power	**6.0**	2,014

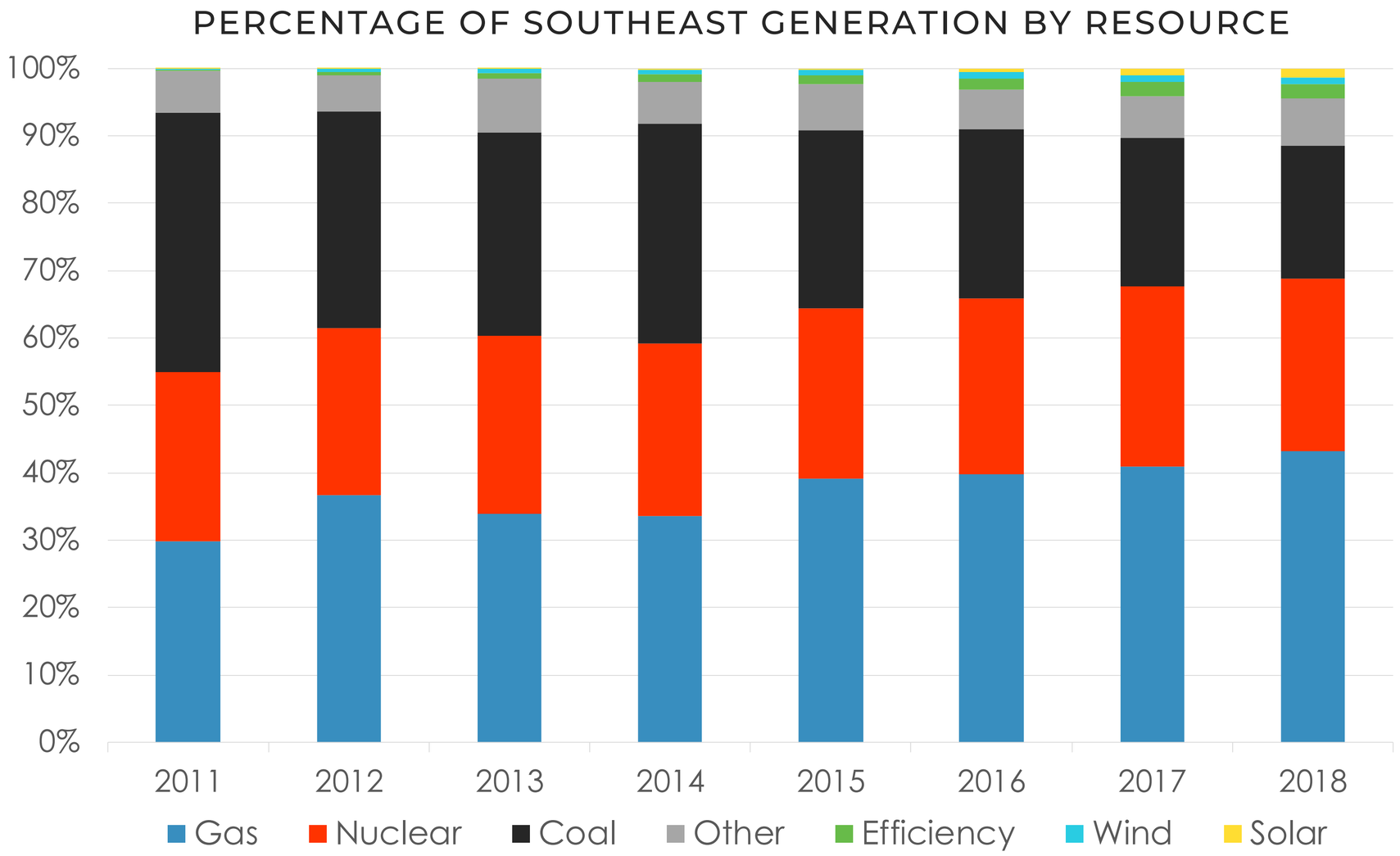
COAL PLANTS IN THE SOUTHEAST



OPERATING & PLANNED CAPACITY BY YEAR BUILT



HISTORICAL RESOURCE MIX



UTILITY PLANS SHAPE THE RESOURCE MIX

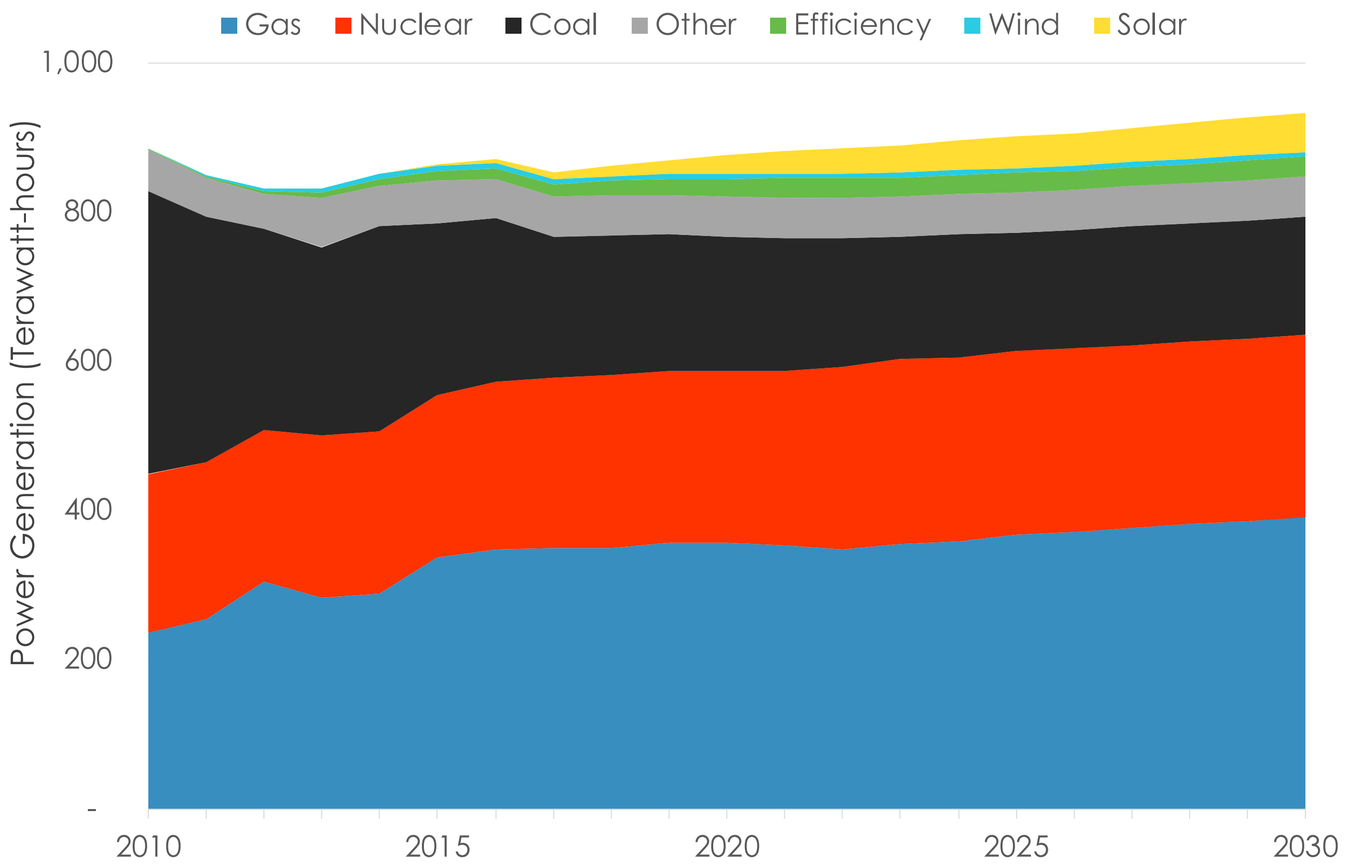
Resource mix, or the combination of resources that provide power, varies from state to state and utility to utility. At a regional level, 90-95% of generation has historically come from fossil gas, coal, and nuclear.

CAN SOLAR REPLACE GAS?

In 2012, the top fuel for power generation in the Southeast shifted from coal to fossil gas. While the *current Southeast* resource mix is primarily from fossil fuels, solar has doubled its contribution to the resource mix every year for the past four years. Still, only 2-3% of Southeast power generation comes from renewables, and efficiency, in comparison to 10% across the U.S, showing there is room for improvement.

SOUTHEAST GENERATION FORECAST

SOUTHEAST GENERATION BY FUEL TYPE, 2010-2030



PLANS SHOW CONTINUED FOSSIL FUEL USE

Dependence on fossil gas will continue to grow. By 2030, current utility resource plans would result in fossil gas fueling nearly half of the region's total electric generation. While current plans include continued significant use of coal through *at least* 2030, individual utilities such as Duke Energy have signaled intent to retire remaining coal generation during that timeframe.

UTILITY CLEAN ENERGY INVESTMENTS

Utility investment in solar shows no sign of slowing, with solar making significant additions each year until 2030. Future forecast updates may reflect new opportunities for wind as utilities evaluate in-region and offshore resources.

FUTURE OF NUCLEAR IS UNCERTAIN

Operating licenses for existing nuclear plants will begin to move into uncharted territory after 2030, when many will need renewed licenses to operate beyond 60 years. Currently the only nuclear plant in construction is Plant Vogtle in Georgia Power's service territory.

DUKE ENERGY

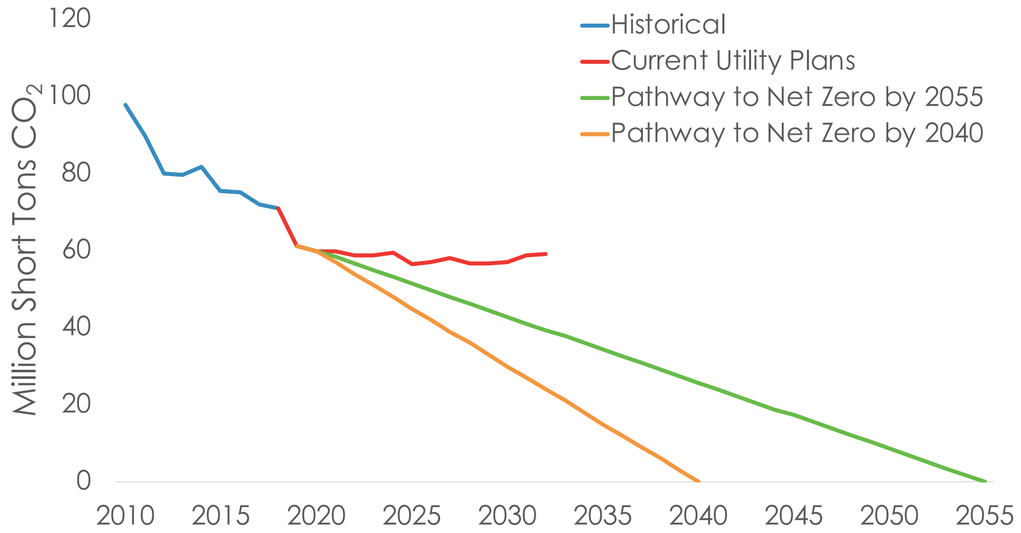
SETTING HIGHER GOALS

In 2017, Duke Energy announced its plan to reduce total CO_2 emissions by 40% by 2030, compared to 2005 levels, for all Duke Energy subsidiaries. Last year, Duke built on that to establish a long-term goal of net-zero by 2050. Now, in its latest 2020 update, Duke upped the ante to a 50% reduction by 2030 and released a net-zero scenario analysis where all coal units in the Carolinas are retired by 2030.

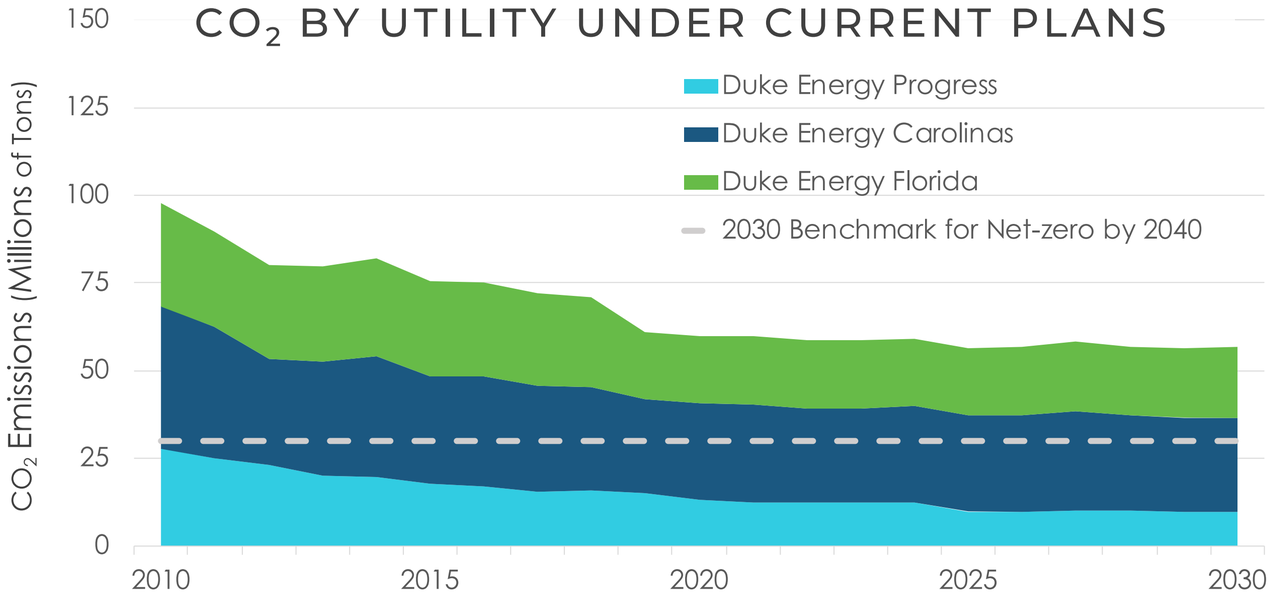
REGIONAL LEADER

Duke Energy's Southeastern utilities account for approximately three-fourths of reported CO_2 emissions. Its Southeast fleet emitted an estimated 99 million tons of CO_2 in 2005. Based on current plans, Duke's Southeast utilities will have reduced emissions by over 45% from their 2005 levels, meaning Duke is on its way to meeting the interim goal, but must change its plans for further emission reductions to meet its long-term goal.[1]

PLANS VS. NET-ZERO PATHWAYS



CO_2 BY UTILITY UNDER CURRENT PLANS



[1] Figures based on Duke's 2019 IRP, the 2020 IRP is planned to be submitted to the North Carolina Commission by September 1, 2020.

SOUTHERN COMPANY

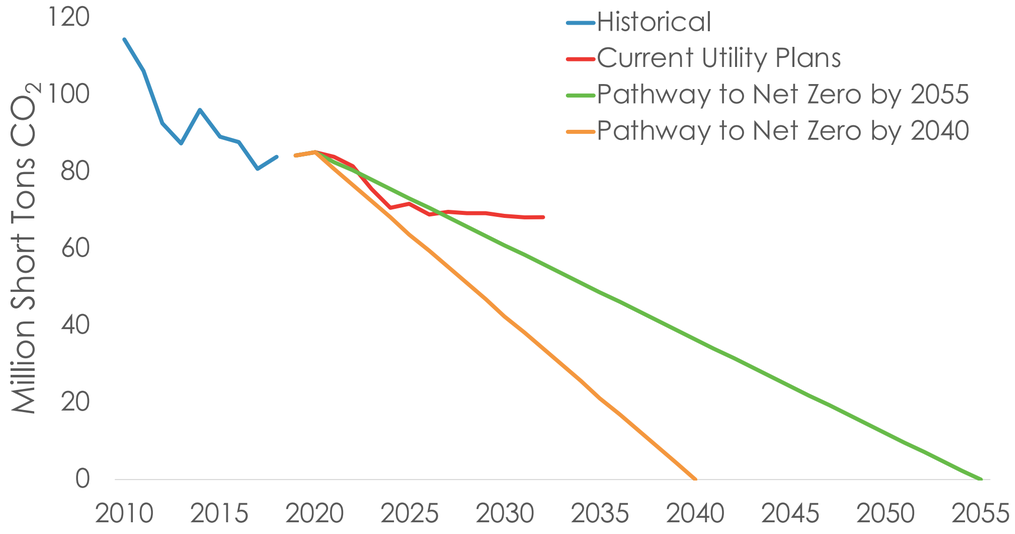
"LOW TO NO" CARBON TO NET-ZERO

In 2018, Southern Company announced an intermediate goal to reduce CO_2 emissions by 50% from 2007 levels by 2030 and a long-term goal of "low-to-no" carbon by 2050, but that has shifted to a net-zero approach that will allow the company to "emit some carbon emissions" but "wash out their effects by removing carbon in other ways." The pledge also does not explicitly call for the closure of coal plants like Duke does.

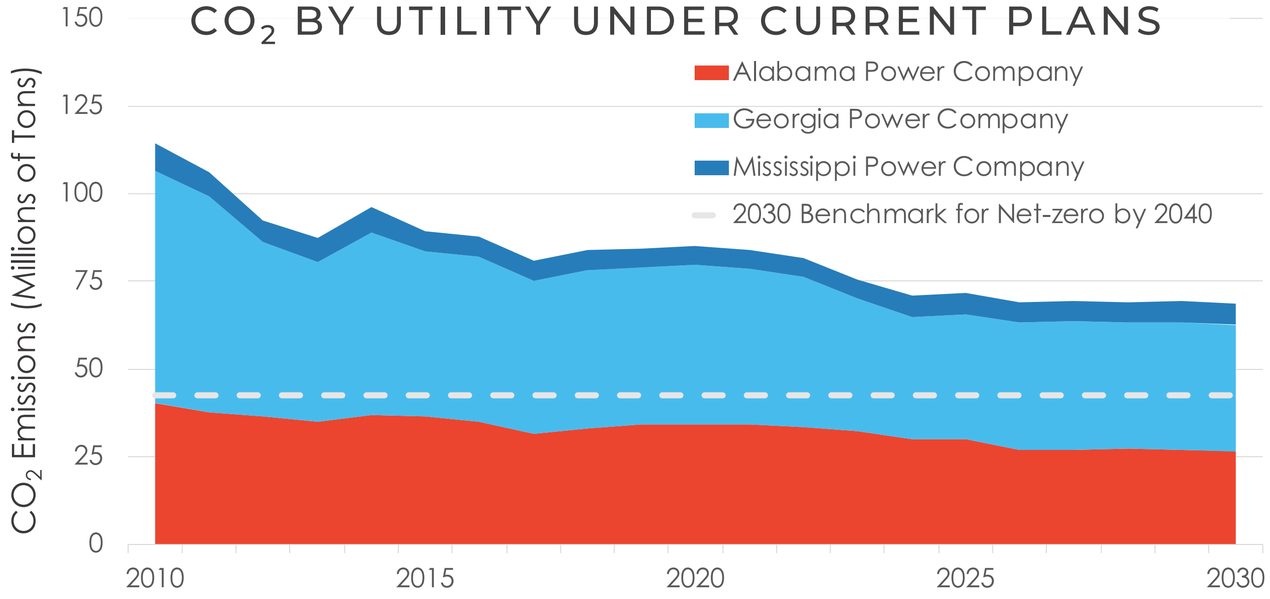
FINANCIAL CONTROL VS. POWER PURCHASES

According to annual shareholder reports, Southern Company's 2007 emissions are calculated based on a "financial control" standard, which doesn't include power purchased from other utilities. Current plans and practices result in an emission reduction of half of 2007 levels by 2030, when taking into account purchased power. Coal is declining in Georgia, but Alabama Power hasn't disclosed any retirement plans.

PLANS VS. NET-ZERO PATHWAYS



CO_2 BY UTILITY UNDER CURRENT PLANS



NEXTERA ENERGY

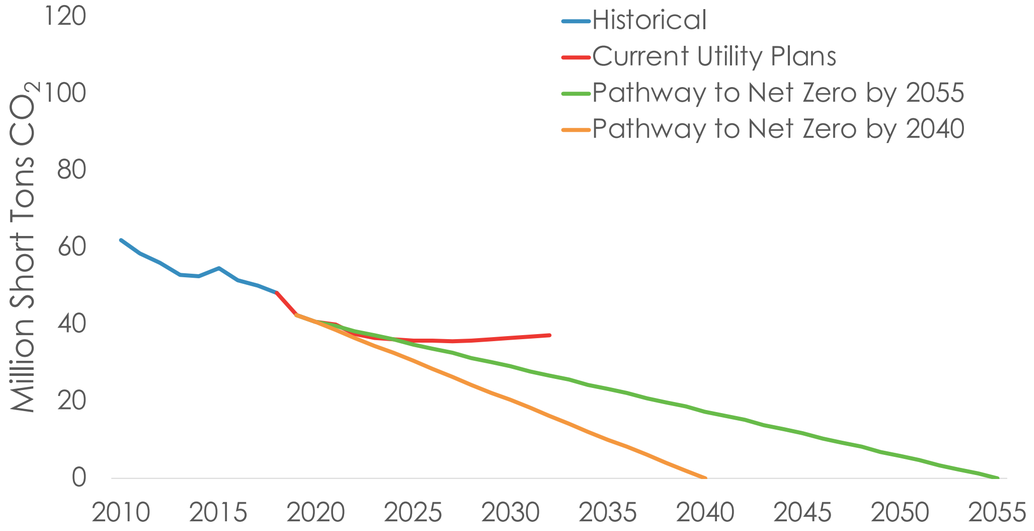
THE GOAL

NextEra announced a goal to reduce its CO_2 emissions *rate* by 76% by 2025 from a 2005 baseline, which is the equivalent of a 40% reduction in absolute emissions according to the company. This is generally in line with the company's plans prior to the announcement. Because NextEra is only reducing its emissions rate, it could continue to have a large CO_2 footprint if demand increases as the utilities have projected.

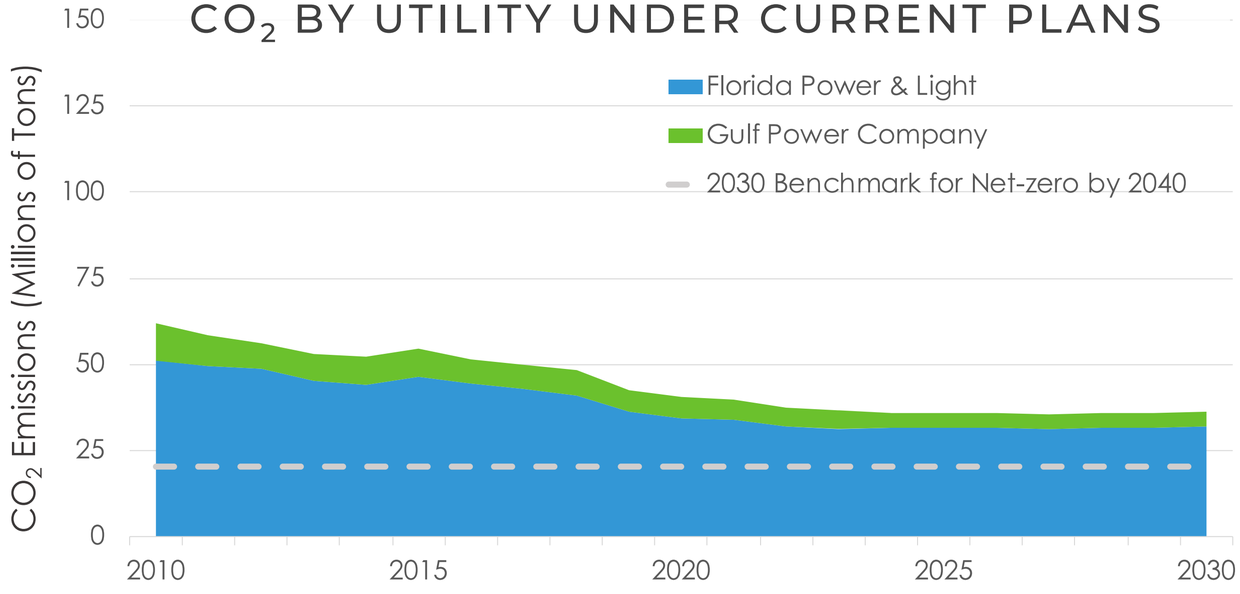
THE GROWTH

NextEra recently purchased Gulf Power and is in the process of merging that utility with its existing regulated utility subsidiary: Florida Power & Light. The company plans to build an 850 MW transmission line to connect the two, and has shifted some of the solar that was planned in the FP&L footprint into Gulf. More discussion on this integration will likely happen when each company has a rate case in the Q1 of 2021.

PLANS VS. NET-ZERO PATHWAYS



CO_2 BY UTILITY UNDER CURRENT PLANS



TENNESSEE VALLEY AUTHORITY

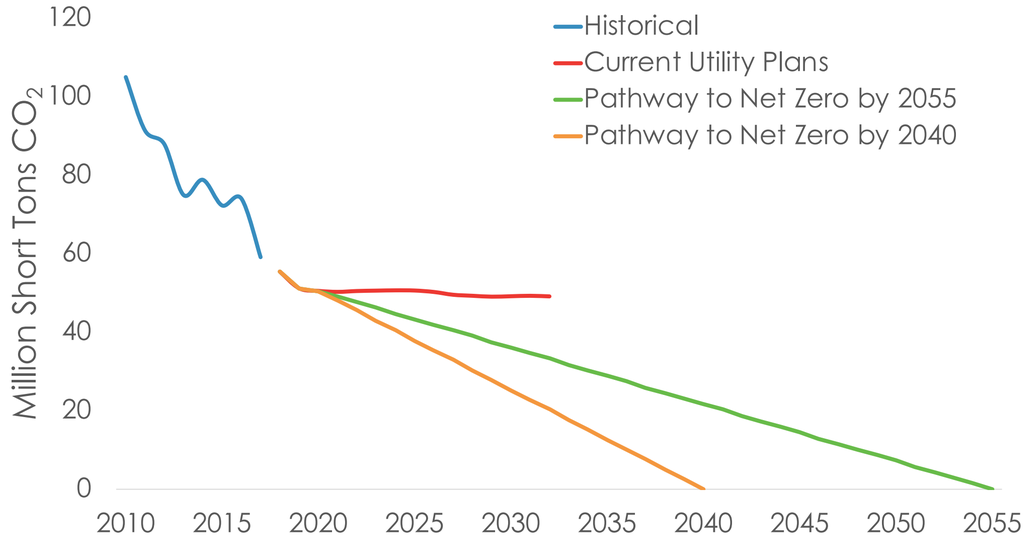
ODD MAN OUT

TVA stands in contrast to peer utilities like Duke and Southern that have both announced net-zero goals. One of the unifying traits of many utility carbon goals is that they include *long-term* reductions targets by 2050. While TVA has publicized an expected reduction in its *emissions rate* (but not total emissions) of 80% from 2005 levels, its analysis is limited to the 2030 to 2035 timeframe and does not constitute a formal goal or plan.

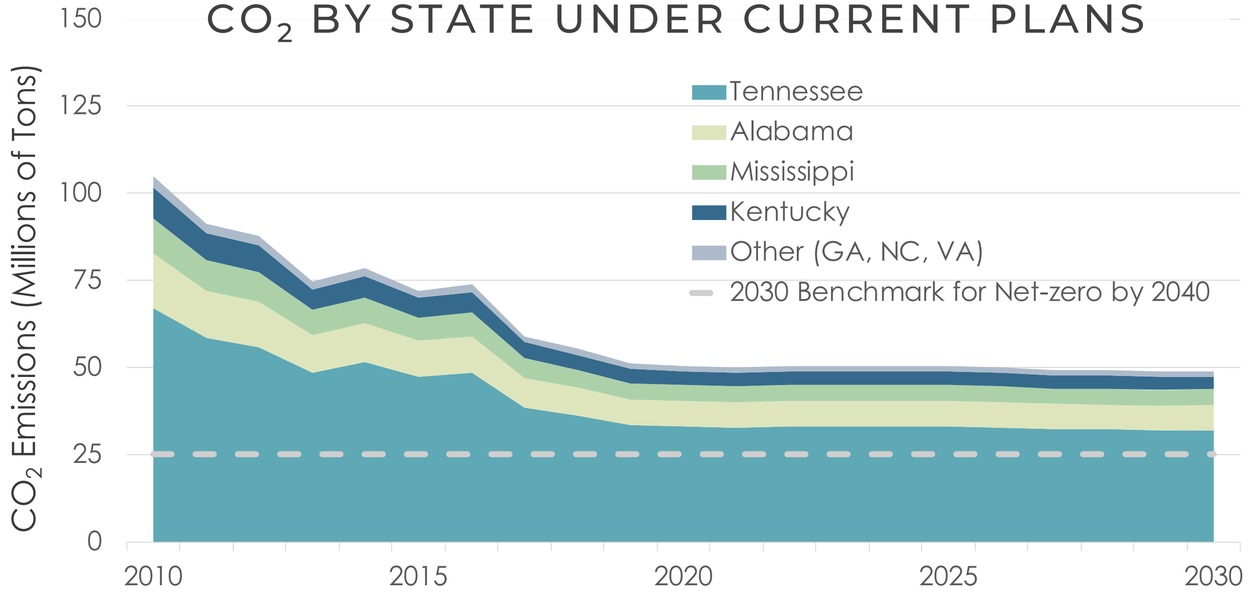
WHY NOT?

TVA remains hesitant to formalize a decarbonization goal. However, city leaders like Knoxville and Nashville, both in TVA's service territory, have sent a strong message to TVA by enacting their own climate-related goals. TVA's disinterest in actively formulating plans to decarbonize makes it unclear if it is unable or unwilling to hear that message.

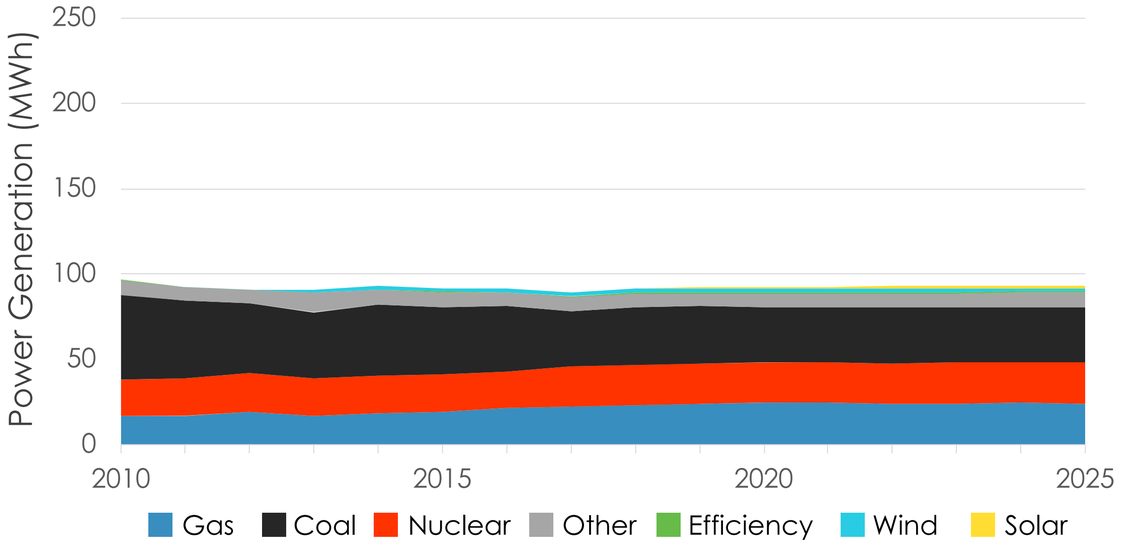
PLANS VS. NET-ZERO PATHWAYS

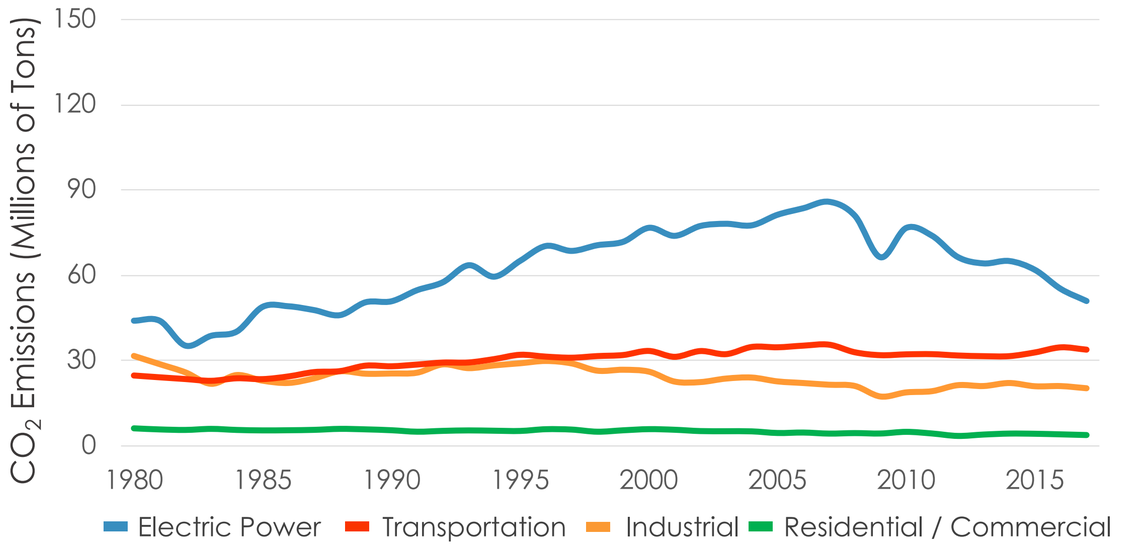


CO_2 BY STATE UNDER CURRENT PLANS



ALABAMA





STILL COMMITTED TO COAL

Alabama is currently the only state in the region where CO_2 emissions from utilities remain *significantly* higher than the transportation sector. While most states are slowly decarbonizing, Alabama continues to rely heavily on coal. With no coal retirements on the horizon, the state will only see slight declines in emissions over the next three to five years.

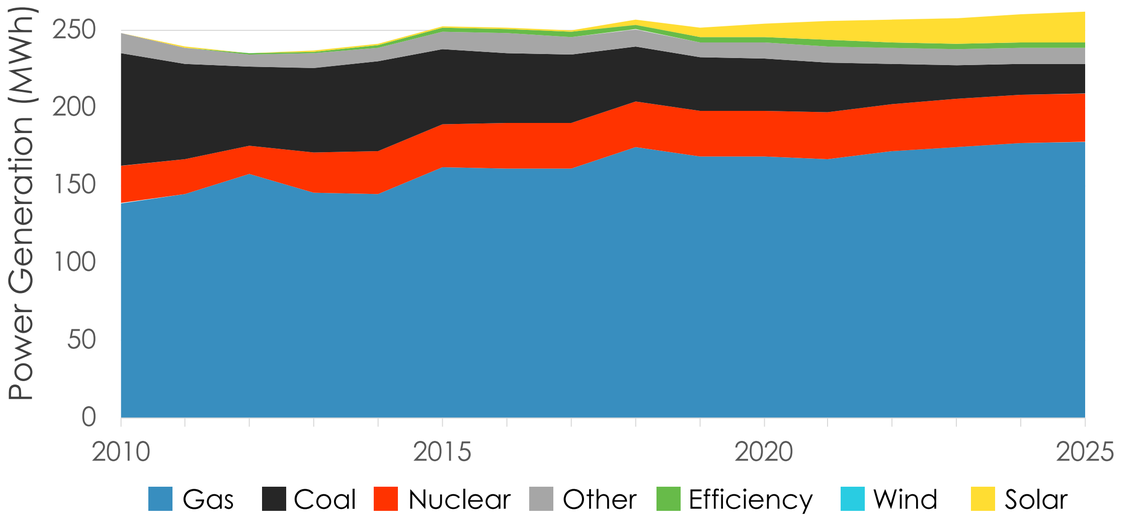
LACK OF OVERSIGHT

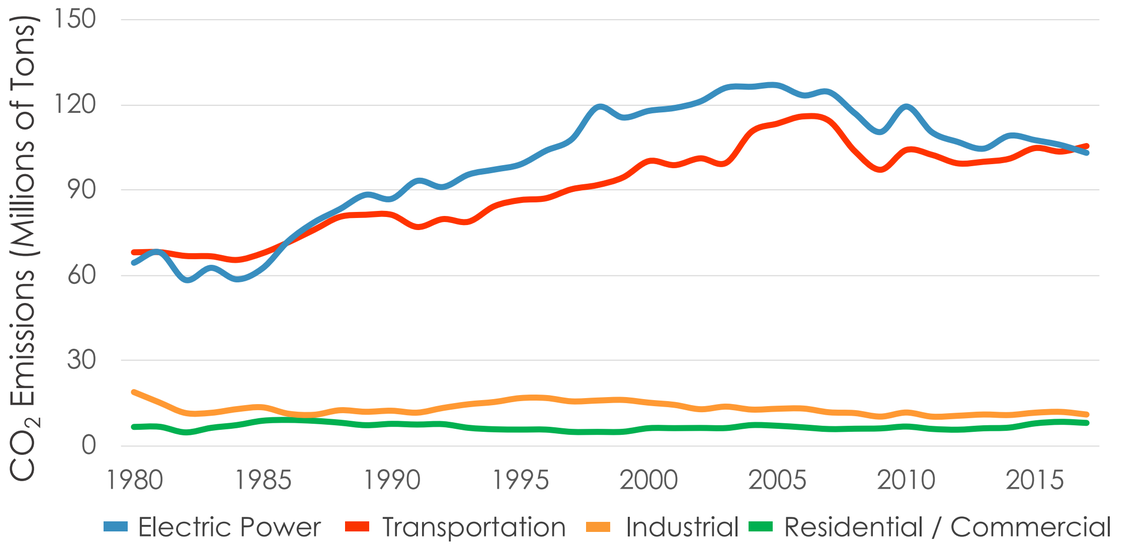
There is very little oversight over decisions regarding the generation supply in Alabama. Nearly every state in the country requires approval from regulators on long-range resource plans. The state's largest utility, Alabama Power, currently does not make its IRPs open to public review.

Alabama		2010	2018	2025
State CO_2	*Million Tons*	63.9	47.0	43.5
	Lbs/ MWh	1,322	1,017	932
% of Power	*Fossil Fuels*	68.9%	61.3%	60.2%
	Clean Energy	0.1%	3.3%	5.1%

Clean energy is non-hydro renewables and efficiency.

FLORIDA





POINT OF DIMINISHING RETURNS FOR GAS

Florida utilities average over 1,000 lbs of CO_2 / MWh, higher than the Southeast average of 890. Fossil gas generation makes up an outsized portion of the resource mix in Florida. While fuel switching from coal to fossil gas has helped reduce emissions, it also makes it difficult for future emissions rates to go much lower than that of an average fossil gas plant, even while accounting for significant solar additions in the future.

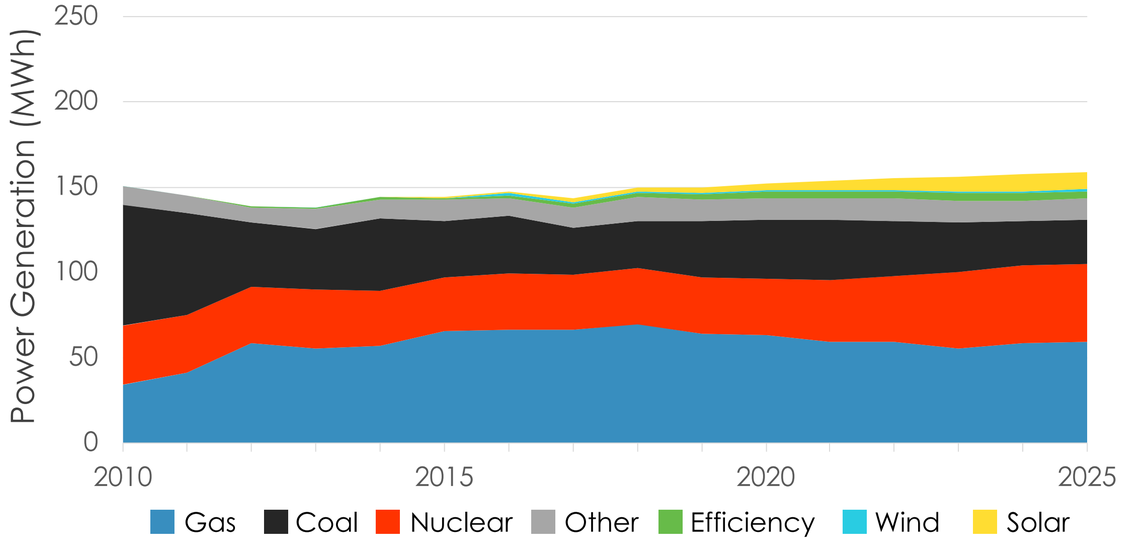
SPECIAL CONNECTION TO CLIMATE CRISIS

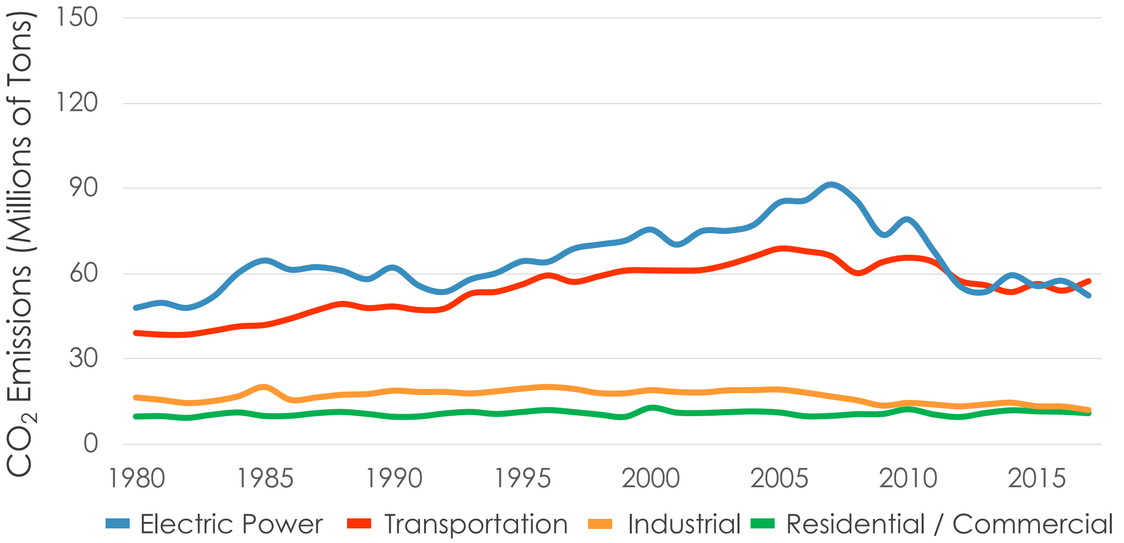
Florida is home to a high number of cities and municipalities with local climate goals, due in part to important regional partnerships such as climate compacts, and widespread opinion that the climate crisis will impact residents personally.

Florida		2010	2018	2025
State CO_2	*Million Tons*	156.3	129.1	99.7
	Lbs/ MWh	1,259	1,022	776
% of Power	*Fossil Fuels*	85.1%	81.9%	75.3%
	Clean Energy	0.2%	2.9%	9.2%

Clean energy is non-hydro renewables and efficiency.

GEORGIA





GEORGIA POWER MISSES MULTIPLES CUES

Southern Company's decarbonization goal and Atlanta's 100% clean energy goal have something in common: they were not part of Georgia Power's long-term resource plan. Despite strong signals from major customers *and* its parent company, the state's largest utility failed to make meaningful steps towards bringing the state's emissions down.

NUCLEAR REDUCES CO_2, BUT AT WHAT COST?

Nuclear is slated to supply a large portion of generation in the future. It's true this is significant emissions-free generation, but numerous delays and cost overruns (which will be saddled onto ratepayers) have made Vogtle the most expensive, time intensive, and impractical way to reduce emissions.

Georgia		2010	2018	2025
State CO_2	*Million Tons*	98.6	71.0	63,6
	Lbs/ MWh	1,309	967	825
% of Power	*Fossil Fuels*	69.8%	65.3%	53.8%
	Clean Energy	0.0%	4.0%	9.6%

Clean energy is non-hydro renewables and efficiency.

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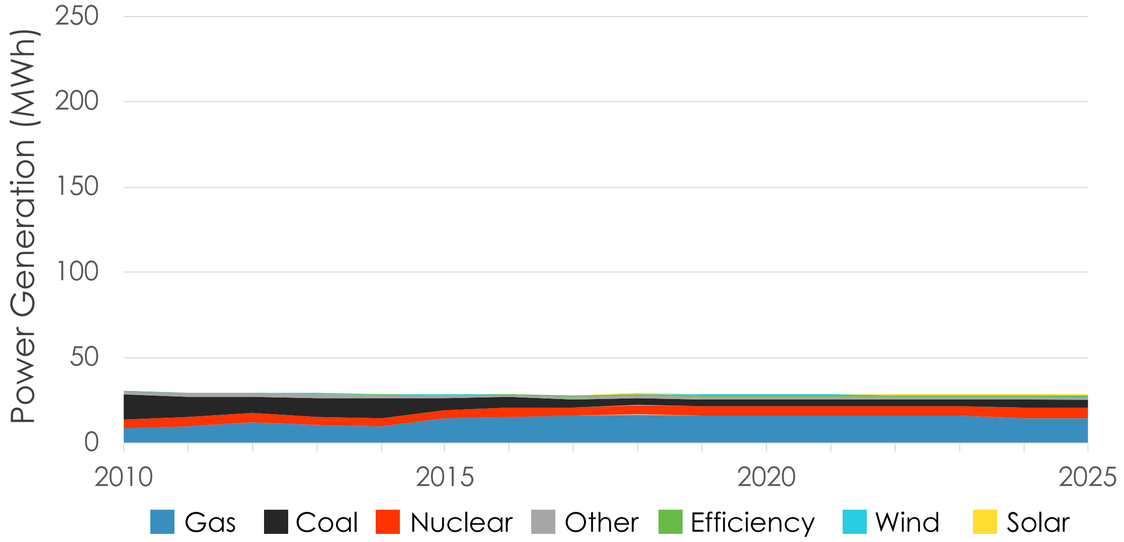
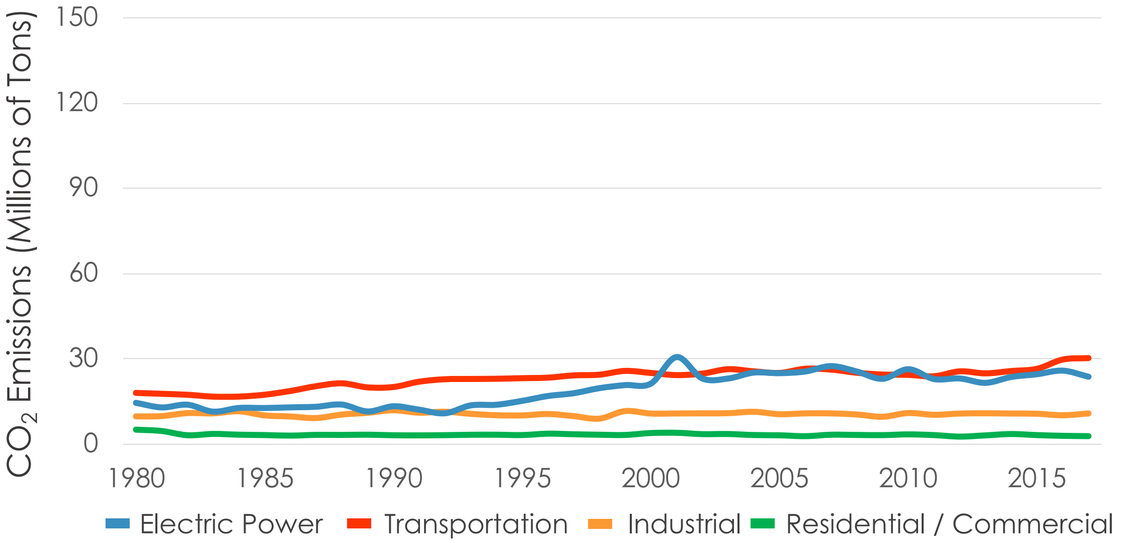




COULD NEW IRP RULE HELP MISSISSIPPI LEAPFROG OVER OTHER STATES?

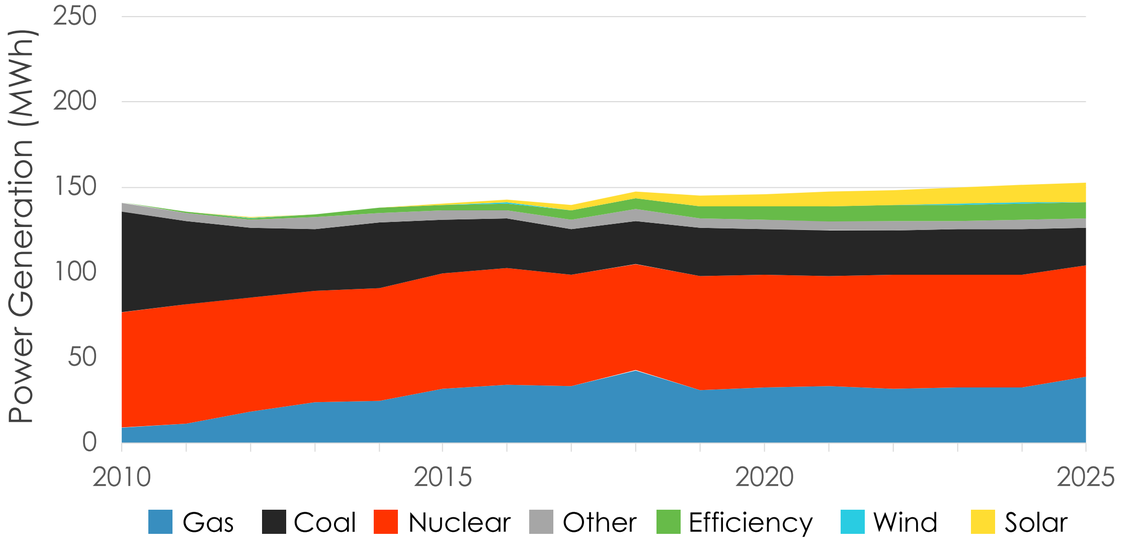
Mississippi recently passed a rule requiring utilities to file an integrated resource plan (IRP). While other states have developed and changed IRP rules over decades, Mississippi has the benefit of knowing what does and doesn't work everywhere else in the country. Thus, it's possible for the state to immediately begin using best practices, such least-cost strategies that allow for early retirement of coal plants, or as market-based benchmarking for renewable prices.

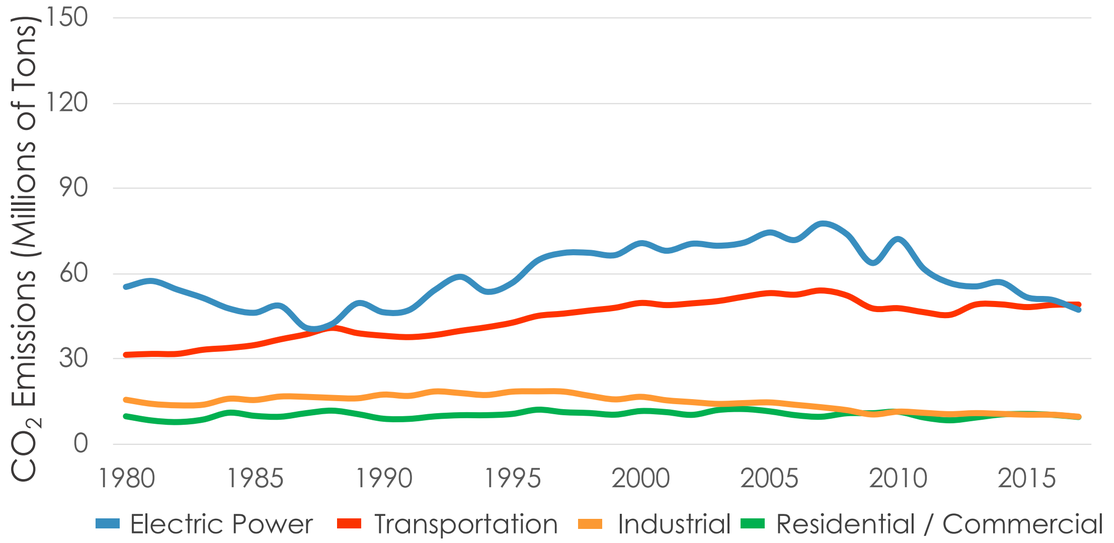
Although not yet reflected in this year's forecast, Mississippi's first round of utility IRPs is underway and is expected to result in higher solar capacity for Mississippi Power.

Mississippi		2010	2018	2025
State CO_2	*Million Tons*	20.4	12.1	12.4
	Lbs/ MWh	1,336	844	886
% of Power	*Fossil Fuels*	76.9%	69.7%	67.9%
	Clean Energy	0.3%	4.4%	6.0%

Clean energy is non-hydro renewables and efficiency.

NORTH CAROLINA





STATE LEADERS SET CLIMATE GOAL

North Carolina utilities are already the cleanest in the Southeast on a CO_2 / MWh basis, but strong state leadership can take it even further. Executive Order 80 set a goal to reduce state emissions to 40% below 2005 levels by 2025. The state developed a clean energy plan based on this goal, with projects slated to reduce emissions across many sectors.

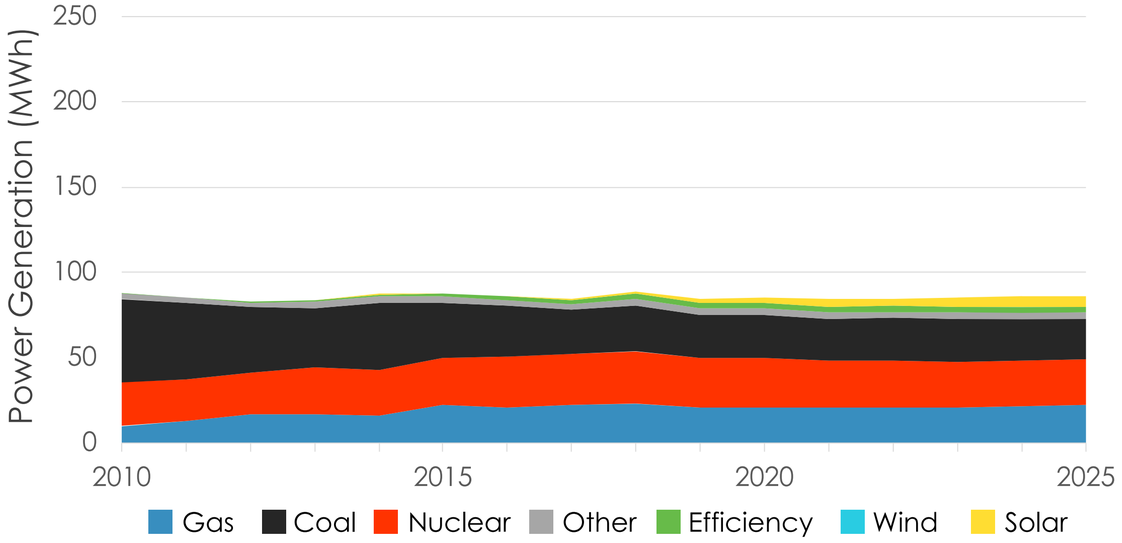
ATLANTIC COAST PIPELINE NO MORE

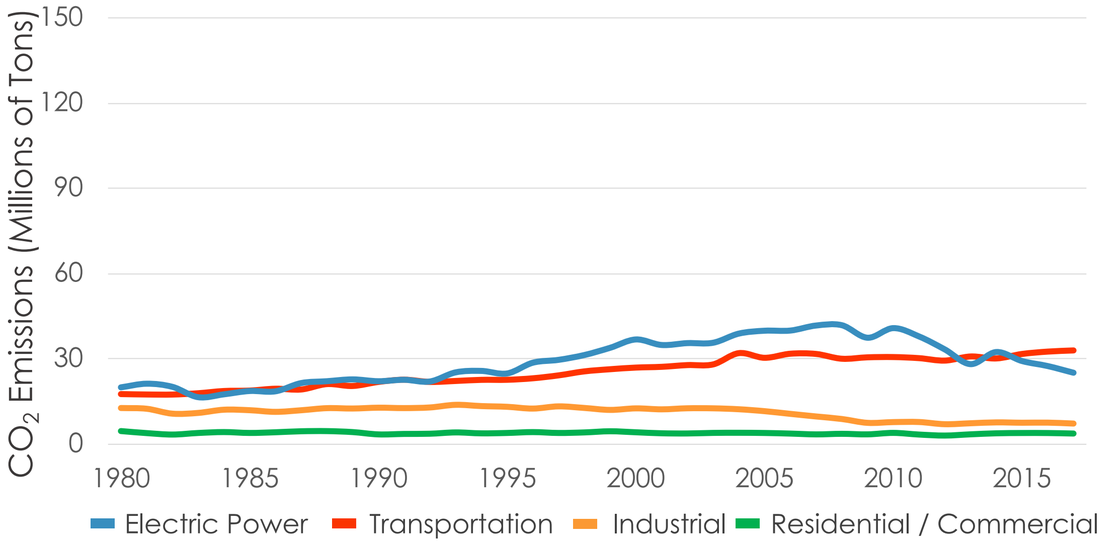
The Atlantic Coast Pipeline project was cancelled in July of this year, impacting Duke and Dominion's plans to expand fossil gas infrastructure in the state. Following the cancellation, both utilities have signaled a desire to shift towards solar and storage in pursuit of their net-zero goals.

North Carolina		2010	2018	2025
State CO_2	*Million Tons*	67.9	46.8	36.7
	Lbs/ MWh	964	664	517
% of Power	*Fossil Fuels*	48.3%	45.7%	40.0%
	Clean Energy	0.4%	7.2%	13.9%

Clean energy is non-hydro renewables and efficiency.

SOUTH CAROLINA





WHAT WILL BECOME OF SANTEE COOPER?

Earlier this year, state legislators and the Governor examined how to move forward with state-owned utility Santee Cooper, and whether to reform or sell it. The state House passed a resolution calling for 100% clean energy from Santee Cooper, and the legislature did authorize it to move forward with solar expansion and a major coal retirement, but the issue of ownership may arise again next year.

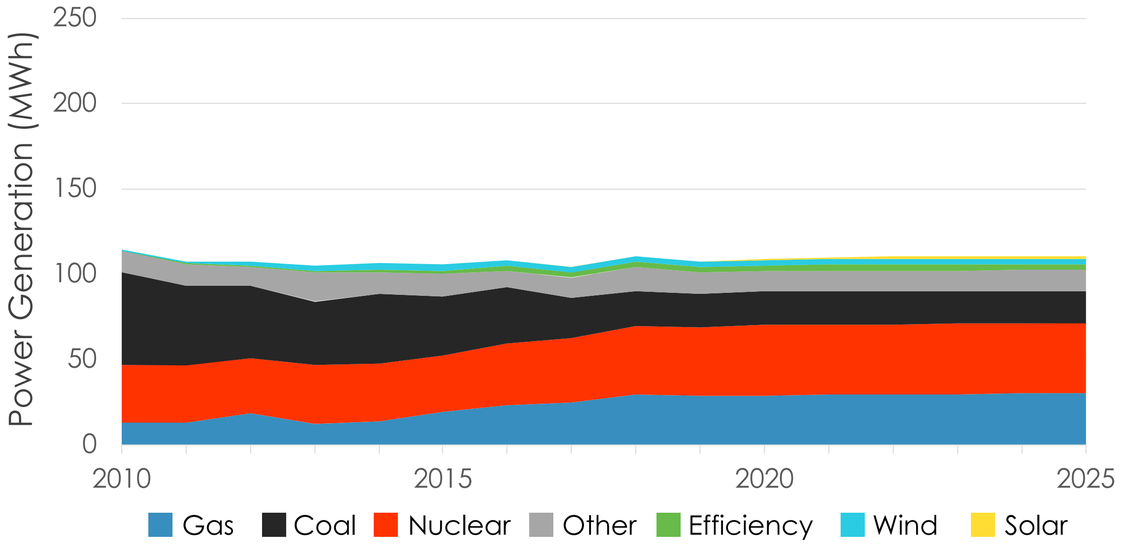
SOLAR FREEDOM

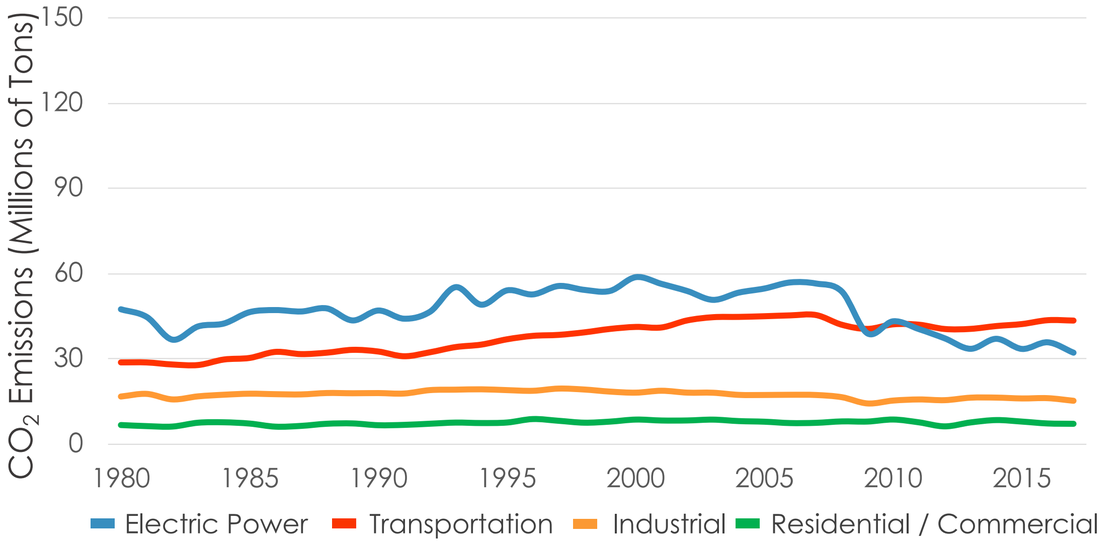
As noted in this year's solar report from SACE, utility forecasts are beginning to growth in the solar market made by a comprehensive solar bill passed by the legislature, additionally, many deals for utility-scale projects are still in the works.

South Carolina		2010	2018	2025
State CO_2	*Million Tons*	57.4	39.8	36.1
	Lbs/ MWh	1,308	927	870
% of Power	*Fossil Fuels*	67.0%	56.0%	53.7%
	Clean Energy	0.2%	4.7%	11.1%

Clean energy is non-hydro renewables and efficiency.

TENNESSEE





IS MEMPHIS IN OR OUT OF TVA?

Memphis is home to the largest utility in Tennessee by demand: Memphis Light, Gas, & Water (MLGW). As of publication of this report, MLGW is in the midst of deciding whether to switch power providers from TVA to a combination of self generation, including both significant local solar and new fossil gas, and supply of both renewable and conventional generation through the MISO market.

This switch has the potential to *reduce* the emissions associated with the City's electricity usage because MLGW will be able to pursue far more solar and efficiency on its own than it will within the TVA system. This is significant because the state's progress towards decarbonization is largely dictated by TVA's actions.

Tennessee		2010	2018	2025
State CO_2	*Million Tons*	67.3	36.3	33.2
	Lbs/ MWh	1,176	675	620
% of Power	*Fossil Fuels*	59.2%	45.7%	44.6%
	Clean Energy	0.5%	5.6%	7.1%

Clean energy is non-hydro renewables and efficiency.

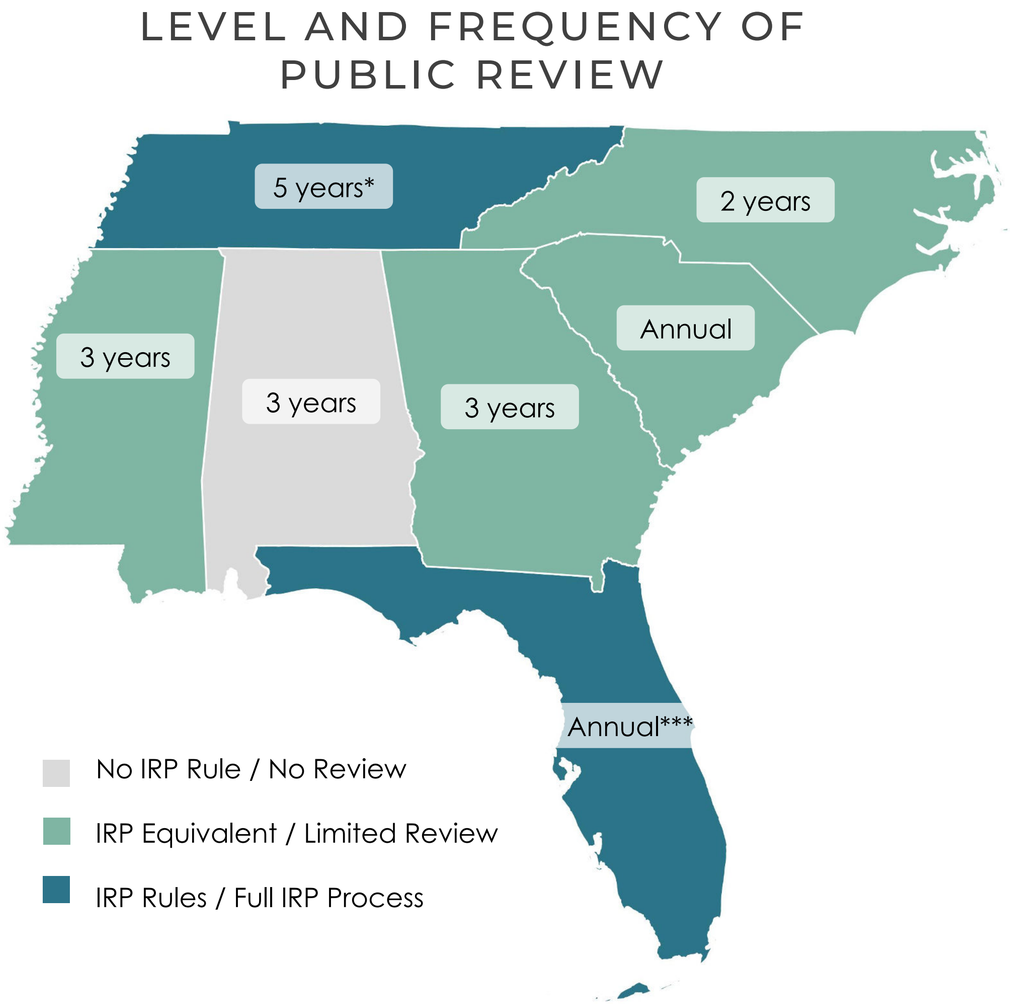
OPPORTUNITY: RESOURCE PLANNING

EACH STATE HELPS DECIDE THE RESOURCE MIX

Utilities regularly evaluate long-term resource plans to produce what is typically called an Integrated Resource Plan, or IRP. The amount and source of energy that power the Southeast is collectively guided by the IRPs of utilities in the region. IRPs evaluate a number of potential future scenarios, such as whether electricity demand increases or remains flat and what happens with gas prices. The goal is to compare different types of energy and develop a future resource mix that best fits forecasted energy demand. The planning process is *usually* overseen and ultimately voted on by state regulators representing the public interest. Rejection of an IRP has historically been very rare.

CAN STATES PICK RESOURCES THAT AVOID EMISSIONS?

Since many aspects of generation resources can be considered during an IRP, they are also a tool where utilities have an opportunity to pursue their on decarbonization goals. So far, Southeast states have been slow to use the IRP process to evaluate pathways to zero emissions. Some states do not even require that resource plans be approved by regulators; in these cases the need for the new generation is reviewed only when the utility proposes constructing a new power plant.



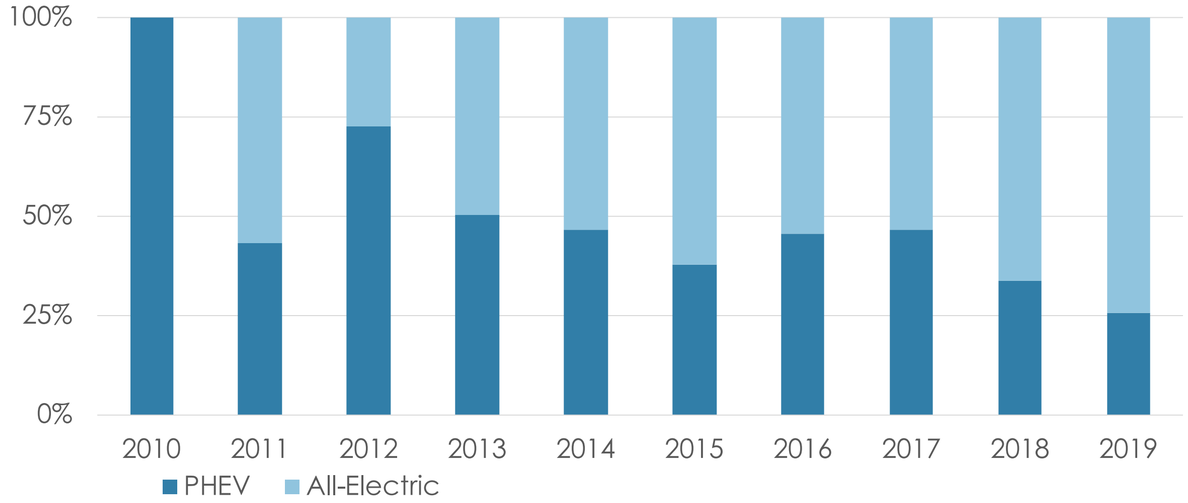
*TVA policy is to update its IRP at least every five years though the span between recent IRPs was three years.

***Florida utilities submit ten-year site plans, which serve a function similar to IRPs but are not integrated with demand-side planning and do not include meaningful public participation.

OPPORTUNITY: ELECTRIC VEHICLES

State	Registered Vehicles (Millions)	Annual Miles Traveled per Vehicle
Alabama	5,056,073	11,115
Florida	16,959,269	11,622
Georgia	8,442,325	11,940
North Carolina	8,070,717	11,390
South Carolina	4,404,100	11,334
Tennessee	5,800,489	11,564

EV MARKET SHARE: PLUG-IN HYPBRID VS ALL-ELECTRIC



REDUCE VEHICLE MILES TRAVELED

There are over 273,000,000 registered motor vehicles in the U.S. traveling 3.3 trillion miles annually fueled by 145 billion gallons of gasoline. To support both a reduction in vehicle miles traveled *and* an increase in electric vehicles (EVs), the percentage of new car sales from EVs will be an important indicator to follow.

CLEAN THE POWER SUPPLY

Electric vehicles plug into the electric utility grid. Thus, the cleaner the electricity, the cleaner the EV. This becomes increasingly important as automobile market share becomes dominated by all-electric models. In states outside the Southeast with higher renewable penetration, driving an EV is like driving a car that gets 231 miles per gallon!

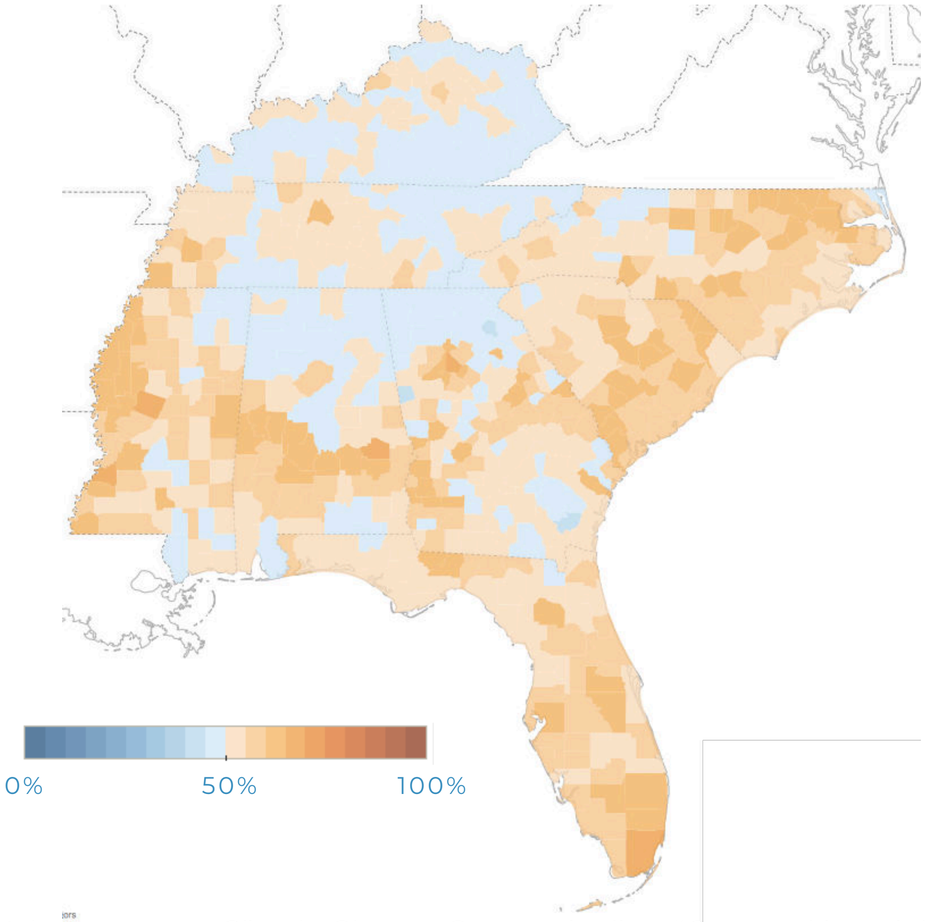
ELECTRIFY TRANSPORTATION

2019 was the first year when **consumers had more choices for electric vehicles than vehicle models with a gas guzzler tax**. Approximately 69 models of plug-in hybrid and all-electric are offered versus 58 car models with a gas guzzler tax associated.

Source: Oak Ridge National Laboratory - National Household Travel Survey and Transportation Energy Data Book;

OPPORTUNITY : LOCAL GOVERNMENT

PERCENT OF PEOPLE WHO THINK LOCAL GOVERNMENT SHOULD DO MORE FOR CLIMATE



CITIES TAKE ACTION WHILE STATES SLEEP

In lieu of immediate action from state legislators or regulators, local authorities possess another opportunity for high-impact emissions reductions. Cities have made commitments at varying levels, such as joining key climate compacts, as is the case with Florida, or simply conducting emissions inventories and included relevant goals in their comprehensive city plans.

COMMUNITIES SEE CLIMATE CONNECTION

Residents in the region show a strong belief that their local government should do more to address climate change (see left - **warm colors** indicate areas where the majority hold this opinion, while **cool colors** show areas where that is not the case). Despite this, demands by citizens in some cities have gone unanswered due to large utility interests. Tools such as franchise agreements and municipalizing have galvanized conversation in North Carolina and throughout Tennessee.

Source: Yale Program on Climate Change Communication, "Geographic variation in opinions on climate change at state and local scales in the USA", Climate Opinion Maps by County

EMISSION TRENDS AND THE CLIMATE CRISIS

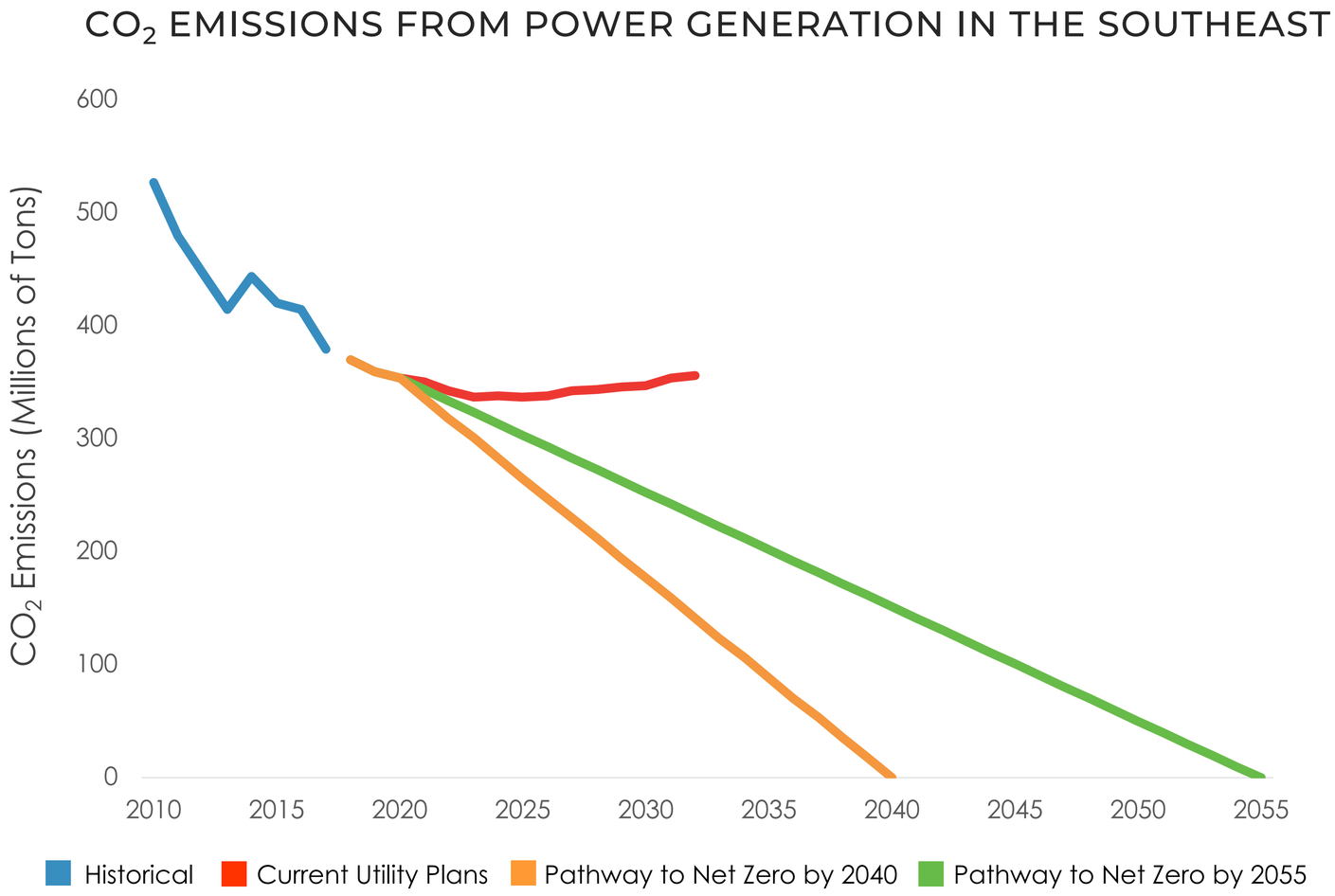
GLOBAL GREENHOUSE GAS EMISSIONS MUST REACH NET-ZERO BETWEEN 2040 AND 2055 TO LIMIT GLOBAL TEMPERATURE RISE TO 1.5°C.
~IPCC SPECIAL REPORT, OCTOBER 2018

Scientific guidance is to limit global temperature rise to 1.5°C to avoid the worst of the climate crisis.

189 countries have stated their aim to keep temperature rise "well below" 2°C and to pursue efforts to limit the temperature increase to 1.5°C.

CO_2 emissions from power generation in the Southeast represent a measurable portion of global greenhouse gas emissions.

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



DATA SOURCES, METHODS, AND ASSUMPTIONS

The primary source for Southeastern generation, capacity, and fuel type for plants and units are reported directly by utilities to the U.S. Energy Information Administration (EIA) in Forms EIA 860 (Annual Electric Generator Data), EIA 861 (Annual Electric Power Industry Report), and EIA 923 (Annual Electric Utility Data). These are supplemented by public domain sources, including other federal data or guidance documents, utility resource plans, utility press releases, security commission filings, and the professional judgment of SACE staff.

The Southeastern baseline generation forecast used in this report includes historic and forecast information related to over 3,500 generators located at over 1,400 plants in the Southeast (or specifically identified as serving load in the Southeast) through 2035. Also included is forecast information related to generation anticipated by utilities through 2035 that has not been sited at a specific plant. Generation and peak demand forecasts are obtained from FERC 714 (Annual Electric Balancing Authority Area and Planning Area Report).

Emissions are calculated based on fuel use and US EPA, *CO2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule*, Docket ID No. EPA-HQ-OAR-2013-0602 (August 2015). Emissions are presented in short tons.

Generation is matched to load based on SACE's research into plant ownership, firm contracts, utility power sharing agreements, and judgement of staff experts regarding short-term bilateral market activity. The annual net generation of each unit (or portions of a unit) is assigned to load-serving utilities, "trading" unit assignment between utilities to result is a balanced system; all demand is met by a collection of portions of generating units, having allocated generation proportionally to the percent of the unit assigned to that utility for that year.

The matching of generation to load allows SACE to estimate the actual mix of generation serving a utility's load, taking into account imports or exports, as necessary. Thus, generation and emission estimates in this report are not usually equal to the utility's owned and operated generation.

Additional details on sources, methods and assumptions for solar and energy efficiency resources are available in

- Southern Alliance for Clean Energy (2020). *Solar in the Southeast Annual Report.*
- Southern Alliance for Clean Energy (2019). *Energy Efficiency in the Southeast Annual Report.*

TRACKING DECARBONIZATION IN THE SOUTHEAST

CONTACT INFORMATION

HEATHER POHNAN
Energy Policy Manager
heather@cleanenergy.org

MAGGIE SHOBER
Director of Utility Reform
maggie@cleanenergy.org