



TRACKING DECARBONIZATION IN THE SOUTHEAST

GENERATION + CO₂ EMISSIONS FOURTH ANNUAL REPORT

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INTRODUCTION

The scientific guidance to avoid the worst impacts of the climate crisis is to limit warming to 1.5 degrees Celsius. This can be achieved by reducing global greenhouse gas emissions to net-zero between 2040 and 2055. While emissions reduction opportunities exist all over the world and in many different sectors, this report will discuss decarbonizing the electric power sector of the Southeastern United States.

Several electric utilities in the region have set long-term goals to reduce carbon dioxide (CO₂) emissions. Solar is being deployed at an increasing scale, utilities say they are investing in energy efficiency, and developers are moving to build offshore wind farms... but will it be too little too late?

To answer this question, SACE has compiled historical data from the past decade, and utility resource plans, called Integrated Resource Plans (IRPs), that utilities are required to file by state law. To inform regulatory advocacy, generation and emissions figures in this report are tied to the utility or state where the power is consumed, and not where it is generated or emitted.

The purpose of this report is to review emissions and generation trends of the electric power sector in the Southeast. We will identify what utility resource plans (IRPs) tell us about the region's resource mix, future carbon emissions, and the rate of decarbonization.

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.

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EXECUTIVE SUMMARY

Changes in power generation have driven CO₂ emissions from electric utilities in the Southeast down for over a decade. Despite deployment of new solar generation and ample energy efficiency potential, emissions flatten out under current utility plans. This falls far short of the trajectories recommended to avoid the worst of the climate crisis, prompting several questions and observations:

EVERY YEAR MATTERS AND EVERY CHOICE MATTERS

The scientific consensus is that global emissions must reach net-zero between 2040-2055 to limit global temperature rise to 1.5° C. President Biden has set a goal for the power sector to be carbon free by 2035. Several utilities have goals to be net-zero carbon by 2050.

North Carolina has legislated goals for carbon reductions in the power sector, and South Carolina can require utilities to evaluate zero-carbon resource plans. Municipalities in Georgia, Florida, and Tennessee have passed clean energy resolutions, but the structure of utility service can make meeting these difficult for cities since they require utility action.

DECARBONIZATION + ELECTRIFICATION

Electric utilities in the Southeast need to decarbonize quickly by switching from fossil fuels to clean energy that emits zero CO₂ emissions.

Decarbonization of the power sector is a critical tool to reduce emissions in *all* sectors through electrification. The most prominent opportunity is to electrify the transportation sector.

Fossil fuel markets are currently volatile, a trend that is expected to continue. Continued investment in fossil fuels for electricity generation puts utility customers at risk of higher energy bills both in the immediate future and throughout the transition to clean energy and electrification.

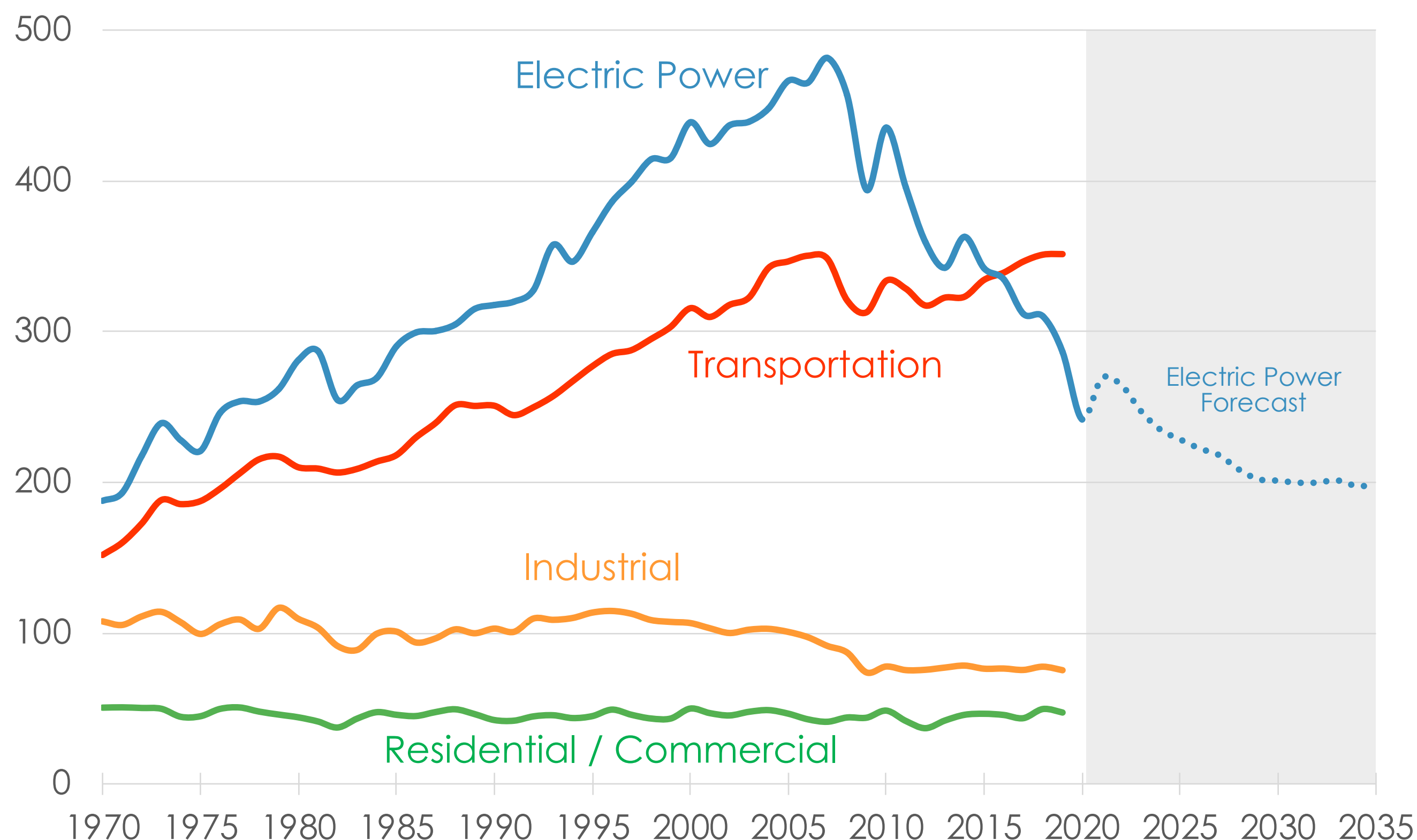
FIRST AND WORST FOR IMPACTS

The Southeast is home to many frontline communities that are already being negatively affected by fossil fuels and the climate crisis. Stronger and more frequent extreme weather events, coastal flooding, poor air quality, and unpredictable energy prices are likely to continue to harm our communities.

The pace of decarbonization can be sped up with increased engagement in resource planning process. This can range from increasing competition through market reforms or all-source procurement, or regulators championing technologies that are available *today* like solar, wind, and energy efficiency.

SOUTHEAST CO₂ EMISSIONS IN CONTEXT

SOUTHEAST CO₂ (MILLION TONS) BY SECTOR



Southeast grouping covers AL, FL, GA, MS, NC, SC, TN. Regions are Census regions.
Data: U.S. Energy Information Administration (EIA) – [State CO₂ Emissions](#).

WHO IS EMITTING CARBON?

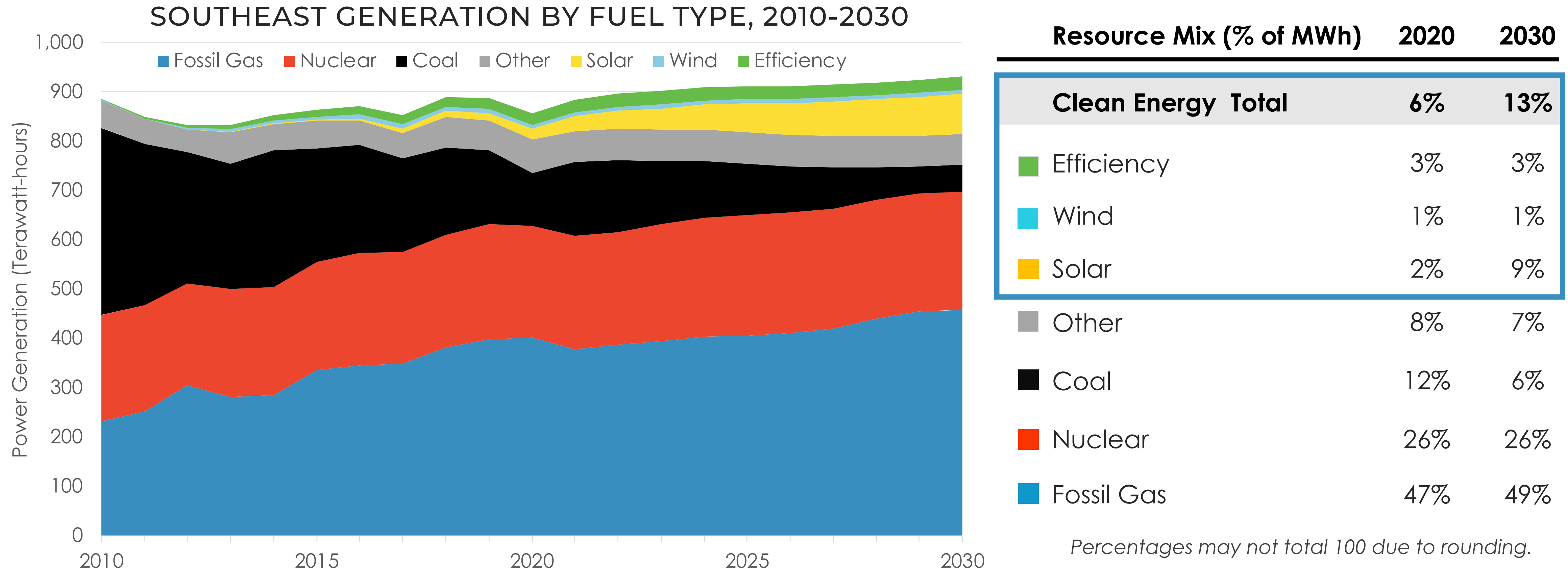
CO₂ emissions can be reported by sector to measure who is burning fossil fuels, thus contributing to emissions. The two largest contributors are electric utilities and transportation. Coal or gas is burned in power plants run by utilities in the electric power sector, while gasoline and diesel are used for transportation.

Total annual CO₂ emissions from fossil fuel use in the Southeast have dropped about 20% from their peak in 2005. The primary driver of this drop is a 35-40% reduction in the **electric power sector**, which is the focus of this report. Instead of continuing reductions at the recent pace, a worrying trend among utilities is a leveling-off of emissions reductions starting in the near-term.

WHAT IS DECARBONIZATION?

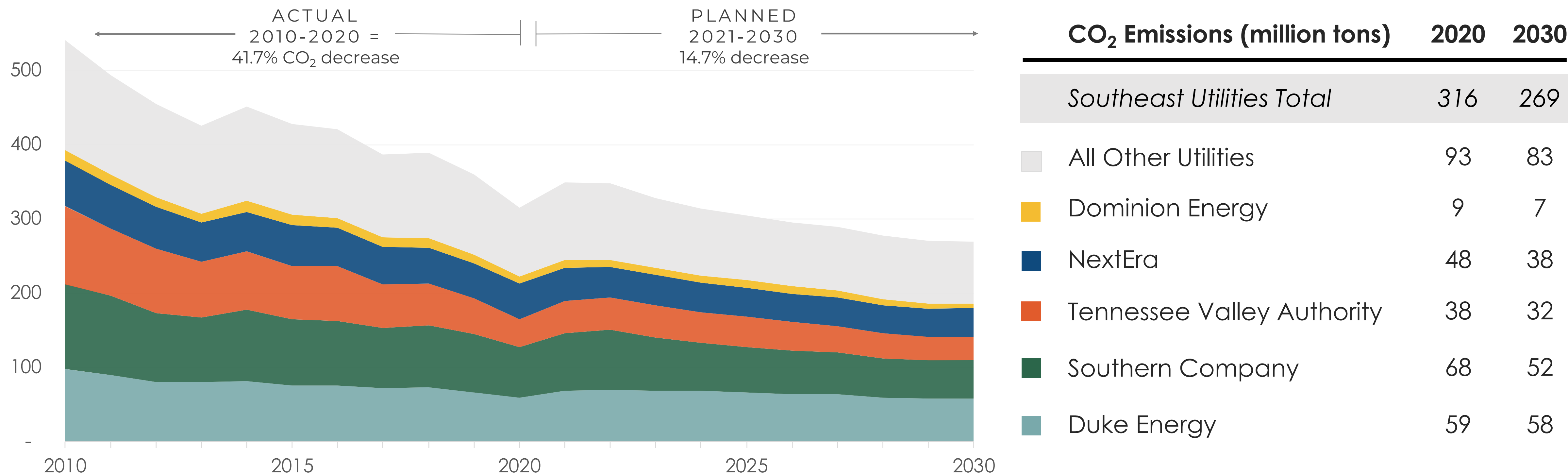
Decarbonization is the transition of our energy supply to sources that emit lower levels of CO₂, usually with the goal of using zero-carbon resources to power all sectors. Utilities can decarbonize by replacing fossil fuels with zero-carbon energy sources like wind, solar, storage, and energy efficiency. Other sectors use a decarbonization strategy called electrification, which means switching from direct fossil fuel use to charging with electricity instead. Common examples of electrification include vehicles, cooking appliances, and building heating.

SOUTHEAST GENERATION FORECAST



Fossil gas fuels nearly half of the region's total electric generation today yet utilities plan to still increase reliance on gas generation in the coming years. While current forward-looking plans include continued use of coal through *at least* 2030, utilities such as Duke Energy and the Tennessee Valley Authority (TVA) have indicated they intend to retire remaining coal generation by 2030-2035. Utility investment in solar is continuing across the region, with solar quadrupling its share in the resource mix. Future resource plans may reflect new opportunities for wind as utilities evaluate in-region and offshore resources.

SOUTHEAST UTILITIES EMISSIONS FORECAST



Based on current utility resource plans, total CO₂ emissions from utilities in the Southeast are expected to decrease by 15% from current levels by 2030. To bring forecasts in line with the target of reaching zero emissions by 2035 – which would limit warming to 1.5°C – **planned emissions reductions need to be closer to 67% by 2030, or to a total of about 105 million tons annually by 2030.** Emissions decreased in 2020 partially because load dropped during the Covid-19 pandemic lockdowns. However, this dip is not expected to be sustained, as utility plans have indicated that load is rebounding. In fact, some utilities may see increased emissions in the next few years as high fossil gas prices mean utilities may decide to burn more coal. If utilities had acted sooner, wind, solar, and storage projects would have already been underway, avoiding some of this impact.

SOUTHEAST UTILITIES EMISSIONS REDUCTIONS

CO₂ EMISSION RATE REDUCTION TRENDS

Utility Group	Average Annual CO ₂ Reduction		Estimated Year to Zero	
	2010-2020 (Actual)	2020-2030 (Planned)	2010-2020 Pace	2020-2030 Pace
Duke Energy	-4.8%	0.0%	2051	Past 2100
Southern Company	-4.8%	-2.4%	2051	2071
TVA	-9.2%	-1.7%	2041	2088
NextEra	-2.5%	-2.3%	2071	2073
Dominion SC	-3.5%	-2.4%	2059	2072

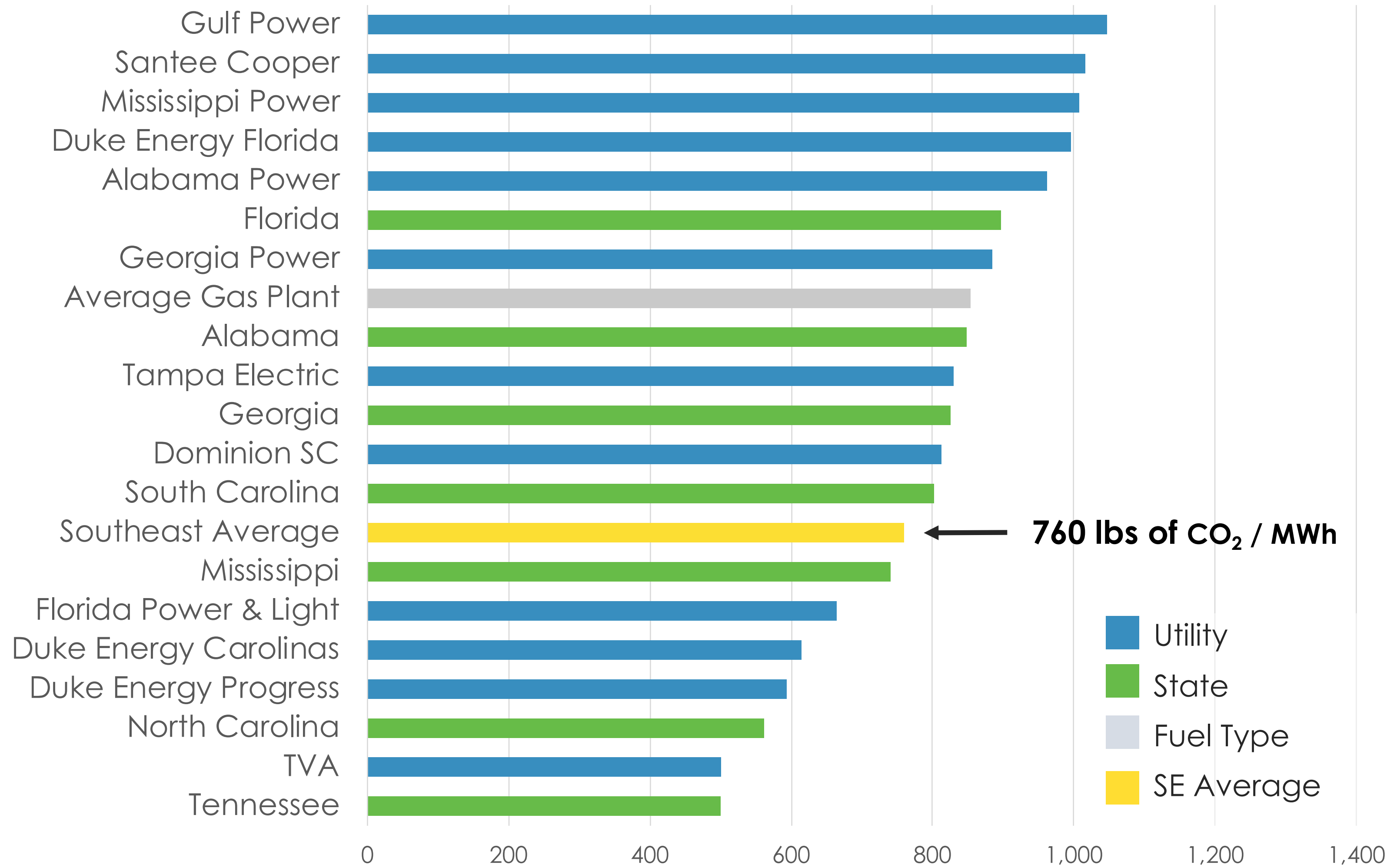
“The decisions we make now can secure a livable future. We have the tools and know-how required to limit warning.”

*- 2022 PRESS RELEASE:
IPCC SIXTH ASSESSMENT REPORT, WORKING
GROUP III*

One way to track decarbonization is to observe emission reductions over specified time increments, so there is less emphasis on annual ups and downs that may include outlier years such as 2020. Most utilities reduced carbon at a higher rate in the last decade than they plan to reduce in the coming decade. This is because utilities are seeing fewer and fewer emissions reductions from replacing coal generation with fossil gas. Fossil gas has been the dominant fuel in the region for several years, so utilities looking to decarbonize at the pace seen in the 2010s must continue to retire remaining coal plants at a steady pace and **replace fossil gas and remaining coal with clean, zero-carbon energy sources like wind, solar, storage, and energy efficiency.**

CO₂ INTENSITY OF POWER SUPPLY

CO₂ EMISSIONS INTENSITY IN 2020 (lbs of CO₂/MWh)



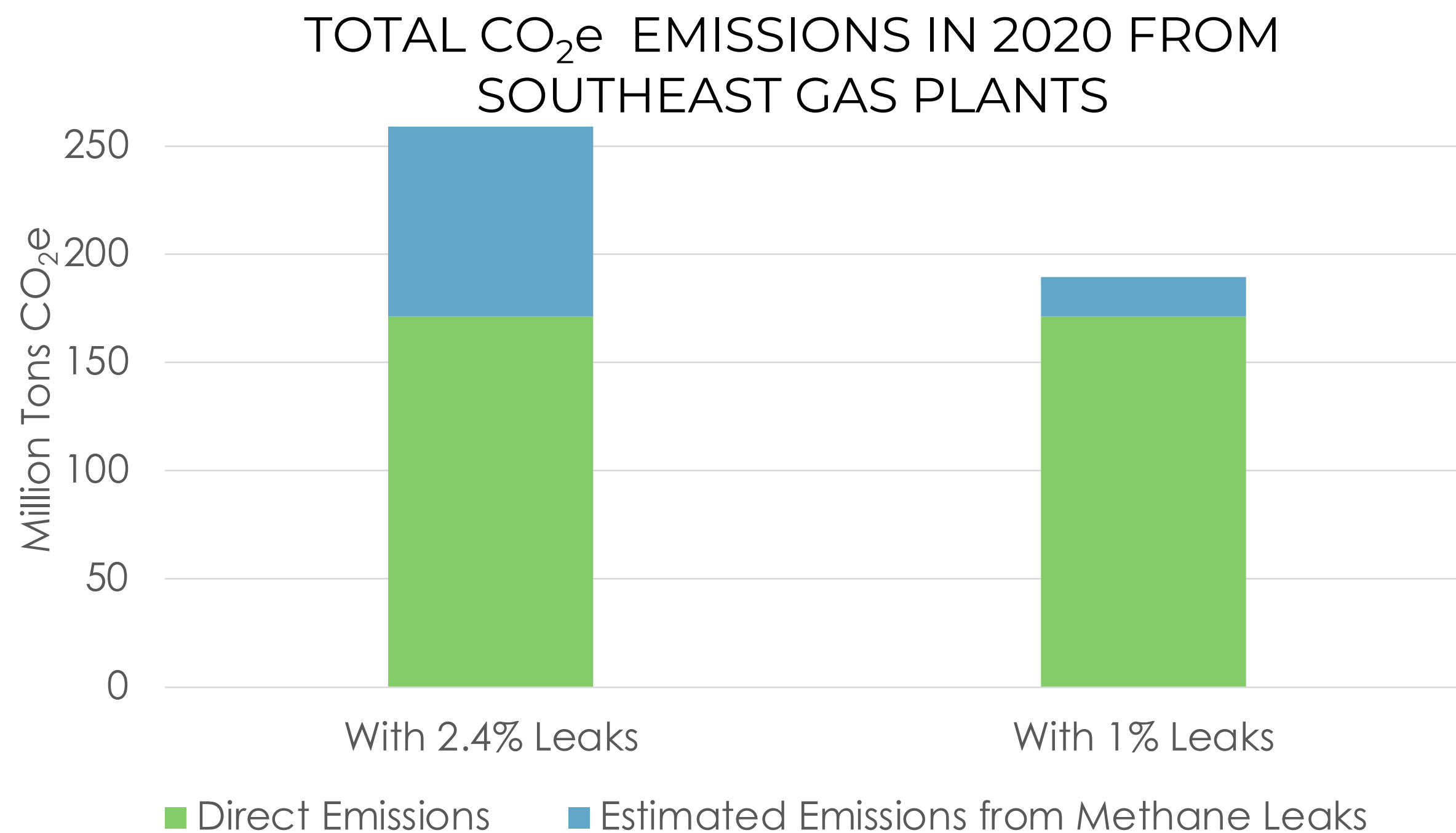
SOUTHEAST GAS RELIANCE DRIVES EMISSION RATE

Another measure of decarbonization is the **carbon intensity** of the power supply. When consumed in power plants, different fuels emit different amounts of carbon for each megawatt hour (MWh) of electricity produced.

In 2020, the average for Southeast utilities was 760 lbs/MWh, a sharp drop from the previous year average of 833 lbs/MWh. This trend may or may not continue in the future. The first pandemic year resulted in lower energy demand that meant utilities used less fossil fuels without having to retire a plant entirely.

While instructive for comparing utilities and states, the per megawatt-hour CO₂ rate can be an incomplete measure when utilities do not have total reduction targets in place. Even a utility with relatively low carbon intensity can contribute significantly when they are providing power to a large number of customers.

FOSSIL FUEL EMISSIONS IMPACTS

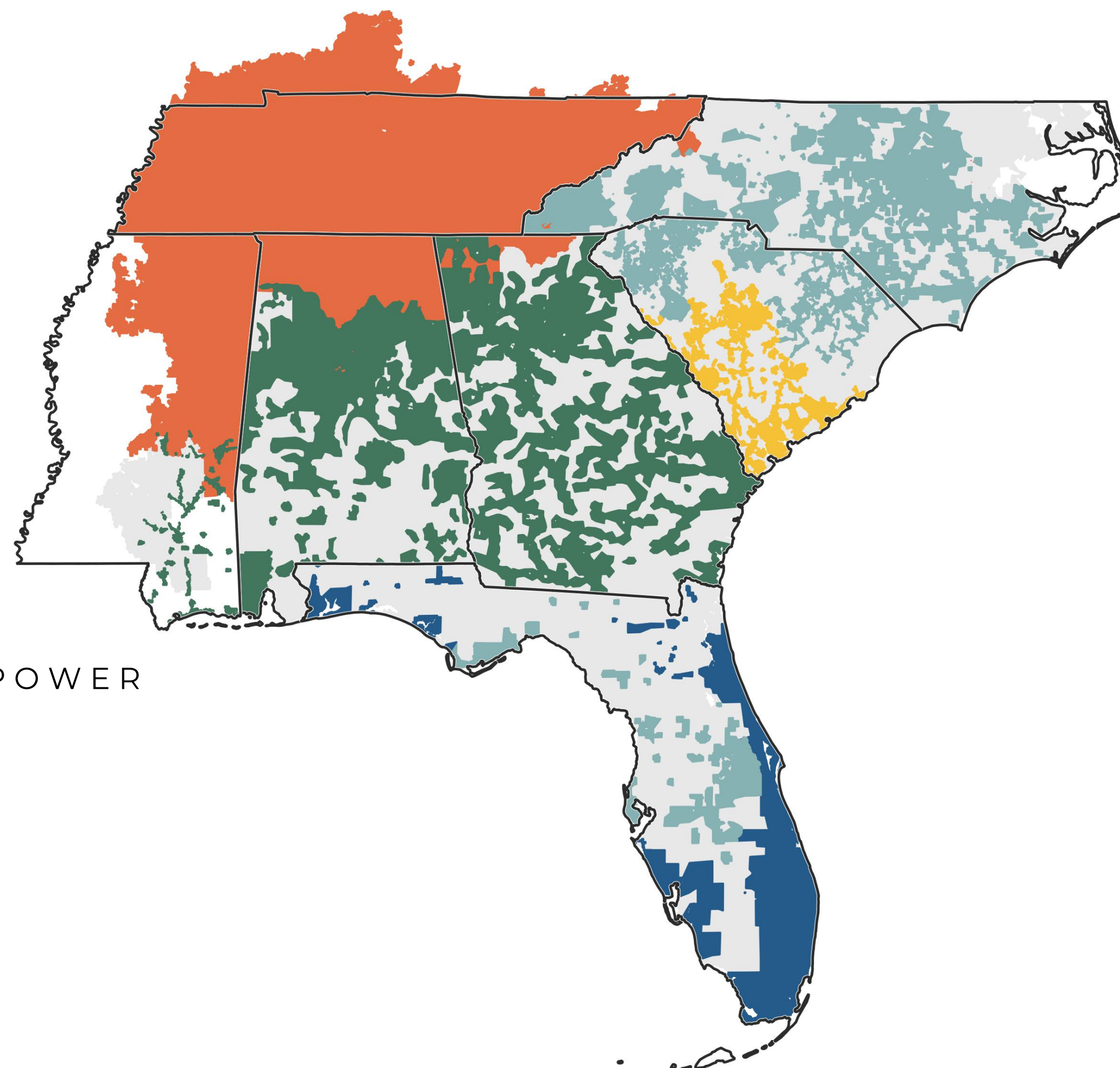


Existing Fossil Gas Plants	5% Leak Rate	1% Leak Rate
Direct CO ₂	171.6 million tons	
Indirect Emissions		
Tons of Methane (CH ₄)	2,684,738	536,948
CO ₂ e (millions of tons)	91.5	18.3
Emissions Intensity from Gas		
Without Methane Leaks	854	854
With Methane Leaks)	1,310	945

While utilities have steadily retired coal plants, current utility plans show that ***the impact of the few remaining retirements will be hindered by rising fossil gas consumption.*** Even utilities with zero-carbon goals such as Duke, Southern Company, and TVA are continuing to pursue gas. This is troubling as there are indirect emissions from the production and distribution of gas, which includes the potent greenhouse gas methane that leaks and enters the atmosphere. Estimates of leakage rates are highly variable, ranging from approximately 1-5%, with 2.4% being a commonly used figure. Even it a minimal leak rate, this is responsible for adding at least 18 million tons of CO₂ equivalent to the region's annual total, with higher leak rates approaching 100 million tons.

UTILITY SYSTEM PROFILES

- DUKE ENERGY**
 PROGRESS, CAROLINAS, FLORIDA
- DOMINION ENERGY**
- NEXTERA**
 FLORIDA POWER & LIGHT
- SOUTHERN COMPANY**
 ALABAMA POWER, GEORGIA POWER, MISSISSIPPI POWER
- TENNESSEE VALLEY AUTHORITY**
- ALL OTHER UTILITIES**



SOUTHEAST ELECTRIC UTILITY CARBON GOALS

DECARBONIZATION FACES MANY CHALLENGES

Even where decarbonization goals have been set, there are challenges to realizing these goals and reduction of emissions at rates needed to address the climate crisis. **Namely, there are often inconsistencies between utilities' goals and their plans.** Public facing goals may not have an impact if they are not also adopted internally. Very few utilities model zero-carbon scenarios as part of their IRP to be evaluated by regulators. For example, during its 2022 IRP proceeding, Georgia Power representatives said that its IRP is driving the net-zero goal, rather than the other way around.

And while some utilities have publicized ambitious-sounding figures on decarbonization, these aspirations do not rise to the level of a true commitment to reach zero carbon. Common issues amongst utility planning processes include not aiming to reduce total CO₂ emissions, or passing off and claiming planned reductions that have been known for years as goals. Below is a table of where several major utilities stand:

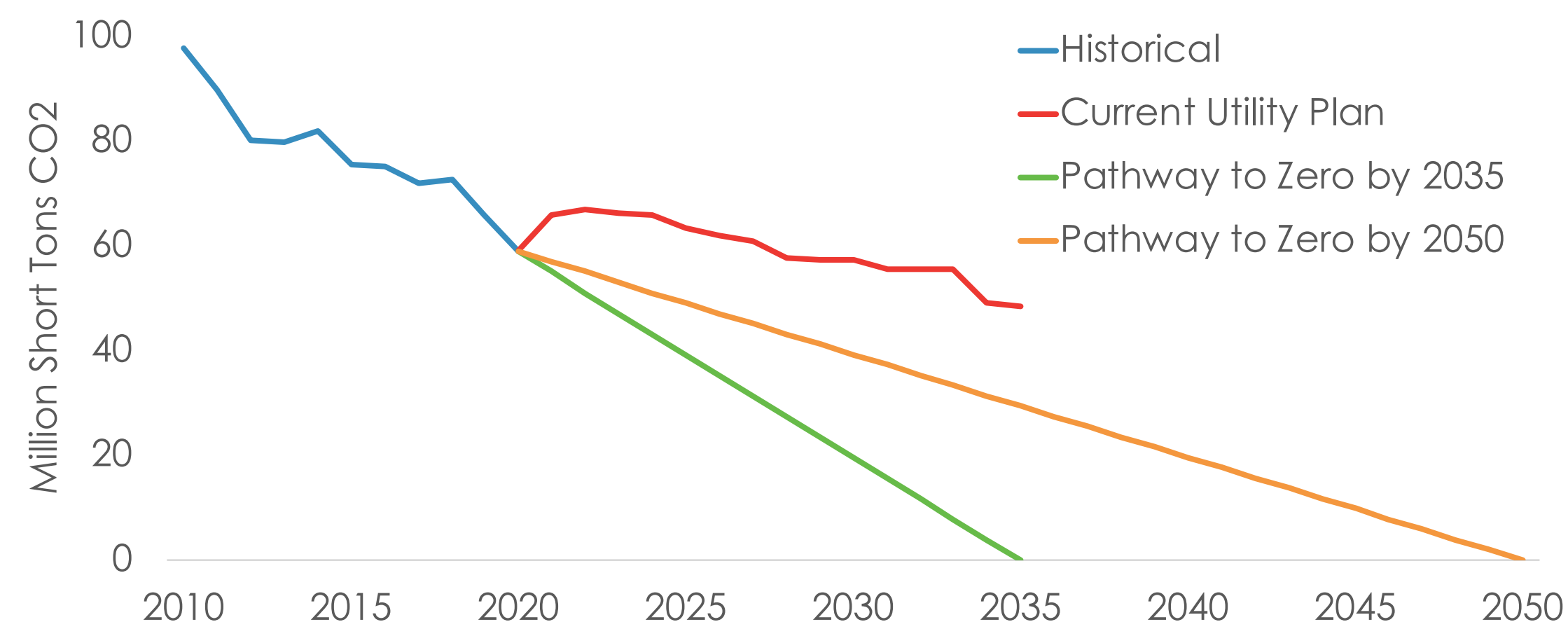
Utility Group	Announced Goal Zero or Net-Zero Goal	Scenario in IRP / Published Plan	On Track to Decarbonize by 2050	Years to Zero at 2020-2030 Pace
Duke Energy	Yes	Yes	No	Past 2100
Southern Company	Yes	No	No	2071
Dominion SC	Yes	No	No	2072
Tennessee Valley Authority	Yes	No	No	2088
NextEra Energy	Yes	Yes	No	2073

DUKE ENERGY

DUKE RESOURCE TRENDS

The emissions in Duke Energy's current plans are primarily driven by continued coal use to serve customers in North and South Carolina, combined with an increase in emissions from gas in the Carolinas and a continuation of a heavy reliance on gas in Florida. In fact, for all three Duke Energy utilities combined, emissions from gas increase an average of 1% per year from 2020 through 2030, whereas emissions from coal declines an average of 3% per year over that same timeframe.

DUKE ENERGY PLANS VS. PATHWAYS TO ZERO



Utility	Total CO ₂ (Million Tons)			Lbs of CO ₂ / MWh			% Decarb / Year	
	2010	2020	2030	2010	2020	2030	2010-2020	2020-2030
Duke Energy	97.8	58.9	58.3	1,117	705	616	-4.8%	0.0%
Duke Energy Carolinas	40.6	24.9	27.6	965	614	578	-4.4%	1.6%
Duke Energy Progress	27.8	13.2	8.5	1,156	594	361	-7.1%	-4.0%
Duke Energy Florida	29.3	20.9	22.1	1,375	996	958	-3.2%	0.6%
Estimated year utility will approach net-zero based on decarbonization rate							2051	Past 2100

DUKE ENERGY

DUKE'S CORPORATE CARBON REDUCTION GOAL

In 2017, Duke Energy announced a goal to reduce total CO₂ emissions by 40% by 2030, compared to 2005 levels, but bumped this up to 50% in 2019. It also added a net-zero by 2050 long-term goal at the corporate level, and includes Duke's utilities in North and South Carolina and Florida, as well as Kentucky, Indiana, and Ohio. Its Southeastern fleet represents approximately 70-75% of its total CO₂ emissions.

DUKE'S DRAFT CARBON PLAN

In 2021 HB 951 was passed in North Carolina requiring Duke's operating utilities to reduce CO₂ emissions from North Carolina's electricity generation by 70% below 2005 levels by 2030 and to net-zero by 2050. On May 16, 2022, Duke Energy presented the North Carolina Utilities Commission (NCUC) with its proposed "Carbon Plan" that includes four future pathways to net-zero by 2050, only one of which hits the 70% by 2030 target. The NCUC will receive comments on Duke's proposal and alternative plans in July of 2022, and will finalize a Carbon Plan for the state by the end of 2022.

WHAT DUKE IS SAYING...

"We're also stepping back and evaluating our climate goals more broadly as we engage with our shareholders and discuss the growing importance of Scope 2 and 3 emissions."

—DUKE CEO LYNN GOOD ON EARNINGS CALL FEB. 10, 2022

WHAT DUKE IS DOING

Despite corporate and legislated emission reduction targets, Duke's three southeast utilities are doubling down on investments in new fossil infrastructure. While Duke's draft Carbon Plan included less new gas capacity than its 2020 IRP, it still included approximately 3.5 GW of new gas by 2030. Duke Energy Florida is retiring a number of older gas plants, but is still moving forward with nearly 600 MW of new gas by 2030.

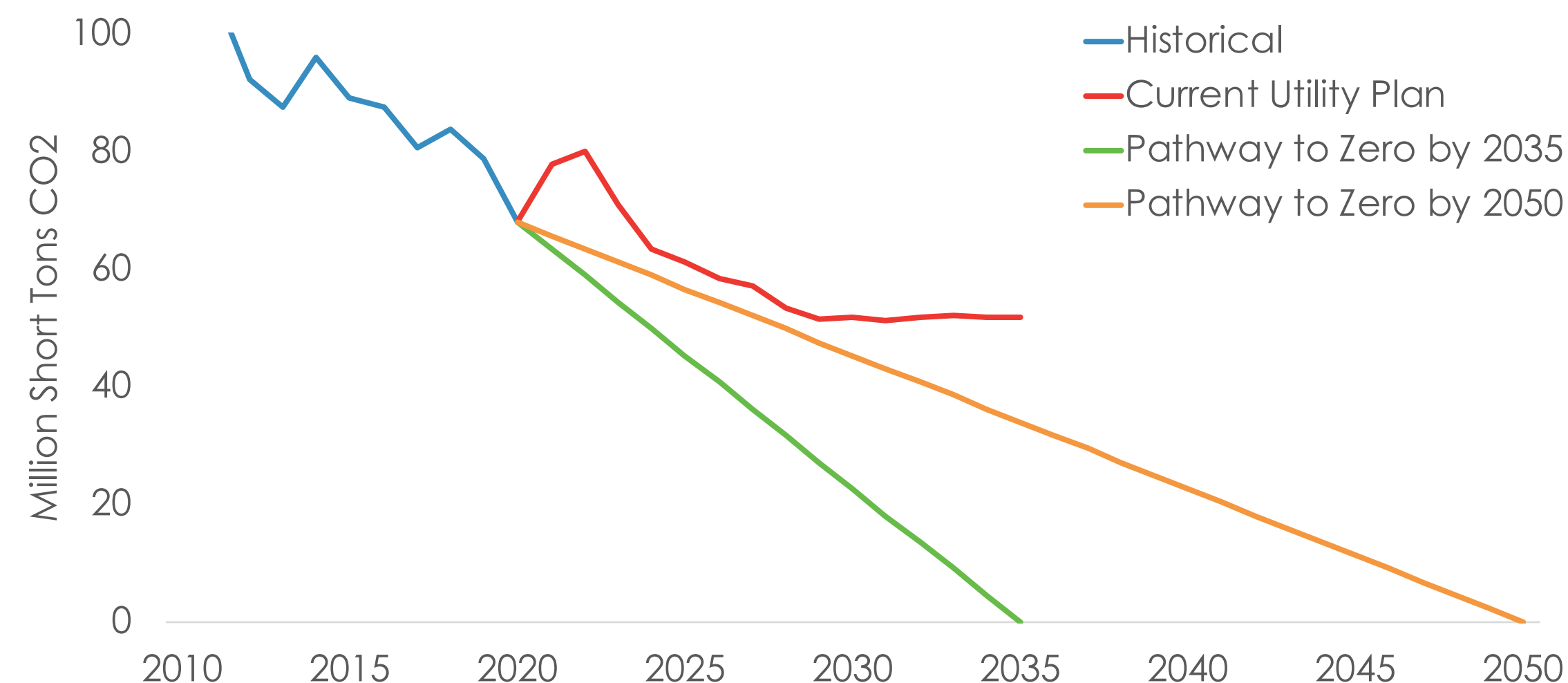
We welcome Duke's look at Scope 2 and 3 emissions, which includes indirect emissions, and hope that process will lead to another look at planned investments in new gas power plants that contribute to both Scope 1 and Scope 2 emissions.

SOUTHERN COMPANY

INTERIM GOALS DON'T SUBSTITUTE LONG-TERM ACTION

While Southern Company is on-track to meet its interim decarbonization goal of a 50% reduction from 2007 levels by 2030, the collective IRPs of its operating companies have seen middling progress towards its net-zero goal by 2050. The only significant expected emissions reduction in current plans comes from the troubled and *still* under construction new nuclear Plant Vogtle units. Georgia Power and Mississippi Power have not done much more than acknowledge the existence of decarbonization goals. Alabama Power's resource planning process is voluntary, and thus so is their need to confront their parent company's decarbonization goals.

SOUTHERN CO. PLANS VS. PATHWAYS TO ZERO



Utility	Total CO ₂ (mTons)			Lbs of CO ₂ / MWh			% Decarb / Year	
	2010	2020	2030	2010	2020	2030	2010-2020	2020-2030
Southern Company	114.5	68.0	51.9	1,412	921	678	-4.8%	-2.4%
Georgia Power	66.3	37.5	28.7	1,435	885	646	-5.2%	-2.4%
Mississippi Power	7.9	4.9	4.2	1,527	1,008	884	-4.2%	-1.3%
Alabama Power	40.3	25.6	18.9	1,355	962	691	-4.2%	-2.5%
Estimated year utility will approach net-zero based on decarbonization rate							2051	2071

SOUTHERN COMPANY

SOUTHERN'S RESOURCE PLANNING

How utilities plan for the future varies by company and jurisdiction. Nowhere is that more apparent than with Southern Company's utility subsidiaries. While investor-owned utilities in the Southeast are regulated by appointed commissioners, in all three states that Southern Company operates in, regulators are elected by voters. But even with public support for addressing the climate crisis, regulator views on the need and methods to decarbonize vary widely.

Georgia Power is the largest Southern Company subsidiary in terms of generation and CO₂ emissions. Alabama Power has a much smaller load, but the gap is narrowing in terms of total emissions. This is in part because Georgia has long-established and relatively inclusive resource planning rules, and an engaged Commission. Alabama Power *excludes* key resources like energy efficiency from its plans. And those plans are voluntary and undergo no public or regulatory review, leaving it the only subsidiary without a public IRP process. The state of Mississippi recently established its resource planning process, but unfortunately Mississippi Power's first IRP delivered no additional energy efficiency or solar. However, in its final order, the Commission did direct the company to evaluate high load and high gas price scenarios, as well as CO₂ intensity scenarios in future IRPs.

WHAT SOUTHERN COMPANY IS SAYING...

*"Through our **energy justice work**, we will strive to ensure the benefits and impacts of our business is equitable to all our customers... We believe the communities we serve should be better off because we are there – **a goal that's bigger than the bottom line.**"*

*~SOUTHERN COMPANY CEO TOM FANNING,
2021 MOVING TO EQUITY REPORT*

WHAT SOUTHERN COMPANY IS DOING

When asked about fossil gas prices in front of regulators, Georgia Power recently argued that the price volatility is a "good thing" for customers because that means that "sometimes" the price will be low. Unpredictable energy bills are never a good thing, especially when the revenues from these bills pay for polluting power plants instead of alternatives that would make good on utility energy justice claims, such as energy efficiency that benefits customers. This problem is not limited to Georgia Power. Alabama Power barely uses energy efficiency in its resource mix, despite being one of the ten largest utilities in the Southeast.

NEXTERA ENERGY

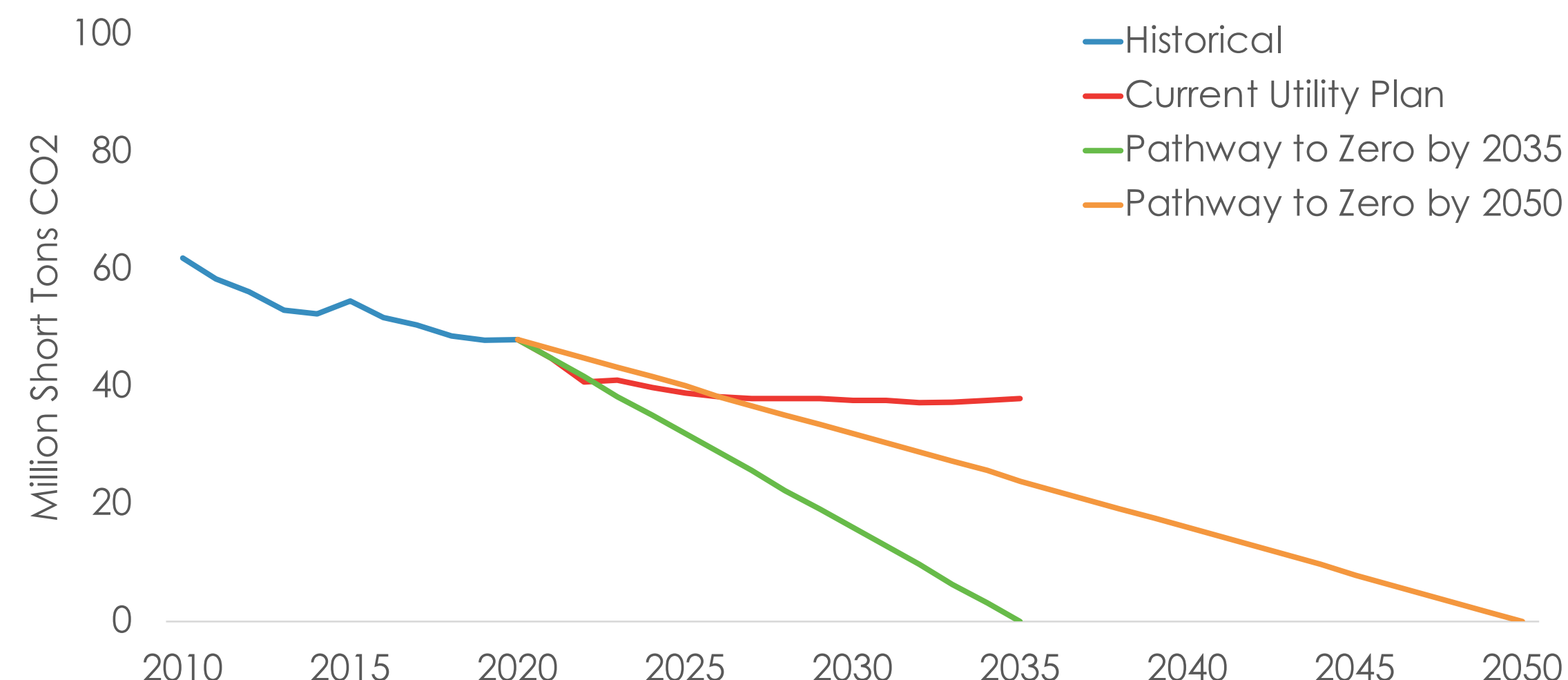
NEXTERA SETS A DECARBONIZATION GOAL

In 2022, NextEra Energy, parent company of Florida Power & Light (FPL), announced a company-wide goal called, “Real Zero,” that would generate 100% carbon-free energy by 2045 *without* offsets. They also aim to make this transition at no incremental cost to customers relative to alternatives. The overarching goal is for NextEra to decarbonize by 2045, but FPL also has interim goals to accelerate the transition to zero-carbon resource by meeting five-year milestones showing the percentage of zero-carbon emission fuel sources.

‘Real Zero’ Goal Milestones	2025	2030	2035	2040	2045
NextEra Energy Mix (% of GWh)	65%	77%	83%	92%	100%
FPL Energy Mix (% of GWh)	36%	52%	62%	83%	100%

The goal is conceptually promising, though it comes with some asterisks. Notably, many of the targeted reductions require completion of projects that are pending regulatory approval have yet to be filed before regulators or incorporated into resource plans.

NEXTERA PLANS VS. PATHWAYS TO ZERO



NextEra	2010	2020	2030
Total CO ₂ (mTons)	61.9	48.0	37.7
Lbs of CO ₂ / MWh	995	705	537
	2010-2020	2020-2030	
% Decarbonization / Year	-2.5%	-2.3%	
Est. year CO ₂ will approach zero by rate	2071	2073	

NEXTERA ENERGY

WHERE NEXTERA IS HEADED

Resource plans in Florida only project ten years ahead. Therefore, how Florida Power & Light plans to get from just over half decarbonized power in 2030 to fully decarbonized in 2045 remains unclear. Its stated goal rests heavily on green hydrogen, but its not yet clear whether this resource will be viable and cost-effective to be used to generate power at the scale implied by this plan. FPL currently has a demonstration green hydrogen project under construction, with expected completion in 2023.

Utilities in Florida are required to file Ten Year Site Plans (TYSP) which are functionally equivalent to IRPs. FPL instituted a major change to its projected future winter peaks in the TYSP it filed in April 2022. Claiming the change is driven by winter extreme weather that challenged power grids in Texas, FPL assumed that the most extreme temperature that has occurred in its service territory, in the winter of 1989, is projected to occur every January in FPL's new winter peak forecast. To meet these extreme peaks, FPL is delaying the retirement of nearly 2,000 MW of fossil generating plants, instead keeping them online to serve load during "extreme" winter weather and adding an additional 700 MW of fossil gas capacity to existing units.

WHAT NEXTERA IS SAYING...

"Solar is cost-effective for customers and represents capital investment of more than \$6 billion over the next four years."

—NEXTERA ENERGY, INVESTORS CONFERENCE 2022

WHAT NEXTERA IS DOING

NextEra is happy to build solar for itself while plotting to block customers from generating their own power. A scandal arose in early 2022 when it was revealed that a Florida Power & Light lobbyist wrote the text of HB 741, an anti-solar bill filed at the legislature. The bill would have eliminated the utility's obligation to credit solar owners fairly for each kilowatt hour of energy they produced and sold back to the grid. The bill passed through the state legislature, but was subsequently vetoed by the governor in a whirlwind. The whole affair highlighted how little NextEra's words and actions align with each other.

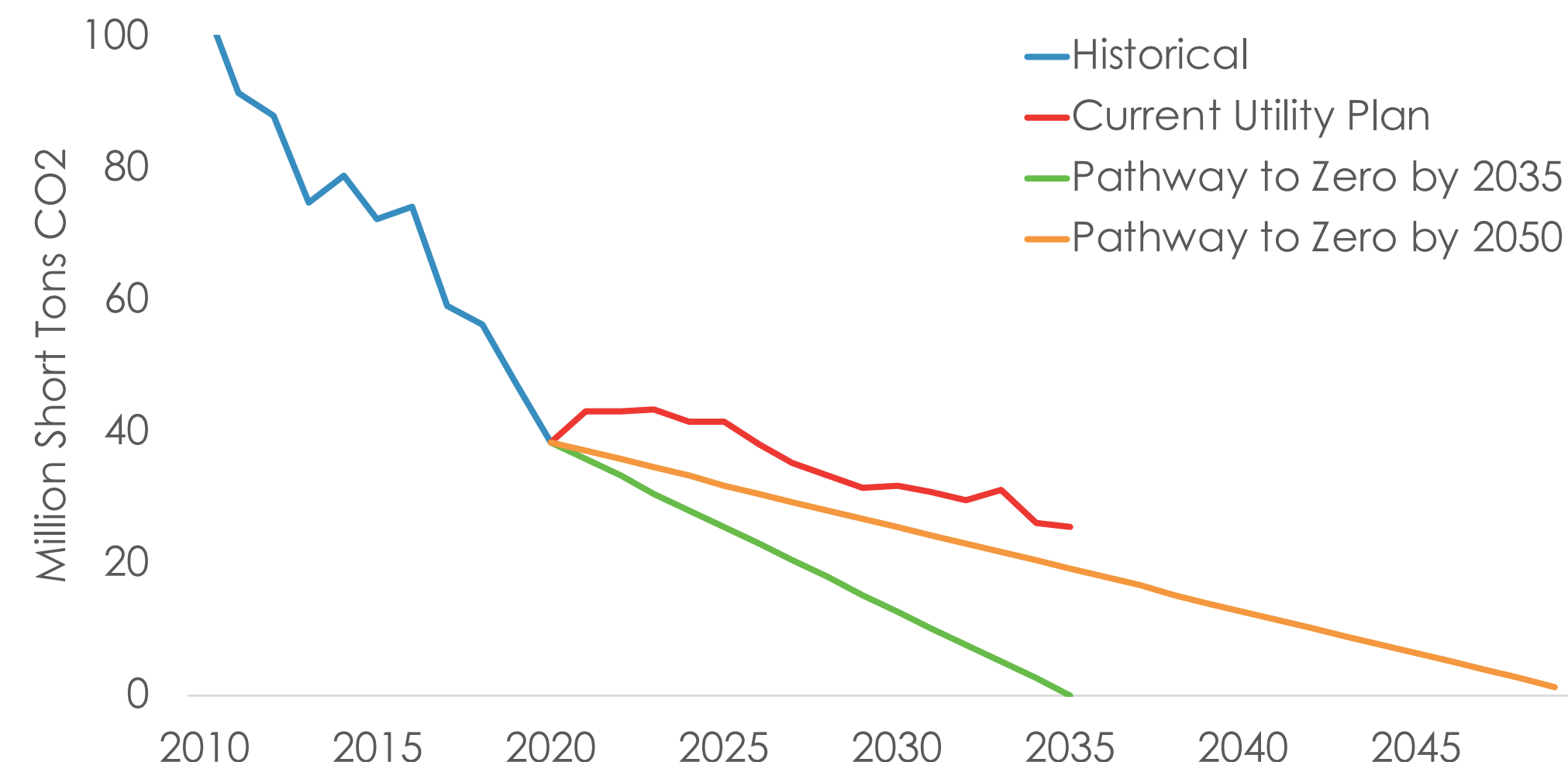
TENNESSEE VALLEY AUTHORITY

TVA CAN LEAD IN DECARBONIZATION

Like many utilities, TVA is expected to see an uptick in emissions between 2020 and 2021 as load returns after the COVID-19 pandemic shutdowns of 2020, and as gas prices remained higher in 2021 and 2022. TVA still has a number of older coal plants that had relatively low capacity factors in 2017-2020, but are expected to be used more often when gas prices are high.

Since TVA is not an investor-owned utility, it does not have the same shareholder pressure that, at least in part, has driven other large utilities in the region to set corporate carbon reduction goals. However, as a federal entity, it is important to note that TVA's stated carbon emission reduction plans are out-of-step with the targets laid out by the current Presidential administration. In January 2021 President Biden issued Executive Order 14008 that initiated a "government-wide" effort to achieve "a carbon pollution-free electricity sector no later than 2035." TVA continues to say it aspires to achieve an 80% reduction in carbon emissions by 2035. Despite this *clear* difference, TVA has not adjusted its plans, even in the wake of questions from the House of Representatives on TVA's carbon reduction plans.

TVA PLANS VS. PATHWAYS TO ZERO



Utility	Total CO ₂ (mTons)		
	2010	2020	2030
Total CO ₂ (mTons)	105.0	38.4	31.7
Lbs of CO ₂ / MWh)	1,178	500	385
		2010-2020	2020-2030
% Decarb / Year		-9.2%	-1.7%
Estimated year utility will approach zero based on decarbonization rate		2041	2088

TENNESSEE VALLEY AUTHORITY

DOES TVA CONSIDER OVERSIGHT OPTIONAL?

On January 13, 2022, the House Energy & Commerce Committee sent an oversight letter to TVA inquiring about its practices and policies on energy efficiency, solar, rate setting, carbon reductions, and funding for anti-Clean Air Act lobbying. TVA's response largely used cherry-picked figures and long-debunked arguments, but in it TVA did commit to increasing its investment in energy efficiency and retiring coal plants by 2035.

TVA has not re-done its long-term plan through an integrated resource planning process since the one approved in 2019, which largely included analysis from sources in 2018 and earlier. Since much has changed, and TVA states it is going to be a leader on decarbonization, a decarbonization-focused IRP would be the most comprehensive and enduring way to put the utility on the path to zero carbon by 2035.

Since TVA is a federal entity, it is regulated by its Board of Directors instead of a state commission. TVA's Board is at quorum, with only five of the nine seats filled. A long delay in the confirmation of President Biden's nominations to the TVA Board could harm the utility's ability to get on a path to zero carbon.

WHAT TVA IS SAYING...

"We recognize the urgency – and TVA is uniquely positioned to lead in developing solutions that will deliver a carbon-free energy future."

–TVA CEO, JEFF LYASH

WHAT TVA IS DOING...

In April 2022 TVA announced it plans to replace one of its retiring coal plants – Cumberland in middle Tennessee – with a gas power plant that would require an additional new gas pipeline. Another plan to replace the Kingston coal plant with a new gas power plant and pipeline is expected before the end of 2022. These two projects would lock TVA customers into carbon-emitting power for decades to come. TVA currently has some of the lowest levels of solar and energy efficiency in the region, two resources it could ramp up to replace these retiring coal plants and negate the need to build new fossil fuel infrastructure.

DOMINION SOUTH CAROLINA

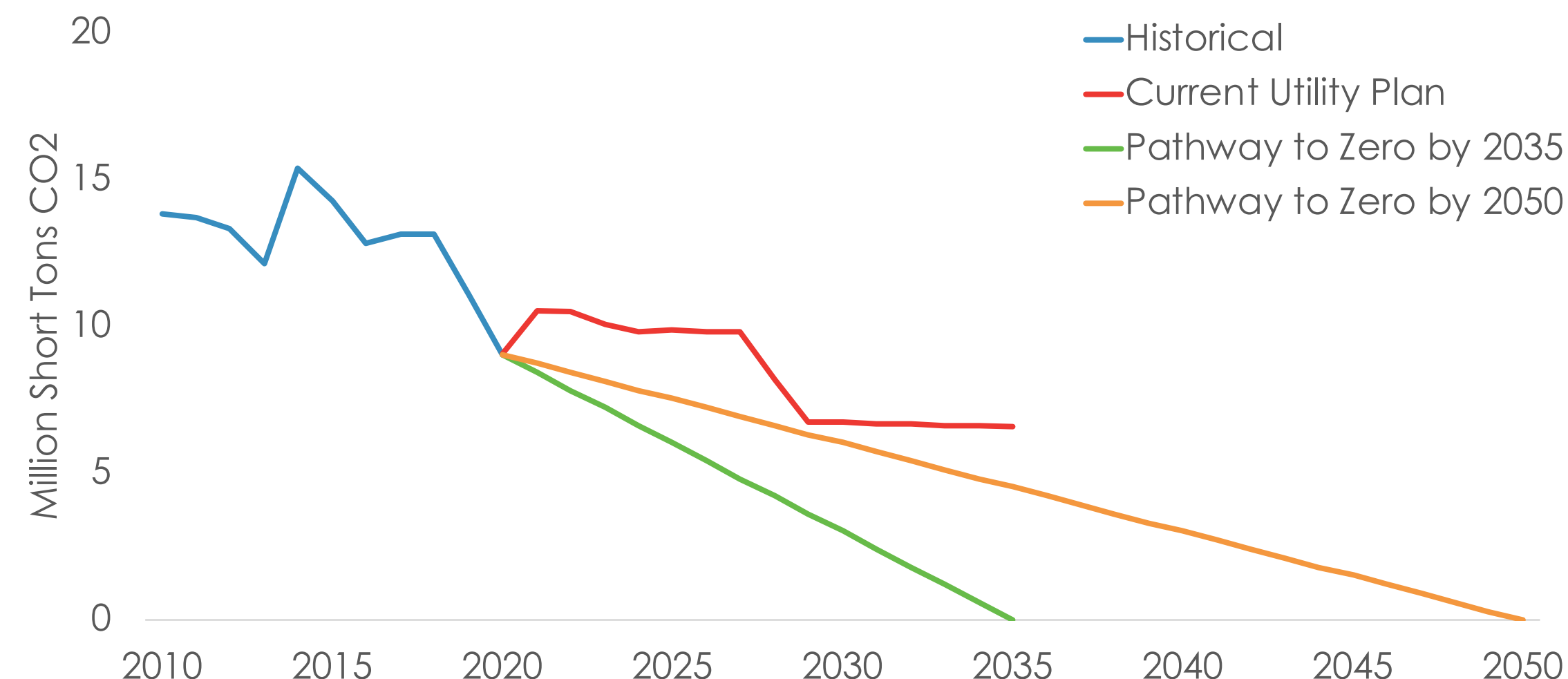
DOMINION'S PLANS MEET THE STATE LEGISLATURE

The landmark 2019 Energy Freedom Act passed by the South Carolina legislature revamped some of the state's requirements for resource planning. In late 2020, Dominion's IRP was rejected by the state's Public Service Commission for failing to fulfill the requirements set out by the new law, such as modeling renewable energy additions prior to 2026, and not failing to model coal retirements before 2028.

It filed an amended IRP that would increase its rate of decarbonization, showing that improvement to resource plans *can* help utilities change their course. Even more changes are expected in Dominion Energy's next IRP, to be filed in 2023, where it will have to evaluate higher levels of energy efficiency.

Like most of its peers, Dominion Energy has committed to cutting carbon emissions. The goal sets out to achieve net zero CO₂ and methane emissions from its power generation by 2050.

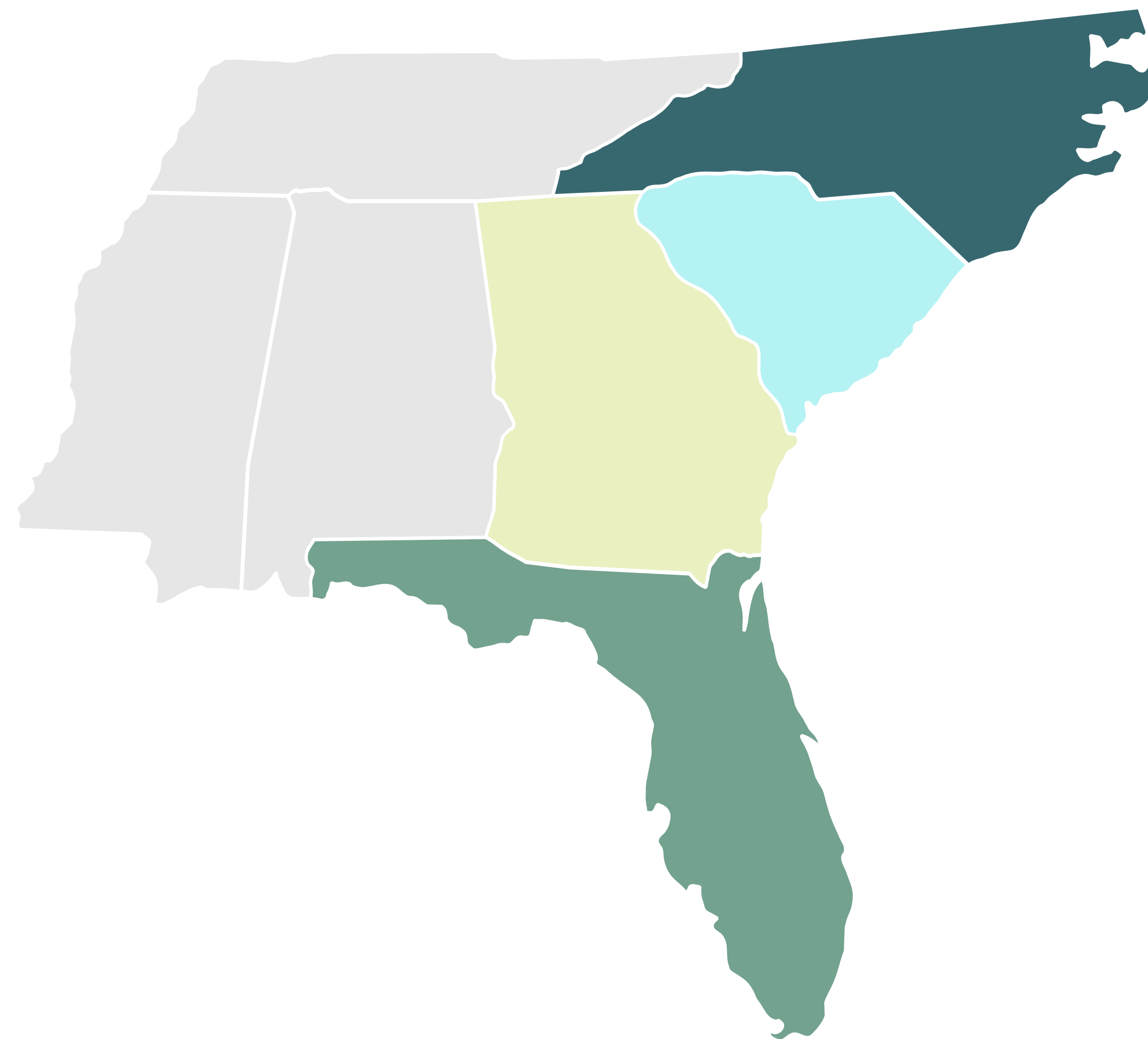
DOMINION PLANS VS. PATHWAYS TO ZERO



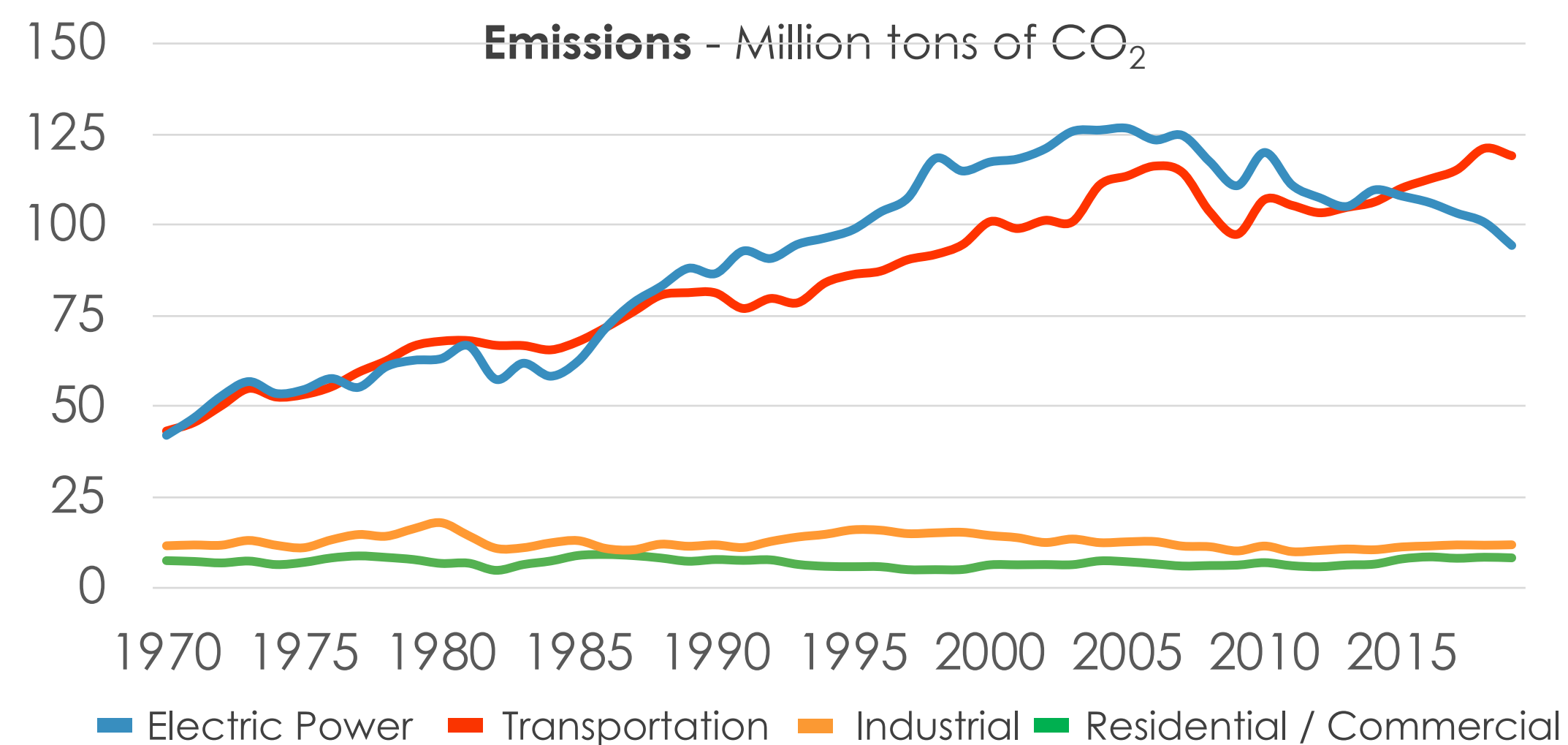
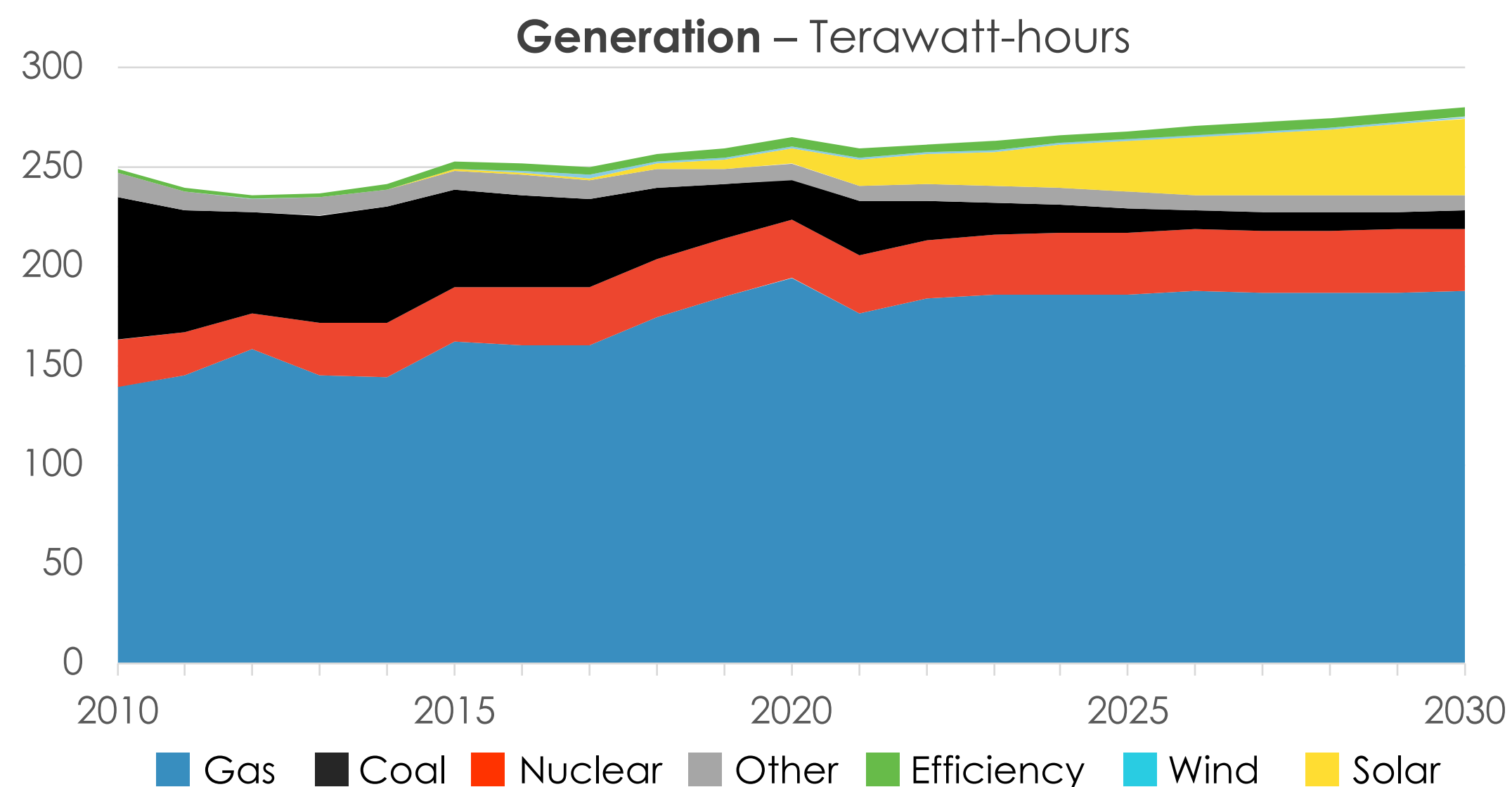
Utility	Total CO ₂ (mTons)		
	2010	2020	2030
Total CO ₂ (mTons)	13.8	9.0	6.8
Lbs of CO ₂ / MWh	1,146	813	572.4
		2010-2020	2020-2030
% Decarb / Year		-3.5%	-2.4%
Estimated year utility will approach zero based on decarbonization rate		2059	2072

STATE PROFILES

- FLORIDA
- GEORGIA
- NORTH CAROLINA
- SOUTH CAROLINA
- STATES COVERED IN UTILITY PROFILES



FLORIDA



FOSSIL GAS DEPENDENCE HAS REPLACED COAL

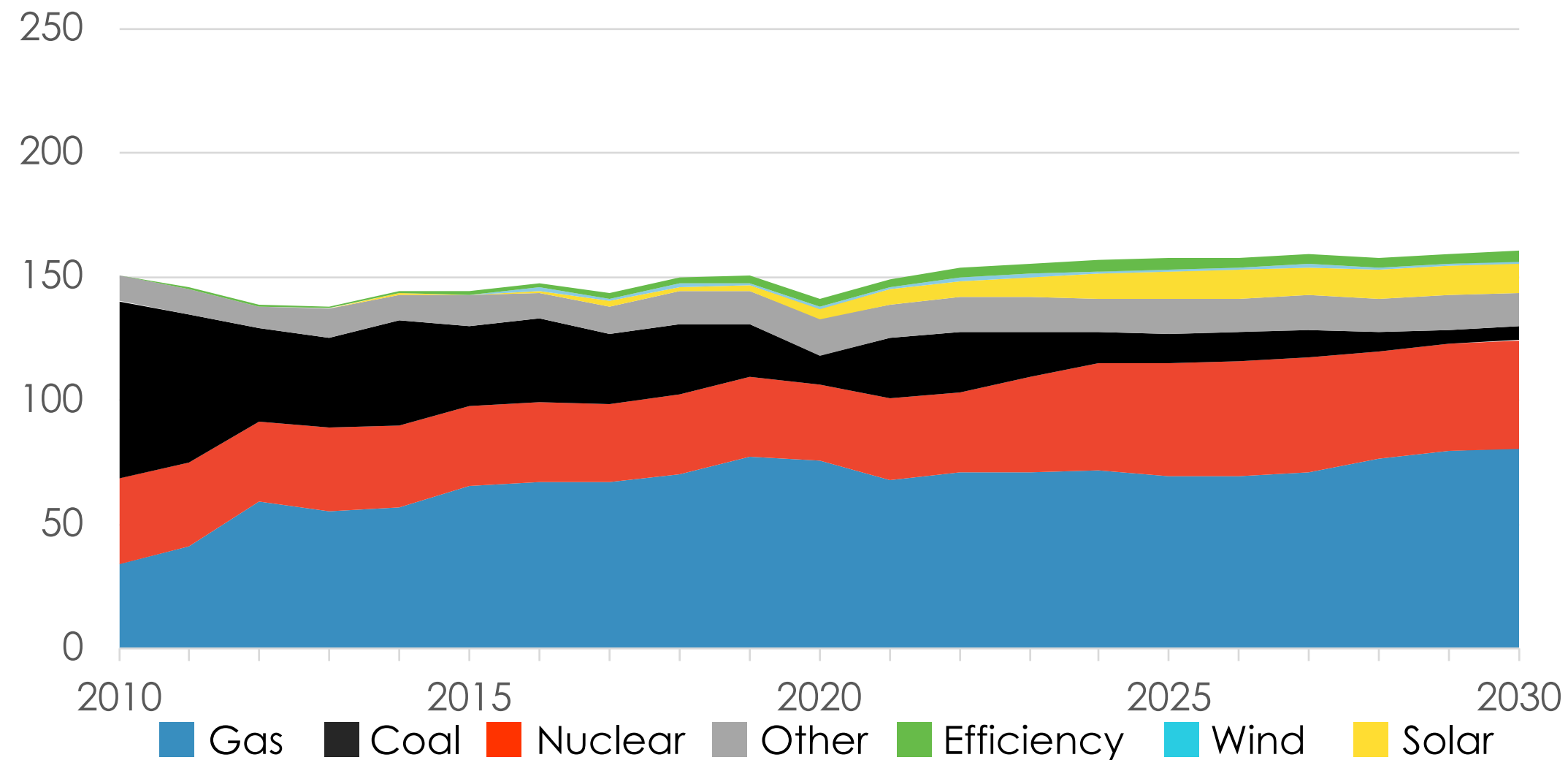
Florida is the least coal-heavy state in the region, yet is also the state with the largest portion of its power from fossil fuels. Why? Because ‘natural’ gas is actually a fossil fuel, and relying on it delays full decarbonization. The state is by far the largest in the Southeast but instead of leading in decarbonization, Florida has no overarching clean energy policy and leaves important policies like solar net metering in precarious positions routinely on the edge of being reversed.

Residents of cities all across Florida show a heightened belief that climate change will harm them personally, due in part to increased extreme weather events and coastal flooding. A win-win for the state might include policies like energy efficiency home improvements that have the potential to build resilience for storms and flooding, while also decarbonizing.

Florida		2010	2020	2030
State CO ₂	Million Tons	156.1	116.3	95.0
	Lbs/ MWh	1,258	897	696
% of Power	Fossil Fuels	87.0%	82.0%	71.0%
	Clean Energy	0.6%	4.9%	16.0%

GEORGIA

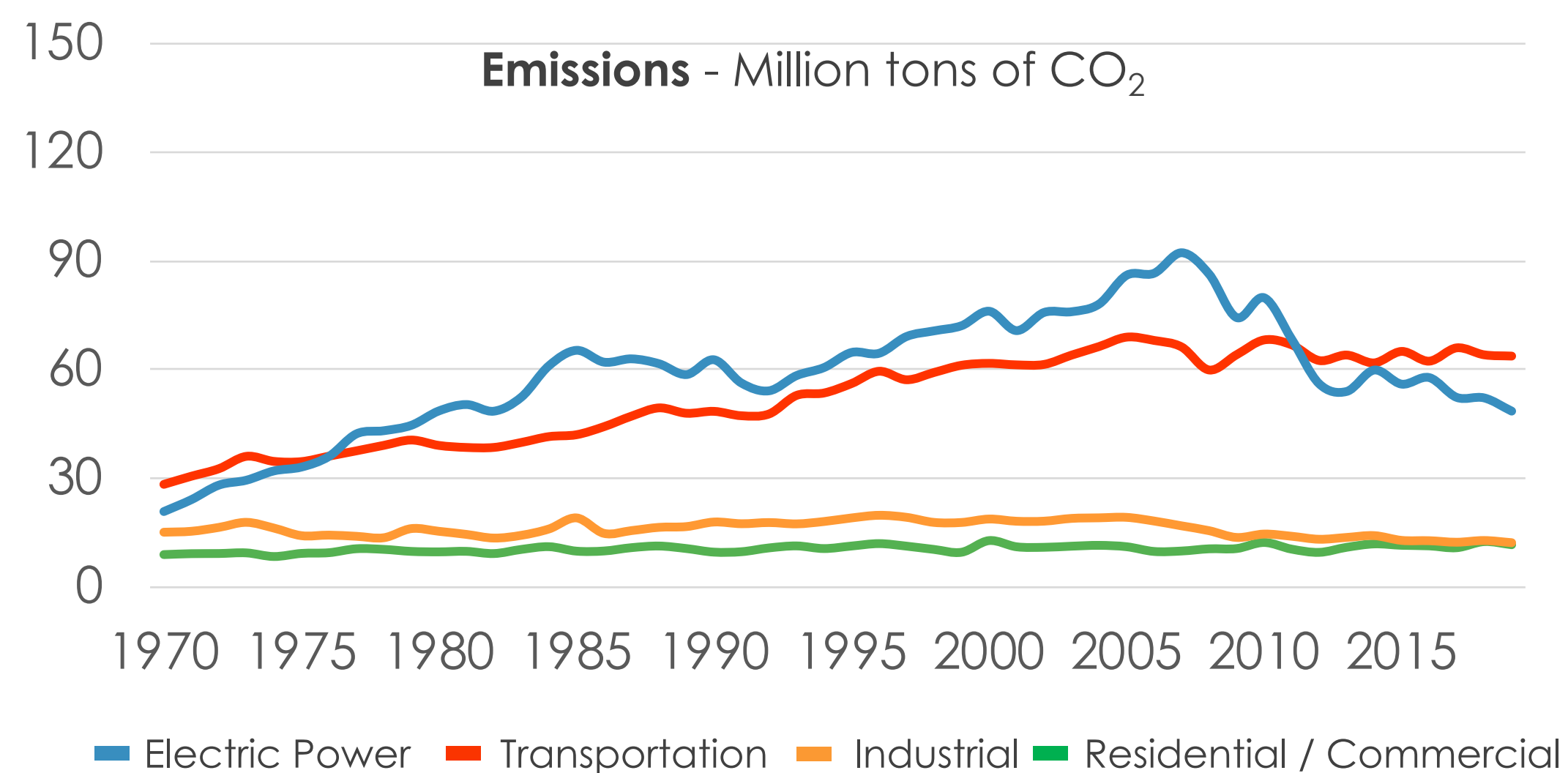
Generation – Terawatt-hours



COAL, NEARLY GONE BUT DEFINITELY NOT FORGOTTEN

While the statewide energy mix in 2030 is slated to have very little coal contributing to the state's energy needs, the legacy of coal will live on for years to come in the form of exorbitant costs to clean up coal ash. Georgia is also one of many states that plans to continue to rely on gas despite the risk of saddling customers with yet more costs for fossil fuels.

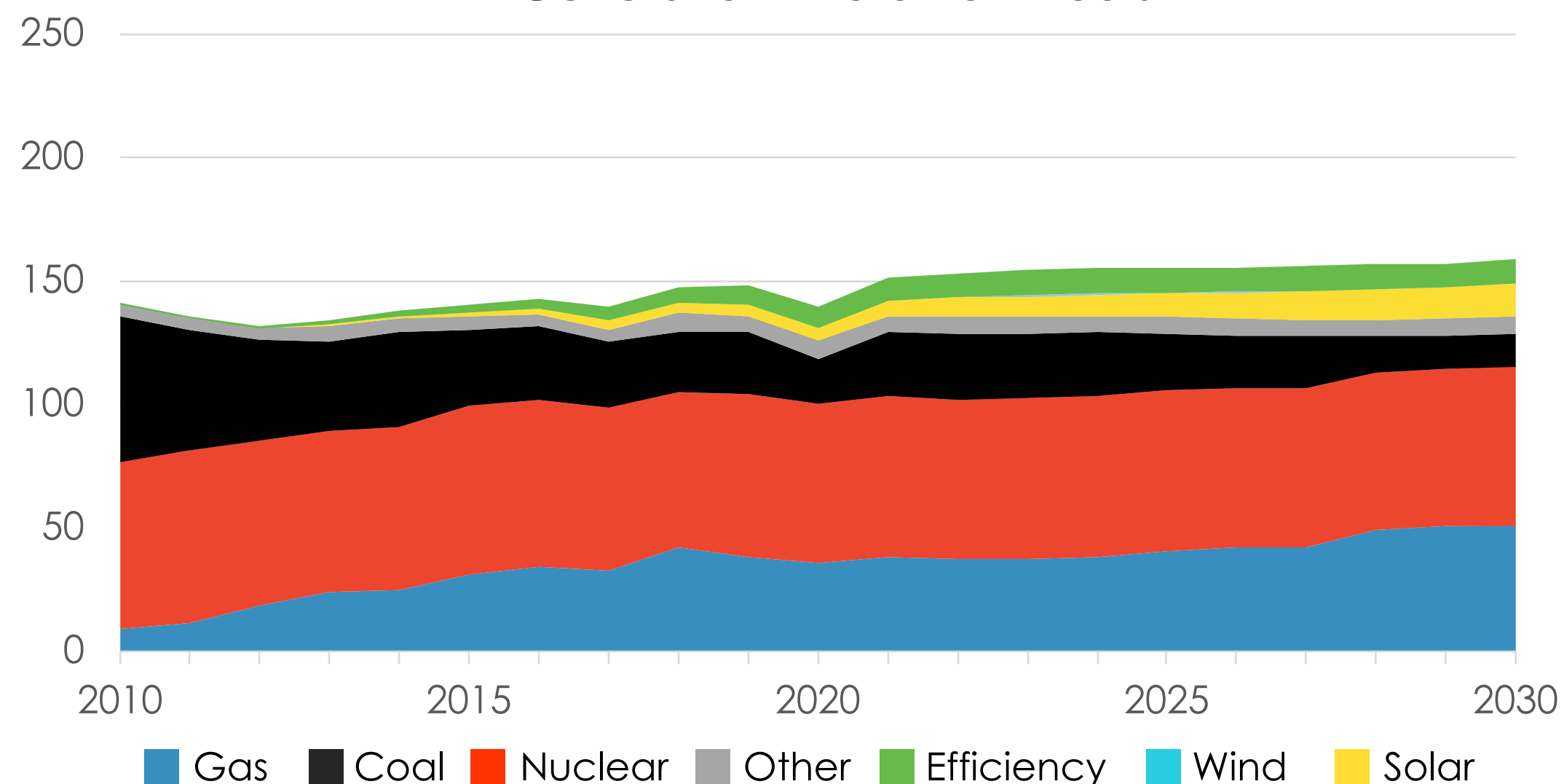
Oglethorpe Power provides power to electric coop utilities in Georgia and is the second largest utility system in Georgia in terms of energy needs and CO₂ impact, emitting over 15 million in 2020. The unique structure of a utility owned by nearly 40 smaller electric membership cooperatives can be both a challenge and an opportunity for decarbonization. Some members like Cobb EMC have even set their own goals to reduce carbon emissions and double their renewable portfolio by 2030.



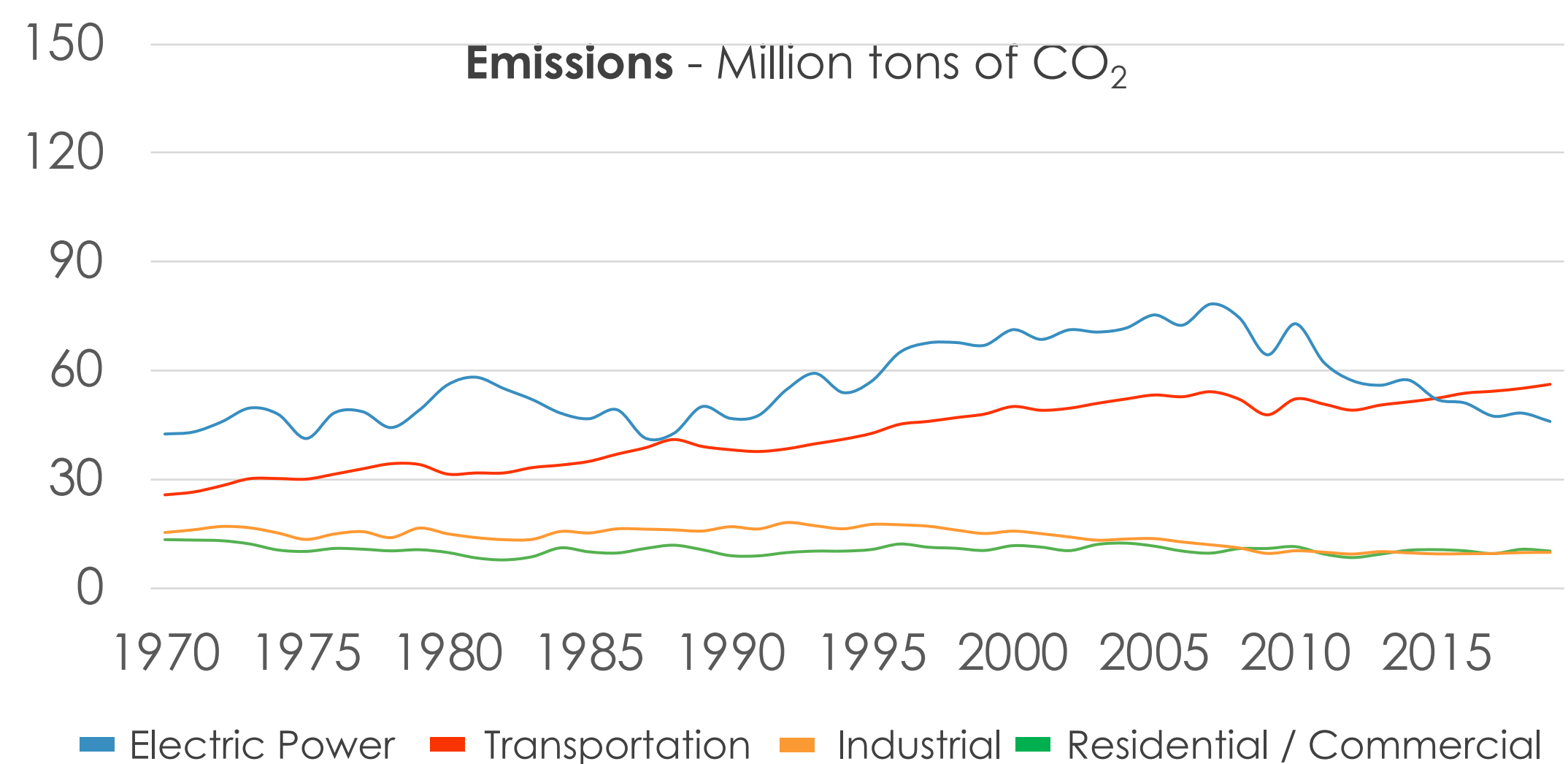
Georgia		2010	2020	2030
State CO ₂	Million Tons	98.7	56.7	51.6
	Lbs/ MWh	1,311	826	662
% of Power	Fossil Fuels	70.4%	62.2%	54.1%
	Clean Energy	0.0%	5.9%	10.5%

NORTH CAROLINA

Generation – Terawatt-hours



Emissions – Million tons of CO₂



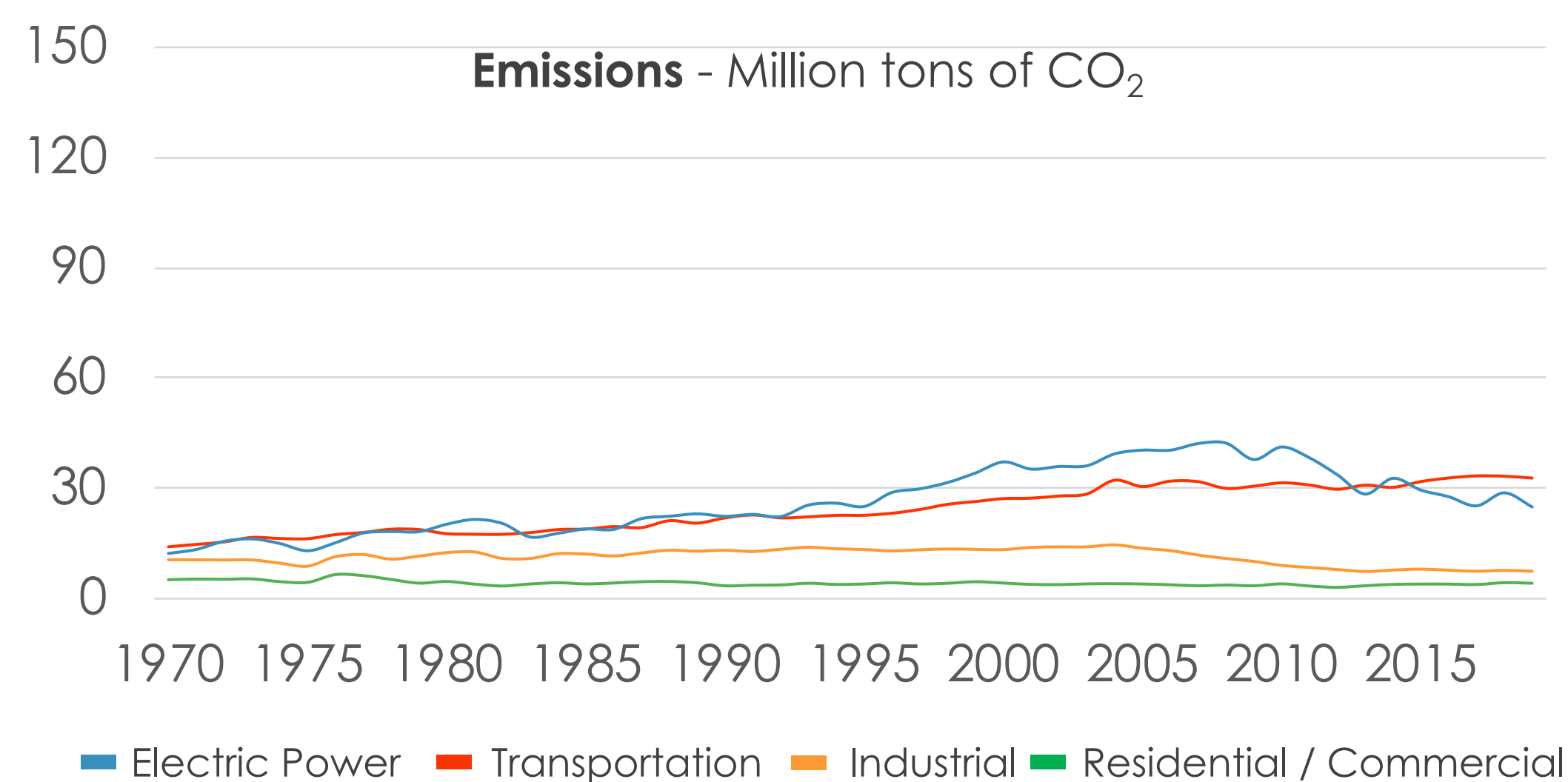
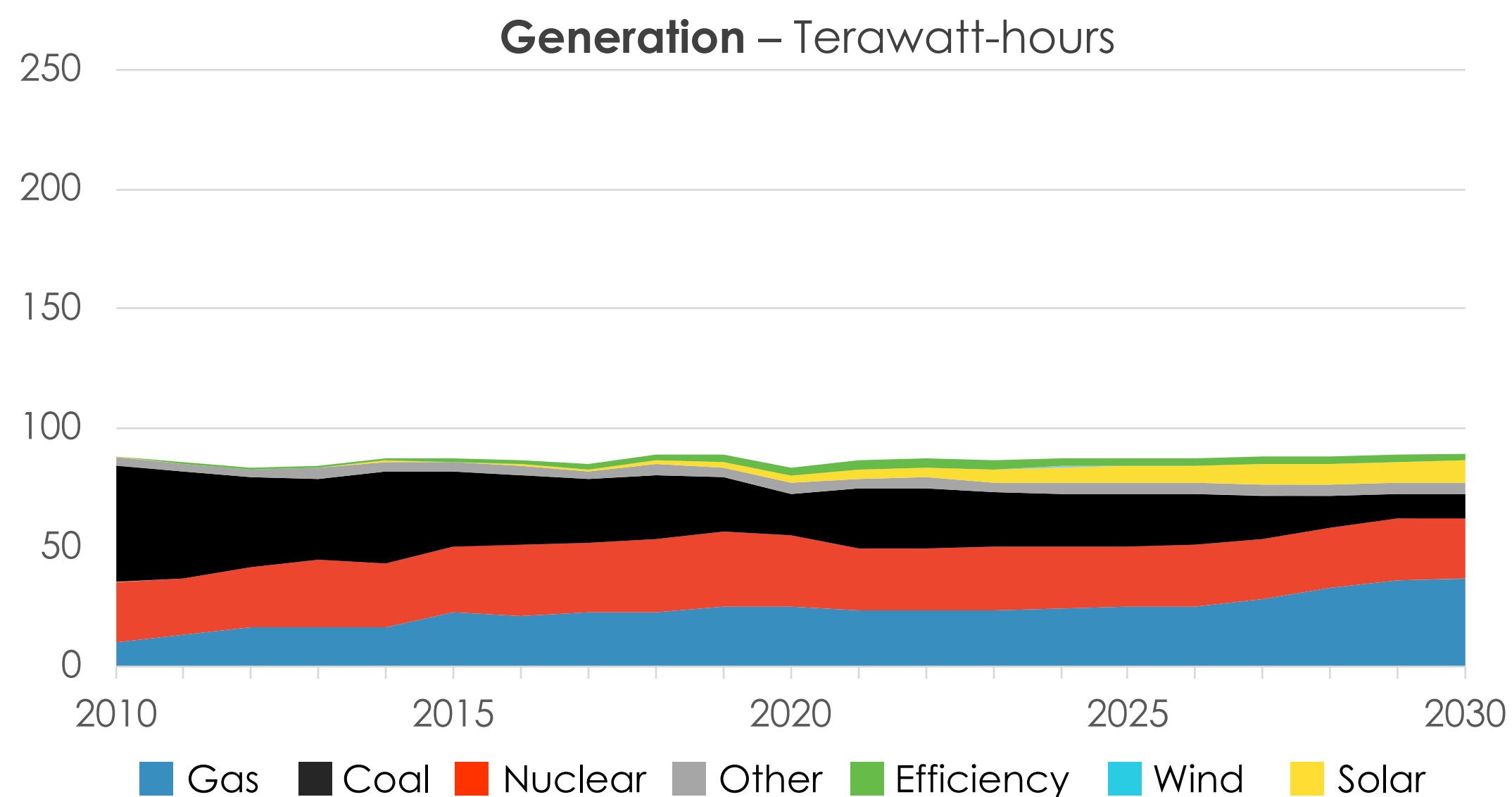
SETTING THE STAGE FOR STATEWIDE DECARB

In January 2022, Executive Order 246 from Governor Cooper lays out a goal to reduce statewide greenhouse gas emissions by 50% below 2005 levels by 2030 and to net-zero by 2050. A major part of EO 246 is the goal to have at least 1.25 million zero-emission vehicles (ZEVs) registered in the state by 2030 and that ZEVs make up half of all new sales by 2030.

In 2021 North Carolina passed HB 951, which included a requirement that Duke Energy's two utilities operating in the state reduce CO₂ emissions from in-state generation by 70% below 2005 levels by 2030 and to net-zero by 2050. The Commission is required to finalize a Carbon Plan by the end of 2022. Also in 2021, Gov. Cooper issued Executive Order 218 targeting 2.8 GW of offshore wind by 2030 and 8 GW by 2040.

North Carolina		2010	2020	2030
State CO ₂	Million Tons	67.9	36.7	35.5
	Lbs/ MWh	964	562	480
% of Power	Fossil Fuels	48.4%	38.8%	40.4%
	Clean Energy	0.4%	9.9%	14.8%

SOUTH CAROLINA



A NEW ERA OF PUBLIC REVIEW FOR UTILITY PLANS

State-owned utility Santee Cooper emitted over 13 million tons of CO₂ in 2020, over one third of the state's utility emissions. Recent reforms at the state legislature in Act 90 have altered how Santee Cooper conducts its resource planning process. Namely, the law will require the utility to evaluate at least one scenario that retires coal generation by 2028 while meeting a net zero carbon emission goal by the year 2050.

Santee Cooper will have to submit its resource plans to the PSC for approval, with paths for participation through formal intervention or a public process to receive feedback being established through the act as well. This, along with the positive changes already made in the state's 2019 Energy Freedom Act, have set the tools for deep decarbonization in the state.

South Carolina		2010	2020	2030
State CO ₂	Million Tons	57.4	31.9	28.2
	Lbs/ MWh	1,308	802	661
% of Power	Fossil Fuels	67.0%	51.4%	52.7%
	Clean Energy	0.2%	7.7%	13.5%

SOUTHEAST EMISSIONS IN CONTEXT

WHY THE SOUTHEAST?

The Southeast is home to many frontline communities that are already being negatively affected by fossil fuels and the climate crisis. Stronger and more frequent extreme weather events, coastal flooding, poor air quality, and unpredictable energy prices are likely to continue to harm our communities. Emission reductions from electricity generation and transportation are key tools to combat these impacts.

Key decisions regarding decarbonization are also made at the state level in the Southeast. Investor-owned utilities across the region are regulated by state regulatory bodies, where decisions about future investments are made on a regular basis. Both regulatory decisions and policies set by legislatures and administrations are key drivers of how, including how fast and how equitable we transition to clean energy. Many local municipalities and counties are looking to reduce carbon emissions, but they can run into roadblocks when decisions that drive the carbon intensity of the power consumed within their geography are made by utilities, utility regulators, and state legislators that may not be supportive of their goals.

DECARBONIZE POWER AND ELECTRIFY FOR MAXIMUM BENEFITS

Decarbonizing electricity generation and electrifying direct fossil use, particularly in transportation and buildings, provides the enormous benefit of reducing emissions from multiple sectors. Electrification is already happening, and in particular the electric vehicle market is growing rapidly. Continued or accelerated reductions of carbon emissions from electric generation means each electric vehicle reduces overall emissions even further.

GAS NOT THE STABLE LOW CARBON FUTURE THAT WAS PROMISED

The replacement of coal with gas drove most of the carbon emission reductions seen in the Southeast electric sector so far. This switch was sold with the justification that gas prices would remain low and stable. Even before the 2022 conflict in Ukraine began, gas prices have been higher and more volatile than any forecast since the mid-2000s. The Ukraine conflict, and resulting foreign policy decisions across the globe, show how unreliable gas is for low-cost power generation. These conflicts are likely to get more frequent as the impacts of climate change worsen and the globe transitions away from fossil fuels.

EMISSION TRENDS AND THE CLIMATE CRISIS

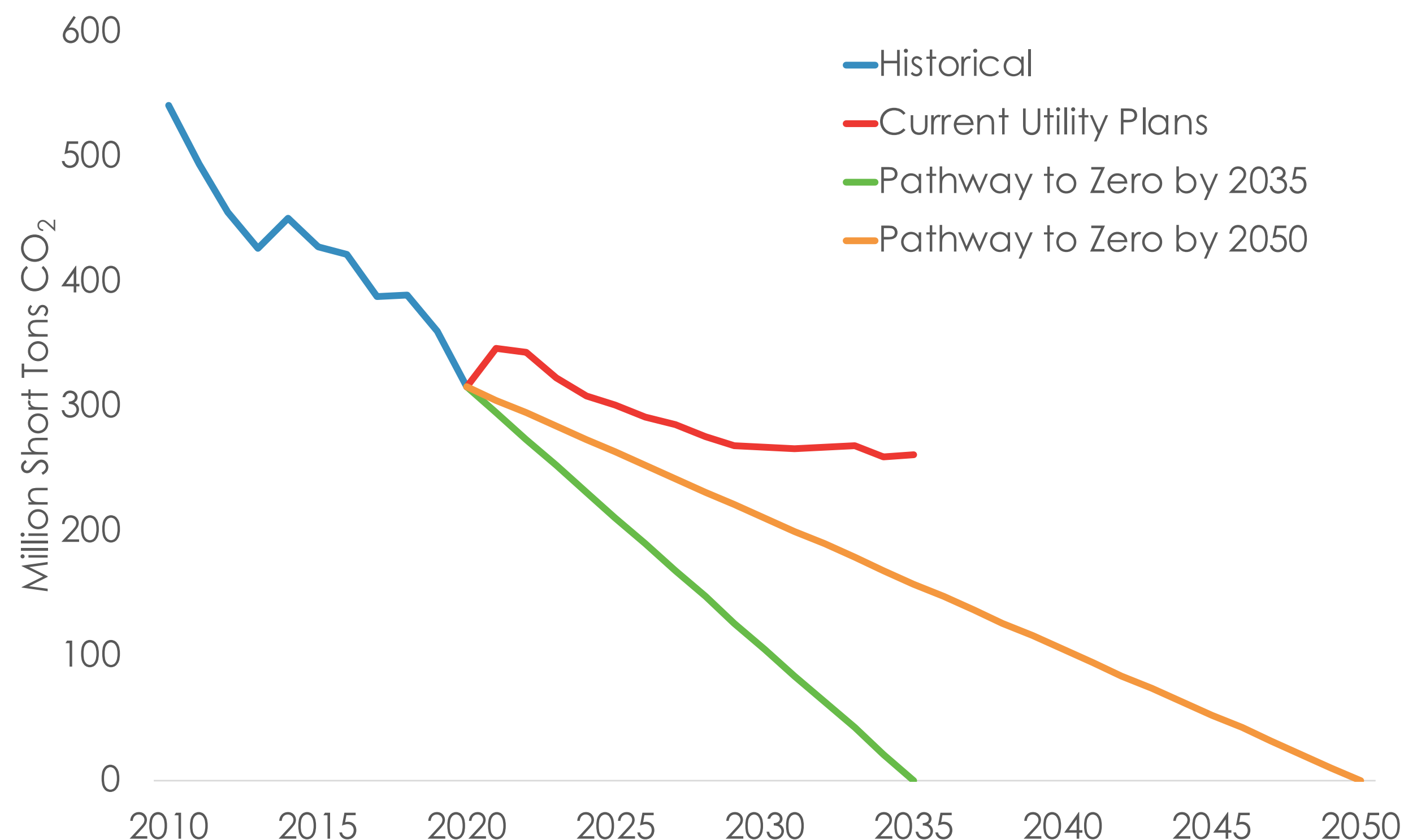
GLOBAL GREENHOUSE GAS EMISSIONS MUST

PEAK BY 2025,
DECLINE RAPIDLY, AND
REACH NET-ZERO BY 2050

TO LIMIT GLOBAL TEMPERATURE RISE TO 1.5°C

~IPCC WGIII AR6 REPORT, APRIL 2022

CURRENT SOUTHEAST UTILITY PLANS
VS. NET-ZERO PATHWAYS



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 addressing the climate crisis.

DATA SOURCES, METHODS, AND ASSUMPTIONS

DATA SOURCES AND ASSUMPTIONS

U.S. Energy Information Administration (EIA) - the primary source for Southeastern generation, capacity, and fuel type for plants and units are reported directly by utilities in the following:

- Forms EIA 860 (Annual Electric Generator Data)
- EIA 861 (Annual Electric Power Industry Report)
- EIA 923 (Annual Electric Utility Data)

Utility integrated resource plans (IRPs) – EIA data is supplemented by public domain sources, including utility resource plans, utility press releases, guidance documents, and the judgment of SACE staff.

Federal Energy Regulatory Commission (FERC) – Generation and peak demand forecasts are obtained from FERC 714 (Annual Electric Balancing Authority Area and Planning Area Report).

U.S. Environmental Protection Agency (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).

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

- Southern Alliance for Clean Energy (2021). [Solar in the Southeast, Fourth Annual Report](#)
- Southern Alliance for Clean Energy (2022). [Energy Efficiency in the Southeast, Fourth Annual Report](#)

METHODS

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 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 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. Emissions are presented in short tons and calculated based on fuel use and EPA guidance on CO₂ emissions computation.

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 in 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.

APPENDIX A + B

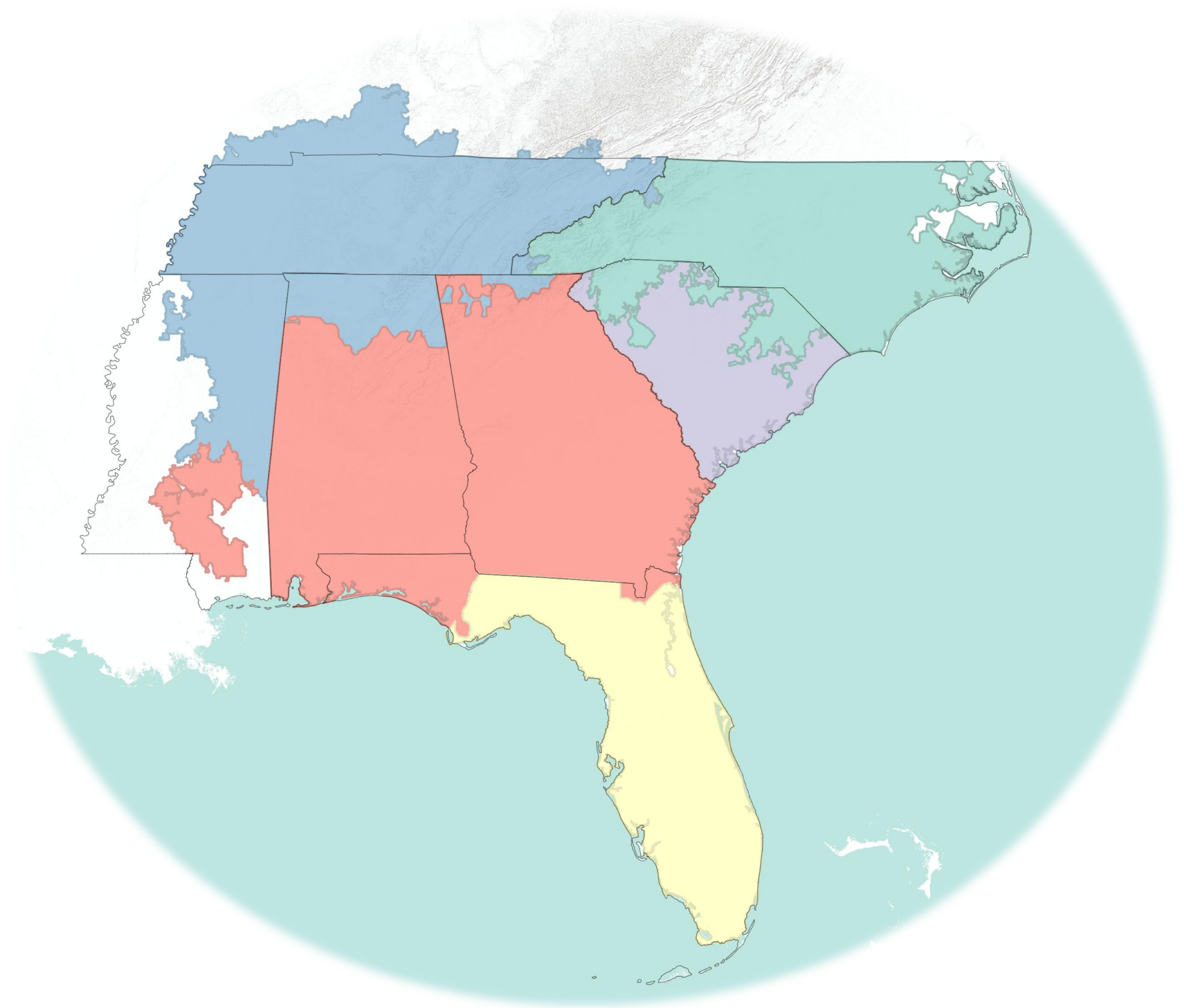
APPENDIX A: GEOGRAPHIC COVERAGE

The geographic coverage of data encompasses Southeastern utilities outside of interstate electricity markets such as PJM and MISO. The states of Alabama, Florida, Georgia, and South Carolina are fully covered. Relatively small portions of North Carolina and Tennessee are served by utilities that participate in PJM (thus while statewide reports for these states are relatively comprehensive, they may not align exactly with other data sources); only portions of Mississippi, Kentucky, and Virginia that are parts of the Tennessee Valley Authority or the Southern Planning Area are included.

APPENDIX B: EMISSIONS AND GENERATION DATA

Emissions and generation data used in the report are available for download. Because this report is inclusive of how power is sold between utilities and states, it uniquely presents emissions in terms of where the power is ultimately consumed, and not where it is generated.

For state and utility data for years 2010, 2020, and 2030 please [visit our website to access the appendix](#).



TRACKING DECARBONIZATION IN THE SOUTHEAST

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