Risk Assessment of Florida Power and Light and NextEra Energy Clean Energy Transition Plans

Applied Economics Clinic
Prepared on behalf of
Environmental Defense Fund

Authors:

Tanya Stasio

Joshua R. Castigliego

Chirag Lala

Elizabeth A. Stanton, PhD

May 4, 2022 (Updated May 16, 2022)

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

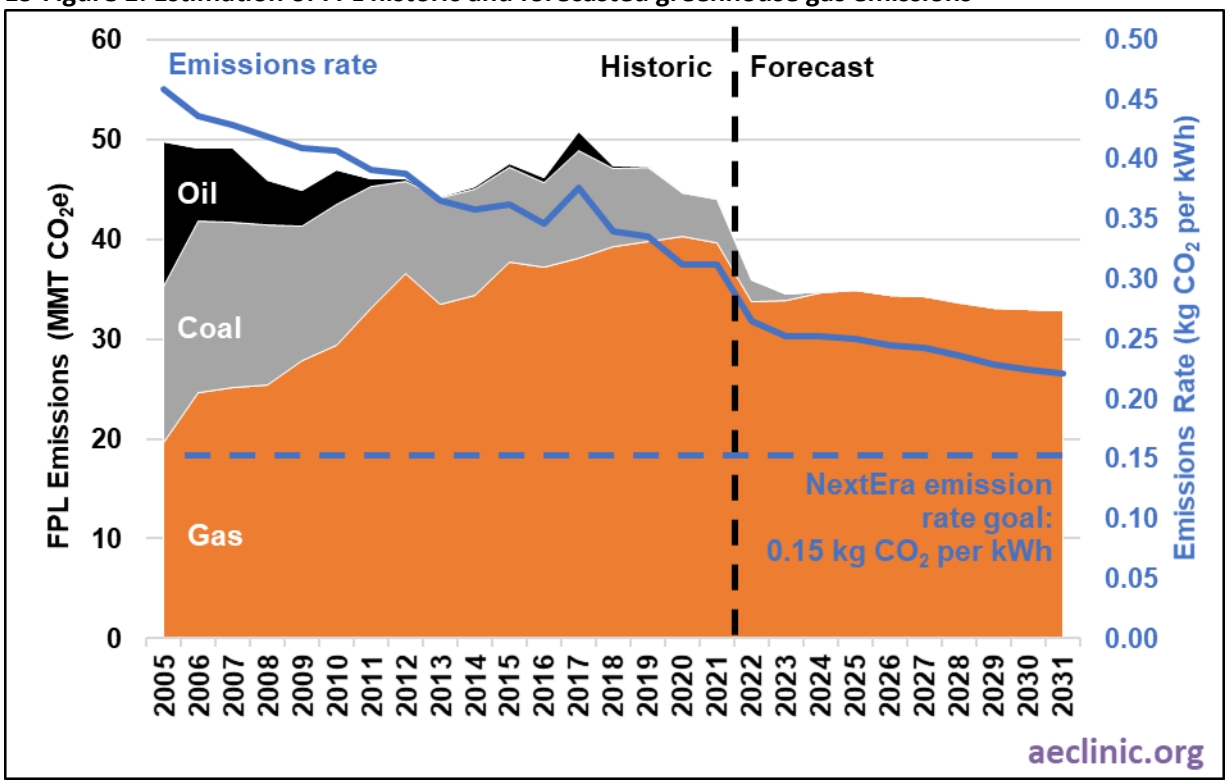
Executive Summary

The clean energy transition is an opportunity for utilities to take advantage of recent technological advancements in grid modernization and the decline in renewable energy costs. For utilities that are apprehensive about moving away from fossil fuels, however, the prospect of a U.S.-wide transformation of the energy sector taking place without them poses a major risk. This Applied Economics Clinic report makes recommendations for Florida Power and Light (FPL) that would assist the utility in embracing the clean energy transition and in doing so reducing risks to ratepayers and its parent company, NextEra Energy's shareholders.

Utilities across the United States are taking decisive steps towards a clean energy transition. FPL—and NextEra Energy—portray themselves as part of this movement. FPL's transition plans, however, show a continued reliance on fossil fuels, undermining NextEra Energy's decarbonization goals.

Utilities across the United States are pursuing net-zero emissions targets while NextEra, the only large utility parent company that lacks an absolute carbon reduction goal, aims to reduce carbon intensity by 67 percent of 2005 levels by 2025. Moreover, FPL's plans for the future are not aligned with NextEra's emission rate reduction target; FPL plans for its emission rate to fall 0.46 to 0.22 kg of carbon dioxide (CO_2) per kilowatt-hour (kWh) by 2031, far short of the reductions needed to match the corporate goal (0.15 kg CO_2 per kWh, see ES-Figure 1).

ES-Figure 1. Estimation of FPL historic and forecasted greenhouse gas emissions



FPL's plans fall short, in part, because its strategy centers on an increase in renewable capacity without a corresponding phase out of natural gas resources. FPL forecasts do not comport with the U.S. Energy Information Administration (EIA) 2022 Annual Energy Outlook projections for future electric demand. Overestimation of customer demand results in over-procurement of generation capacity, which raises bills for ratepayers. At the same time, FPL's scanty energy efficiency compared to competitors' offerings deprive its customers of bill savings while unnecessarily inflating Florida's greenhouse gas emissions. NextEra's underwhelming emission reduction targets and FPL's continued reliance on natural gas puts investors at risk of:

- failing to meet their own climate commitments,
- volatile and uncertain natural gas prices,
- public opposition to new fossil fuel infrastructure,
- regulatory actions that limit fossil fuel generation,
- competition from renewable energy and battery storage technology, and
- over-procurement of capacity.

Florida's lack of an energy planning process across its utilities and its failure to require approval of utility plans limits opportunities for achieving best, least-cost energy investments in Florida. While FPL's 2022 planning documents consider multiple scenarios related to winter electric demand forecasts and tax credits, they continue to fail to include natural gas prices and new federal regulation; lack of foresight regarding these important uncertainties could prove costly to investors and customers.

Based on our assessment of FPL/NextEra's transition plans and a review of electric utility climate plans, AEC offers seven recommendations for a new transition plan:

1. **Coordinate NextEra and FPL transition plans**

   Comparison of current planning documents from NextEra and FPL reveals a distinct lack of coordination—FPL, which contributes over 80 percent of NextEra's operating revenues, only plans to reduce its share of capacity fired by fossil fuels by 21 percentage points and its emissions by 45 percent by 2025 despite NextEra's plans to reduce its emissions rate by 67 percent by 2025.

2. **Establish short-, medium-, and long-term emission reduction targets, including a net zero target**

   AEC recommends that FPL establish short-, medium-, and long-term emission reduction targets that align their transition plan with the Paris Climate Agreement—which aims to reduce greenhouse gas emissions 50 percent by 2030 and limit global temperature rise to below 2 degrees Celsius —and its parent company's climate goals. This includes establishing a net zero emissions target for 2050 or earlier.

3. **Ramp up demand-side management efforts**

   AEC recommends that FPL accelerate its demand-side efforts to increase energy efficiency savings from 0.4 percent of sales to a minimum of 1 percent of sales, the U.S. national average.

4. **Invest in energy storage technologies**

   AEC recommends that FPL continue to invest in energy storage technologies to improve and maintain system reliability and to work together with renewable and distributed energy (i.e., solar) for a zero-emission grid.

5. **Modernize the electric grid and increase renewable energy capacity**

   Grid modernization strategies followed by utilities in several states include distributed generation, smart meters, microgrids, and two-way energy flow. AEC recommends that FPL invest more in modernizing its electric grid to improve overall reliability, flexibility, and sustainability of the electric system.

6. **Consider multiple scenarios in future planning and reduce planning time horizon**

   AEC recommends that FPL report the results of several scenarios and portfolios in its planning reports.

7. **Increase stakeholder and community engagement and continue to align plan with TCFD recommendations** AEC recommends that NextEra: embrace transparency in publicly reporting their progress towards their climate goals; continue to align its reporting with the Task Force on Climate-Related Financial Disclosure's recommendations for governance, strategy, risk management, and metrics and targets; adopt and add to the disclosure metrics and action milestones proposed in Ceres' 2030 Roadmap; and conduct an assessment of the potential equity implications of their transition plan.

Table of Contents

I. Introduction

Investors, customers of electric utilities, and related power businesses are no strangers to risk and uncertainty: storm damage to equipment and paralyzing power outages, heat waves and cold snaps that endanger lives and livelihoods; COVID-19-related economic swings that erase businesses' electric demand and leave customers unable to pay their bills; and, most recently, geopolitical struggle with unmistakable and far-reaching impacts on global (and local) energy markets. Energy production and supply is a risky business, made more perilous when utilities and their parent companies fail to take reasonable steps to protect stock values and insulate their customers from bill increases.

This Applied Economics Clinic report examines successes and failures in the efforts of Florida's largest utility to reduce risks to its shareholders and ratepayers. Florida Power and Light—and its parent company NextEra Energy—have made strong commitments to lower risks by embracing the clean energy transition being pursued by utilities across the United States. These commitments, however, promise more than they achieve, and the companies' public statements have provided a mixed message, at best, regarding the sincerity of the utility's intention to decarbonize, putting investors at risk of public opposition, declining share values, and failure to meet climate commitments. Investors need clear signals to keep stock values high and customers deserve the Company's best effort to provide a least-cost pathway to a modernized electric service.

Section II of this report describes the utility, its parent company, their planned clean energy transition, and the insufficient emission reductions that it provides. (Note that an overview of Florida's power sector is provided in Appendix A of this report.) Section III categorizes key risks to electric utility investors and ratepayers. Section IV identifies best practices in electric utility clean energy transition planning based on a review of 30 utilities across the country. Finally, Section V presents seven recommendations for reducing risk to electric utility shareholders and ratepayers in the context of a clean energy transition.

The clean energy transition is an opportunity for utilities to take advantage of recent technological advancements in grid modernization and the decline in renewable energy costs. For utilities that are apprehensive to move away from fossil fuels, however, the clean energy transition poses a major risk.

II. NextEra and Florida Power and Light

Florida Power and Light (FPL) is a Florida-based electric utility owned by NextEra Energy (NextEra), a Florida-based electric power and energy holding company.[1] FPL was founded in 1925 and NextEra Energy was formed in 1997, then known as FPL Energy. It was renamed as NextEra Energy Resources in 2009 to highlight the Company's growing role in energy holdings outside of Florida.[2] NextEra was formed from the FPL Group in 2010 for similar reasons.[3] In January 2019, NextEra acquired Gulf Power, an electric utility company serving northwest Florida. In 2021, FPL and Gulf Power merged into a single entity, still known as FPL.[4]

The electricity market in Florida is vertically integrated. That is, utilities own and provide generation, transmission, and distribution; FPL is the largest of Florida's five investor-owned utilities. In 2021, the Florida Public Service Commission (FPSC) had regulatory authority over the five investor-owned electric companies as well as 34 municipally owned electric utilities and 18 rural electric cooperatives.[5] The investor-owned utilities serve nearly 8.3 million customers, 73 million of which are residential customers (see Table 1).

Table 1. Average number of customers for investor-owned utilities by class of service (2021)

	2021 Customers				
Utility	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
Duke Energy Florida	1,655,304	179,666	1,999	26,832	1,863,801
Florida Power & Light Company and Gulf Power	4,963,448	629,189	12,242	5,728	5,610,607
Florida Public Utilities Company	25,038	4,342	2	2,952	32,334
Tampa Electric Company	698,493	76,790	1,409	9,356	786,048
Total	**7,342,283**	**889,987**	**15,652**	**44,868**	**8,292,790**

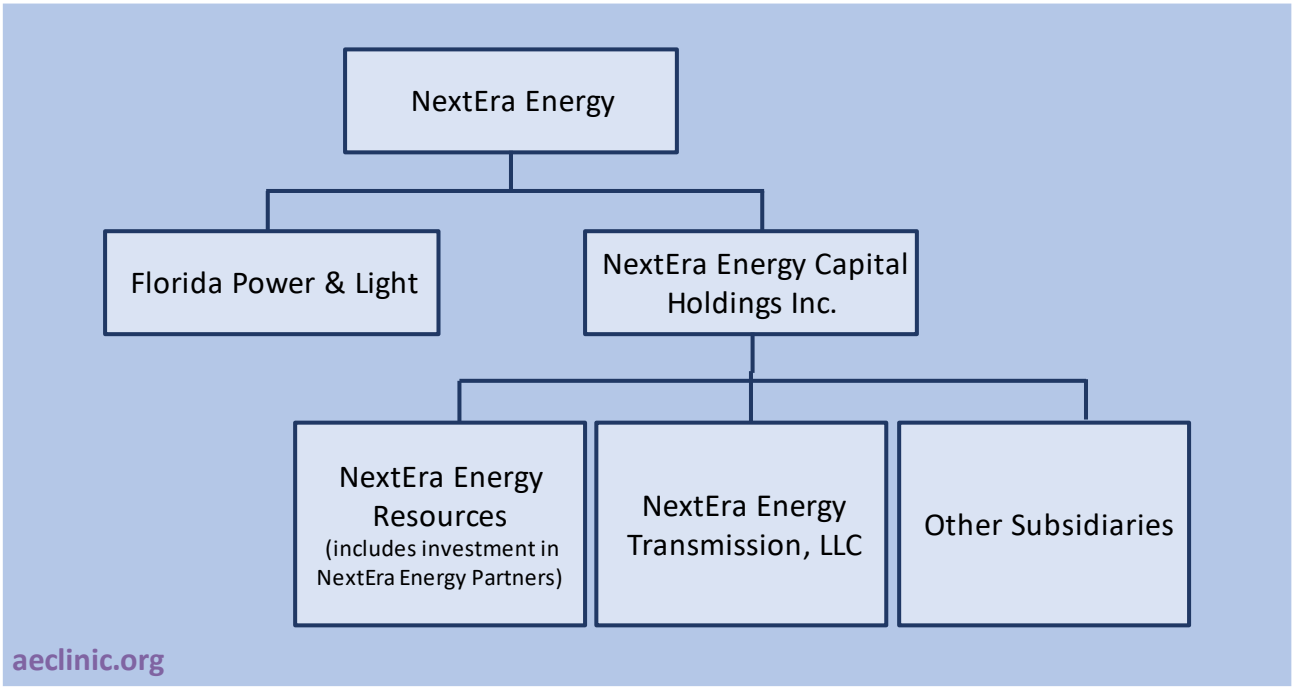
Data Source: FPSC. 2022. Facts & Figures of the Florida Utility Industry. Available at: http://www.psc.state.fl.us/Files/PDF/Publications/Reports/General/Factsandfigures/April%202022.pdf. p. 4

According to NextEra's 2020 Form 10-K—NextEra's annual report to the U.S. Securities and Exchange

[1] NextEra Energy. 2022. *Form 10-k for the fiscal year ended December 31, 2021*. Available at: https://www.investor.nexteraenergy.com/reports-and-filings/annual-reports
[2] NextEra Energy. "Our History." Available at: https://www.nexteraenergy.com/company/history-timeline.html
[3] (1) Ibid; (2) Salisbury, S. 2010. "Juno-based FPL Group to become NextEra Energy." Palm Beach Post. Available at: https://www.palmbeachpost.com/story/business/2012/03/31/juno-based-fpl-group-to/7755078007/
[4] NextEra Energy. 2022. *Form 10-k for the fiscal year ended December 31, 2021.*
[5] FPSC. 2021. *Facts & Figures of the Florida Utility Industry.* Available at: http://www.psc.state.fl.us/Files/PDF/Publications/Reports/General/Factsandfigures/April%202021.pdf. Pg. 1.

Commission, which provides an overview of the Company's business and financial condition[6]—FPL is one of NextEra's two "principal businesses," the other being the NextEra Energy Resources (see Figure 1).[7]

Figure 1. NextEra organizational chart



Source: NextEra Energy Inc. 2022. Form 10-k for the fiscal year ended in December 31, 2021.

NextEra owns and funds NextEra Energy Resources through its subsidiary, NextEra Energy Capital Holdings.[8] In 2021, operating revenues from FPL and Gulf Power amounted to 83 percent of NextEra's total income; the remaining 17 percent was attributed to NextEra Energy Resources.[9] NextEra Energy Resources owns, develops, constructs, manages, and operates electric generation facilities in wholesale energy markets in the United States and Canada; NextEra also reports ownership of a transmission business (held in a separate subsidiary of NextEra Energy Capital Holdings named NextEra Energy Transmission). An affiliate of NextEra Energy Resources,[10] NextEra Energy Partners owns and manages contracted clean energy projects.[11]

NextEra Energy Resources' owned generation capacity was 23,896 MW in 2020;[12] this includes NextEra's

[6] U.S. Securities and Exchange Commission. n.d. "Form 10-K." Available at: https://www.investor.gov/introduction-investing/investing-basics/glossary/form-10-k

[7] NextEra Energy. 2022. *Form 10-k for the fiscal year ended December 31, 2021.*

[8] Ibid.

[9] Ibid.

[10] In Figure 1, NextEra Energy Partners would be considered part of the NextEra Energy Resources box.

[11] NextEra Energy. 2022. *Form 10-k for the fiscal year ended December 31, 2021.*

[12] For reference, FPL's capacity was about 28 GW in 2020. See: FPL. April 2022. *Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan*. Available at: http://www.psc.state.fl.us/ElectricNaturalGas/TenYearSitePlans

ownership share in projects of NextEra Energy Partners.[13] Of that capacity, two-thirds is wind, 13 percent is solar, 10 percent is nuclear, 7 percent is natural gas, and 3 percent is oil.[14] According to its 2021 *Environmental, Social, and Governance* report, NextEra aims to reduce its carbon dioxide (CO_2) emissions rate, the amount of emissions released per energy unit (e.g., kilogram CO_2 per kilowatt-hour (kWh)), by 67 percent by 2025, relative to 2005.[15] This is a company-wide target and does not specifically apply to FPL but rather to NextEra's company-wide emissions rate, to which FPL's contribute a substantial share.

Together with its climate target, NextEra—and through it FPL—has set a "30-by-30" goal which aims to install 30 million solar panels (11.7 gigawatts (GW)) in Florida by 2030.[16] As of December 2021, FPL had achieved about 30 percent of its 30-by-30 goal (3.2 GW, of which 1.3 GW were installed in the past couple years) according to FPL's 2022 Ten-Year Site Plan.[17] Although FPL appears to be lagging behind on NextEra's commitment, FPL says in its 2022 Ten-Year Site Plan that it will reach the 30-by-30 goal in 2025, five years ahead of schedule.[18]

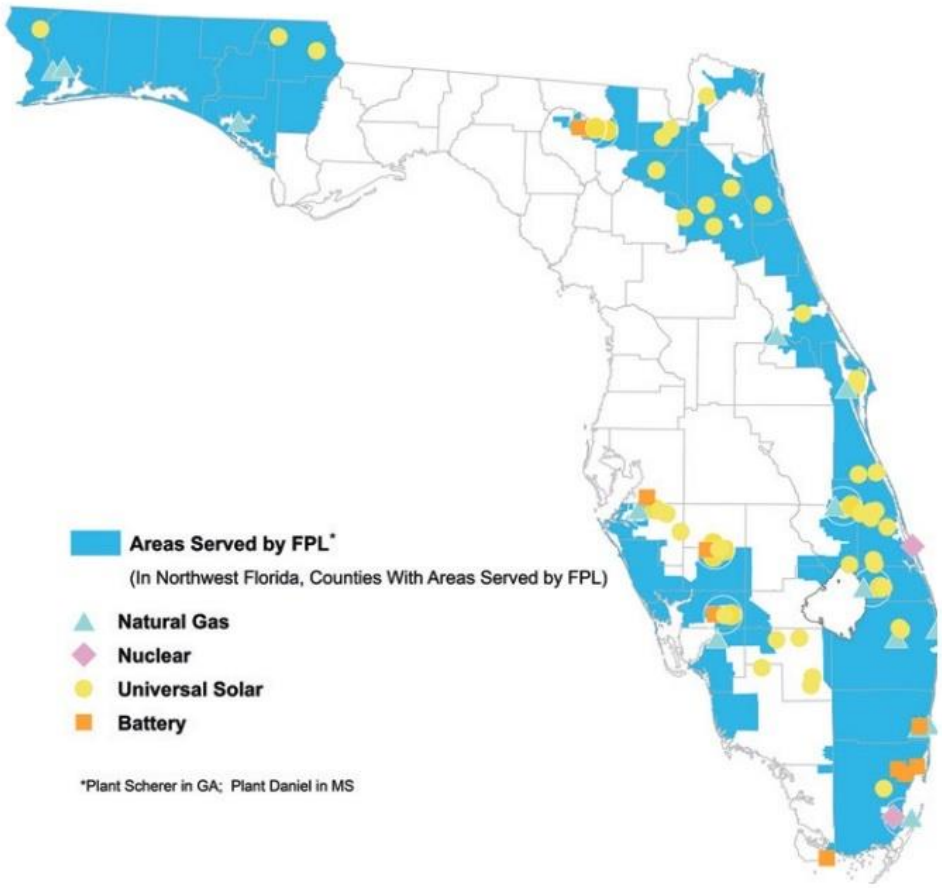
This section reviews FPL's historic and projected generation, capacity, and use of demand-side management programs. In addition, AEC estimates FPL's historic and projected greenhouse gas emissions and provides an overview of FPL and NextEra's public perception.

FPL's Clean Energy Transition Plan

FPL (including its Gulf Power territory) is the largest electric utility in Florida, serving more than 5.6 million customers across 192 municipalities and counties in the northwestern corner and along the eastern and southern coasts of the state: including Miami and Fort Lauderdale (see Figure 2). FPL serves 55percent rural and residential customers and 45 percent commercial and industrial customers.[19]

[13] NextEra Energy Inc. "By the Numbers." Available at: https://www.nexteraenergy.com/sustainability/overview/about-this-report/by-the-numbers.html
[14] Ibid.
[15] Next Era Energy. 2021. *Environmental, Social and Governance Report*. Available at: https://www.nexteraenergy.com/content/dam/nee/us/en/pdf/2021_NEE_ESG_Report.pdf. pg. 6, 13.
[16] Next Era Energy. 2021. *Environmental, Social and Governance Report*. Ibid. pg. 21.
[17] FPL. April 2022. *Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan*. Available at: http://www.psc.state.fl.us/ElectricNaturalGas/TenYearSitePlans. p.12
[18] Ibid.
[19] FPL. April 2022. *Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan*. Schedule 2.1

Figure 2. Service areas and plant locations for FPL (including Gulf Power)



Reproduced from: [1] NextEra Energy. 2022. Form 10-k for the fiscal year ended December 31, 2021. Available at: https://www.investor.nexteraenergy.com/reports-and-filings/annual-reports

In accordance with Florida Statutes,[20] FPL submits a power plant site plan each year to the Florida Public Service Commission that forecasts the next ten-years of the utility's future electric generation needs, reports on how it plans to meet future electric demand, and discloses information about current and future power plant sites. These reports are an important resource for understanding FPL's current energy portfolio and its plans for a transition towards cleaner energy sources. FPL's most recent plan—the *2022-2031 Ten Year Power Plant Site Plan*—is the best publicly available resource providing information on FPL's investment and operations planning.[21]

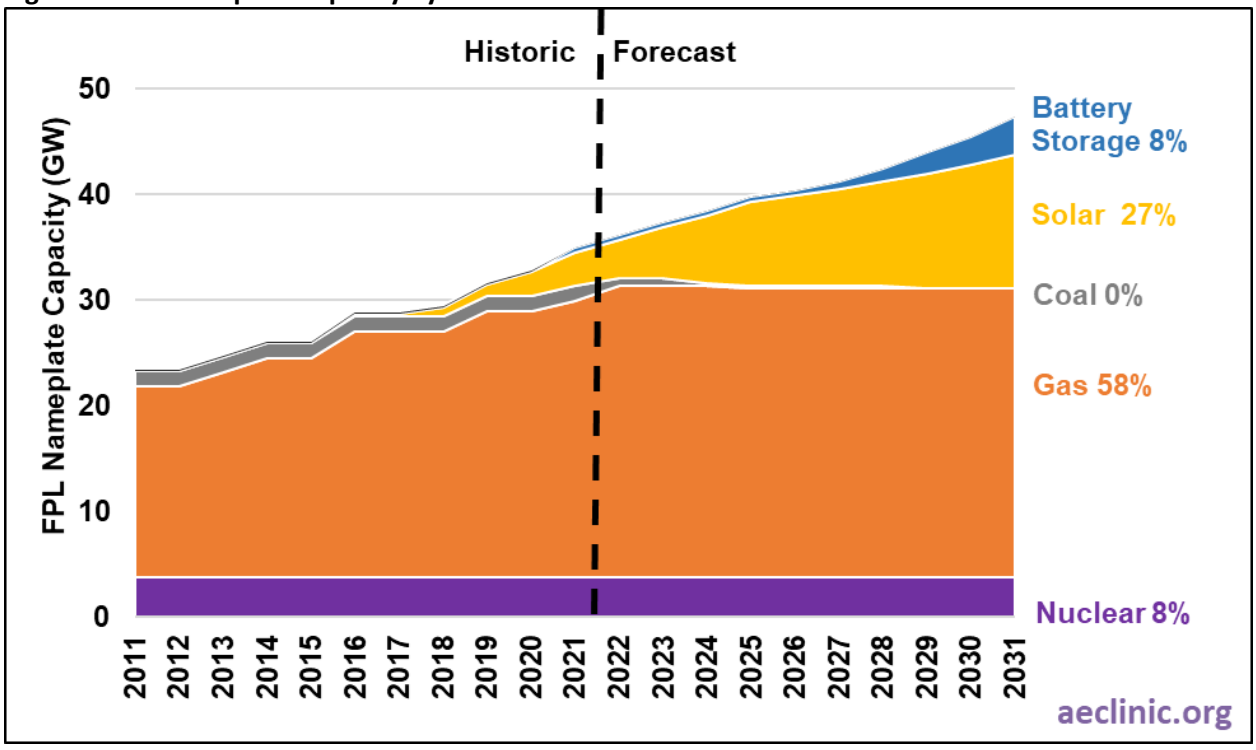
In 2021, FPL's summer peak load (the maximum power usage in a single hour over the course of the year) and total annual demand reached approximately 26,500 megawatts (MW) and 136,800 gigawatt-hours (GWh), respectively.[22] In that year, rural and residential customers consumed roughly 67,200 GWh,

[20] Florida Statutes Chapter 186. *State and Regional Planning.* Available at: http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0100-0199/0186/0186ContentsIndex.html
[21] FPL. April 2022. *Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan*.
[22] Ibid. [Schedules 3.1 and 3.3]

commercial customers 50,500 GWh, and industrial customers 4,700 GWh.[23]

According to FPL's *10-Year Site Plan*, the share of FPL's capacity (that is, its maximum possible total generation) powered by fossil fuels (including coal, oil, and gas) is expected to drop by 21 percentage points over the next ten years, from 79 percent of FPL's capacity in 2021 down to 58 percent in 2031 (see Figure 3). At the same time, FPL's overall capacity is planned to grow by more than one-third from 35 GW in 2021 to 48 GW 2031. This means that while the **share** of FPL's capacity attributed to fossil fuels declines, the **amount** of fossil fuel capacity stays relatively the same: 27.8 GW in 2021 to 27.5 GW in 2031.[24] FPL's solar capacity is expected to grow by almost 300 percent over the next decade, from 3.16 GW in 2021 to 12.60 GW in 2031.[25] That being said, FPL plans for its renewable capacity to grow without a corresponding phase out of its fossil fuel capacity: a future that is not consistent with NextEra's climate goal to reduce its CO_2 emissions rate to 67 percent of its 2005 emissions rate by 2025.

Figure 3. FPL nameplate capacity by resource



Note: Oil is not visible on the map due to its low capacity (124 MW in 2031).
Data source: FPL. April 2022. Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan [Schedule 1 and Schedule 8].

In addition, FPL introduced 0.47 GW of battery storage into its capacity resource mix in 2021, just 1 percent of FPL's total forecasted capacity. FPL projects its battery storage capacity to grow by 800 percent between 2022 and 2031 reaching 3.8GW, or 8 percent of FPL's capacity. The utility's *10-Year Site Plan* does not

[23] Ibid. Schedule 2.2
[24] The share of FPL's current and future generation is also dominated by fossil fuels (see Figure 4 below).
[25] Ibid. Schedule 1 and Schedule 8

provide a transparent report of its planned renewable resources, omitting all financial data for 41 out of 51 proposed solar and battery storage facilities.[26] Florida House Bill 7117 requires the following information to be included in utility ten-year site plans:

> *The amount of renewable energy resources the utility plans to produce or purchase over the 10-year planning horizon and the means by which the production or purchases will be achieved.*[27]

By omitting financial information for proposed solar projects, FPL fails to show the means by which they will recover the cost.

FPL's last wholly owned coal-fired power plant was retired on December 31, 2020 and its demolition began in June 2021.[28] FPL's Gulf Power territory converted its last coal-fired facility to gas in January 2021—ahead of schedule due to the damage Hurricane Sally caused to the plant's coal-handling equipment.[29] The coal capacity shown in Figure 3 above is FPL's shared ownership of coal units in Mississippi. According to FPL's 2022 *10-year Site Plan*, the Daniel 1 and 2 units are scheduled to retire in 2024.

Generating **capacity** (in GW)—total possible or maximum generation—is one of two key measures of energy supply (as shown in Figure 3 above). The second metric is annual **generation** (in GWh), which measures how much electricity is produced in a year. Fossil fuels accounted for 75 percent, or 106 GWh, of FPL's generation in 2021 (see Figure 4).[30]

[26] FPL April 2022 10-Year Plan. p. 188 - 239

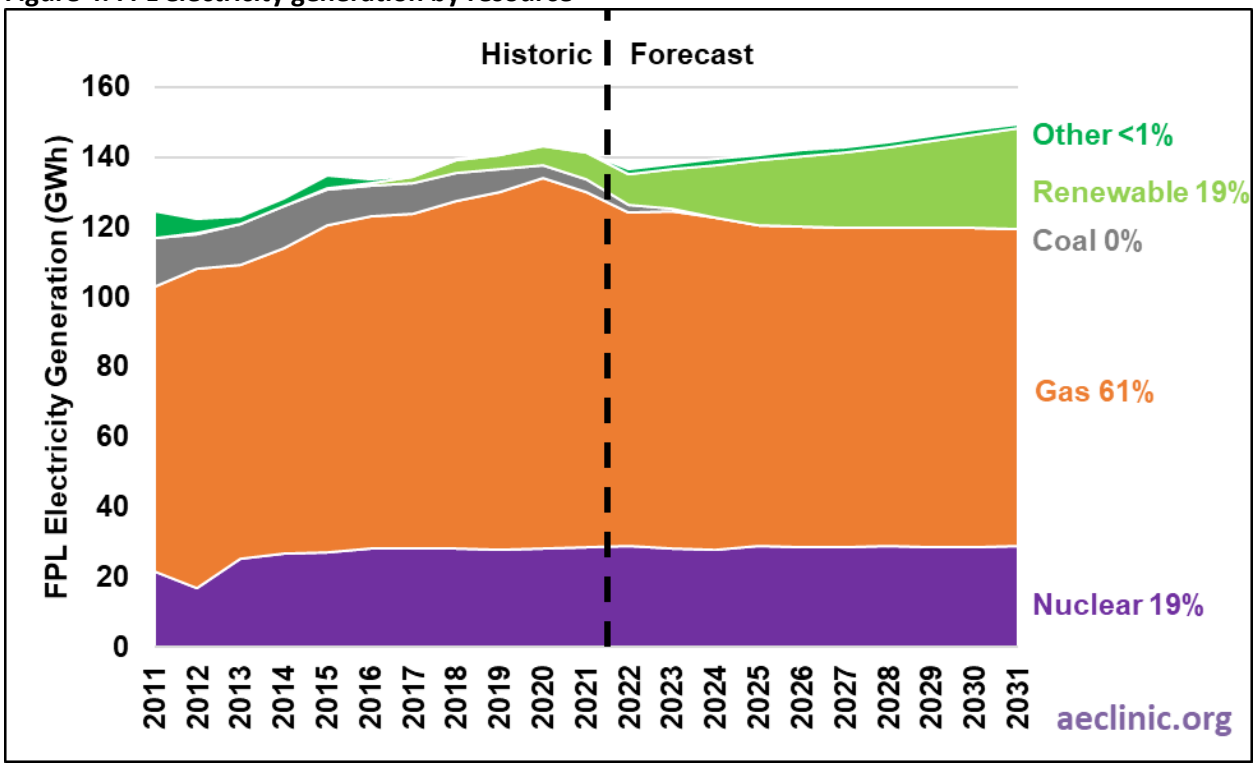
[27] Florida General Laws Chapter 2012-117 (Energy), Section 186.801(2012). *An act relating to energy*. Available online: http://laws.flrules.org/2012/117. p.3

[28] FPL. 2021. "FPL begins demolishing its last coal-fired power plant while advancing zero-emissions energy facilities in Florida." Available at: http://newsroom.fpl.com/news-releases?item=126228

[29] Little, J. 2021. "Gulf Power's Plant Crist converts to natural gas, renamed Gulf Clean Energy Center." Available at: https://www.pnj.com/story/news/2021/01/22/gulf-powers-plant-crist-converts-natural-gas-gets-new-name/6674602002/

[30] Ibid. Schedule 6.1

Figure 4. FPL electricity generation by resource

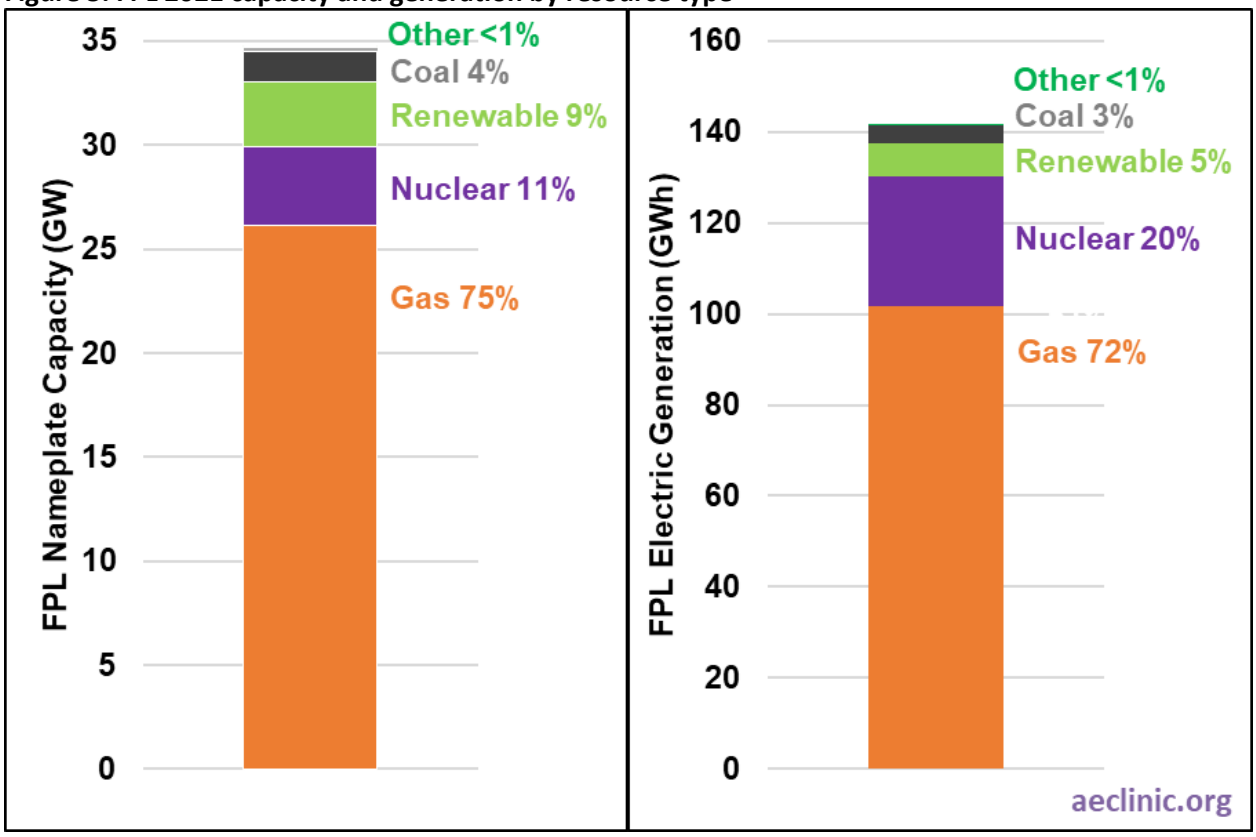


Note: "Other" includes Biomass, Non-Utility Generators, and Power Purchase Agreements
Data source: FPL. April 2022. Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan [Schedule 6.1].

According to FPL's *10-Year Site Plan*, the utility's fossil fuel share of generation is expected to drop 15 percentage points, down to 61 percent by 2031. Solar energy accounted for just 5percent of FPL's generation in 2021 (compared to 3 percent Florida-wide). The final 20 percent of FPL's generation was served by nuclear, biomass, and non-renewable market energy purchases; this share remains about the same in 2031 in FLP's projection.[31] A comparison of FPL's 2021 capacity and generation is shown in Figure 5 below.

[31] Ibid.

Figure 5. FPL 2021 capacity and generation by resource type



Data source: FPL. April 2022. Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan. [Schedules 1 and 6.1]

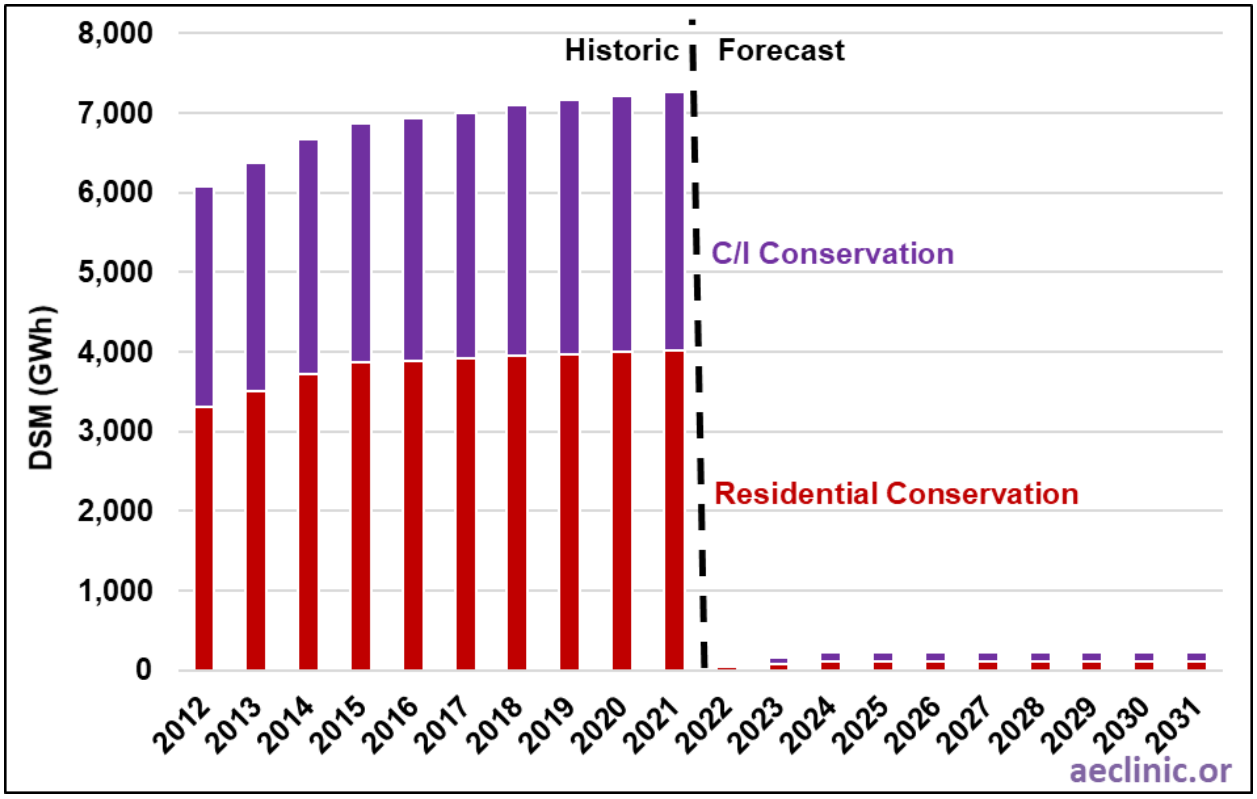
NextEra plans to invest $65 million into a 25 MW FPL hydrogen pilot program that will produce hydrogen through electrolysis using solar energy. FPL intends to test the feasibility of using a hydrogen/natural gas blend in its Okeechobee combined cycle unit. Hydrogen produced using renewable energy, called "green" hydrogen, does not produce emissions in its combustion.[32]

FPL's site plan accounts for both "supply-side" resources (generating capacity) and "demand-side" resources such as energy efficiency programs. An assortment of programs, measures and policies together called "demand-side management" aim to reduce the amount of electricity used by consumers both annually and in the peak demand hour. Energy efficiency savings are achieved through programs that incentivize reducing building energy needs (e.g., building shell improvements, efficient lighting and appliances). Demand response efforts, in contrast, provide incentives for customers to reduce the amount of electricity used at peak times (i.e., mid-day summer when there are lots of air-conditioners running). Time-of-use rates are an example of a peak shaving program that offers reduced rates for customers willing to shift their energy usage outside of peak times. Both energy efficiency and demand response play key roles in curbing consumer electric demand and related emissions while lowering energy costs in the transition away from fossil fuels. FPL's demand-side management savings rose slightly from 2011 to 2021

[32] FPL April 2022 10-Year Plan. p. 147

but the utility plans for these savings to drop drastically from 2021 onwards according to the *10-Year Site Plan* (see Figure 6—which shows FPL's own reported past and expected future annual energy savings — and Figure 7— which shows FPL's own reported past and expected future customer electric demand reductions on peak hours). The drop is attributable to FPL's planned collapse in residential and commercial and industrial (C/I) demand-side measure investment; residential energy efficiency savings plunge more than 1,900 MW between 2021 and 2022 forecasts and C&I savings is expected to fall approximately 1,200 MW in that same period.[33] In its site plan, FPL argues the lower costs and increased fuel efficiency of new generation options reduce the cost-effectiveness of demand-side management activities aimed at reducing peak load and annual energy consumption.[34] With lower levels of demand-side management FPL's customer demand will grow, requiring more capacity to meet peak needs and more renewables to achieve emission reduction targets.

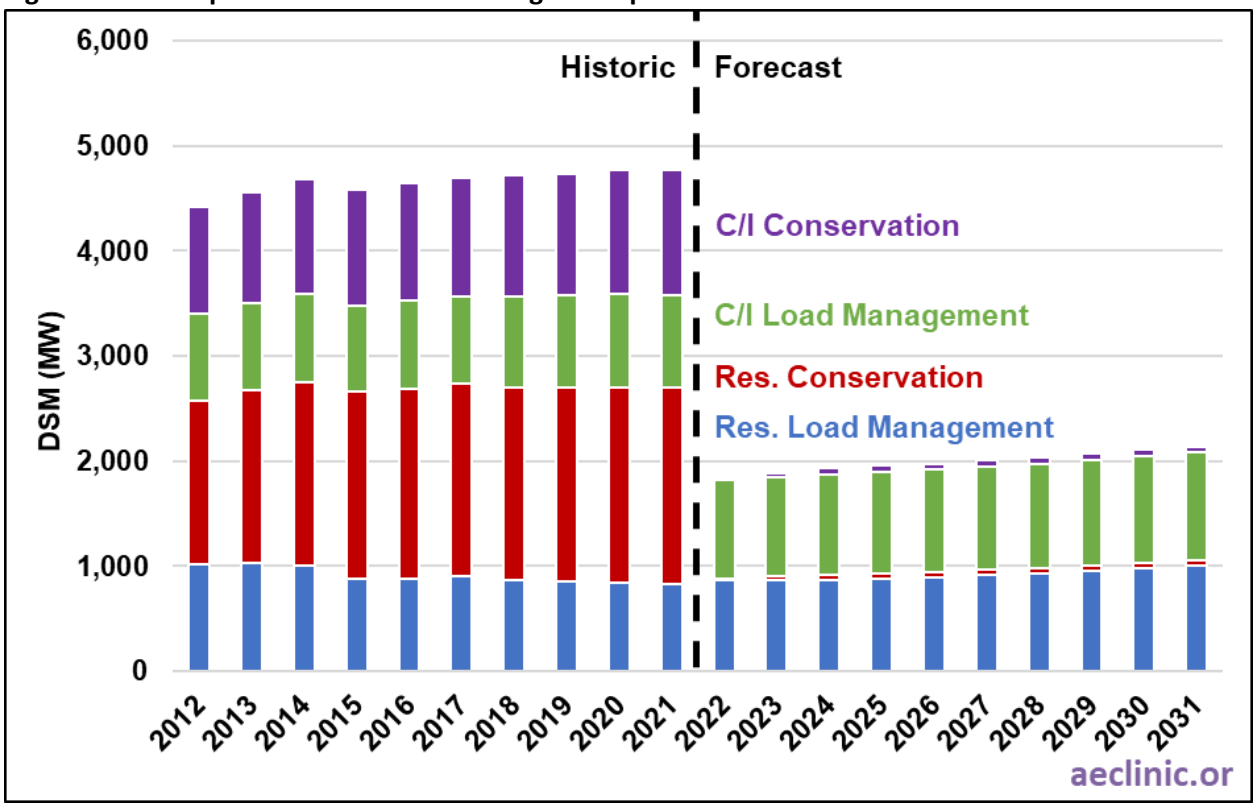
Figure 6. FPL's reported demand side management annual energy savings



Data source: FPL. April 2022. Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan [Schedule 3.1 and Schedule 3.3].

[33] FPL April 2022 10-Year Plan. [Schedule 3.1 and Schedule 3.3]
[34] FPL April 2022 10-Year Plan. p. 39

Figure 7. FPL's reported demand side management peak load reductions



Data source: FPL. April 2022. Florida Power & Light Company and Gulf Power Company's 2022-2031 Ten Year Power Plant Site Plan [Schedule 3.1 and Schedule 3.3].

In addition, FPL's *2021 10-Year Plan* noted that certain Biden Administration actions could raise utility costs and that the Company wished to gauge the impact of those in future analyses before committing to additional demand-side investments.[35]

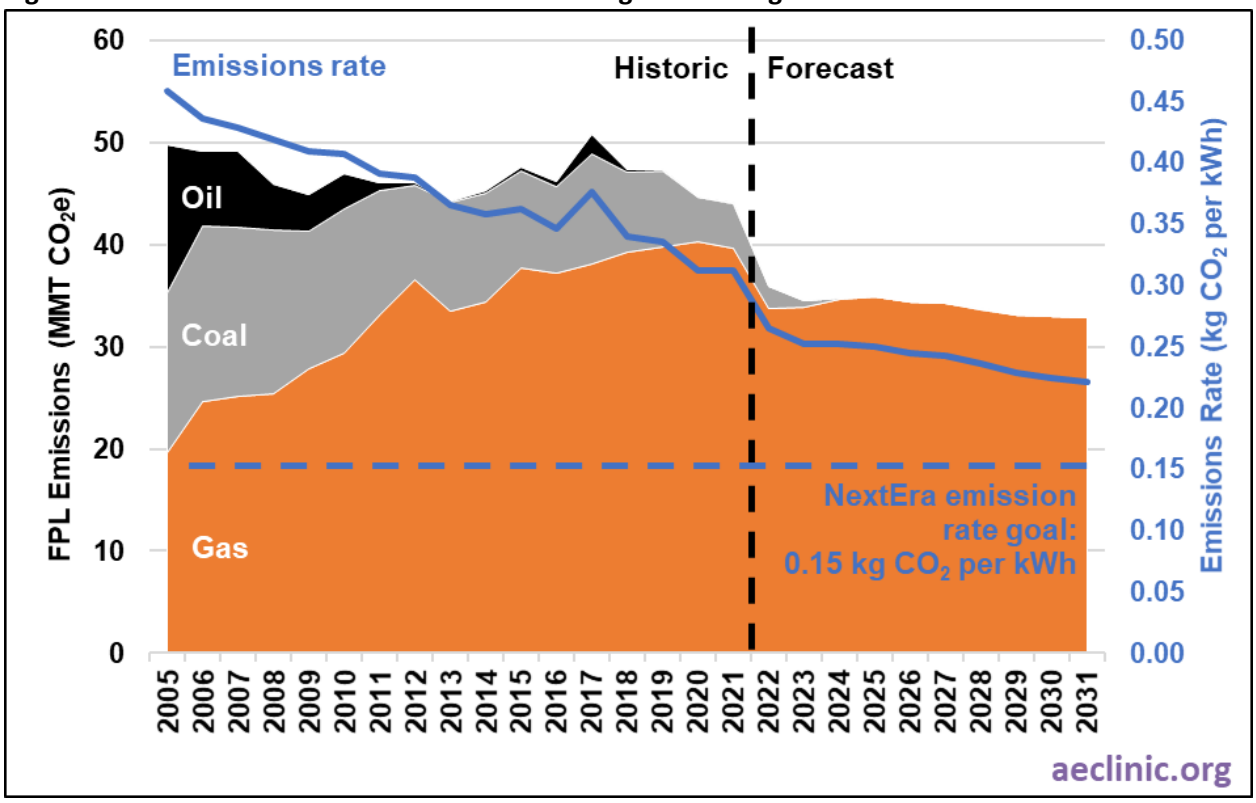
FPL's greenhouse gas emissions

Tracking utility greenhouse gas emissions is essential to ensuring alignment between investor and customer interests. FPL's *10-Year Site Plans* omit any reporting on greenhouse gas emissions or other pollutants caused by power production. In this section, AEC estimates FPL's greenhouse gas emissions using fuel requirement data provided in the Company's 2022 *10-Year Site Plan* and fuel-specific emissions factors for CO_2, methane (CH_4), and nitrous oxide (N_2O) from the U.S. Environmental Protection Agency (EPA).[36] The global warming potential for CH_4 and N_2O is 25 and 298 times that of CO_2 emissions, respectively. [37] FPL's coal, oil and gas resources emit 44 MMT CO_2e today and can be expected (based on FPL's 2022 *10-Year Site Plan*) to emit 33 MMT CO_2e in 2031 as the utility retires coal and oil generation and

[35] FPL April 2021 10-Year Plan p. 28.
[36] NextEra reports 2005 and current CO_2, NO_x, and SO_2 emissions but does not provide the methodology used to calculate these emissions.
[37] U.S. EPA. April 2021. Emission Factors for Greenhouse Gas Inventories. Available at: https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

adds renewables to its portfolio (see Figure 8). Further decarbonization of the utility's electric supply requires a deeper reduction of its share of fossil-fuel derived electricity together with more investment in demand-side savings measures. FPL's greenhouse gas emissions have fallen just 11percent over the last sixteen years (50 MMT CO_2e in 2005 to 44 MMT CO_2e in 2021).

Figure 8. Estimation of FPL historic and forecasted greenhouse gas emissions



Data source: (1) FPL. 2010-2022. Florida Power & Light Company and Gulf Power Company Ten Year Power Plant Site Plans [Schedule 5]; (2) U.S. EPA. April 2021. Emission Factors for Greenhouse Gas Inventories.

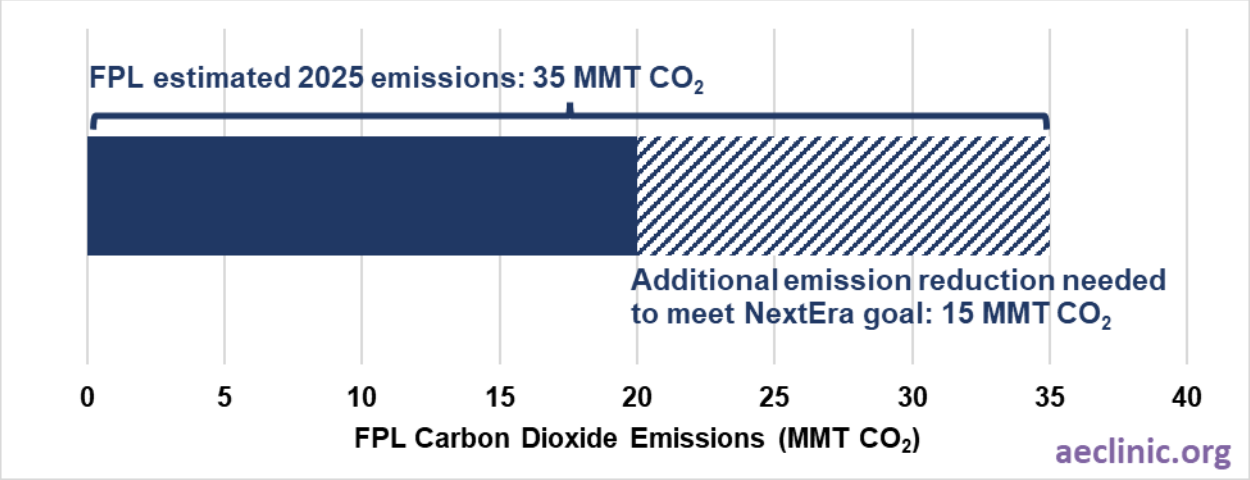
FPL's decarbonization plan is not consistent with NextEra's climate commitments. According to its *Environmental, Social, and Governance* report, NextEra aims to reduce its CO_2 emissions rate by 67 percent of 2005 levels by 2025.[38] An emissions rate is the amount of emissions released per energy unit (e.g., kg CO_2 per kilowatt-hour (kWh)), whereas total emissions are tons of emissions released. A falling emissions rate does not guarantee that total emissions are decreasing if a utility's annual generation is rising. AEC estimates that FPL's *10-Year Site Plan* will achieve about a 45 percent decrease in the utility's CO_2 emissions rate, and a 30 percent reduction in total CO_2 emissions, by 2025 relative to 2005. AEC estimates that achieving NextEra's emissions rate target would require FPL to

AEC estimates that achieving NextEra's emissions rate target would require FPL to reduce emissions by an additional 15 MMT CO_2.

[38] NextEra Energy. 2021. *Environmental, Social and Governance Report*. Available at: https://www.nexteraenergy.com/content/dam/nee/us/en/pdf/2021_NEE_ESG_Report.pdf. pg. 6, 13.

reduce emissions by an additional 15 MMT CO_2 (i.e., an additional 0.10 kg CO_2 per KWh reduction in the emissions rate) (see Figure 9).

Figure 9. FPL CO_2 emissions and NextEra's climate target



Data source: (1) FPL. 2010-2022. Florida Power & Light Company and Gulf Power Company Ten Year Power Plant Site Plans [Schedule 5].; (2) U.S. Environmental Protection Agency. April 2021. Emission Factors for Greenhouse Gas Inventories.

Moreover, if ambitious statewide climate targets are established in Florida in a future legislative session, or if federal policy is enacted to mandate emissions reduction (e.g., the Build Back Better Act[39]), FPL will need to be far more aggressive in its transition away from fossil fuels (i.e., follow other electric utilities across the United States by reducing greenhouse gas emissions by 50 percent by 2030 and achieving net-zero emissions by 2050). If not, the utility risks significant stranded assets that will reduce profitability, deter investors, and undercut stock prices.

If ambitious statewide climate targets are established in Florida in a future legislative session, or if federal policy is enacted to mandate emissions reduction, FPL will need to be far more aggressive in its transition away from fossil fuels.

Reputational concerns

FPL has received criticism for its support of Florida's new solar net metering bill that "guts" residential rooftop solar incentives.[40] FPL argued that maintaining net metering incentives would result in higher costs

[39] Mulkerrin, M. 2021. "The Build Back Better Act Takes Historic Action to Address the Climate Crisis and Reduce Energy Costs for Families." Steny Hoyer House of Representatives Majority Leader. Available at: https://www.majorityleader.gov/content/build-back-better-act-takes-historic-action-address-climate-crisis-and-reduce-energy-costs#:~:text=The%20Build%20Back%20Better%20Act%20would%20create%20a%20new%20Civilian,in%20communities%20across%20the%20country.

[40] Gheorghiu, I. 2022. "Florida passes net metering bill that will gut rooftop solar, advocates say, as they call for a veto." Utility Dive. Available at: https://www.utilitydive.com/news/florida-passes-net-metering-bill-that-will-gut-rooftop-solar-advocates-say/620000/

to customers but failed to produce evidence to support their claim.[41] Studies conducted in Georgia and Arizona have argued the use of connection fees (such as proposed in HB 741) could be subject to antitrust laws.[42] In addition, these studies conclude that net metering can lower costs for solar customers.[43] In addition, some reports indicate that FPL may have advocated for "fake" or "ghost" candidates in local Florida races.[44] Both the net metering bill and the "ghost" candidate scandals led to widespread criticism on social media and calls by state politicians for investigations.[45]

Lastly, FPL has been called out as one of three investor-owned utilities in Florida accused of using anti-solar tactics; for example, donating to campaigns, employing lobbyists, funding a 2016 anti-solar ballot initiative that would have limited rooftop solar, and attempted to pressure the Public Service Commission to roll back net metering rules.[46] NextEra Power PAC's political contributions in the 2021-2022 cycle include recipients such as the Edison Electric Institute,[47] a trade group involved in attacking solar at the state level.[48]

NextEra has taken pains to convey the Company as being ahead-of-the-curve on decarbonizing their energy generation resources.[49] According to its 2021 Environmental, Social and Governance report:

> *As one of the largest electric power and energy infrastructure companies in North America and a leader in the renewable energy industry, NextEra Energy is committed to building a sustainable energy future that is affordable, reliable and clean.*

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[41] Ibid.

[42] (1) Klas, M. E., M. A. Ariza. 2021. "Documents show FPL wrote bill to slow rooftop solar's growth by hampering net metering." *Miami Herald.* Available at: https://www.miamiherald.com/news/politics-government/state-politics/article256663672.html; (2) Uteuova, A. 2022. "Florida Republican bill 'basically erases' state's only pro-solar energy policy." Available at: https://www.theguardian.com/us-news/2022/apr/01/florida-solar-energy-bill-financial-incentive; (3) Howard Fischer Capitol Media Services. February 2, 2022. "Court: AZ utility can be held liable for charging higher rates to rooftop-solar customers". Tuscon. Available at: https://tucson.com/news/local/court-az-utility-can-be-held-liable-for-charging-higher-rates-to-rooftop-solar-customers/article_dbd0f11c-82d4-11ec-8a3a-ffd6be99729a.html

[43] Ibid.

[44] Garcia, J., A. Martin. 2021. "Florida Power & Light execs worked closely with consultants behind 'ghost' candidate scheme, records reveal | Special Report." *Orlando Sentinel.* Available at: https://www.orlandosentinel.com/politics/os-ne-florida-power-and-light-senate-ghost-candidates-20211202-szjhv7ox6vcmphm6pgd437y52i-htmlstory.html

[45] Eskamani, A. 2022. Tweet on fake candidate schemes. Available at: https://twitter.com/AnnaForFlorida/status/1478776488707215366

[46] PIRG Education Fund. 2021. *Blocking Rooftop Solar: The companies, lobbyists and front groups undermining local clean energy.* Available at: https://uspirg.org/reports/usp/blocking-rooftop-solar

[47] Open Secrets. "Party Breakdown of PAC Recipients, 2021-2022." Available at: https://www.opensecrets.org/political-action-committees-pacs/nextera-energy/C00064774/pac-to-pac/2022

[48] 1) PIRG Education Fund. 2021. *Blocking Rooftop Solar: The companies, lobbyists and front groups undermining local clean energy.* Available at: https://uspirg.org/reports/usp/blocking-rooftop-solar; 2) C. Pittman. 2021. "Rick Scott now acknowledges climate change, but still won't do anything about it." Florida Phoenix. Available at: https://floridaphoenix.com/2021/01/28/rick-scott-now-acknowledges-climate-change-but-still-wont-do-anything-about-it/; 3) Money Trails. "State Solutions Inc." Available at: https://moneytrails.org/state-solutions-inc/

[49] (1) Huus, K., J. Gold. 2022. "How NextEra is gearing up to be the energy giant of tomorrow." *GreenBiz.* Available at: https://www.greenbiz.com/article/how-nextera-gearing-be-energy-giant-tomorrow#:~:text=NextEra%20has%20earmarked%20a%20whopping,or%20by%20about%20150%20percent. (2) NextEra Energy. "FPL Group lauded for quality of climate change disclosure." Available at: https://newsroom.nexteraenergy.com/FPL-Group-lauded-for-quality-of-climate-change-disclosure

> *As a renewable energy leader, climate-related issues are core to our overall business strategy. As such, the entire board, led by our chairman and CEO, has oversight of climate-related risks and opportunities, including their impact on our strategy. The board understands the impacts of climate change on our future growth, as well as how we prepare our business to adapt to the effects of climate change.*[50]

AEC's review of social and news media references to both NextEra and FPL found that—contrary to NextEra's self-portrayal—public perception surrounding FPL is generally negative.

While FPL's reputation as a leader in decarbonization is itself a positive one, it contrasts with public statements made by NextEra CEO, Jim Robo, in which he calls net-zero targets "disingenuous",[51] and with criticism of NextEra by the Energy and Policy Institute (EPI), a watchdog group that seeks to identify attacks on renewable energy development from fossil fuel companies.[52] According to EPI, NextEra lacks an absolute carbon reduction goal for net-zero emissions that would align with keeping temperature rises below the Paris Climate Agreement target of 2 degrees Celsius.[53] The Paris Agreement's binding goal is for countries to limit warming to well below 2 degrees Celsius, and preferably to 1.5 degrees Celsius.[54] Starting in 2024, countries will regularly report on their progress towards achieving this goal in preparation for setting more ambitious goals for emissions reduction.[55]

FPL engages in public disputes with newspaper editorials that the Company deems too harsh or mistaken regarding FPL's actions (particularly rate increases).[56] FPL's public critique of newspaper editorials earned it a rebuke in news stories and further publicized and drew attention to FPL's other activities.[57]

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[50] NextEra Energy. 2021. *Environmental, Social and Governance Report*. p. 13

[51] Rives, K. 2021. "Utility net-zero carbon goals 'disingenuous,' says NextEra CEO." S&P Global Market Intelligence. Available at: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/utility-net-zero-carbon-goals-disingenuous-says-nextera-ceo-64516067#:~:text=NextEra%20Energy%20Inc.%2C%20the%20largest,major%20power%20utilities%20have%20done.

[52] Energy Policy Institute. "About." Available at: https://www.energyandpolicy.org/about/#:~:text=The%20Energy%20and%20Policy%20Institute,to%20address%20the%20climate%20crisis.

[53] Schafer, J. 2020. "NextEra Energy Only Large Utility Company Without Absolute Carbon Reduction Goal." Energy Policy Institute. Available at: https://www.energyandpolicy.org/nextera-energy-only-large-utility-company-without-absolute-carbon-reduction-goal/#:~:text=In%20fact%2C%20NextEra%20is%20the,emissions%20rates%20or%20intensity%20instead.&text=NextEra%20says%20that%20it%20will,2025%20from%20a%202005%20baseline.

[54] UNFCCC. "The Paris Agreement." Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[55] Ibid.

[56] FPL. 2022. "Truth Matters: The truth is, we're still waiting." Available at: https://www.fpl.com/landing/truth-matters.html
Silgay, E. 2019. "FPL's CEO says Sun Sentinel is hypocritical and misleads readers." *South Florida Sun Sentinel.* Available at: https://www.sun-sentinel.com/opinion/commentary/fl-op-com-fpl-eric-silagy-sun-sentinel-20190527-iofd4nxzznc67jwwylnhq567bq-story.html

[57] Ovalle, D. 2022. "FPL makes unusual public attack on Miami Herald after solar power coverage." *Miami Herald.* Available at: https://www.miamiherald.com/news/politics-government/article257095457.html

III. Risks to Investors

This section describes the six main risks to investors resulting from NextEra and FPL's transition plans (see Table 2). Most of these risks are tied to FPL's continued dependence on natural gas at a time when utilities need to double down on renewable energy and phase out fossil fuels in order to align with the Paris Climate Agreement. Several of these risks also adversely impact ratepayers through increased energy bills.

Table 2. Risks to NextEra Investors

	Risks	Explanation
1	**Failing to meet their own climate commitments**	A misalignment of transition plans threatens investors' ability to meet their own company targets, putting their reputation at risk and potentially causing their own shareholders to demand their divestment from NextEra.
2	**Volatile and uncertain natural gas prices**	Both volatility and uncertainty in natural gas prices leave NextEra's investors vulnerable to unreliable price forecasts, unpredictable global crises and variable weather conditions.
3	**Public opposition to new fossil fuel infrastructure**	Public opposition to fossil-fuel-dependent project development can cause long delays and raise overall costs.
4	**Regulatory actions that limit fossil fuel generation**	If more stringent climate regulations are adopted in Florida or the United States as a whole, FPL is at considerable risk of needing to close its fossil fuel plants prematurely.
5	**Competition from renewable energy and battery storage technology**	As the cost of renewable energy technology continues to decline as a result of falling capital costs, increased market competition, and economies of scale, fossil fuel plants inevitably will become increasingly uneconomic.
6	**Over-procurement of capacity**	Overestimation of customer demand results in over-procurement of generation capacity, which threatens the profitability of plants, putting investors at risk for a drop in NextEra stock value and values.

NextEra investors risk failing to meet their own climate commitments

According to the 2022 *Climate Action 100+ Net-Zero Company Benchmark*,[58] electric utilities are not living up to their investors' expectations on climate investments and lobbying efforts. The *Climate Action 100+* study looked at several criteria including emissions reduction targets, decarbonization strategies and climate policy engagement and found that out of the 33 electric utilities examined, no utility met more

[58] Climate Action 100+. 2021. *Net-Zero Company Benchmark*. Available at: https://www.climateaction100.org/progress/net-zero-company-benchmark/

than four of its ten criteria. NextEra was included in this assessment and met the criterion for a short-term greenhouse gas reduction target, and partially met the criteria for climate policy engagement, climate governance, and Task Force on Climate-Related Financial Disclosure (TCFD). NextEra did not meet the other six criteria.[59] With their own investors and climate commitments to consider, NextEra's shareholders must judge whether NextEra's transition plans align with their own. A misalignment of transition plans threatens investors' ability to meet their own company targets, putting their reputations at risk and potentially causing their own shareholders to demand divestment from NextEra.

Of NextEra's 2,451 shareholders, Vanguard Group Inc. and BlackRock Inc. hold the largest shares of the Company at about 1 percent each, each valued at about $26 million in 2022.[60] The next largest investors are State Street Corporation, JPMorgan Chase and Company, and Bank of America Corporation.[61]

According to Moody's 2021 credit analysis of FPL, the utility's reliance on natural gas-fired generation puts investors at "moderate carbon transition risk"[62] where transition risk "include[s] those [risks] related to regulation, technological development and market preferences and can increase firms' costs and decrease revenue."[63] Natural gas-fired plants are long-term assets, meaning that they are expected to run for decades. It is reasonable to expect that within that time frame (and before these units' lifetime has concluded), federal or state climate regulations would result in these assets being retired. NextEra itself is also cognizant of the potential risk the Company would face with any new federal or state emissions limits:

"Our operations may become subject to new federal, state and/or other regulation, such as the adoption of regulations that would impose new or additional limits on the emissions of greenhouse gases from electric generation units using fossil fuels like coal and natural gas that could impact our natural gas electric generation units at FPL."[64]

NextEra investors Vanguard,[65] BlackRock,[66] State Street Global Advisors,[67] and JP Morgan[68] are all

[59] Smyth, J. and Pomerantz, D. March 23, 2021. "Major Investors Find Electric Utilities are Not on Track to Meet Decarbonization Goals." *Energy and Policy Institute*. Available at: https://www.energyandpolicy.org/investors-utility-decarbonization/
[60] NASDAQ. 2022. "NEE Institutional Holdings." *Nasdaq.* Available at: https://www.nasdaq.com/market-activity/stocks/nee/institutional-holdings
[61] Ibid.
[62] Moody's Investors Service. August 2021. *Florida Power & Light Company*. Available at: https://www.investor.nexteraenergy.com/~/media/Files/N/NEE-IR/fixed-income-investors/download-library/Rating%20Agency%20Reports/Moodys%20FPL%20Aug%2023%202021.pdf. p. 8
[63] Ambrosio Preudhomme, N., Bruce, E., and Grant, A. 2022. *Transition risk and opportunities for asset managers: greenhouse gas emissions provide an important baseline*. Moody's. Available at: https://assets.website-files.com/5df9172583d7eec04960799a/6216b84237c34d13cc936299_BX11454_MA_Transition%20Risk%20AM_23Feb2022.pdf
[64] NextEra Energy, Inc. 2021. CDP Response. NEE. Available at: https://www.investor.nexteraenergy.com/~/media/Files/N/NEE-IR/Sustainability/NextEra%20Energy%202021%20CDP%20Response.pdf. p. 7
[65] Vanguard. N.d. "Building a Sustainable Future." *Vanguard*. Available at: https://corporate.vanguard.com/content/corporatesite/us/en/corp/who-we-are/we-care-about/sustainability.html
[66] BlackRock. 2022. "From ambition to action – the path to net zero." BlackRock. Available at: https://www.blackrock.com/us/individual/about-us/road-to-net-zero#
[67] State Street. N.d. "Environmental Sustainability." *State Street*. Available at: https://www.statestreet.com/values/environmental-sustainability.html
[68] JPMorgan Chase & Co. May 2021. "JPMorgan Chase Releases Carbon Reduction Targets for Paris-Aligned Financing Commitment." *JPMorgan Chase & Co.* Available at: https://www.jpmorganchase.com/news-stories/jpmorgan-chase-releases-carbon-reduction-targets-for-paris-aligned-financing-commitment

signatories of the Net Zero Asset Managers Initiative, a group of asset managers committed to achieving net zero emissions by 2050 or sooner.[69] Signatories also commit to set interim targets that are in line with the fair share of 50 percent global reduction by 2030 deemed necessary by the Intergovernmental Panel on Climate Change to keep global average temperature rise below 2 degrees Celsius.[70] Goldman Sachs, another shareholder of NextEra, has allocated $750 billion towards achieving its target of net-zero emissions by 2030.[71]

NextEra investors are at risk from volatile and uncertain natural gas prices

Unpredictable global events, such as the COVID-19 pandemic or Russia's recent invasion of Ukraine, can cause dramatic swings in the price of natural gas across the globe and make accurate price forecasting impossible.[72] From 2000 to 2019 Florida's average natural gas price for electric power generators has fluctuated substantially from year to year.[73] In December 2022, Florida's PSC approved FPL's request to recover $810 million from customers from spiking fossil gas prices and indicated additional requests from other utilities could be forthcoming.[74]

Moreover, U.S. natural gas prices have experienced increased volatility from variable weather events and the growing demand for U.S. liquified natural gas (LNG) exports (which leaves domestic natural gas prices sensitive to international gas markets).[75] While increased fuel prices are passed on to consumers, they also push the utility to run high-emitting resources less and rely more on their lowest emitting generating resources. Over time, the fossil fuel resources that make up the bulk of FPL's investments become increasingly uneconomic and run less often, a drag on overall utility profitability. These same fuel price increases and fluctuations put upward pressure on customer rates and bills over time, increasing household energy burdens. So far in 2022 U.S. natural gas prices have experienced two major shocks, a large winter storm that affected much of the United States, and the Ukraine-Russia crisis which both caused a jump in the Henry Hub[76] spot price (see Figure 10). Both volatility (daily fluctuations) and uncertainty (unknown future circumstances) in natural gas prices threaten the profitability of FPL's natural gas plants and, as a result, the share value of NextEra, leaving its investors (and ratepayers) vulnerable to

[69] Net Zero Asset Managers Initiative. n.d. "Signatories." Available at: https://www.netzeroassetmanagers.org/signatories/
[70] Net Zero Asset Managers Initiative. n.d. "The Net Zero Asset Managers Commitment." Available at: https://www.netzeroassetmanagers.org/commitment/
[71] Cruz, R. March 2020. "Goldman Sachs commits to reach net-zero carbon emissions by 2030." *S&P Global Market Intelligence*. Available at: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/goldman-sachs-commits-to-reach-net-zero-carbon-emissions-by-2030-63025530
[72] (1) U.S. EIA. 2021. "In 2020, U.S. natural gas prices were the lowest in decades." Available at: https://www.eia.gov/todayinenergy/detail.php?id=46376; (2) Bahceli, Y. 2022. "Ukraine crisis-led gas price surge revives demand for inflation hedges." Reuters. Available at: https://www.reuters.com/business/energy/ukraine-crisis-led-gas-price-surge-revives-demand-inflation-hedges-2022-02-28/
[73] U.S. EIA. 2022. "Natural Gas Prices." Available at: https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SFL_a.htm
[74] CBS Miami. December 7, 2021. "FPL Bills To Go Up Due To Fuel Costs". Available at: https://miami.cbslocal.com/2021/12/07/fpl-raising-rates-fuel-costs/
[75] U.S. EIA. 2022. "Prices." Short-term Energy Outlook. Available at: https://www.eia.gov/outlooks/steo/report/prices.php
[76] The Henry Hub is located in Louisiana, where several natural gas interconnections meet. These pipelines serve markets all over the United States. Due to its central location, local markets typically price their natural gas in relation to the Henry Hub price. For more information, see: CME Group. n.d. "Understanding Henry Hub." Available at: https://www.cmegroup.com/education/courses/introduction-to-energy/introduction-to-natural-gas/understanding-henry-hub.html

unreliable price forecasts, unpredictable global crises and variable weather conditions. Gas price fluctuation is less of a risk to investors given that Florida is a regulated utility (that is, not in a market-based region or "deregulated") but it is of some concern, nonetheless.

Figure 10. Henry Hub natural gas spot price fluctuations in 2022

Data source: U.S. EIA. 2022. "Henry Hub Natural Gas Spot Price." Available at: https://www.eia.gov/dnav/ng/hist/rngwhhdd.htm

NextEra investors are at risk from public opposition to new fossil fuel infrastructure

There is substantial public opposition to the continued dependence on fossil fuels for powering and heating our homes and businesses.[77] Public opposition to energy project development can cause long delays and raise overall costs.[78] For example, protesters have delayed and/or have been successful in terminating several pipeline projects across the United States in recent years including the Keystone XL

[77] (1) Worland, J. 2020. "The Reason Fossil Fuel Companies Are Finally Reckoning with Climate Change." Time. Available at: https://time.com/5766188/shell-oil-companies-fossil-fuels-climate-change/; (2) Hart Research Associates. 2016. *Americans' Views on Federal Fossil Fuel Policy and Clean Energy*. Prepared for the Natural Resources Defense Council and the League of Conservation Voters. Available at: https://www.nrdc.org/sites/default/files/views-on-fossil-fuel-policy-clean-energy-summary.pdf

[78] Woods, B., Stanton, E. A., and Wamsted, D. Risks Outweigh Rewards for Investors Considering PJM Natural Gas Projects. Available at: https://aeclinic.org/publicationpages/2020/9/24/risks-outweigh-rewards-for-investors-considering-pjm-natural-gas-projects

pipeline,[79] the Dakota Access pipeline,[80] the Sandpiper pipeline,[81] the Enbridge Line 3 pipeline,[82] and the Mariner East 2 pipeline.[83] These delays and shutdowns are expensive, threatening the profitability of NextEra, and subsequentially the value of shareholder investments.

By providing financing for a fossil fuel-heavy company, NextEra investors put their reputations at risk and may face pressure from their own investors to divest.[84] Moreover, strong public opposition to natural gas may influence public policy—resulting in more stringent environmental regulations and a worse policy environment for FPL's natural-gas-heavy portfolio going forward—another risk to the value of shareholder investments.

NextEra investors are at risk from regulatory actions that limit fossil fuel generation

If more stringent climate regulations are adopted in Florida or the United States as a whole, FPL is at considerable risk of needing to close its fossil fuel plants prematurely. Several federal clean energy standards are under consideration in the 117th Congress with emission reduction targets ranging from 100 percent by 2035 at the most stringent to 80 percent by 2050 at the least.[85] Moreover, the Build Back Better Act, also being considered in the 117th Congress, includes several provisions to facilitate the shift towards clean energy.[86]

The costs associated with building and maintaining prematurely retired generation facilities (which become "stranded assets") are passed on to consumers through higher rates and bills, adversely impacting FPL's public perception and relationship with its ratepayers. FPL already faces significant public backlash from rate increases; were the utility to increase rates to compensate for decommissioned fossil fuel facilities, the utility may face significant public opposition that would reflect badly on investors. Moreover, if FPL were not able to pass the cost on to ratepayers as a result of this backlash, then investors would risk losing the return on investment for these assets.

NextEra investors at risk from competition from renewable energy and battery storage technology

Renewable energy, demand response, and battery storage alternatives are becoming increasingly affordable. According to the financial advisory firm Lazard's latest analysis, renewable energy technologies

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[79] Adler, B. 2015. "The inside story of the campaign that killed Keystone XL." Vox. Available at: https://www.vox.com/2015/11/7/9684012/keystone-pipeline-won

[80] Kenny, C., Krieg, G., Sidner, S., & Blau, M. 2016. "Dakota Access Pipeline to be rerouted." CNN. Available at: https://www.cnn.com/2016/12/04/politics/dakota-access-pipeline/

[81] Hughlett, M. 2016. "Enbridge Energy pulling plug on Sandpiper pipeline." StarTribune. Available at: https://www.startribune.com/enbridge-energy-pulling-plug-on-sandpiper-pipeline/392082361/

[82] Mueller-Hsia, K. 2021. "How an Oil Company Pays Police to Target Pipeline Protesters." Brennan Center for Justice. Available at: https://www.brennancenter.org/our-work/analysis-opinion/how-oil-company-pays-police-target-pipeline-protesters

[83] Hurdle, J. N.d. "Mariner East: A pipeline project plagued by mishaps and delays." StateImpact Pennsylvania. Available at: https://stateimpact.npr.org/pennsylvania/tag/mariner-east-2/

[84] Sanzillo, T., Hippie, K., Williams-Derry, C. 2018. The Financial Case for Fossil Fuel Divestment. Institute for Energy Economics and Financial Analysis. Available at: http://ieefa.org/wp-content/uploads/2018/07/Divestment-from-Fossil-Fuels_The-Financial-Case_July-2018.pdf

[85] Congressional Research Service. 2021. Clean Energy Standards: Selected Issues for the 117th Congress. Available at: https://sgp.fas.org/crs/misc/R46691.pdf

[86] Mulkerrin, M. 2021. "The Build Back Better Act Takes Historic Action to Address the Climate Crisis and Reduce Energy Costs for Families."

such as community and large (or "utility-scale") solar, wind, and geothermal resources are currently competitive with fossil fuels.[87] The U.S. Solar Energy Technologies Office is working to further reduce the cost of solar by 50 percent by 2030,[88] and a 2020 survey of industry experts predicts a further 37 to 49 percent reduction in the cost of wind resources by 2050.[89]

As the cost of renewable energy technology continues to decline as a result of falling capital costs, increased market competition, and economies of scale, fossil fuel plants inevitably will become increasingly uneconomical.[90] This renders investors in fossil fuel dependent companies subject to higher risks as natural gas plants become less profitable compared to renewable generation. Again, this less of a risk for FPL given that Florida utilities are regulated (not market-based) but it is a concern, nonetheless. If shareholders were to sell their stock when natural gas is unprofitable compared to renewables, their share value would likely be lower.

It is an oft-stated concern of utilities that reliance on renewable energy, and the phase-out of fossil fuel resources, will put system reliability at risk during peak times due to the intermittency of wind and solar. When coupled with energy storage, electricity generated from renewable sources can be stored when demand is low and then discharged during these peak times; with flexible demand-side management resources (demand response, smart meters, virtual power plants), system load can be balanced throughout the year. A model developed from the National Renewable Energy Laboratory demonstrates that energy storage is a valuable asset for meeting peak demand, and utilities across the nation are adding battery storage and demand response to their portfolios.[91]

NextEra investors are at risk from over procurement of capacity

According to FPL's *10-Year Site Plan*, FPL's summer peak electric demand rose by an annual average of 1.2 percent from 2012 to 2021 (or 11 percent in total over this period). FPL forecasts that summer peak demand will rise more quickly than it has in recent years: 1.4 percent each year from 2022 to 2031 (or 13 percent in total over this period).[92] These predictions do not comport with the U.S. Energy Information Administration (EIA) 2022 *Annual Energy Outlook* projections for future electric demand. EIA projects that U.S. electric demand will fall (not rise) by 0.03 percent and fall by 1.12 percent in the Southeast region each year from 2022 to 2031.[93] While FPL expects to **add** about 4 GW in peak demand, EIA expects that FPL

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[87] Lazard. 2021. *Levelized Cost of Energy, Levelized Cost of Storage, and Levelized Cost of Hydrogen*. Available at: https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen/

[88] Office of Energy Efficiency and Renewable Energy. N.d. "New Solar Opportunities for a New Decade." Office of Energy Efficiency and Renewable Energy. Available at: https://www.energy.gov/eere/solar/sunshot-2030

[89] Wiser, R., Rand, J., Seel, J., Beiter, P., Baker, E., Lantz, E., & Gilman, P. 2021. "Expert elicitation survey predicts 37% to 49% declines in wind energy costs by 2050." Nature Energy. Available at: https://www.nature.com/articles/s41560-021-00810-z

[90] Lazard. 2021..

[91] National Renewable Energy Laborator. 2022. "Happy Hours: Energy Storage Could Support the Grid Every Hour of the Day, All Year Long." Available at: https://www.nrel.gov/news/program/2022/happy-hours-energy-storage-could-support-the-grid-every-hour-of-the-day-all-year-long.html

[92] FPL April 2022 10-Year Plan. [Schedule 3.1 and Schedule 3.3]

[93] U.S. EIA. 2022. *Annual Energy Outlook 2022*. [Energy Use Electric Power Total]. Available at: https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2022&region=1-0&cases=ref2022&start=2020&end=2050&f=A&linechart=~ref2022-d011222a.119-2-AEO2022.1-0~&map=ref2022-d011222a.4-2-AEO2022.1-0&ctype=linechart&sourcekey=0

will **lose** about 3 GW in peak demand (based on the agency's projection for the Southeast region).

Overestimation of customer demand results in over-procurement of generation capacity, which raises bills for ratepayers. In the short run, overestimation of electric demand can improve utility investors return on investment but when higher demand does not materialize the opposite can be true: the process of overestimation and correction of demand can put downward pressure on stock values.

IV. Clean Energy Transition Plan Best Practices

To provide the framework for recommending best practices of electric utility transition plans, AEC reviewed related studies from the Institutional Investors Group on Climate Change, National Renewable Energy Laboratory (NREL), and Regulatory Assistance Project (RAP).[94] Based on the priorities stressed in this literature we focus on four main areas of review across existing utility transition plans: (1) emissions reduction, (2) demand-side management, (3) grid modernization, and (4) diversity and inclusion. A clean, reliable, and equitable transition away from fossil-fuel derived electricity requires strong, consistent efforts in all five areas.

Table 3. Best Practices for Utility Transition Plans

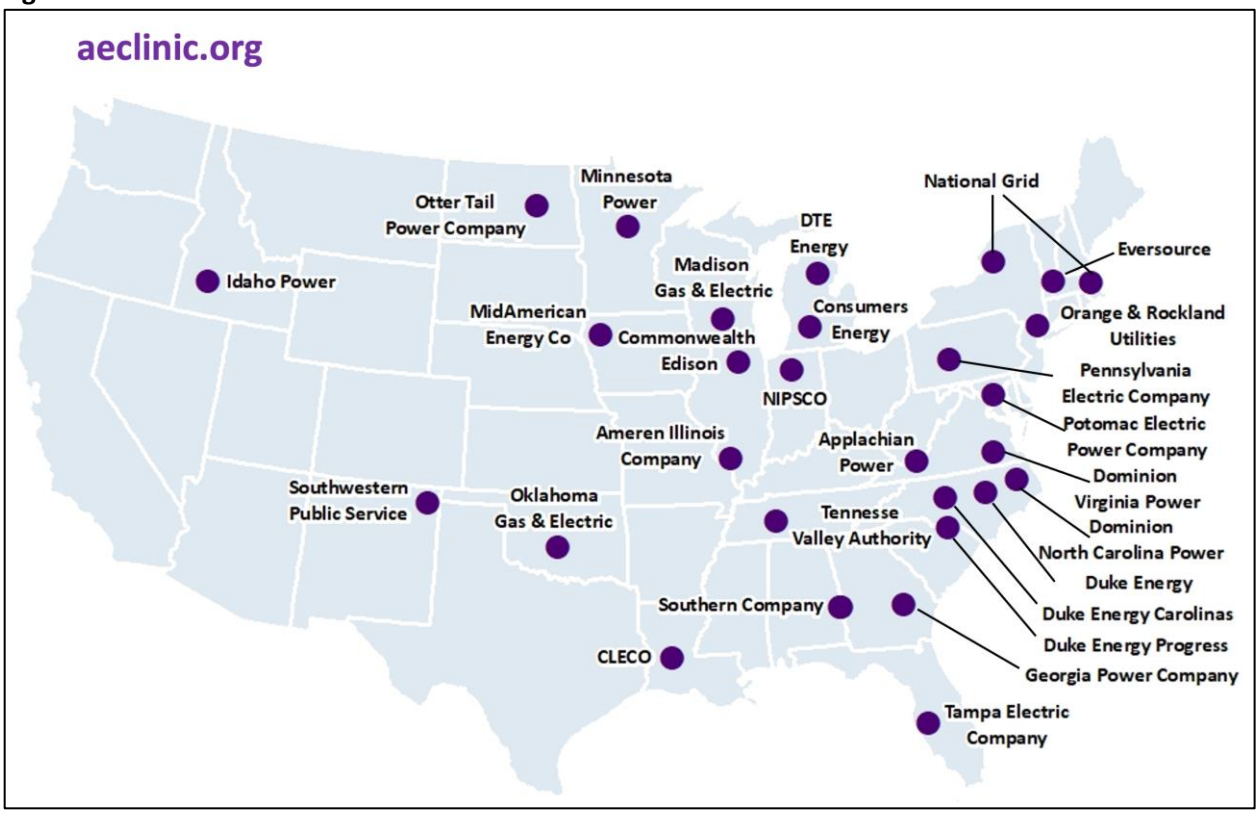
Priorities	Best Practice	Example Utility
Emissions Reduction	Set short-, medium-, and long-term greenhouse gas emissions reduction targets	Southern Company TECO
	Install large-scale renewable energy	TECO
	Invest in carbon capture and sequestration technologies	Southern Company
Demand-Side Management	Provide an array of energy efficiency, demand response, smart meter, and electrification incentives	Dominion Virginia TECO
Grid Modernization	Invest in distributed generation resources, battery storage, smart meters, and microgrid technology	Dominion Virginia Tennessee Valley Authority TECO
Diversity and Inclusion	Transparent resources for measuring progress on transition plan goals	Southern Company
	Ensure community and stakeholder involvement in decision making	Southern Company
	Aim to address racial-ethnic and social equity within the community	ComEd

In total, AEC reviewed the transition plans of 30 electric utilities around the United States selected from those included in the SEPA Utility Carbon-Reduction Tracker[95] among those most comparable to FPL and for their geographic diversity (see Figure 11).

[94] (1) Spavieri S., Spooner N., Garcia-Manas, C. 2020. *Accelerating the transition to zero emissions in the power sector*. Institutional Investors Group on Climate Change. Available at: https://www.iigcc.org/resource/power/; (2) Cox, S. et al. 2017. *Bridging Climate Change Resilience and Mitigation in the Electricity Sector Through Renewable Energy and Energy Efficiency*. NREL and USAID. Available at: https://www.nrel.gov/docs/fy18osti/67040.pdf; (3) James, Christopher. March 2019. *Best Practices for Achieving Cleaner Air and Lower Carbon*. RAP. Available at: https://www.raponline.org/wp-content/uploads/2019/03/rap-james-best-practices-achieving-cleaner-air-lower-carbon-2019-march-26.pdf

[95] SEPA. January 2022. SEPA Utility Carbon-Reduction Tracker. Available at: https://sepapower.org/utility-transformation-challenge/utility-carbon-reduction-tracker/

Figure 11. Electric utilities reviewed in this assessment



Data source: See Table 7 in Appendix C: References for Utility Review

1. Emissions reduction

Best practices: Set short-, medium-, and long-term greenhouse gas emissions reduction targets, install large-scale renewable energy, invest in carbon capture and sequestration technologies.

The electric sector contributes 25 percent of total U.S. greenhouse gas emissions. Utilities' emissions reduction targets go beyond their state or parent company goals; they have the power to substantially reduce U.S. electric sector emissions and ensure the United States meets its Paris Climate Agreement commitments.[96]

Electric utilities throughout the United States have established their own "climate goals" or greenhouse gas emissions reduction targets not required by local, state or federal requirements. These targets aim to

[96] Godlevskaya, D. et al. December 17, 2021. "Major US electric utility climate pledges have the potential to collectively reduce power sector emissions by one-third." *One Earth. Volume 4, Issue 12*. Available at: https://doi.org/10.1016/j.oneear.2021.11.008

partially reduce or eliminate either CO_2 or all greenhouse gas emissions. Net-zero[97], or carbon-neutral, targets seek to balance emissions released from fuel combustion with gases removed from the atmosphere via planting trees, or through carbon capture and storage technology.[98] In contrast, CO_2 or greenhouse gas-free targets seek to produce no emissions at all.[99] From AEC's 30-utility assessment, Southwestern Public Service, DTE Energy, Idaho Power, Consumers Energy, Ameren, Madison Gas & Electric, Appalachian Power, Southern Company, CLECO, Dominion Virginia, Commonwealth Edison (ComEd), Pepco, and National Grid are all aiming for net-zero carbon emissions between 2040 and 2060.[100] NextEra is the only large utility parent company that lacks an absolute carbon reduction goal and instead aims to reduce carbon intensity by 67 percent of 2005 levels by 2025.[101]

NextEra is the only large utility parent company that lacks an absolute carbon reduction goal and instead aims to reduce carbon intensity by 67 percent of 2005 levels by 2025.

Meeting these targets will entail large-scale installation of renewable energy. Depending on the geographic region of the utility, this translates into large investments in solar, onshore wind, and/or offshore wind and large-scale retirement of fossil-fuel-fired power plants.

Tampa Electric (TECO), along with its parent company, Emera Inc., aims to achieve net-zero carbon emissions by 2050. To get there, they have also set interim goals of 60 and 80 percent reduction in carbon emissions from 2000 levels by 2025 and 2040 respectively.[102] To meet its targets, TECO is investing in solar energy and in emerging solutions like carbon capture, biofuels and hydrogen.[103] So far, TECO has cut carbon emissions by half from 2000 levels.[104] Similarly, Duke Energy Florida aims to reduce carbon emissions at least 50 percent of 2005 levels by 2030 and to achieve net-zero carbon emissions by 2050.[105] In contrast, AEC estimates that FPL's *10-Year Site Plan* will achieve a 35 percent reduction in CO_2 emissions by 2030.

Both TECO and Duke Energy Florida (both located in Florida) have higher emissions rates than FPL and rely

[97] For a discussion of concerns raised regarding net zero policies see https://theconversation.com/climate-scientists-concept-of-net-zero-is-a-dangerous-trap-157368.

[98] (1) National Grid. n.d. "What is net zero?" Available at: https://www.nationalgrid.com/stories/energy-explained/what-is-net-zero; (2) Levin, K., Song, J., and Morgan, J. December 2015. "COP21 Q&A: What is GHG Emissions Neutrality in the Context of the Paris Agreement?" *World Resources Institute*. Available at: https://www.wri.org/insights/cop21-qa-what-ghg-emissions-neutrality-context-paris-agreement

[99] (1) National Grid ESO. n.d. "What is net zero and zero carbon?" Available at: https://www.nationalgrideso.com/future-energy/net-zero-explained/net-zero-zero-carbon; (2) National Academies of Science, Engineering, and Medicine. n.d. "Is it possible to achieve net-zero emissions?" Available at: https://www.nationalacademies.org/based-on-science/is-it-possible-to-achieve-net-zero-emissions#:~:text=Achieving%20zero%20emissions%20means%20releasing,oxide%20or%20other%20greenhouse%20gases

[100] See Table 7 in Appendix C: References for Utility Review.

[101] Schafer, A. J. 2020. "NextEra Energy Only Large Utility Company Without Absolute Carbon Reduction Goal." Available at: https://www.energyandpolicy.org/nextera-energy-only-large-utility-company-without-absolute-carbon-reduction-goal/

[102] TECO. November 8, 2021. "Tampa Electric Expands Environmental Stewardship, Outlines Vision for "Net Zero" by 2050." Available at: https://www.tampaelectric.com/mediacenter/2021/11-08-2021/

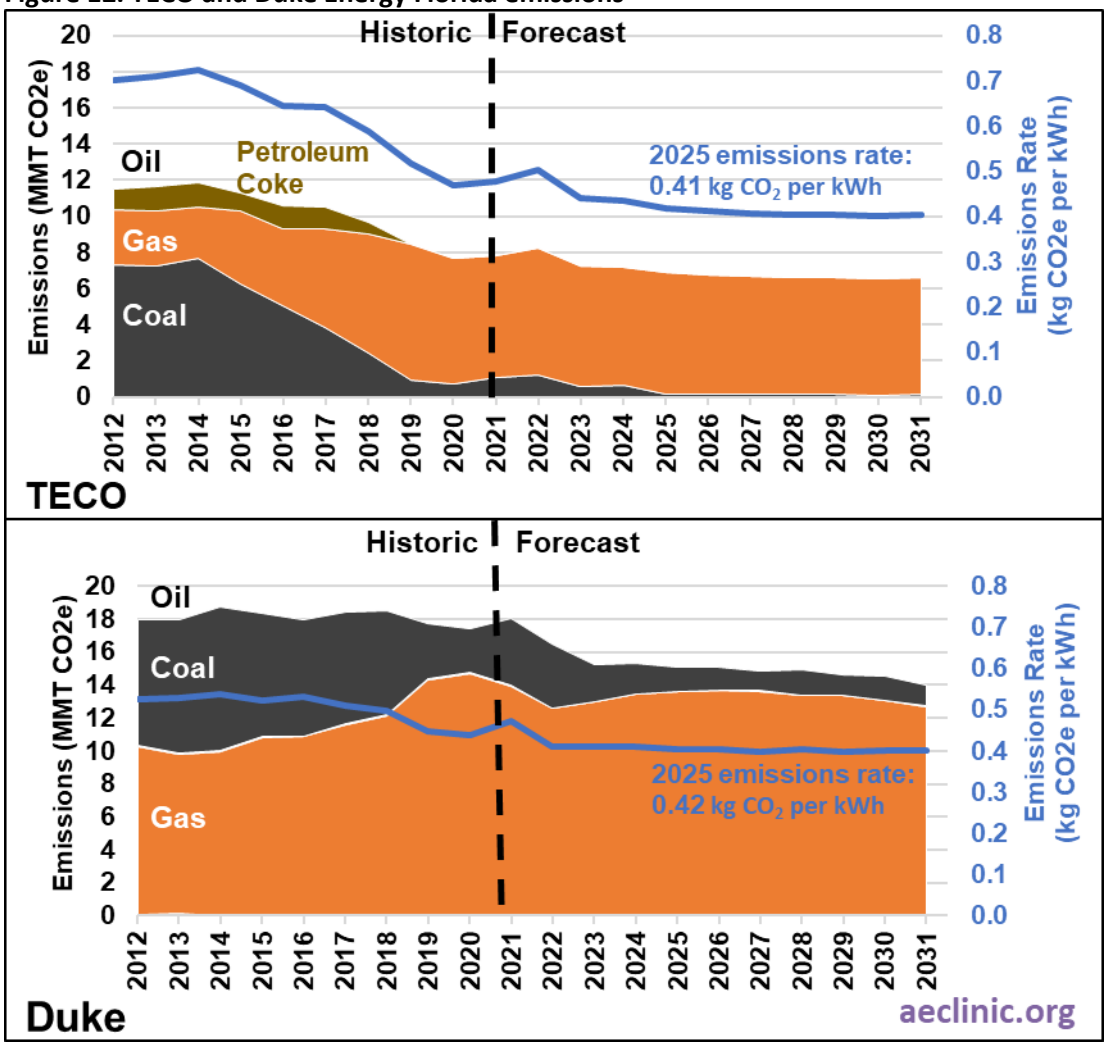
[103] Ibid.

[104] TECO. n.d. "Tampa Electric Eyes Net-Zero Carbon Future." Available at: https://www.tampaelectric.com/teconetzero

[105] Duke Energy. February 9, 2022. "Duke Energy expands clean energy action plan." Available at: https://news.duke-energy.com/releases/duke-energy-expands-clean-energy-action-plan

heavily on fossil fuels (see Figure 12).

Figure 12. TECO and Duke Energy Florida emissions



Source: (1) Duke Energy Florida. 2022. Ten-Year Site Plan as of December 31, 2021. Available at: http://www.psc.state.fl.us/ElectricNaturalGas/TenYearSitePlans; (2) Tampa Electric Company. 2022. Ten-Year Site Plan as of December 31, 2021. Available at: http://www.psc.state.fl.us/ElectricNaturalGas/TenYearSitePlans; (3) U.S. Environmental Protection Agency. April 2021. Emission Factors for Greenhouse Gas Inventories. Available at: https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

Bottom line: To reduce risks to the Company and its investors, FPL must do more to reduce its carbon emissions by following other electric utilities in the United States and establishing a net-zero carbon emissions target by 2050 or earlier with interim emissions reduction targets for 2030 and 2040. To meet these targets FPL should invest even more into renewable energy while also retiring its natural gas plants.

2. Demand-side management

Best practices: Provide an array of energy efficiency, demand response, smart meter, and electrification incentives to residential, commercial and industrial customers.

Demand-side management aims to reduce the amount of electricity needed by consumers (e.g., energy efficiency, demand response, smart meters, time-of-use rates, etc.). Demand-side management plays a key role in curbing consumer demand and related emissions while lowering energy costs in the transition away from fossil fuels. Almost every utility describes energy efficiency as a key component in achieving their climate goals. Investments in energy efficiency include rebate programs for retrofits, heat pumps, and energy efficiency appliances, and/or customer outreach and education. For example, Dominion Virginia will increase energy efficiency program funding by 47 percent from 2020 to 2025 and Ameren Missouri and Illinois have invested about $181 million in 2020 to fund energy efficiency programs. Moreover, ComEd, TECO and Dominion Virginia have installed smart meters to allow for peak time savings and improved customer energy consumption monitoring.[106] In 2020, Tennessee Valley Authority was able to offset about 1,500 MW of investment in new capacity through demand response programs.[107]

FPL's energy savings are very low—just 0.06 percent in 2020. In comparison, Orlando Utilities Company and Jacksonville Electric Association achieved 0.35 percent and 0.40 percent energy efficiency savings as a percentage of sales, respectively.

FPL has several demand-side management programs including residential home surveys and business energy evaluations, load management programs, and retrofit assistance. However, FPL's energy savings are very low—just 0.06 percent in 2020. In comparison, Orlando Utilities Company and Jacksonville Electric Association achieved 0.35 percent and 0.40 percent energy efficiency savings as a percentage of sales, respectively. Orlando Utilities Company also spent 1.04 percent of revenues on energy efficiency, exceeding FPL's 0.79 percent in energy efficiency spending. [108]

Bottom line: FPL's past energy savings have been very low, in the context of the Southeastern region and across United States, and FPL plans to all but cease demand-side management investment moving forward (see Figure 7 and Figure 6 above). Instead, FPL should be increasing load management and energy efficiency efforts.

3. Grid modernization

Best practices: Invest in distributed generation resources, battery storage, smart meters, and microgrid technology to improve reliability and flexibility.

Grid modernization encompasses strategies, like distributed generation, that aim to improve the flexibility of the electric grid while making it more reliable, resilient, sustainable, and secure. Distributed generation

[106] See Table 7 in Appendix C: References for Utility Review

[107] Tennessee Valley Authority. May 6, 2021. "Sustainability Report". Available at: https://www.tva.com/environment/environmental-stewardship/sustainability/sustainability-report

[108] York, D. and Cohn, C. 2021. *Unrealized Potential: Expanding Energy Efficiency Opportunities for Utility Customers in Florida*. American Council for an Energy Efficient Economy (ACEEE). Available at: https://www.aceee.org/white-paper/2021/01/unrealized-potential-expanding-energy-efficiency-opportunities-utility

is electricity generated at or near where it will be used—most commonly, this takes the form of rooftop solar panels on homes and businesses and small scale battery storage.[109] Distributed generation provides a back-up power source when the main electric grid experiences an outage and also reduces the wasted energy that occurs during transmission and distribution.[110] Rooftop solar panels are a distributed generation resource that provide benefits for both consumers (lower bills) and the utility (avoided capacity and transmission costs).[111] Storage technologies can be an important tool for working together with intermittent renewable resources to reliably meet customer peak demand. According to the U.S. Energy Information Administration, the Southeast was second to last in large-scale battery storage in 2019 with only 25 MW of installed capacity.[112]

National Grid, ComEd, TECO, Dominion Virginia, Tennessee Valley Authority, Eversource Energy and Appalachian Power all include distributed generation in their transition plans. Electric utilities also identify two-way energy flows (i.e., the ability for power to flow both to and from customers using "net metering") as a strategy for modernizing the electric grid (e.g., Tennessee Valley Authority, Ameren). In Florida, modernizing the electric grid is one of the focus areas of TECO's plans for a net-zero carbon future.[113] TECO has launched a $2 million microgrid pilot program, which includes battery storage and residential solar, that will power up to 27 homes in Hillsborough County.[114] Dominion Virginia has launched three battery storage pilot projects amounting to 16 MW in total.[115]

FPL's modernization plans include installation of about 4 GW of battery storage—8 percent of FPL's capacity—which will be primarily charged by solar energy.[116] In addition, FPL's large-scale battery storage pilot program includes: (1) a microgrid consisting of a 3 MW battery alongside an existing solar PV system; and (2) three battery storage plus electric vehicle and/or electric vehicle infrastructure pilot programs.[117]

Bottom line: FPL's grid modernization plans are misleading; they highlight plans for increasing battery storage and investing in microgrid technologies, but the scale of these projects is very small. For example, in Southern Company's 2020 *Implementation and Action toward Net Zero* report, the utility provides an illustrative capacity mix for 2050 that includes 17 percent solar resources (10 GW) and 22 percent solar

[109] U.S. EPA. n.d. "Distributed Generation of Electricity and its Environmental Impacts." Available at: https://www.epa.gov/energy/distributed-generation-electricity-and-its-environmental-impacts#:~:text=Distributed%20generation%20refers%20to%20a,and%20combined%20heat%20and%20power.&text=In%20the%20residential%20sector%2C%20common,Small%20wind%20turbines

[110] Ibid.

[111] American Public Power Association. n.d. "Solar Distributed Generation." Available at: https://www.publicpower.org/issue/solar-distributed-generation

[112] U.S. Energy Information Administration. 2021. Battery Storage in the United States: An Update on Market Trends. Available at: https://www.eia.gov/analysis/studies/electricity/batterystorage/

[113] TECO. November 8, 2021. "Tampa Electric Expands Environmental Stewardship, Outlines Vision for "Net Zero" by 2050."

[114] Florida Public Service Commission. 2021. "Florida PSC Approves TECO Microgrid Pilot Program." Available at: http://www.psc.state.fl.us/Home/NewsLink?id=11940

[115] Dominion Energy. 2020. "Leading The Way To A Clean-Energy Future". Available at: https://www.sustainability.dominionenergy.com/

[116] FPL April 2022 10-Year Plan. [Schedule 1 and Schedule 8], p. 142-143

[117] Ibid. p. 142-143

with storage (13 GW).[118] In contrast, FPL plans for 27 percent of its total capacity in 2031 to be solar resources while battery storage only comprises 8 percent of total capacity. To fully reap the benefits of solar, and balance renewable intermittency, solar and storage should be co-located and installed simultaneously.[119]

4. Diversity and Inclusion

Best practices: Provide transparent resources for measuring progress on transition plan goals, ensure community and stakeholder involvement in decision making, and aim to address racial-ethnic and social equity within the community.

Ensuring that utilities' decarbonization efforts are equitable requires transparency about climate progress, evaluation of potential equity implications of the transition, and identification of strategies to lessen these impacts with accountability measures in place to ensure these strategies are carried out. For many electric utilities, investing in local communities means recognizing racial-ethnic and social inequities and prioritizing vulnerable groups for local solar projects or other green infrastructure. For example, ComEd is seeking to support racial and social equity by providing education, workforce development, and general investment into vulnerable communities.[120] In addition, Southern Company is planning to invest $200 million by 2025 to advance racial equity and social justice in their community.[121]

Without accountability, utilities' climate efforts may be no more than empty promises. For example, to ensure accountability to their customers and stakeholders, utility progress towards transition plans should be transparent and easily accessible to the public. Some utilities are already doing this; Pepco has an online progress tracker for emissions reduction, LED lighting expansion, leak rates, and electrification their vehicle fleet. Similarly, Southern Company publishes data on energy use, emissions, water and waste management, and workforce demographics[122] Moreover, establishing frequent communications with utility stakeholders and the local community helps to guide utilities in their decision making and ensuring accountability.

FPL's *Environmental, Social, and Governance Report*[123] does include several quantitative metrics, including data on emissions, customers, community efforts, and employees but there is a significant opportunity to

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[118] Southern Company. 2020. *Implementation and Action Toward Net Zero*. Available at: https://www.southerncompany.com/about/governance/reports.html

[119] See: (1) NREL. 2020. "Where and when does solar plus storage make sense for commercial buildings?" Available at: https://www.nrel.gov/docs/fy21osti/77112.pdf; (2) McLaren, J., Laws, N., Anderson, K, DiOrio, N., & Miller, H. 2019. "Solar-plus-storage economics: What works where, and why?" *Electricity Journal*, 32(1). Available at: https://doi.org/10.1016/j.tej.2019.01.006

[120] Exelon. August 4, 2021. "Exelon Utilities Announces Goal to Achieve Net-Zero Emissions by 2050." Available at: https://www.exeloncorp.com/newsroom/exelon-utilities-announces-goal-to-achieve-net-zero-emissions-by-2050#:~:text=CHICAGO%20%E2%80%93%20Exelon%20Utilities%20today%20announced,to%20address%20the%20climate%20crisis.&text=Converting%2030%20percent%20of%20its,and%2050%20percent%20by%202030

[121] Southern Company. 2020. "Reports". Available at: https://www.southerncompany.com/about/governance/reports.html

[122] Southern Company. 2021. "ESG Data Table." Available at: https://www.southerncompany.com/content/dam/southerncompany/pdfs/about/governance/reports/Southern_Company_Data_Download.pdf

[123] (1) NextEra Energy. 2021. *Environmental, Social and Governance Report*.; (2) NextEra Energy. 2021. "By the Numbers." Available at: https://www.nexteraenergy.com/sustainability/overview/about-this-report/by-the-numbers.html

expand upon these metrics. For example, more detailed information on workplace accidents and workforce composition.[124]

In addition, FPL's Gulf Power territory (but not the rest of FPL) assists low-income households through their Community Energy Saver Program, which provides both education on energy efficiency and behavior changes to reduce energy use and direct installation of conservation measures.[125] However, it is not clear how much energy savings have been achieved for low-income households through this program and whether FPL plans to offer this program to customers outside of Gulf Power's service area. FPL's Residential Low-Income program assists low-income customers with energy retrofits but again, the amount of assistance provided through this program is not reported. FPL's SunAssist program, directed at low-income households, has subscribed about 7 MW out of 37.5 MW of reserved residential solar capacity as of January 2021.[126]

FPL is under investigation by the House of Representatives Committee on Energy and Commerce for lobbying against a federal shutoff moratorium during the COVID-19 pandemic, arguing that state and local moratoriums were in the works, and then shutting off power to customers, despite receiving funding from the Coronavirus Aid Relief and Economic Security Act.[127]

Bottom line: Other utilities are doing more to engage their community and stakeholders than FPL. The Company should increase stakeholder and community engagement to ensure that a clean energy transition that is just and reflects the needs of both their investors and customers.

[124] See, for example: Southern Company. 2021. "ESG Data Table."
[125] FPL April 2022 10-Year Plan. p. 100
[126] Ibid. p. 140
[127] Pallone, F. et al. 2022. Letter to John W. Ketchum, CEO of NextEra Energy Inc. U.S. House Committee on Energy and Commerce. Available at: https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Letter%20to%20NextEra%20Energy%20re%20Utility%20Shutoffs.pdf

V. Recommendations for a NextEra/FPL Transition Plan

Based on NextEra/FPL's current transition plans and a review of utility best practices, AEC has developed seven recommendations for a new NextEra/FPL clean energy transition plan that is in alignment with both the Paris Climate Agreement and the interests of investors (see Table 4). Together, these recommendations provide a blueprint for reducing the risk to NextEra's investors posed by FPL's dependence on fossil fuels, lack of climate action, slow progress on grid modernization, and negative public perception.

Table 4. Recommendations for NextEra/FPL Transition Plan

	Recommendations for NextEra/FPL Transition Plan
1	Coordinate NextEra and FPL transition plans
2	Establish short-, medium-, and long-term emission reduction targets, including a net zero target
3	Ramp up demand-side management efforts
4	Invest in energy storage technologies
5	Modernize the electric grid and increase renewable energy capacity
6	Consider multiple scenarios in future planning and reduce planning time horizon
7	Increase stakeholder and community engagement, and align plan with TCFD recommendations

Recommendation #1: Coordinate NextEra and FPL transition plans

NextEra Energy has its own emissions rate reduction target, but FPL does not need to comply with that target.[128] NextEra and FPL investors face serious risks from FPL's dependence on natural gas as their primary resource. As a first step in mitigating these risks, AEC recommends that NextEra and FPL coordinate their clean energy transition plans. Comparison of current planning documents from NextEra and FPL reveals a distinct lack of coordination—FPL only plans to reduce its share of capacity fired by fossil fuels by 13 percentage points and its emissions by 45 percent by 2025[129] despite NextEra's plans to reduce its emissions rate by 67 percent by 2025[130]—and FPL's President and CEO has asserted that coordination is not the firms' objective.[131] A lack of consistency between the two plans exposes investors to the risk of

[128] See, for example: Florida Public Service Commission. Docket No. 20210015-EI. June 21, 2021. *Petition for rate increase by FPL. Deposition of Eric Silagy*. p. 15 lines 5 – 15: "Q. Okay. And how does this goal apply to FPL? Because I understand that it's, you know, it's a NextEra Energy company wide goal, but does that -- does it apply a 67-percent reduction to FPL or does it allocate a different percentage? A. No, Katie. It's a goal that is a NextEra Energy goal which FPL, just as well as Gulf, as well as NextEra Energy Resources are all a part of."

[129] FPL April 2022 10-Year Plan. [Schedule 1 and Schedule 8]

[130] NEE. 2021. *Environmental, Social and Governance Report*. Available at: https://www.nexteraenergy.com/content/dam/nee/us/en/pdf/2021_NEE_ESG_Report.pdf

[131] Florida Public Service Comission. Docket No. 20210015-EI. June 21, 2021. Petition for rate increase by FPL. Deposition of Eric

NextEra's inability to meet its own company targets, putting the Company's reputation and stock values at risk.

Coordination of transition plans means that NextEra and FPL would have the same emissions reduction targets and have complementary strategies for achieving them: especially given that over 80 percent of NextEra profits are attributed to FPL.[132] NextEra's 2021 *Environmental, Social and Governance Report* touts a $1.7 trillion investment opportunity for renewable energy with storage through 2050, pointing towards the low cost of renewables compared to natural gas and nuclear and failing to address the contradiction inherent in FPL's fossil fuel-dominated fuel mix.[133] Coordination between NextEra and FPL would require similar shares of NextEra and FPL's renewable capacity mixes. Coordination of utilities and their parent companies is desirable from an investor perspective and is feasible if treated as a priority by both firms. Tampa Electric (TECO) and its parent company, Emera Inc., for example, both aim for net zero carbon emissions by 2050, with interim targets for 2025 and 2040.[134]

Recommendation #2: Establish short-, medium-, and long-term emission reduction targets, including a net zero target

AEC recommends that FPL establish short-, medium, and long-term emission reduction targets that align their transition plan with the Paris Climate Agreement—which aims to reduce greenhouse gas emissions 50 percent by 2030 and limit global temperature rise to below 2 degrees Celsius[135]—and its parent company's climate goals. This includes establishing a net zero emissions target for 2050 or earlier. For example, in alignment with the Paris Agreement, Southern Company and TECO aim to achieve net zero emissions by 2050 with interim targets to keep them on track.[136] Establishing clear climate targets reduces the risk of stranded fossil fuel capital assets in the event that Florida or the United States enact more stringent environmental requirements.

This recommendation is widely supported by both international and domestic institutions, and a growing quorum of utilities follow this practice. The International Energy Association's 2021 report, *Net Zero by 2050: A Roadmap for the Global Energy Sector*, encourages electric utilities—and their parent companies—to set targets for net zero emissions by 2035.[137] This same target is recommended by the Institutional Investors Group on Climate Change.[138] Both the Science Based Targets Initiative—a collaboration between

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Silagy. p. 15 lines 5 –15: "Q. Okay. And how does this goal apply to FPL? Because I understand that it's, you know, it's a NextEra Energy company wide goal, but does that --does it apply a 67-percent reduction to FPL or does it allocate a different percentage? A. No, Katie. It's a goal that is a Next EraEnergy goal which FPL, just as well as Gulf, as well as NextEra Energy Resources are all a part of."

[132] NextEra Energy Inc. 2021. *Form 10-k for the fiscal year ended in December 31, 2020*.

[133] Ibid p. 22, 28

[134] TECO. n.d. "Tampa Electric Eyes Net-Zero Carbon Future." Available at: https://www.tampaelectric.com/teconetzero

[135] United Nations Framework Convention on Climate Change. n.d. "The Paris Agreement." Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[136] (1) TECO. n.d. "Tampa Electric Eyes Net-Zero Carbon Future"; (2) Southern Company. 2020. *Implementation and Action Toward Net Zero*.

[137] International Energy Association. 2021. *Net Zero by 2050 A Roadmap for the Global Energy Sector*. Available at: https://www.iea.org/reports/net-zero-by-2050

[138] IIGCC. 2021. *Global Sector Strategies: Investor Interventions to Accelerate Net Zero Electric Utilities*. Prepared for Climate Action

CDP (a non-profit global disclosure system for investors), the United Nations, the World Resources Institute, and the World Wide Fund for Nature—and the Say on Climate Initiative—a resource to assist shareholders in voting on climate action transition plans, supported by the Children's Investment Fund Foundation—suggest a somewhat less ambitious goal for companies: setting 5-to-10-year emissions reduction targets in line with meeting net zero emissions by 2050.[139] An assessment of company progress in the transition to a low-carbon economy by the Transition Pathway Initiative—a global initiative led by asset owners—however, finds that all 11 of the electric utilities in its assessment that are aligned with the Paris Climate Agreement have net zero targets for 2040 or earlier.[140]

Setting targets is a critical step towards achieving emission reductions but targets alone are not sufficient to signal to customers and investors that FPL is committed to follow-through on meeting its targets. To be effective, emission targets need to be bulwarked by specific accountability measures. To ensure that NextEra and FPL are accountable for meeting their targets, AEC recommends that both entities define and commit to reporting regularly on transparent and measurable metrics to assess their emission reduction progress.[141] For example, Southern Company provides regular reports on its progress towards meeting its emission targets including a description of actions taken by asset category.[142] In Illinois, Ameren, which has interim emission targets as well as a target to achieve net zero emissions by 2050, has established key environment and sustainability metrics for safety, customer satisfaction, renewable generation, and workforce/supplier diversity.[143] For example, Ameren uses the System Average Interruption Frequency Index to measure its energy reliability.[144] NextEra and FPL should identify any barriers to achieving their targets, establish metrics relevant to those barriers, and provide publicly available reports that include plans to address any setbacks.[145]

NextEra and FPL's accountability metrics should be sufficient to identify emission reductions gained by selling electricity generated from underperforming fossil fuel facilities to other companies: a phenomenon known as the "transferred emissions loophole."[146] (Ownership of the fossil fuel generation changes hands but global emissions stay the same; the responsibility is just passed to another company.) Real emission reductions are achieved through demand-side management efforts (energy efficiency and demand

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100+. Available at: https://www.climateaction100.org/wp-content/uploads/2021/10/Global-Sector-Strategy-Electric-Utilities-IIGCC-Oct-21.pdf

[139] SBTi. 2021. *SBTI Corporate Net-Zero Standard*. Available at: https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf

[140] Those electric utilities are AES, CMS Energy, Con Edison, E.ON, ED, Enbw Energie, Eversource Energy, Meridian Energy, Orsted, Public Service Enterprise Group, RWE;(2) Dietz, S., Bienkowska, B., Chiu, H., Gardiner, D., Goon, R., Hastreiter, N., Jahn, V., Jamaleddine, I., Komar, V., Scheer, A., Sullivan, R. 2021. *Management Quality and Carbon Performance of Energy Companies*. Transition Pathway Initiative. Available at: https://www.transitionpathwayinitiative.org/publications/91.pdf?type=Publication

[141] IIGCC. 2021. *Global Sector Strategies: Investor Interventions to Accelerate Net Zero Electric Utilities*.

[142] Southern Company. 2020. *Implementation and Action Toward Net Zero*.

[143] Ameren. May 2021. *Leading the Way to a Sustainable Energy Future*. Available at: https://www.ameren.com/company/environment-and-sustainability/esg-report-library

[144] Ameren. May 2021. *Leading the Way to a Sustainable Energy Future*. Available at: https://www.ameren.com/company/environment-and-sustainability/esg-report-library

[145] IIGCC. 2021. *Global Sector Strategies: Investor Interventions to Accelerate Net Zero Electric Utilities*.

[146] Baxter, A., and Malek, G. 2021. "Oil and gas companies, investors, and policymakers all have important roles to play to solve the problem of transferred emissions." Available at: https://business.edf.org/insights/why-we-need-leadership-to-close-the-transferred-emissions-loophole/

response), increasing renewable energy capacity, investing in storage, and phasing-out old and no longer building new fossil fuel plants.

Together with adopting a net zero emission reduction target, AEC recommends that FPL minimize its use of carbon offsets. (FPL's *10-Year Site Plan* does not mention planned offset investments or projects.[147]) Net zero targets aim to reduce the greatest share of emissions possible and offset any recalcitrant emissions for which zero-emission replacement technologies are not yet available. Typically, the purchase of an emissions offset means that a utility pays someone else, somewhere else, to reduce emissions and takes the "credit" for that reduction, or the utility itself may reduce emissions outside of its grid operations (e.g., by planting trees or restoring wetlands).[148] Issues arise in qualifying what does and does not count as an offset. Appropriate offsets are real, verified, permanent, and additional (i.e., the carbon being removed is additional to what would have been done otherwise).[149] Emissions offsets are expensive, often misused,[150] lack oversight, and present a risk to investors.[151] Once purchased, offsets may turn out to be unqualified and therefore without value—a reputational and financial risk for utility, parent company, and investors. The Science Based Targets Initiative, a partnership between CDP, the United Nations Global Compact, World Resources Institute and the World Wide Fund for Nature, does not count offsets towards emissions targets because renewables are more affordable, and the land and water resources required for offsets should be reserved for hard to decarbonize sectors.[152]

AEC recommends that FPL focus on reducing emissions as much as possible by increasing its investment in renewable energy, storage, and demand response programs, and relying on existing natural plants—if at all—only for peak shaving and emergency backup power.

Recommendation #3: Ramp up demand-side management efforts

Demand-side management efforts curb consumer electric demand and related emissions while offsetting costs of a transition away from fossil fuels. AEC recommends that FPL accelerate its demand-side efforts to achieve energy efficiency savings of a minimum of 1 percent of sales (the U.S. national average).[153] FLP's current cumulative demand-side savings goal for 2015 through 2024 is 526 GWh, or about 0.4 percent of 2021 customer demand.[154]

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[147] Ibid.

[148] Woods, B. 2021. "The Net Zero Debate" [Blog]. Applied Economics Clinic. Available at: https://aeclinic.org/aec-blog/2021/5/18/the-net-zero-debate?rq=offsets

[149] Ibid.

[150] Stasio, T. 2021. "The Misuse of Carbon Offsets: The Mass Audubon Example" [Blog]. Applied Economics Clinic. Available at: https://aeclinic.org/aec-blog/2021/5/27/the-misuse-of-carbon-offsets-the-mass-audubon-example?rq=offsets

[151] (1) Ibid; (2) Institutional Investors Group on Climate Change. 2021. *Global Sector Strategies: Investor Interventions to Accelerate Net Zero Electric Utilities*.

[152](1) Institutional Investors Group on Climate Change. 2021. *Global Sector Strategies: Investor Interventions to Accelerate Net Zero Electric Utilities*; (2) Dowdall, T. 2021. "Science-Based Net-Zero Targets: 'Less Net, more Zero'." Science Based Targets Initiative. Available at: https://sciencebasedtargets.org/blog/science-based-net-zero-targets-less-net-more-zero

[153] York, D. and Cohn, C. 2021. *Unrealized Potential: Expanding Energy Efficiency Opportunities for Utility Customers in Florida*.

[154] (1) Florida Public Service Commission. 2021. 2021 Annual Report on Activities Pursuant to the Florida Energy Efficiency and Conservation Act [Table 5]. Available at: https://www.floridapsc.com/Publications/Reports#; (2) FPL April 2022 10-Year Plan. [Schedule 6.1]

Northeastern utilities National Grid,[155] Eversource,[156] and ComEd[157]—among many others—provide rebates to their customers for efficiency upgrades, heat pumps, smart thermostats, electric vehicle infrastructure, and more. Tennessee Valley Authority's EnergyRight Demand Response program provides financial incentive to participants who curtail their energy usage during extreme weather or energy emergencies.[158] FPL's scanty energy efficiency offerings deprive its customers of bill savings while unnecessarily inflating Florida's greenhouse gas emissions. Neglecting potential energy efficiency savings also places FPL further away from meeting NextEra's climate commitments, an additional risk to investors.

FPL's scanty energy efficiency offerings deprive its customers of bill savings while unnecessarily inflating Florida's greenhouse gas emissions.

Florida's regulatory environment plays a large role in depressing energy efficiency investments in the state. The American Council for an Energy-Efficient Economy expressed concern with the State of Florida's low goal setting for energy efficiency savings, its reliance on the Ratepayer Impact Measure test for measuring cost-effectiveness, and its two-year payback screen on less effective energy efficiency measures.[159] Nonetheless, there is room for utilities like FPL to improve their demand-side management record by partnering with cities and local governments to develop energy efficiency solutions to reduce costs and emissions.[160] FPL's energy efficiency savings as a percentage of sales amounted to only about 0.06 percent in 2020. To put this in context, the Southeast regional average is about 0.5 percent (or eight times higher).[161]

In addition, AEC recommends that FPL develop additional energy efficiency programs and incentives specifically targeted at small businesses and multifamily housing. These customers are in the greatest need of bill savings, especially in the wake of economic contraction due to the COVID-19 pandemic. Examples of utilities that offer these types of programs include National Grid and Eversource. National Grid offers efficiency product discounts of 75 percent or more and rebates for up to $2,750 for energy-efficient equipment.[162] Eversource aims to support environmental justice communities by increasing electric vehicle charging sites in those communities and investing in local grid upgrades to promote electric vehicle adoption. As of 2021, 19 percent of Eversource's electric vehicle charging stations were located in

[155] (1) National Grid. 2022. "Home Energy Assessments." Available at: https://www.nationalgridus.com/MA-Home/Energy-Saving-Programs/Home-Energy-Assessments; (2) National Grid. 2022. "Services and Rebates." Available at: https://www.nationalgridus.com/Services-Rebates?r=10&page=1

[156] Eversource. 2022. "Demand Response Solutions." Available at: https://www.eversource.com/content/ema-c/residential/save-money-energy/energy-efficiency-programs/demand-response

[157] ComEd. 2022. "Rebates and Discounts." Available at: https://www.comed.com/WaystoSave/ForYourHome/Pages/RebatesDiscounts.aspx

[158] EnergyRight. 2022. "Demand Response: Good for the Valley, Good for your Bottom Line." Tennessee Valley Authority. Available at: https://energyright.com/business-industry/demand-response/

[159] York, D. and Cohn, C. 2021. *Unrealized Potential: Expanding Energy Efficiency Opportunities for Utility Customers in Florida*.

[160] Ibid. p. 10

[161] Ibid.

[162] National Grid. 2022. "Home Energy Assessments."

environmental justice communities.[163] In addition, while the Gulf Power demand-side management plan includes incentives for heat pumps and pool pumps, FPL's plan does not.[164]

Recommendation #4: Invest in energy storage technologies

Battery storage—coupled with demand response and other load-responsive measures—is the future of electric load balancing and capacity management. Short-term (4-hour) batteries are already clearing in capacity markets around the country (that is, these resources are found to economically viable as methods for ensuring reliability) and longer-term (8- and 10-hour) batteries are expected to reach commercial viability in the next decade.[165] AEC recommends that FPL continue to invest in energy storage technologies to improve and maintain system reliability and to work together with renewable and distributed energy (i.e., solar) for a zero-emission grid. While FPL is planning to install 3 GW of battery storage over the next decade, AEC recommends that FPL further invest in battery storage in order to fully reap the advantages of solar energy by enabling the ability to store excess energy in times of low demand and dispatch stored energy during peak times.

The energy capacity costs of battery storage have declined over the past 4 years from $2,102 per kilowatt-hour in 2015 to $589 per kilowatt-hour in 2019, and every new investment in fossil fuel capacity risks burdening investors and customers with a stranded asset as greenhouse gas limits are enacted.[166] Following nearby utilities like TECO and Dominion, AEC recommends that FPL develop an energy storage pilot program and set comparable energy storage targets. Both TECO and Dominion Virginia have launched battery storage pilot projects. TECO's Microgrid Pilot Program was approved in 2021 with an initial capital cost cap of about $2 million.[167] Similarly, Dominion's four battery storage pilot programs, with a combined capacity of 16 megawatts (MW), were approved in 2020 and will cost about $33 million to construct.[168]

Recommendation #5: Modernize the electric grid and increase renewable energy capacity

Modern grid technologies do not begin and end with battery storage. So called "grid modernization" strategies followed by utilities in several states include distributed generation, smart meters, microgrids, and two-way energy flow. AEC recommends that FPL invest in modernizing its electric grid to improve overall reliability, flexibility, and sustainability of the electric system.

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[163] Eversource Energy. 2021. *Climate Change 2021.* Prepared for CDP. Available at: https://www.eversource.com/content/docs/default-source/community/sustainability-cdp-2021.pdf

[164] FPL April 2022 10-Year Plan. p. 98-101

[165] (1) LAZARD. 2021. "Levelized Cost Of Energy, Levelized Cost Of Storage, and Levelized Cost Of Hydrogen." Available at: https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen/; (2) Cole, W., Frazier,, A. W., Augustine, C. 2021. Cost Projections for Utility-Scale Battery Storage: 2021 Update. National Renewable Energy Laboratory. Available at: https://www.nrel.gov/docs/fy21osti/79236.pdf; (3) National Renewable Energy Laboratory. 2021. "Utility-Scale Battery Storage." Available at: https://atb.nrel.gov/electricity/2021/utility-scale_battery_storage

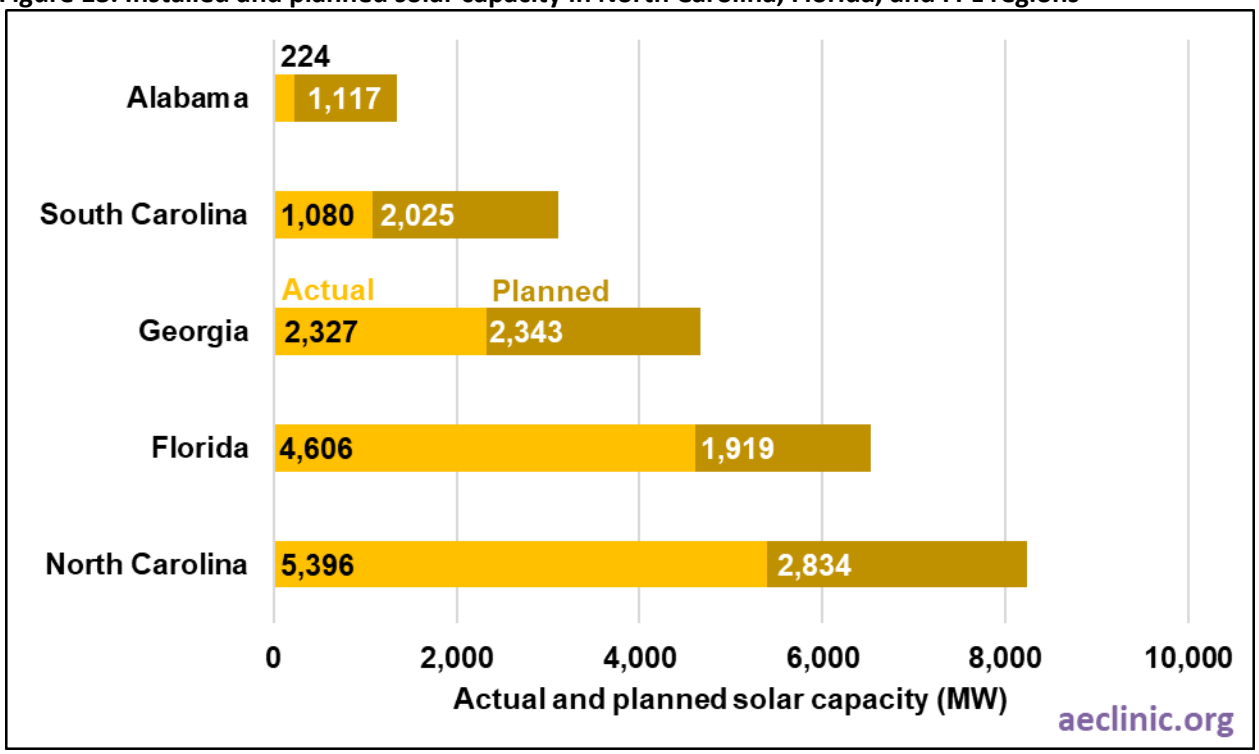
[166] U.S. Energy Information Administration. *Battery Storage in the United States: An Update on Market Trends*. Available at: https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage_2021.pdf

[167] Florida Public Service Commission. 2021. "Florida PSC Approves TECO Micogrid Pilot Program." Available at: http://www.psc.state.fl.us/Home/NewsLink?id=11940

[168] Dominon Energy. 2020. "Dominion Energy's First Battery Storage Projects Approved." Available at: https://news.dominionenergy.com/2020-02-25-Dominion-Energys-First-Battery-Storage-Projects-Approved

Adoption of grid modernization strategies also has the potential to lower customer costs and reduce the risk to investors from FPL's reliance on natural gas. To meet its emissions reduction targets, FPL will need to increase its renewable energy capacity. In Florida, more renewables mean continuing to invest in solar energy projects and incentivizing behind-the-meter rooftop solar (e.g., financial and technical support for residential and commercial solar panels). According to FPL's *10-Year Site Plan*, the electric utility has installed 3,200 MW of solar (9 percent of FPL's total capacity) and plans to install an additional 9,500 MW by 2031 (an additional 16 percent of total capacity), meeting their 30-by-30 goal of 11.7 GW of solar along the way. FPL has the most solar capacity of any Florida utility,[169] in part due to its large customer base. However, Florida still lags behind North Carolina in operating and planned solar capacity (see Figure 13).[170] FPL should stop putting investors at risk from the financial responsibility of new fossil fuel generators with a dubious future and should instead phase out these resources as the utility increases its renewable portfolio.

Figure 13. Installed and planned solar capacity in North Carolina, Florida, and FPL regions



Note: Planned capacity is limited to projects with in-service dates between 2021 and 2025
Data source: Bennett, A. 2021. "State policy, aggressive utility plans to make Florida top Southeast solar state." Available at: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/state-policy-aggressive-utility-plans-to-make-florida-top-southeast-solar-state-65740797#:~:text=Total%20solar%20capacity%20in%20the,of%20solar%20capacity%20for%20Florida.

[169] Bennett, A. 2021. "State policy, aggressive utility plans to make Florida top Southeast solar state." Available at: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/state-policy-aggressive-utility-plans-to-make-florida-top-southeast-solar-state-65740797#:~:text=Total%20solar%20capacity%20in%20the,of%20solar%20capacity%20for%20Florida.
[170] Ibid.

Despite promising planned investments in solar and battery storage over the next decade, most of FPL's generation portfolio today and in the future relies on fossil fuels. According to FPL's *10-Year Site Plan*, almost two-thirds of its capacity will be derived from natural gas in 2031. While FPL has retired their Florida-based coal resources, it still holds ownership of two coal units in Mississippi with planned retirement for 2024.[171] AEC recommends that FPL phase out its coal resources more quickly and begin phasing out natural gas resources as the utility builds out more solar and battery storage.

Recommendation #6: Consider multiple scenarios in future planning and reduce planning time horizon

Electric system resource expansion and dispatch modeling are essential for determining least-cost plans that meet climate goals. This type of modeling is typically done with some combination of scenario-based modeling—testing out a variety of possible future scenarios with respect to prices, regulatory environments, and other uncertainties—and optimization modeling which allows the model to select a least-cost plan and portfolio. (Some utilities add to these practices stochastic—or Monte Carlo—modeling, which permits examination of a much wider set of possible values for uncertain modeling parameters.) Presenting a single plan or resource portfolio in public reports indicates one of two things: either (1) the utility is inappropriately limiting its modeling of an uncertain future to a single guess about what that future looks like; or (2) the utility is performing this modeling but not making its results available for review by stakeholders and third-party experts.

According to FPL's *10-Year Site Plan,* FPL's resource planning group does not explore multiple future scenarios or uncertainties in its modeling. The Plan specifically notes that it does not utilize multiple fuel cost forecasts to test the resource plan:

> *Based on the facts that this fuel cost forecast is projecting natural gas prices that are already low by historical standards, and that the resource plan consists predominantly of solar additions, there was not a need to utilize different fuel cost forecasts to test the resource plan.*[172]

FPL's *2022 10-Year Site Plan* does consider both a "Business as Usual" and "Recommended" plan, but fails to consider alternative fuel price projections, environmental regulation stringency, and technological advancements. The "Business as Usual" plan only differs from the "Recommended" plan in that it has fewer capacity additions. According to FPL, these capacity additions are needed to account for "extreme Winter peak loads."[173] AEC recommends that FPL report the results of several scenarios and portfolios in its planning reports. Assumptions to vary across scenarios include price projections of fossil fuels, the stringency of future environmental regulations, and the pace of technological development and market maturity. Assumptions to vary across portfolio include the level of investment in energy efficiency measures, renewable energy, and storage technology.

In addition, AEC recommends that FPL reduce its planning time horizon from 10 to 5 years.[174] Short-term

[171] FPL April 2022 10-Year Plan.
[172] FPL April 2022 10-Year Plan. p. 296
[173] Ibid. p. 8
[174] Children's Investment Fund Foundation. July 2021. *Essential components of a corporate climate action plan* [PowerPoint slides].

planning, along with short-term climate targets, facilitate more accountability and prevent arbitrary climate promises for the far future ("greenwashing").[175]

Consideration of multiple scenarios and reducing the planning time horizon reduces risk to investors by providing clear information about a full range of potential outcomes to utility investments, increases preparedness for different regulatory actions and price changes, and provides more transparency to both investors and customers.[176]

Recommendation #7: Increase stakeholder and community engagement, and align plan with TCFD recommendations

Stakeholder and community engagement is essential for ensuring that utility actions are in line with investor, customer, and community interests. Investors risk their own reputation when companies they support face public criticism. In Miami-Dade County, the most populated county in Florida, 72 percent of the population is Latino. In facilitating community engagement, FPL must ensure that members of the Latino community are heard.

According to NextEra's website, the Company engaged with its local community through volunteer work, donations and sponsorships, education materials, economic development incentives, and public policy development and with its stakeholders through meetings, speaking engagements, online surveys and more.[177] The frequency of these engagement efforts is not provided.[178] AEC recommends that (1) NextEra and FPL increase stakeholder and community engagement, including enhanced participation in both firms' planning processes, to ensure that a clean energy transition that is just and reflects the needs of both their investors and customers, and (2) that the companies report transparently on these activities. By adding more opportunities for stakeholder and community feedback, NextEra and FPL can improve their public perception, reduce the risk of backlash from the public and their investors, and improve stakeholder relationships. Investors benefit by playing a role in NextEra and FPL's decision-making processes and ensuring that their interests are considered.

AEC recommends that NextEra continue to align its *Environmental, Social, Governance report* with TCFD recommendations for governance, strategy, risk management, and metrics and targets:

- **"Governance:** Disclose the organization's governance around climate-related risks and opportunities.
- **Strategy:** Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Available at: https://sayonclimate.org/wp-content/uploads/2021/09/How-to-evaluate-a-climate-plan_evaluation-criteria-010721_public.pdf.

[175] Ibid.

[176] TCFD. 2017. *Recommendations of the Task Force on Climate-related Financial Disclosures*. Available at: https://assets.bbhub.io/company/sites/60/2020/10/FINAL-TCFD-Annex-Amended-121517.pdf

[177] NextEra. "Engaging our Stakeholders." Available at: https://www.nexteraenergy.com/sustainability/gri-index/materiality-assessment.html

[178] Ibid.

- **Risk Management:** Disclose how the organization identifies, assesses, and manages climate-related risks.
- **Metrics and Targets:** Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material."[179]

In addition, AEC recommends that NextEra adopt and add to the disclosure metrics and action milestones proposed in Ceres' 2030 Roadmap as a good starting point for ensuring a just and inclusive transition.[180] Ceres is a nonprofit organization that works with leading investors, companies, policymakers, and regulators to inform and encourage actions related to climate, natural resources, economy, and sustainable capital markets.[181] Ceres' disclosure metrics include information on equal employment opportunity and wage data disaggregated by race, ethnicity, and job, and tax-related information. The Roadmap's action milestones for today, 2025 and 2030 lay out the steps to develop, integrate, and implement a human capital management strategy in collaboration with stakeholders.[182] Transparency and progress tracking provide essential information for investors to ensure that a company's actions are aligning with their own values and facilitate feedback in the event that they are not.

Finally, AEC recommends that FPL and NextEra conduct an assessment of the potential equity implications of their transition plans. FPL should consider the potential impact of, for example, existing and proposed demand-side management programs on energy burdens in the local community or the location of new solar or storage facilities in relation to vulnerable or under-served communities. This assessment should aim to provide guidance on the impact of the companies' clean energy transition plans on low-income and vulnerable communities in FPL's service areas.[183]

[179] TCFD. 2017. "TCFD Recommendations." Available at: https://www.fsb-tcfd.org/recommendations/

[180] Ceres. Build a Just and Inclusive Economy: A Just and Inclusive Transition. Available at: https://roadmap2030.ceres.org/ai-expectation/just-and-inclusive-transition

[181] Ceres. N.d. "About Us." *Ceres.* Available at: https://ceres.org/about-us

[182] Ibid.

[183] For example, see: (1) Woods, B., Alisalad, S., Tavares, E., Majumder, M., and Stanton, E.A. 2021. *Equity Measurement and Targeting Underserved Communities in Massachusetts' 2022-2024 Energy Efficiency Plan*. Prepared for the Green Justice Coalition. Applied Economics Clinic. Available at: https://aeclinic.org/publicationpages/2021/12/6/targeting-underserved-communities-in-massachusetts-2022-2024-energy-efficiency-plan; (2) Stasio, T., Woods, B., Castigliego, J. R., Stanton, E.A. 2021. *Equity Assessment of Electrification Incentives in the District of Columbia.* Prepared for the Office of the People's Counsel for the District of Columbia. Applied Economics Clinic. Available at: https://aeclinic.org/publicationpages/2021/12/6/equity-assessment-of-electrificatio-incentives-in-the-district-of-columbia

Appendix A: Florida Background

Climate change leads to warmer air and ocean temperatures, rising sea levels, changes in precipitation patterns, and exacerbated weather events—and the State of Florida is especially vulnerable to these risks and impacts.[184] Even with substantial reductions in global greenhouse gas emissions, climate change has and will continue to disrupt Florida's ecosystems, cause economic consequences in several major industries (e.g., tourism, agriculture, fishery) and threaten the state's water and energy infrastructure. A 6 feet sea level rise by 2100 could displace over 2 million people in south Florida.[185] In Southeast Florida, 250,000 people, 140,000 homes, and 310,000 acres of land face risks from 3 feet of flooding;[186] in Tampa Bay, 71,000 people, 42,000 homes, and 56,000 acres of land would be affected.[187]

According to the U.S. Environmental Protection Agency, sea levels in Florida are currently rising at a rate of one inch every ten years, and, if air and ocean temperatures continue to increase, are predicted to rise between one and four feet in the next century (see Figure 14).[188] Under a moderate emissions scenario (1.6 feet of sea level rise by 2100), the height of storm surges in Florida could rise 25 to 47 percent compared to those from hurricanes between 1984 and 2013.[189] In high-end scenarios (8.2 feet of sea-level rise by 2100), storm surges could rise 40-70 percent above historic levels.[190] To make matters worse, Florida's land surface is also sinking, although the rate of land subsidence in Florida is unknown. Senate Bill SB1284 (HB1157 in the House) was introduced in the Florida Legislature in January 2020 to establish the Florida Land Subsidence Research Initiative, but the bill was withdrawn from consideration.[191] Sea-level rise together with subsidence make coastal flooding worse, coastal inundation more rapid, and cause immeasurable damage to Florida's wetlands and beaches.[192]

[184] Florida Oceans and Coastal Council. 2009. *The effects of climate change on Florida's ocean and coastal resources.* Prepared for the Florida Energy and Climate Commission and the people of Florida. Available at: https://floridadep.gov/sites/default/files/The%20Effects%20of%20Climate%20Change%20on%20Florida%27s%20Ocean%20and%20Coastal%20Resources_0.pdf

[185] Oppenheimer, M. et al. 2019. *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate.* Intergovernmental Panel on Climate Change. Available at: https://www.ipcc.ch/srocc/chapter/chapter-4-sea-level-rise-and-implications-for-low-lying-islands-coasts-and-communities/

[186] Raimi, D., A. Keyes, C. Kingdon. 2020. *Florida Climate Outlook: Assessing Physical and Economic Impacts through 2040.* Resources for the Future. Available at: https://www.rff.org/publications/reports/florida-climate-outlook/

[187] Ibid.

[188] U.S. Environmental Protection Agency. 2016. *What climate change means for Florida*. Available at: https://www.epa.gov/sites/production/files/2016-08/documents/climate-change-fl.pdf

[189] Raimi, D., A. Keyes, C. Kingdon. 2020.

[190] Ibid.

[191] (1) The Florida Senate. *Florida Land Subsidence Research Initiative*. SB 1284. Available at: https://www.flsenate.gov/Session/Bill/2020/1284; (2) The Florida House. *Florida Land Subsidence Research Initiative*. HB 1157. Available at: https://www.flsenate.gov/Session/Bill/2020/1157

[192] U.S. Environmental Protection Agency. 2016. *What climate change means for Florida*.

Figure 14. Sea-level rise in Florida: 0 feet and 4 feet

Note: The green dots on the map show low-lying areas that may flood and the lighter blue shows areas experiencing a sea-level rise. The flood risk is characterized by the shade of blue; the darker shades are in areas with heavier flooding. Reproduced from: NOAA Office for Coastal Management. "Sea Level Rise Viewer". National Oceanic and Atmospheric Administration. Available at: https://coast.noaa.gov/digitalcoast/tools/slr.html

Climate change also causes rainfall patterns to become more irregular, with less rain overall leading to more frequent droughts.[193] Moreover, heat waves will increase in frequency and intensity,[194] leaving Florida exposed to worsening weather events, especially an increase in hurricane intensity, with more frequent Category 4 and 5 storms along with more severe storm surges.[195]

These environmental impacts will have economic consequences for several major industries in Florida. The tourism industry is at risk of losing customers and revenue as beaches and other frequently visited areas like the Everglades and the Keys are buffeted by high winds, and inundated by storm surges and rising sea levels causing long term damages to vulnerable ecosystems. According to a report by the First Street Foundation, Miami-Dade County faces operational risks—a level of flooding at which infrastructure facilities become inoperable[196]—to 52 percent of its residential properties, 58 percent of its commercial properties, and 69 percent of its infrastructure facilities.[197]

Similarly, real estate values may fall as properties face higher risks for flooding and storm damages, thus driving up insurance rates and making some properties simply uninsurable.[198] The areas in Florida that are

[193] Stanton, E.A., and Ackerman, F. 2007. *Florida and Climate Change the Costs of Inaction*. Tufts University. Available at: https://static1.squarespace.com/static/5936d98f6a4963bcd1ed94d3/t/5968f0c64c0dbf57b3591fa9/1500049649174/GDAE-Florida_CC_costsofinaction+%282007%29.pdf p. 18.
[194] Ibid. p. 19.
[195] Ibid. p. 16.
[196] First Street Foundation. 2021. *The 3rd National Risk Assessment: Infrastructure on the Brink.* Available at: https://assets.firststreet.org/uploads/2021/09/The-3rd-National-Risk-Assessment-Infrastructure-on-the-Brink.pdf. Pg. 6.
[197] Ibid. p. 42.
[198] (1) Stanton, E.A., and Ackerman, F. 2007. *Florida and Climate Change the Costs of Inaction*; (2) U.S. Environmental Protection Agency. 2016. *What climate change means for Florida*.

vulnerable to 27 inches of sea-level rise have over 900,000 housing units and are valued at about $163.7 billion.[199] According to the Union for Concerned Scientists, Florida currently leads the nation in the number of homes at risk of chronic flooding through the end of the century (accounting for more than 40 percent of the nation's at-risk homes), which by 2045 are valued at about $26 billion.[200] Damage to residential and commercial buildings will be paired with interruptions to electric and water systems, and higher costs to supply these services. Demand for water also grows as rainfall decreases and temperatures rise, taxing fresh water supplies that are already under threat in the State.[201]

Climate damages, like those faced in Florida are the result of global greenhouse gas emissions. In Florida, the largest source of emissions is electric generation.[202] Warmer air temperatures result in higher demand for electricity for air conditioning and other cooling, requiring more energy supply and infrastructure. At the same time, increased temperatures and flooding degrade existing power stations and transmission lines.[203] It is vital that utilities dramatically expand their portfolio of zero-emission generation sources, assist customers in benefiting from the electrification of end-uses, opportunities to improve energy efficiency, and the rise of renewable power, and create the infrastructure necessary to transmit sufficient power to meet increased demand. Over the past few decades, Florida has enacted several relevant policies aimed at promoting renewable energy and improving energy efficiency to reduce emissions from the energy sector (see Figure 15).

[199] (1) Converted from 2006 dollars to 2019 dollars using CPI-U; (2) Stanton, E.A., and Ackerman, F. 2007. *Florida and Climate Change the Costs of Inaction*. p. 36.

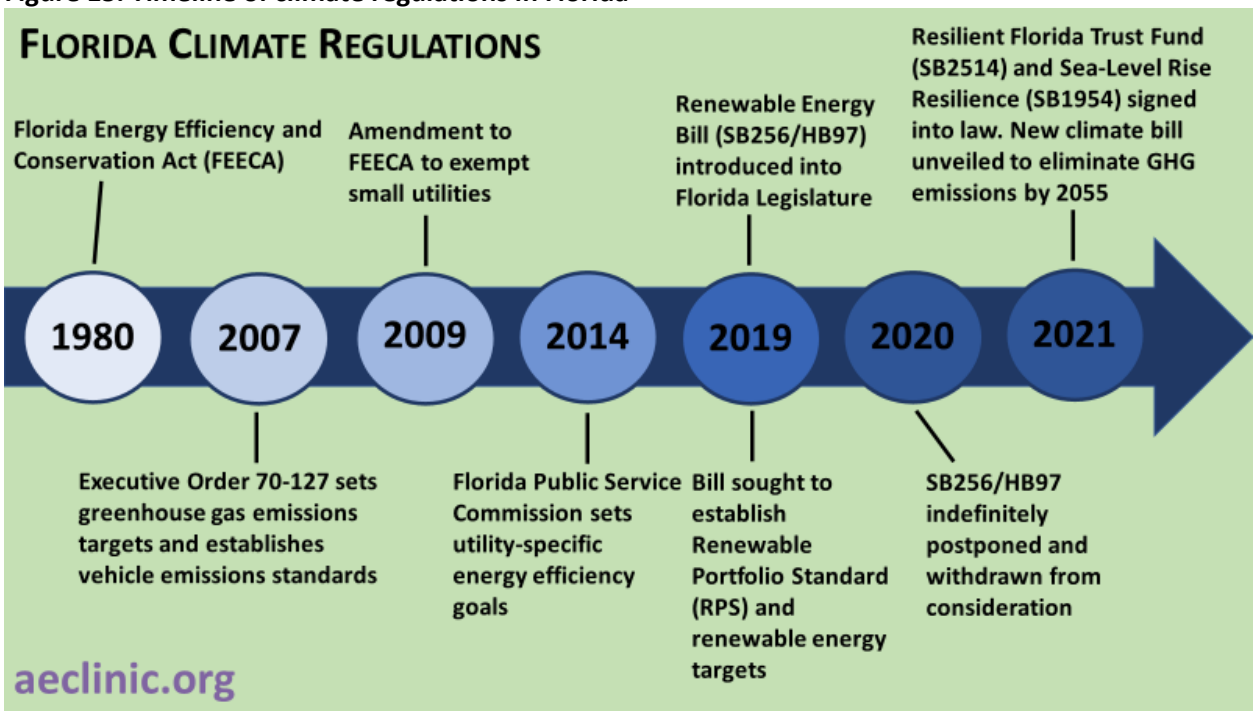
[200] (1) Union of Concerned Scientists. 2019. *Florida: Ground Zero in the Climate Crisis.* Available at: https://www.ucsusa.org/sites/default/files/attach/2019/05/Florida-Gound-Zero-in-the-Climate-Crisis-newer.pdf; (2) Union of Concerned Scientists. 2018. *Underwater: Rising Seas, Chronic Floods, and the Implications for U.S. Coastal Real Estate.* Available at: https://www.ucsusa.org/sites/default/files/attach/2018/06/underwater-analysis-full-report.pdf

[201] Ibid. p. vii.

[202] Friedrich, J. and Ge, M. 2017. "8 Charts to Understand US State Greenhouse Gas Emissions." World Resources Institute. Available at: https://www.wri.org/insights/8-charts-understand-us-state-greenhouse-gas-emissions

[203] Stanton, E.A., and Ackerman, F. 2007. *Florida and Climate Change the Costs of Inaction*. p. vii.

Figure 15. Timeline of climate regulations in Florida



While Florida is a hurricane-prone area, best practices for utility solar[204] and rules for behind-the-meter solar[205] exist that make solar more wind resilient and thus a more viable electric generating resource for the region. These best practices concern the materials used to secure solar and thorough project supervision to ensure proper installation. Florida requires most solar panels to withstand winds of 160 mph (comparable to a Category 5 hurricane).[206] In their 2018 report, the Rocky Mountain Institute advised that utilities equip panels with stronger and more secure hardware to ensure resilient systems.[207]

Wind power is a major renewable resource that is missing from Florida's renewable energy portfolio due to the state's relatively low wind speeds.[208] Florida is relatively heavily forested, leaving wind close to the ground weakened by friction; however, research has shown that taller wind turbines can surpass forest heights in Florida to reach and harness energy from stronger winds comparable to those in the Midwest.[209] While more costly,[210] the technical potential of 110- and 140-meter wind turbines installed throughout

[204] Stone, L., Burgess, C. 2018. *Solar under storm: designing hurricane-resilient PV systems*. Rocky Mountain Institute (RMI). Available at: https://rmi.org/solar-under-storm-designing-hurricane-resilient-pv-systems/

[205] Ost, I. June 7, 2018. "Can my solar panels withstand a hurricane?". *Solar.com*. Available at: https://www.solar.com/learn/can-my-solar-panels-withstand-a-hurricane/

[206] Ibid.

[207] Stone, L., Burgess, C. 2018. *Solar under storm: designing hurricane-resilient PV systems*.

[208] Wind Exchange. No date. "Florida 80-Meter Wind Resource Map". *United States Office of Energy Efficiency and Renewable Energy*. Available at: https://windexchange.energy.gov/maps-data/24

[209] Spear, K. May 19, 2015. "Department of Energy: Taller turbines would bring wind energy to Florida." *Sun Sentinel*. Available at: https://www.sun-sentinel.com/news/os-wind-energy-orlando-announcement-20150519-story.html

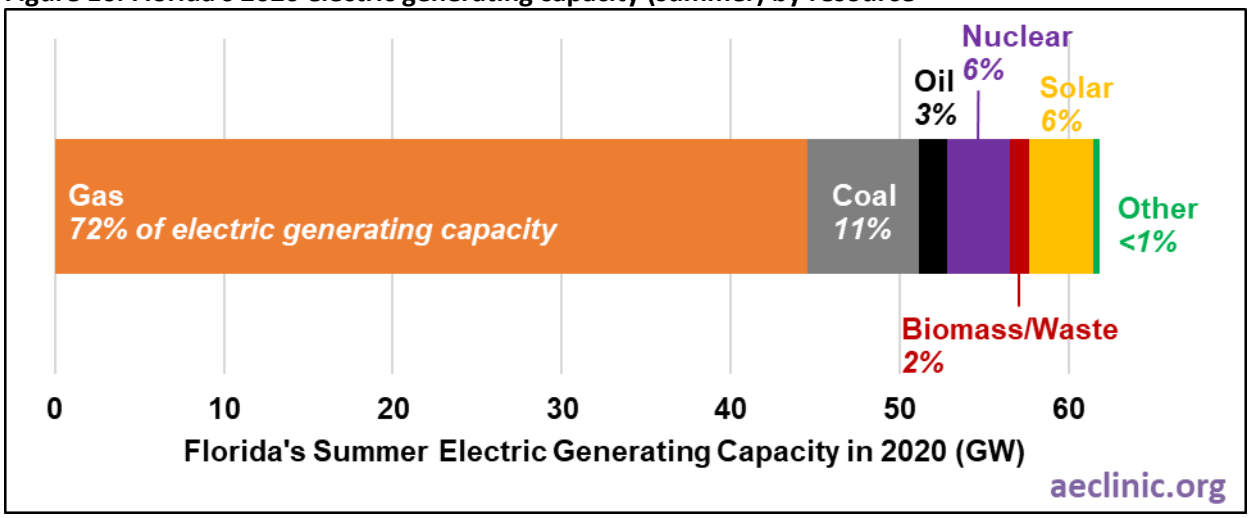
[210] Lantz, E., Roberts, O., Nunemaker, J., DeMeo, E., Dykes, K., and Scott, G. 2019. *Increasing wind turbine tower heights: opportunities and challenges*. Available at: https://www.energy.gov/sites/prod/files/2019/05/f63/73629.pdf. p. 12-13.

Florida could provide 35,900 GWh and 576,100 GWh of energy, respectively.[211] For context, FPL's electric generation amounted to about 141 GWh in 2021.[212]

Florida's electric supply

Florida's electric sector is largely powered by fossil fuels. In 2020, fossil fuels accounted for nearly 90 percent of Florida's electric generating capacity with over two-thirds (45 GW out of the total 62 GW) fired by natural gas[213] (see Figure 16) Florida's non-fossil electric generating capacity is composed of solar (6 percent), nuclear (6 percent), and biomass and waste sources (2 percent).[214]

Figure 16. Florida's 2020 electric generating capacity (summer) by resource

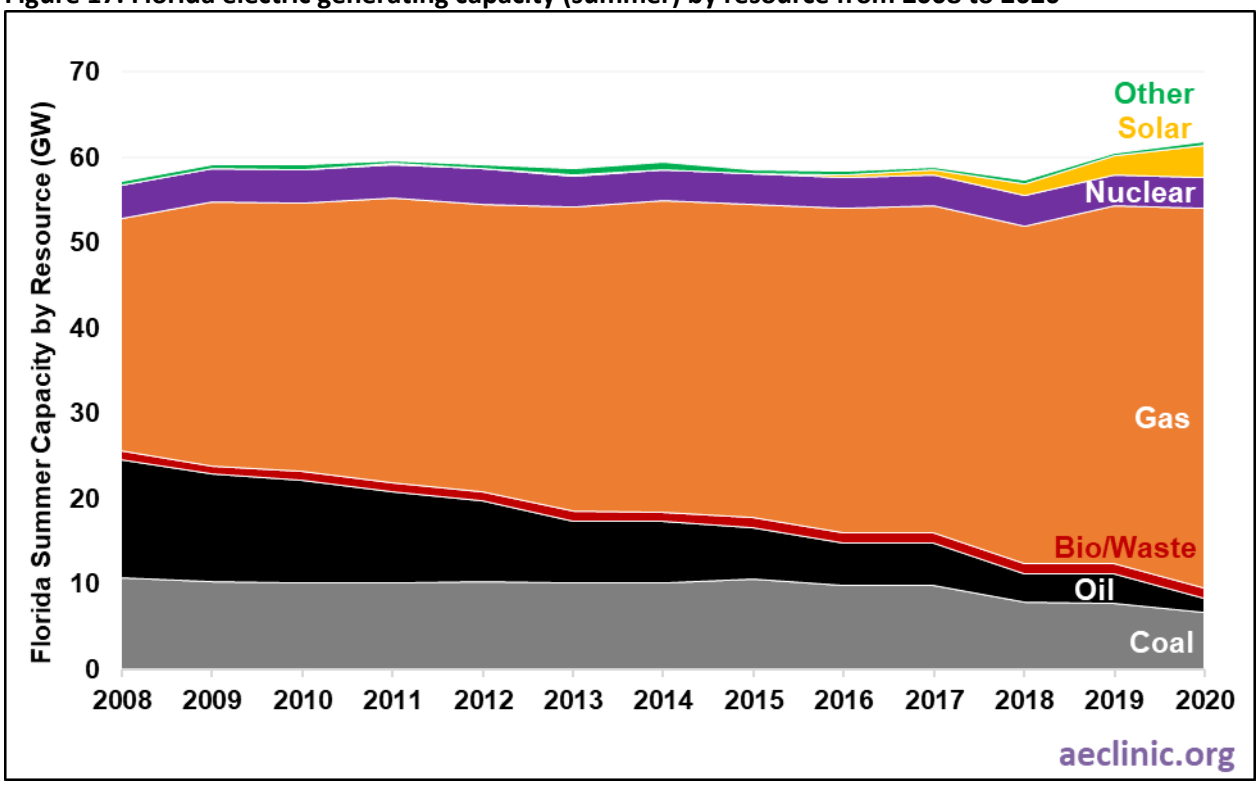


Note: Summer generating capacity is the maximum amount of energy that can be supplied by a resource at summer peak demand.
Data Source: Form EIA-860. 2020. Form EIA-860 detailed data with previous form data - Generator. Available at: https://www.eia.gov/electricity/data/eia860/

Florida's overall electric generating capacity remained constant over the ten-year period between 2010 and 2020 at 67 GW, and the composition of generating resources has shifted only slightly: gas capacity grew by an average of 3.6 percent per year while coal and oil capacity fell by about 8 percent per year (see Figure 17).

[211] Southeastern Wind Coalition. No date. "Florida Wind Energy Fact Sheet". Available at: https://www.sewind.org/images/fact_sheets/SEWC%20FL%20Wind%20Energy%20Fact%20Sheet%20-%20Dec%202014.pdf
[212] FPL April 2022 10-Year Plan.
[213] This paper uses the terms "gas" and "natural gas" interchangeably.
[214] U.S. Energy Information Administration. 2008-2018. *Form EIA-860 detailed data with previous form data - Generator*.

Figure 17. Florida electric generating capacity (summer) by resource from 2008 to 2020



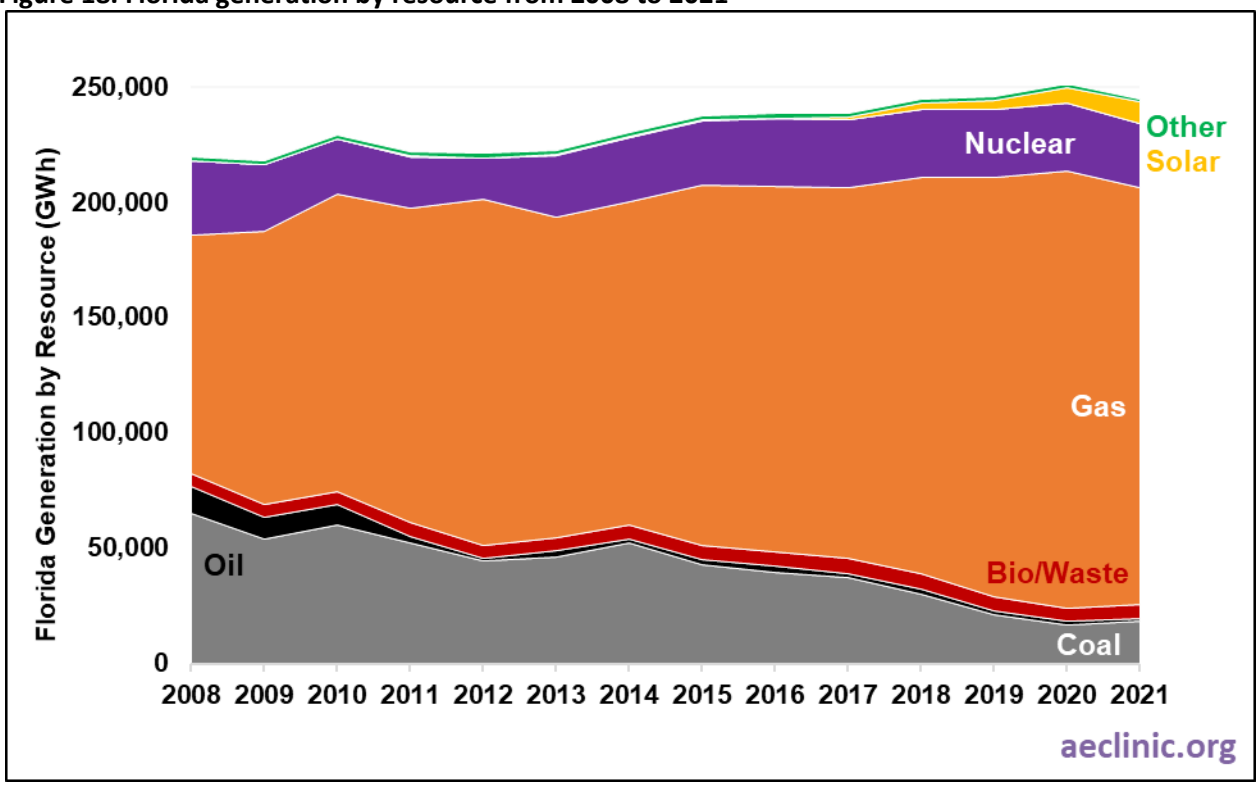
Data source: U.S. EIA. Form EIA-860. 2008-2020. Form EIA-860 detailed data with previous form data - Generator. Available at: https://www.eia.gov/electricity/data/eia860/

Florida generated 244,401 GWh and sold 241,061 GWh of electricity within Florida in 2021; Florida has been a net exporter of electricity since 2012.[215] Renewable energy accounts for only a small percentage of Florida's gas-dominated resource mix: just 4 percent of Florida's electric generation in 2021 or 9,055 GWh, while gas and other fossil fuels accounted for nearly 82 percent of total generation (see Figure 18).[216]

[215] (1) EIA. 2008-2018. *Form EIA 923 Detailed data with previous form data: Electricity*. Available at: https://www.eia.gov/electricity/data/eia923/; (2) EIA. Retail Sales of Electricity, Florida, Annual. Available at: https://www.eia.gov/electricity/data/browser/

[216] EIA. 2008-2018. *Form EIA 923 Detailed data with previous form data: Electricity*.

Figure 18. Florida generation by resource from 2008 to 2021



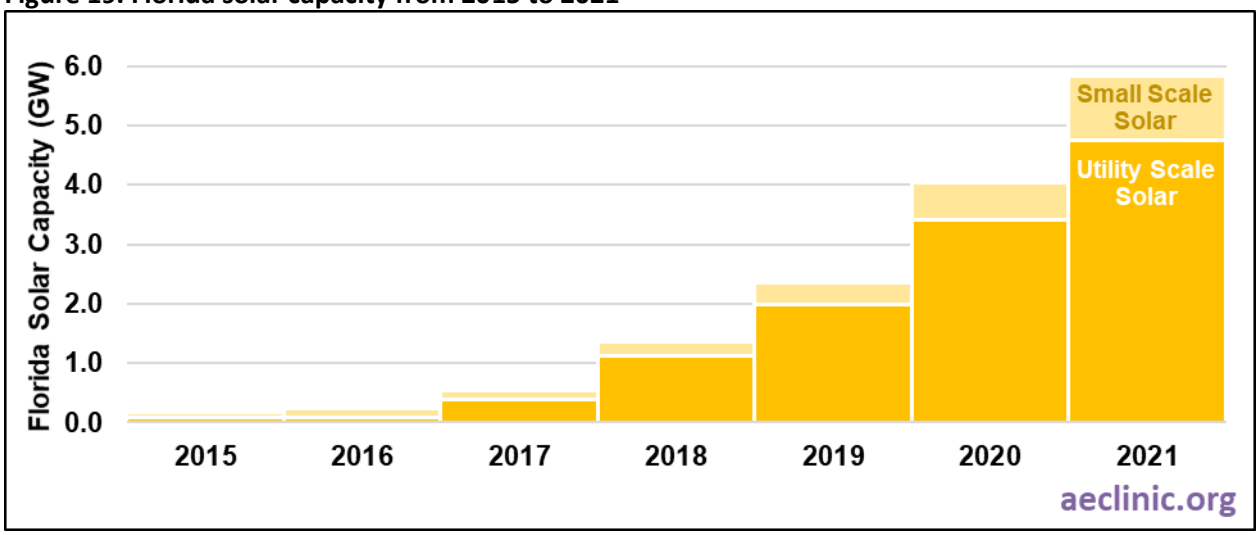
*Note: *Other includes Biomass, NUGs, PPAs. Data source: U.S. EIA. Form EIA 923. Detailed data with previous form data: Electricity. Available at: https://www.eia.gov/electricity/data/eia923/*

Florida's electric utilities' resource mix currently includes just two types of renewable sources: hydro and solar. Hydro capacity has remained constant over the last decade accounting for less than 0.1 percent of Florida's total electric capacity in 2020, or 0.1 GW.[217] Florida's solar capacity, on the other hand, more than doubled each year from 2015 through 2021 (growing from 0.1 GW to 5.8 GW). Despite this large increase, solar still makes up only about 6 percent of the State's total electric capacity.[218]

About 80 percent, or 5 GW, of the state's solar capacity is utility-scale solar while the remaining 20 percent, or 1 GW, is small-scale, rooftop solar (see Figure 19).[219] This statewide increase in solar capacity has been largely driven by FPL, which by itself added 3.1 GW between 2015 and 2021.[220] According to FPL's *10-Year Site Plan*, 2.6 GW of this growth can be attributed to FPL's SolarTogether program, which provides customers credits for subscribing to the program and the opportunity to receive solar-derived electricity (this program will be extended to add an additional 1.8 GW of solar through 2025).[221]

[217] Florida draws power from one hydroelectric dam on Lake Seminole at the Georgia-Florida border.
[218] U.S. EIA. 2015-2020. *Electric Power Monthly*. [Table 6.2 B]. Available at: https://www.eia.gov/electricity/monthly/
[219] Ibid.
[220] FPL 2015-2022 10-Year Plans.
[221] (1) FPL. n.d. "A brighter future we can all share." Available at: https://www.fpl.com/energy-my-way/solar/solartogether-res.html; (2) FPL April 2022 10-Year Plan.

Figure 19. Florida solar capacity from 2015 to 2021

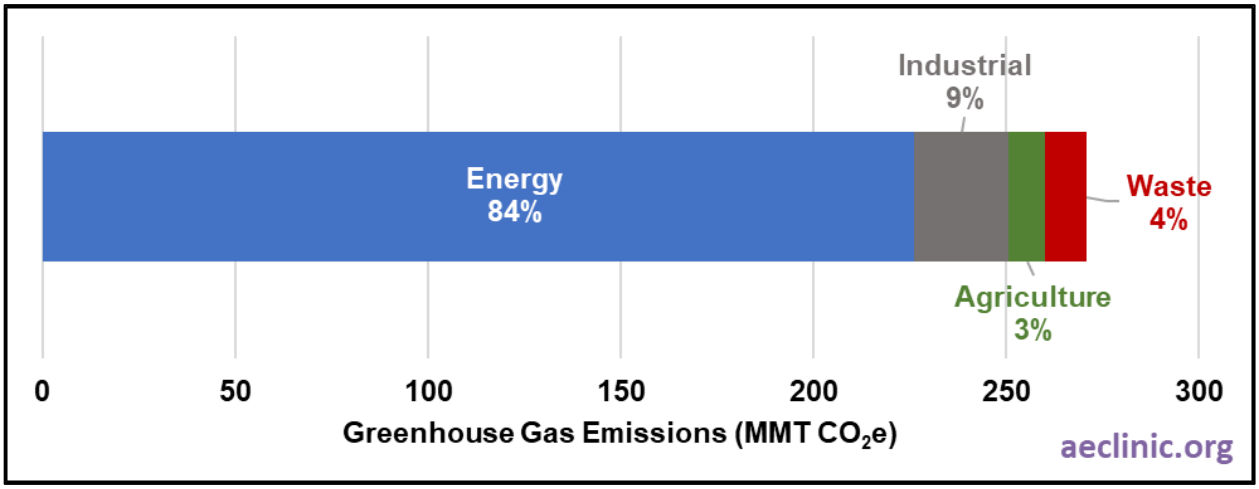


Data source: U.S. EIA. November 2021. Electric Power Monthly. [Table 6.2 B]. Available at: https://www.eia.gov/electricity/monthly/

Appendix B: Role of Policy in the Transition towards Clean Energy

Commitment from utilities to decarbonize their electric sector often starts with federal or state policy that requires emission reduction efforts or establishes standards with which utilities are required to comply.[222] Without regulatory pressure, utilities have little incentive to pursue emissions reduction efforts. Florida does not currently have a state-wide greenhouse gas emissions reduction target, a renewable portfolio standard for electric utilities, energy storage targets, or an integrated resource plan process. Florida does set energy efficiency requirements for each of its utilities, but these targets are modest compared to requirements in other states. According to the U.S. Environmental Protection Agency, Florida's statewide greenhouse gas emissions amounted to 271 million metric tons of carbon dioxide equivalents (MMT CO_2e) in 2019.[223] Florida's energy sector (almost all of which is the electric system)[224] accounted for more than 80 percent of those emissions (see Figure 20).[225]

Figure 20. Florida greenhouse gas emissions by sector



Source: U.S. EPA. 2019. "Greenhouse Gas Inventory Data Explorer." Available at: https://cfpub.epa.gov/ghgdata/inventoryexplorer/#electricitygeneration/entiresector/allgas/category/current

Renewable portfolio standards

Most U.S. states have a renewable portfolio standard (RPS), also referred to as a renewable or clean energy requirement, that establishes a target for the percentage of electric sales that must be derived from renewable energy like solar or wind (see Figure 21). (Typically, rights to renewable generation are secured through renewable energy credits or certificates, which can be purchased separately from energy.) There are ten states with a 100 percent RPS by 2032 to 2050. According to the National Conference of

[222] James, Christopher. March 2019. *Best Practices for Achieving Cleaner Air and Lower Carbon*. Regulatory Assistance Project (RAP). Available at: https://www.raponline.org/wp-content/uploads/2019/03/rap-james-best-practices-achieving-cleaner-air-lower-carbon-2019-march-26.pdf

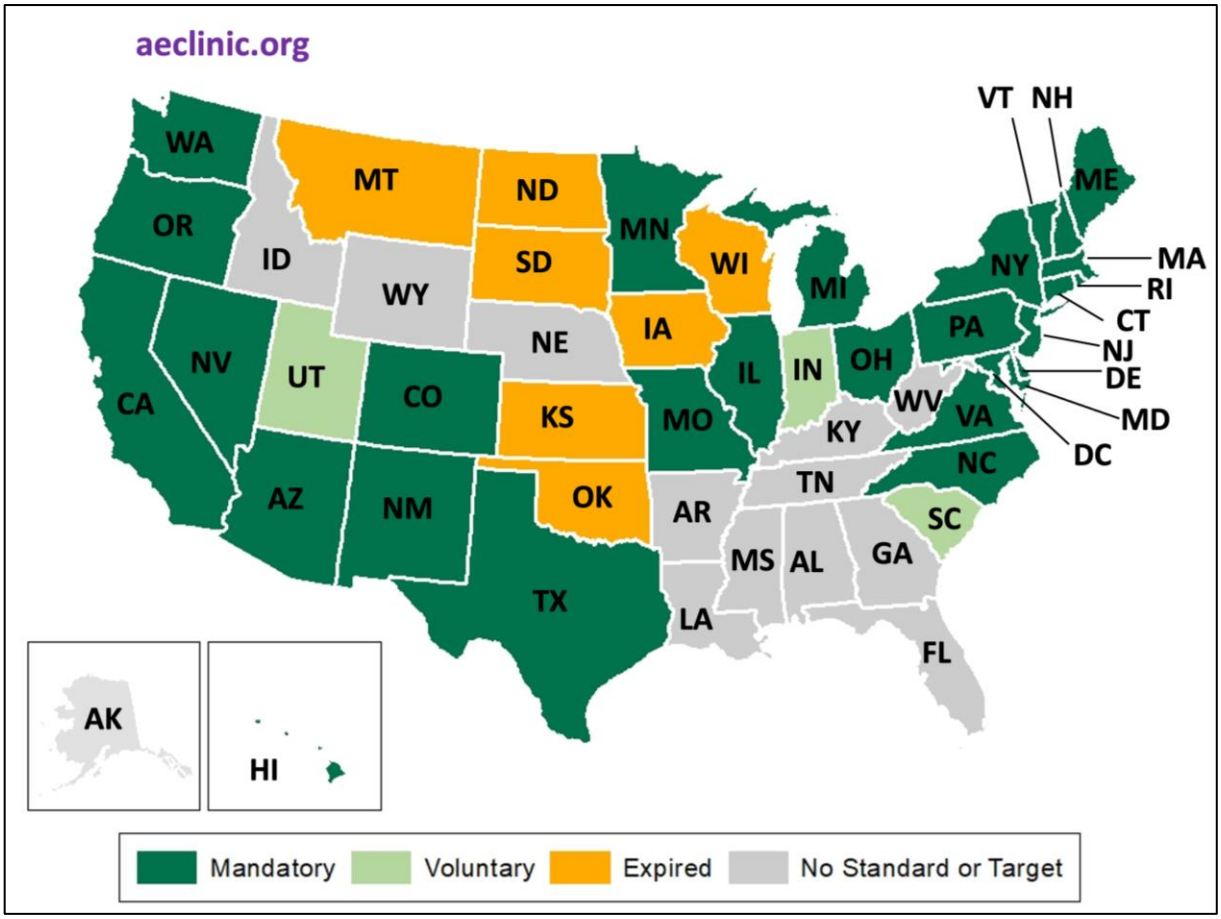
[223] U.S. EPA. 2019. "Greenhouse Gas Inventory Data Explorer." Available at: https://cfpub.epa.gov/ghgdata/inventoryexplorer/#iallsectors/allsectors/allgas/inventsect/current

[224] U.S. DOE. 2015. "State of Florida Energy Sector Risk Profile." Available at: https://www.energy.gov/sites/prod/files/2015/05/f22/FL-Energy%20Sector%20Risk%20Profile.pdf

[225] Florida Department of Agriculture and Consumer Services. 2019. *Florida Energy and Climate Plan.* p. 24.

State Legislatures (NCSL), RPS policies are responsible for about half of the growth in U.S. renewable energy generation over the last 20 years. However, a handful of states have allowed their RPS to expire and 13 states have no standard at all, including Florida.[226]

Figure 21. Renewable portfolio standards in the United States



Data source: NCSL. 2021. "State Renewable Portfolio Standards and Goals." Available at: https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

Emission reduction targets and policy

Currently, 24 states and the District of Columbia have established economy-wide greenhouse gas targets.[227] Of these states, eight aim for net-zero emissions by either 2045 or 2050, two aim for zero gross emissions, and others produce reductions from a base year of either 1990 or 2005 of greater than 75 percent (see Figure 22).[228] Among Southeast states, Louisiana aims to be net-zero by 2050, Virginia aims to be net-zero by 2045, and North Carolina aims to reduce greenhouse gas emissions 40 percent below 2005

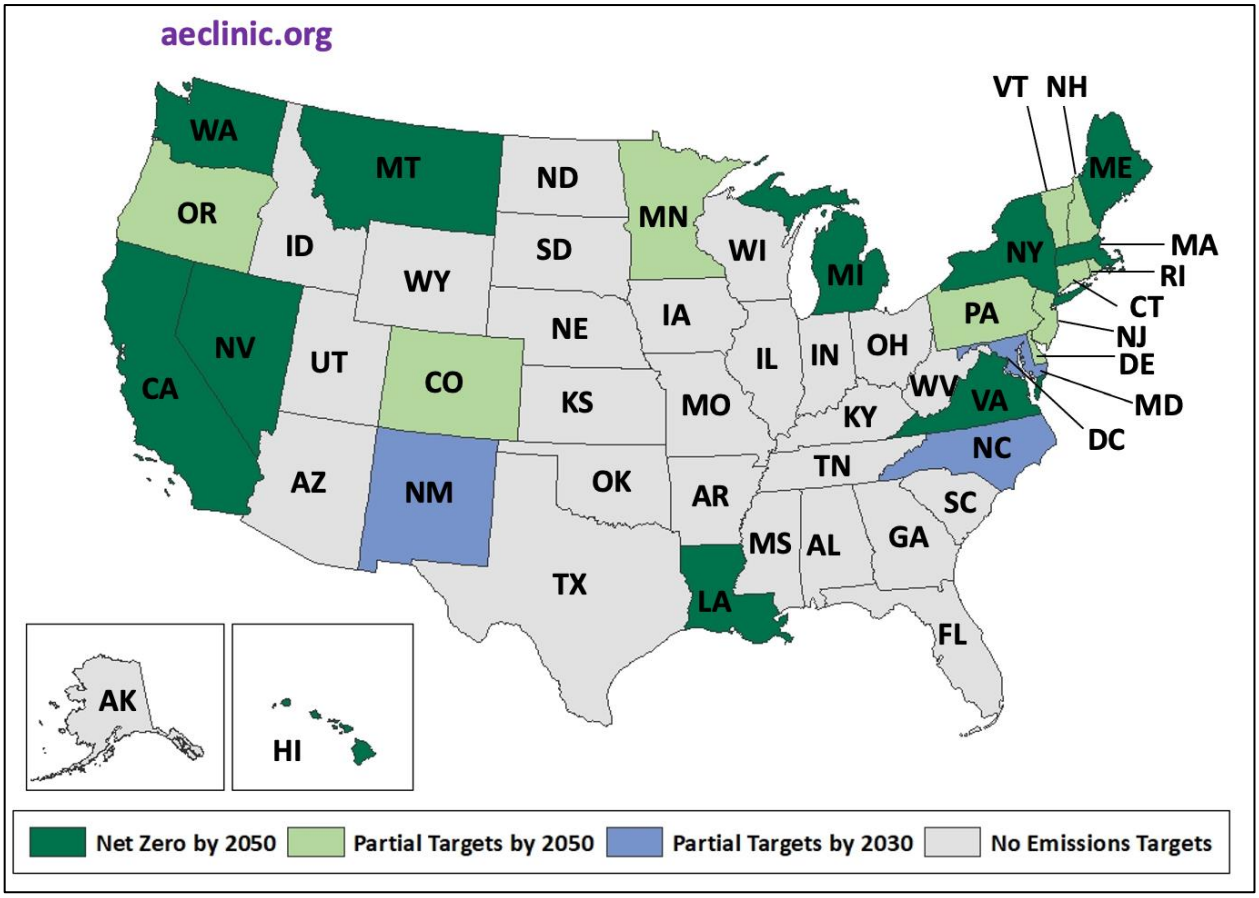
[226] NCSL. 2021. "State Renewable Portfolio Standards and Goals." Available at: https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx

[227] Center for Climate and Energy Solutions. *U.S. State Greenhouse Gas Emissions Targets.* Available at: https://www.c2es.org/document/greenhouse-gas-emissions-targets/

[228] Ibid. Note, base years of 2001 and 2006 are used respectively in Connecticut and New Jersey.

levels by 2025. Eleven Northeast states participate in the Regional Greenhouse Gas Initiative, a market-based cap-and-trade program to limit emissions from the power sector, and California participates in a similar cap-and-trade initiative together with the Canadian province of Quebec.[229]

Figure 22. State emission reduction targets



Data source: Center for Climate and Energy Solutions. 2021. "State Climate Policy Maps." Available at: https://www.c2es.org/content/state-climate-policy/

In addition, there are federal greenhouse gas emission performance standards (EPS) which limit the release of several pollutants including CO_2, methane, nitrogen oxide, and fluorinated gases from air pollution sources (e.g., power plants, industrial facilities, or vehicles). Several states—California, New York, Oregon, and Washington—have enacted their own more stringent emissions standards that apply to electric generating units.[230] Florida does not have more stringent emissions standards than the EPS.

[229] (1) The Regional Greenhouse Gas Initiative. n.d. "Elements of RGGI." Available at: https://www.rggi.org/program-overview-and-design/elements; (2) California Environmental Protection Agency. n.d. ARB Emissions Trading Program. Available at: https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/guidance/cap_trade_overview.pdf

[230] (1) U.S. EPA. n.d. "Setting Emissions Standards Based on Technology Performance." Available at: https://www.epa.gov/clean-air-act-overview/setting-emissions-standards-based-technology-performance; (2) U.S. EPA. 2016. *CO2 Emissions Performance Standards*. Available at: https://archive.epa.gov/epa/sites/production/files/2016-03/documents/2-_co2_emission_performance_standards.pdf

Energy storage requirements

Deployment of energy storage projects is limited by several barriers including a lack of markets and high technology costs; public policies such as energy storage construction requirements and subsidies can counteract these barriers and encourage more projects.[231]

At the federal and state levels, there exist very few laws or statutes requiring investments in energy storage. The Long Duration Storage Shot initiative, part of the U.S. Department of Energy's Energy Earthshots Initiative, establishes a goal to reduce the cost of grid-scale energy storage by 90 percent for systems that deliver 10+ hours of duration, within the decade.[232] In February 2018, the Federal Energy Regulatory Commission (FERC) issued Order No. 841, requiring system operators to remove barriers for electric storage resources to participate in capacity, energy, and ancillary services markets.[233] Then in November 2020, FERC approved Order No. 2222, requiring grid operators to create financial pathways for distributed energy resources to compete to provide services normally reserved for large-scale systems, which could enable more economic deployment of small-scale battery storage systems.[234] State of Florida has no procurement targets or requirements for energy storage.[235] The American Clean Power Association recommends that state policy makers capture the full value of energy storage, enable competition in all grid and resource planning, and ensure fair and equal access for storage to realize the most benefits to ratepayers.[236]

Energy efficiency standards

Energy efficiency standards are a tool for promoting efficient generation, transmission, and use of electricity. These standards can either set minimum amounts of required energy savings[237] or set appliance or system-specific requirements. Energy efficiency savings are an essential part of any plan to decarbonize the power industry and incentivize fuel switching.[238]

Energy efficiency requirements are established by the Department of Energy through its Buildings Technologies Office and are targeted toward specific appliances and products, such as consumer products, plumbing products, lighting products, and commercial and industrial products.[239] These standards are developed across over 60 categories of appliances and other energy products, are unique to each

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[231] Bhatnagar, D., et al. 2013. *Market and Policy Barriers to Energy Storage Deployment*. Sandia National Laboratories White Paper, SAND2013-7606. Available at: https://www.sandia.gov/ess-ssl/publications/SAND2013-7606.pdf

[232] U.S. Department of Energy. July 2021. "Long Duration Storage Shot: An Introduction." Available at: https://www.energy.gov/sites/default/files/2021-07/Storage%20shot%20fact%20sheet_071321_%20final.pdf.

[233] U.S. EIA. August 2021. "Battery Storage in the United States: An Update on Market Trends." Available at: https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage_2021.pdf. p. 25.

[234] Ibid.

[235] State Policy Opportunity Tracker for Clean Energy. July 2, 2021. "Florida – Energy Storage Standard." Available at: https://spotforcleanenergy.org/state/florida/energy-storage-standard/

[236] American Clean Power Association. n.d. "State Policy Menu for Storage." Available at: https://energystorage.org/thought-leadership/state-policy-menu-for-storage/

[237] Center for Climate and Energy Solutions. 2019. *Energy Efficiency Standards and Targets*. Available at: https://www.c2es.org/document/energy-efficiency-standards-and-targets/

[238] Office of Energy Efficiency and Renewable Energy. N.d. *About the Appliance and Equipment Standards Program.* Department of Energy. Available at: https://www.energy.gov/eere/buildings/about-appliance-and-equipment-standards-program

[239] Office of Energy Efficiency and Renewable Energy. N.d. *About the Appliance and Equipment Standards Program*.

individual product, and must go through the energy efficiency standards and test procedures required by federal law.[240]

In November of 2021, President Biden signed a bill that will put $1 trillion toward infrastructure and funding for advancing energy efficiency standards.[241] Out of this $1 trillion, $3.5 billion is allocated for the weatherization of low-income households. Over $1 billion is allocated for building energy codes, new revolving loan funds for commercial and residential building upgrades, public school and federal building upgrades, and worker training. An additional $7.5 billion is allocated toward the installation of electric vehicle chargers. The remaining money is allocated toward industrial energy efficiency. Funding for advancing energy efficiency nationwide is also available through the 2021 American Rescue Plan Act.[242]

As of 2019, there were 22 states with mandatory Energy Efficiency Resource Standards—efficiency savings targets as a percent of utility sales—and four states with voluntary standards.[243] Further, many states have adopted and implemented the 2018 International Energy Conservation Code (IECC) and are now working on reviewing and adopting the new 2021 IECC.[244] A handful of states have adopted their own energy efficiency appliance standards on top of those required at the federal level; Maine, Massachusetts, Nevada, Oregon, and Rhode Island have specific appliance standards for over 15 energy-using products.[245] In additional, Minnesota applies energy efficiency standards using their Energy Conservation and Optimization (ECO) Act, which increases the minimum savings targets and increases funding for low-income energy efficiency programs and updates on an annual basis.[246]

In 1980, Florida's Energy Efficiency and Conservation Act (FEECA) required utilities to implement energy efficiency programs, conduct energy audits, and improve overall efficiency. FEECA mandates the FPSC to review each utility's conservation goals at least once every five years. In 2009, FEECA was amended to exempt smaller utilities with annual sales below 2,000 GWh. Finally, in 2014, the FPSC set utility-specific energy conservation goals for 2015-2024 (see Table 5).[247] FPL's energy efficiency targets comprise more than half of the state's total targets.

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[240] (1) DSIRE. 2021. *Federal Appliance Standards.* NC Clean Energy Technology Center. Available at: https://programs.dsireusa.org/system/program/detail/1709/federal-appliance-standards; (2) Office of Energy Efficiency and Renewable Energy. N.d. *About the Appliance and Equipment Standards Program.* Department of Energy.

[241] Berg, W., Cooper, E., & DiMascio, M. 2022. *State Energy Efficiency Scorecard: 2021 Progress Report.* ACEEE. Available at: https://www.aceee.org/sites/default/files/pdfs/u2201.pdf

[242] Ibid.

[243] Center for Climate and Energy Solutions. 2019. *Energy Efficiency Standards and Targets.*

[244] Berg, W., Cooper, E., & DiMascio, M. 2022. *State Energy Efficiency Scorecard: 2021 Progress Report.* ACEEE. p. vi

[245] Ibid. p. iv

[246] Ibid. p. vii

[247] (1) DSIRE. 2015. "Energy Efficiency Goals". Available at: https://programs.dsireusa.org/system/program/detail/4505; (2) American Council for an Energy-Efficient Economy (ACEEE). "State and local policy database". Available at: https://database.aceee.org/#:~:text=ACEEE's%20State%20and%20Local%20Policy,the%20state%20and%20local%20level.&text=Communities%20not%20included%20in%20the,efficiency%20policies%20to%20other%20communities.

Table 5. Utility-specific energy efficiency goals 2015-2024

Electric Utility	Summer Demand Goals (MW)	Winter Demand Goals (MW)	Annual Energy Goals (GWh)
Florida Power & Light (FPL)	526	324	526
Duke Energy Florida (DEF)	259	419	195
Tampa Electric Company (TECO)	56	78	144
Gulf Power Company (GULF)	68	37	84
Florida Public Utilities Company (FPUC)	1	0	2
Orlando Utilites Comission (OUC)	5	8	13
Jacksonville Electric Authority (JEA)	11	10	26
Total	927	877	991

Data source: FPSC. November 2021. FEECA Annual Report on Activities Pursuant to the Florida Energy Efficiency and Conservation Act [Table 5]. Available at: http://www.psc.state.fl.us/Publications/Reports#

According to the American Council for an Energy-Efficient Economy's (ACEEE) 2020 State Energy Efficiency Scorecard, Florida ranks among the top three states in the Southeast for energy efficiency. However, Florida ranks 27th nationally, two spots lower than last year.[248] ACEEE grades states according to five categories: utilities, transportation, building policies, state-led initiatives, and appliance standards. Florida's utilities scored below the national median score.[249]

Integrated Resource Plans

Integrated Resource Plans (IRPs) are an essential tool for achieving the best, and the least cost, energy investments and operations in states—like Florida—with vertically integrated utilities. (A vertically integrated utility owns power plants in addition to owning and operating local electric distribution. In contrast, states with electric utilities that are organized into a common market make capacity investment and real-time generation decisions based on economics; typically, utilities in market territories are not permitted to own electric generating resources.) Utility IRPs present a more detailed planning effort than Florida's *10-Year Site Plans*, including: specific technical and cost information on a full-range of potential new investments; a detailed development of annual demand and peak load projections; supply- and demand-side resource planning; modeling of numerous future scenarios, investment portfolios and sensitivity analyses of uncertain variables; and optimization modeling to determine a least-cost portfolio of resources.

Critically, almost all IRPs are developed in the context of a public stakeholder process that presents and receives feedback on modeling assumptions, projections, scenarios, and modeling results before the plan is completed and published. These plans are then submitted to the state utility commission for its approval. While stakeholder input holds very different levels of importance in different states, these public processes enhance the transparency of utility planning and the chances that details of future plans will become

[248] Berg, W., S. Vaidyanathan, B. Jennings, E. Cooper, C. Perry, M. DiMascio, and J. Singletary. 2020. *The 2020 State Energy Efficiency Scorecard*. ACEEE. aceee.org/research-report/u2011

[249] ACEEE. 2020. *2020 State Energy Efficiency Scorecard: Florida.* Available at: https://www.aceee.org/sites/default/files/pdfs/ACEEE_ScrSht20_Florida.pdf

widely available through media reports or social media. Utilities that couple their IRP with an all-source request for proposals (RFP) for real-world cost and availability information for new supply- and demand-side resources can provide the most accurate modeling information for stakeholders.

Florida's Commission does not require utilities to prepare or submit IRPs, and FPL does not independently publish an IRP. The result is a reduced planning capacity that creates unnecessary risk for investors and ratepayers alike. Insufficient planning leads to worse financial outcomes and more risk:

- IRP's modeling of multiple future scenarios and portfolios, along with optimization modeling to identify least-cost portfolios, protects investors from poor investment choices and ratepayers from unnecessary costs.
- IRP's sensitivity analyses test the impact of a range of likely values for uncertain parameters like fuel costs or the impacts of environmental regulations, protecting investors from unplanned changes in market or policy circumstances that could be damaging to stock prices.
- IRP's use of all-source RFPs in development resource costs and potentials protects investors and ratepayers from poor planning using incorrect information.
- IRP's stakeholder processes bring utility planning into the light of day, where both investors and ratepayers can benefit from more complete and earlier information on investment plans and their costs.

Appendix C: References for Utility Review

Table 6. Investor-owned utilities in SEPA's Utility Carbon-Reduction Tracker

	Utility		
1	Ameren Illinois Company	**23**	Minnesota Power
2	Appalachian Power (AEP)	**24**	Nantucket Electric Co (National Grid)
3	Arizona Public Service	**25**	Narragansett Electric (National Grid)
4	Avista Utilities	**26**	New York State Electric & Gas
5	Bear Valley Electric Service	**27**	Niagara Mohawk Power (National Grid)
6	Central Hudson Gas & Electric	**28**	NIPSCO
7	Commonwealth Edison Co	**29**	Oklahoma Gas & Electric
8	Consolidated Edison Company of New York	**30**	Orange & Rockland Utilities
9	Consumers Energy	**31**	Otter Tail Power Company
10	Dominion Virginia Power	**32**	Pacific Gas & Electric
11	DTE Energy	**33**	Pacific Power
12	El Paso Electric	**34**	Penelec
13	Eversource Energy	**35**	Pepco
14	Fishers Island Utility Company	**36**	Portland General Electric
15	Fitchburg Gas and Electric Light (Unitil)	**37**	Public Service Company of New Mexico
16	Green Mountain Power	**38**	Puget Sound Energy
17	Hawaiian Electric	**39**	Rochester Gas & Electric
18	Idaho Power	**40**	San Diego Gas & Electric
19	Liberty Utilities	**41**	Southern California Edison
20	Madison Gas & Electric	**42**	Southwestern Public Service
21	Massachusetts Electric (National Grid)	**43**	Tampa Electric Company
22	MidAmerican Energy Co	**44**	Tucson Electric Power

Source: SEPA. January 2022. SEPA Utility Carbon-Reduction Tracker™[Workbook]

Table 7. List of sources reviewed in review of utility transition plans

	Utility Transition Plan Citations
1	Algonquin & Liberty. 2020. Sustainability Report 2020. Algonquin Power & Utility and Liberty. Available at: https://libertyutilities.com/uploads/APUC-Sustainability-Report-2020.pdf
2	(1) Ameren Illinois Company. 2020. "Committed to Clean" [Summary of Ameren's 2020 IRP]. Available at https://s21.q4cdn.com/448935352/files/doc_downloads/summary-sheet.pdf; (2) Ameren. May 2021. "ESG Report Library". Available at: https://www.ameren.com/company/environment-and-sustainability/esg-report-library; (3) Ameren. n.d. "Our Sustainability Approach." Available at: https://www.ameren.com/company/environment-and-sustainability#:~:text=We%20strive%20to%20achieve%20net,by%202040%2C%20from%202005%20levels.
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