



# **Electric Markets, Energy Costs and EPA's Greenhouse Gas Rulemaking**

FGU Annual Meeting

October 12, 2023



# Families and Businesses in U.S. Had A Tough Year

*Energy, Food, and Housing Cost Inflation Heavy Burden to Bear*

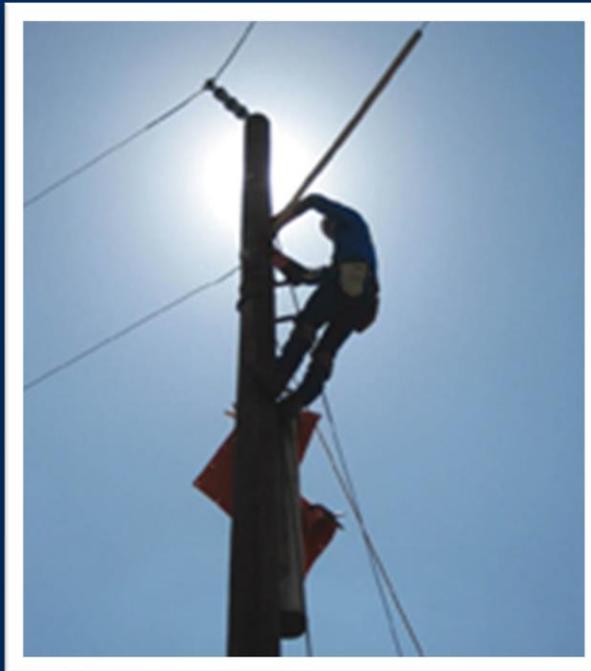
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- FL highest percentage of senior citizen/elderly population in US
- FL families have higher electric use than U.S. average - humidity
- Food and housing costs impacting all households
- Many Floridians have limited discretionary disposable income
- Florida families counting on us



**AFFORDABLE**



**RELIABLE**



**CLEAN**

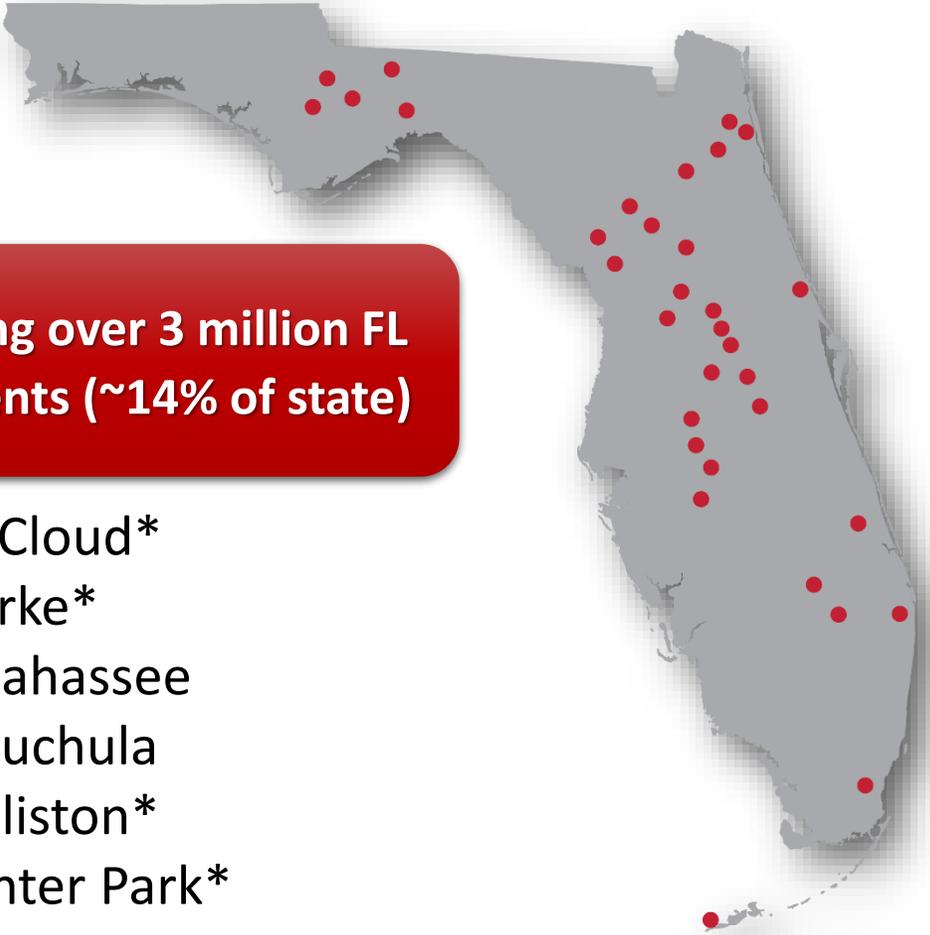
**At FMPA, we are committed to fulfilling our Mission for our Members.**

# All 33 Municipals Are Members of FMPA

*Mission: Low-Cost, Reliable and Clean Power*

Alachua\*  
Bartow\*  
Blountstown  
Bushnell\*  
Chattahoochee  
Clewiston\*  
Fort Meade\*  
Fort Pierce\*  
Gainesville  
Green Cove Springs\*  
Town of Havana\*  
Homestead\*  
Jacksonville Beach\*

Jacksonville (JEA)  
Key West\*  
Kissimmee\*  
Lake Worth Beach\*  
Lakeland\*  
Leesburg\*  
Moore Haven\*  
Mount Dora  
New Smyrna Beach\*  
Newberry\*  
Ocala\*  
Orlando\*  
Quincy

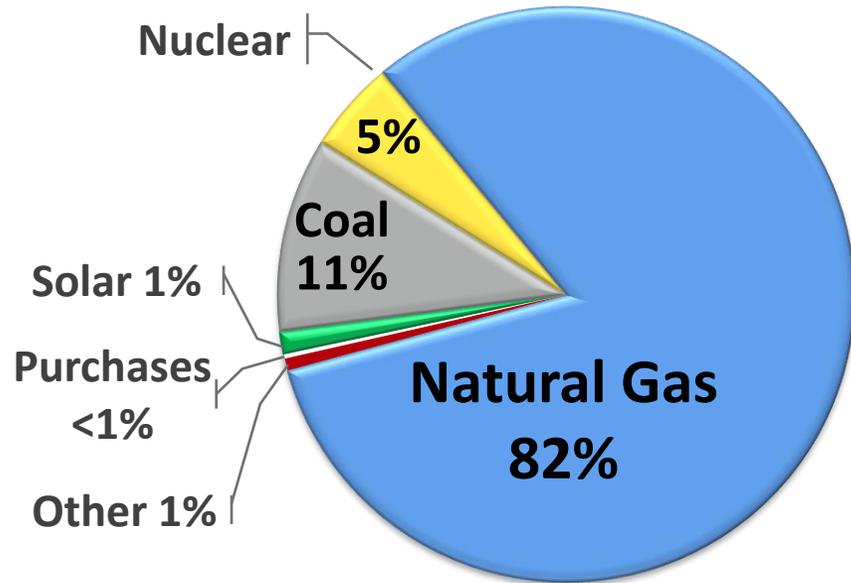


**Serving over 3 million FL residents (~14% of state)**

St. Cloud\*  
Starke\*  
Tallahassee  
Wauchula  
Williston\*  
Winter Park\*

# FMPA Will Control over 2,100 MW of Generation 2025

## *More than 80% of Energy from Natural Gas*



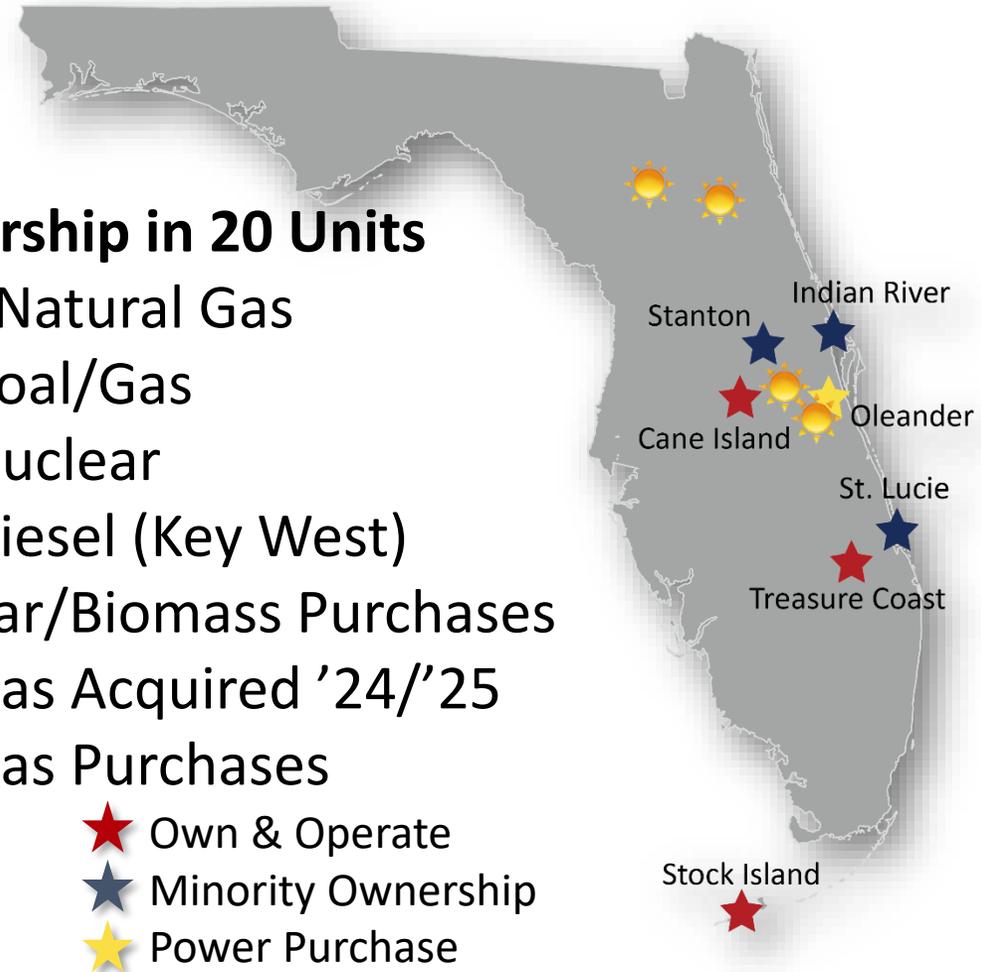
FY 2022 Total FMPA ARP Generation

 Two solar sites operational, 2 additional sites online by 2024 and 4 more by 2026

### Ownership in 20 Units

- 10 Natural Gas
- 2 Coal/Gas
- 1 Nuclear
- 7 Diesel (Key West)
- Solar/Biomass Purchases
- 3 Gas Acquired '24/'25
- 2 Gas Purchases

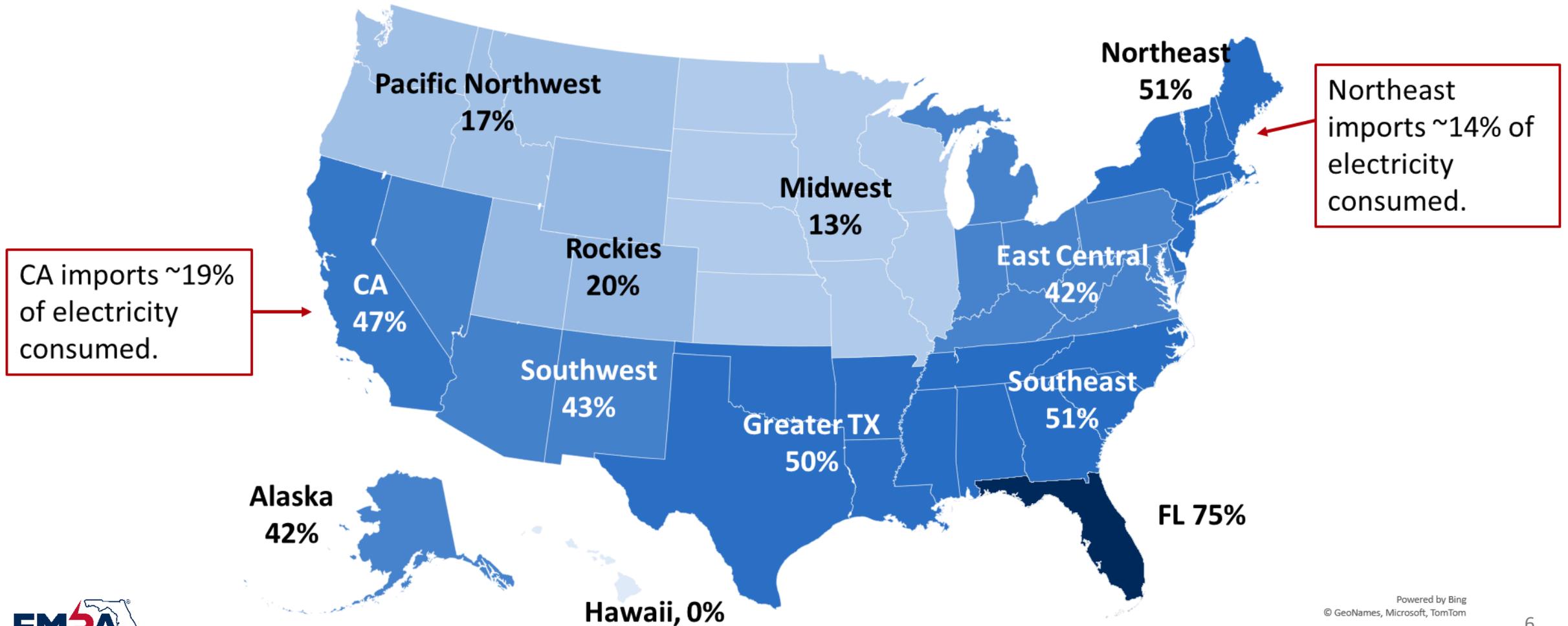
- ★ Own & Operate
- ★ Minority Ownership
- ★ Power Purchase



# Florida is Most Gas-Dependent State in the Country

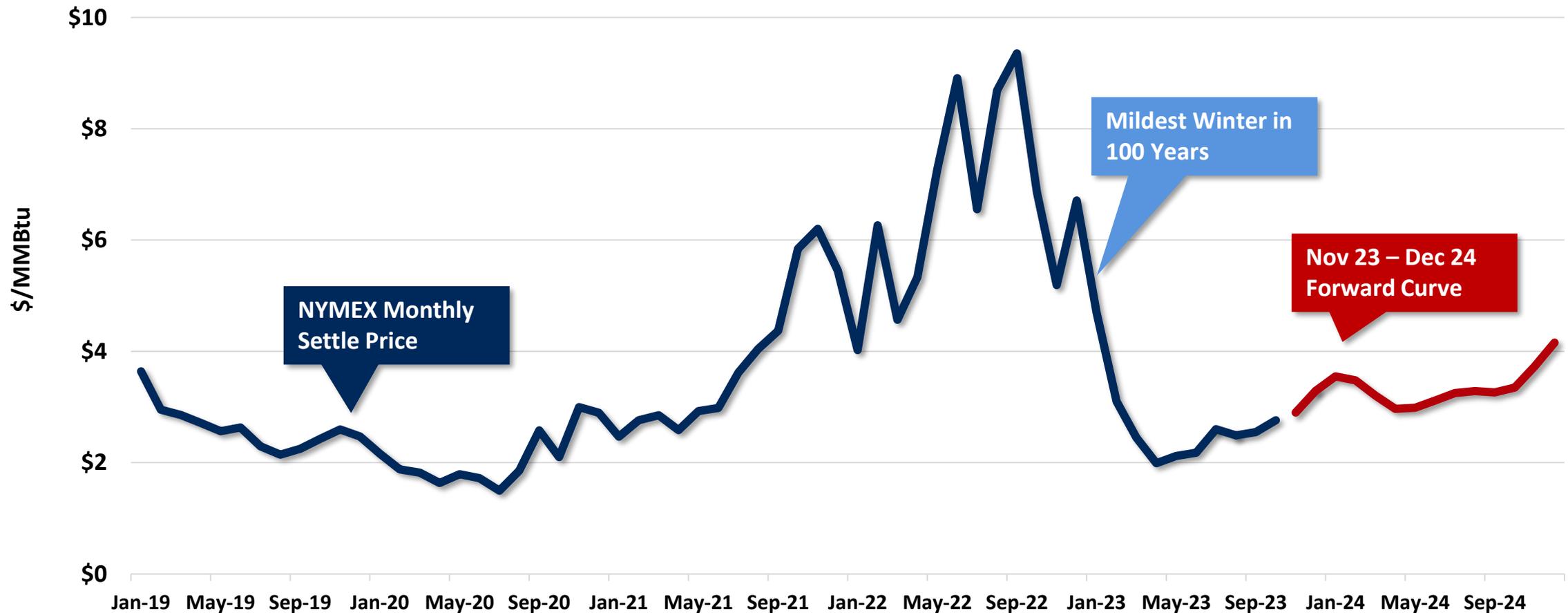
## *In Non-Wind or Hydro Regions, Natural Gas Dominant Fuel*

Regional Electricity Generation from Natural Gas as Percentage of Total Generation (2022<sup>1</sup>) (%)



# Natural Gas Drives Electricity Prices in Florida

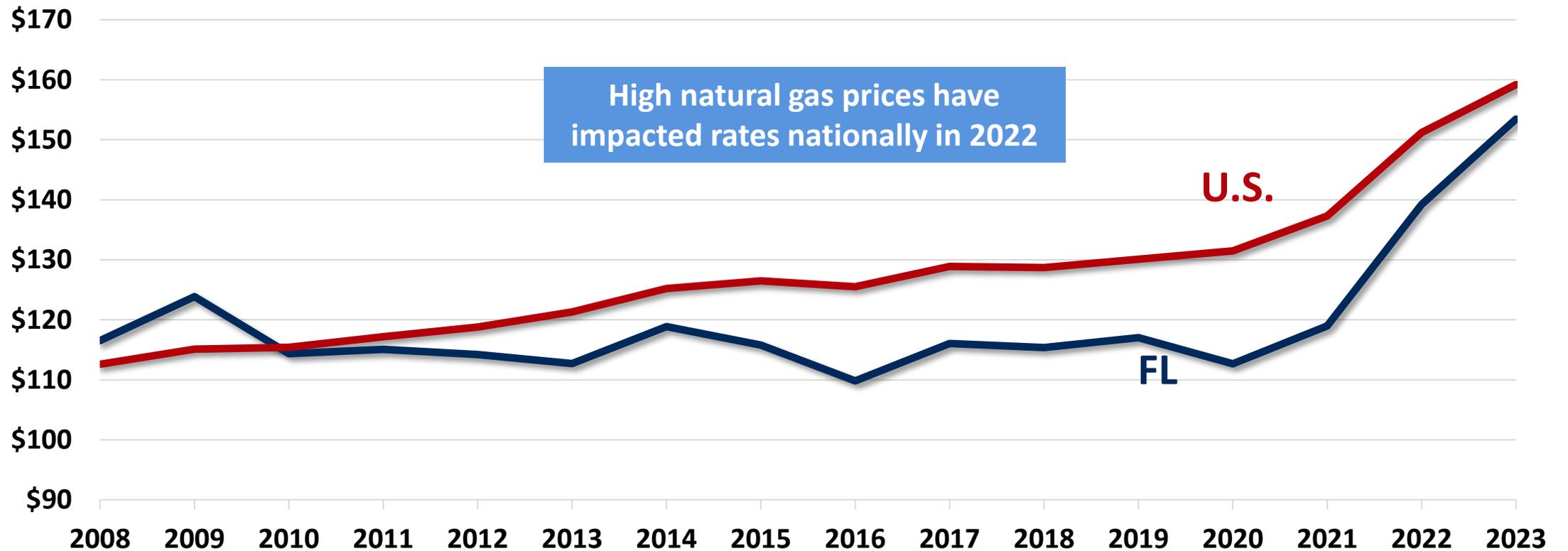
## *Mildest Winter in 100 Years Led to Lower Gas/Power Prices*



# FL Rates Rose More Than U.S. With Gas Prices

## *FL Rates Still Below U.S. Average*

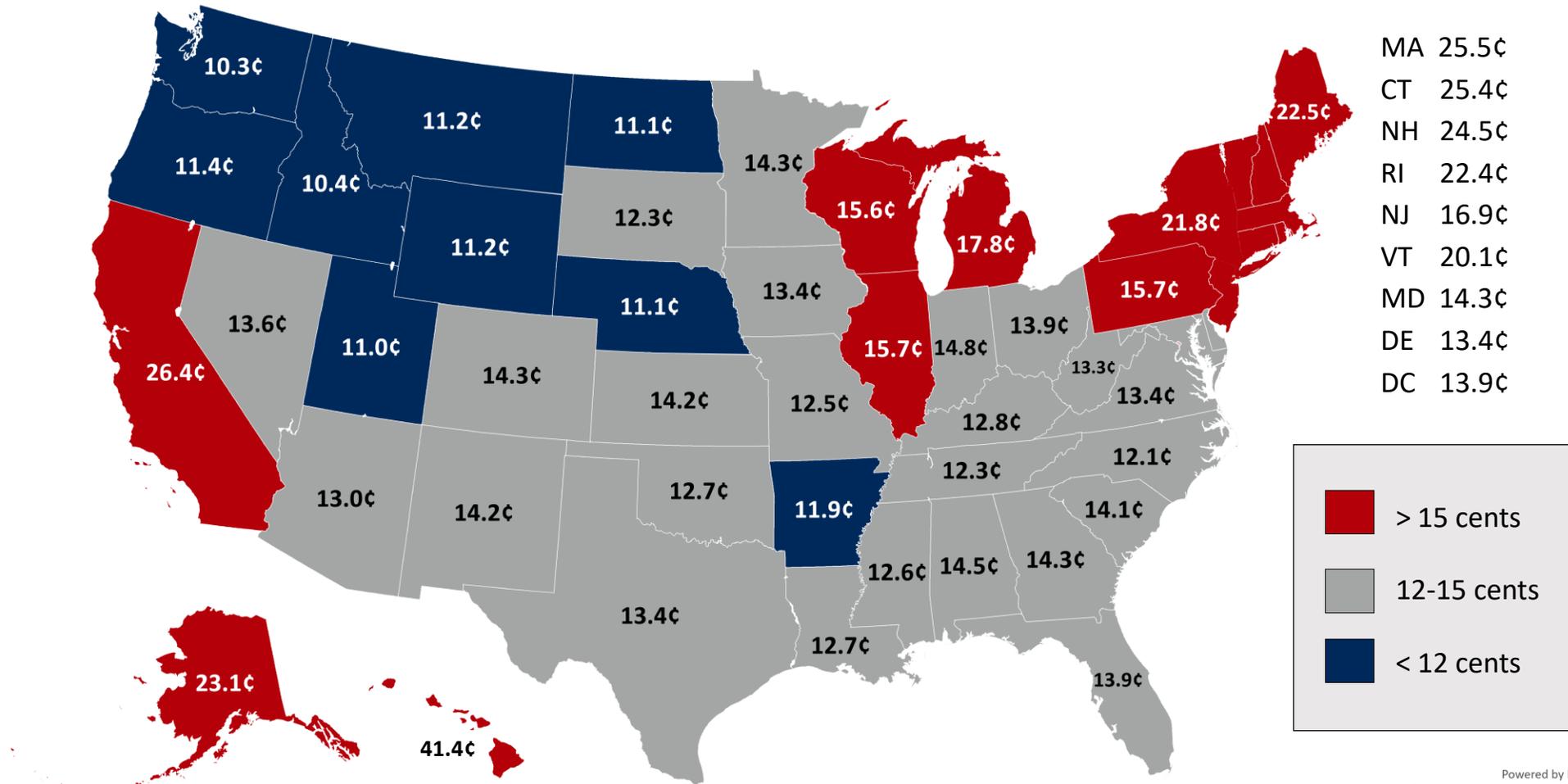
Residential Customers using 1,000 kWh/month



# Florida's Residential Electric Cost 25th Lowest in U.S.

## *Our High Electric Use Depends on Low-Cost Power*

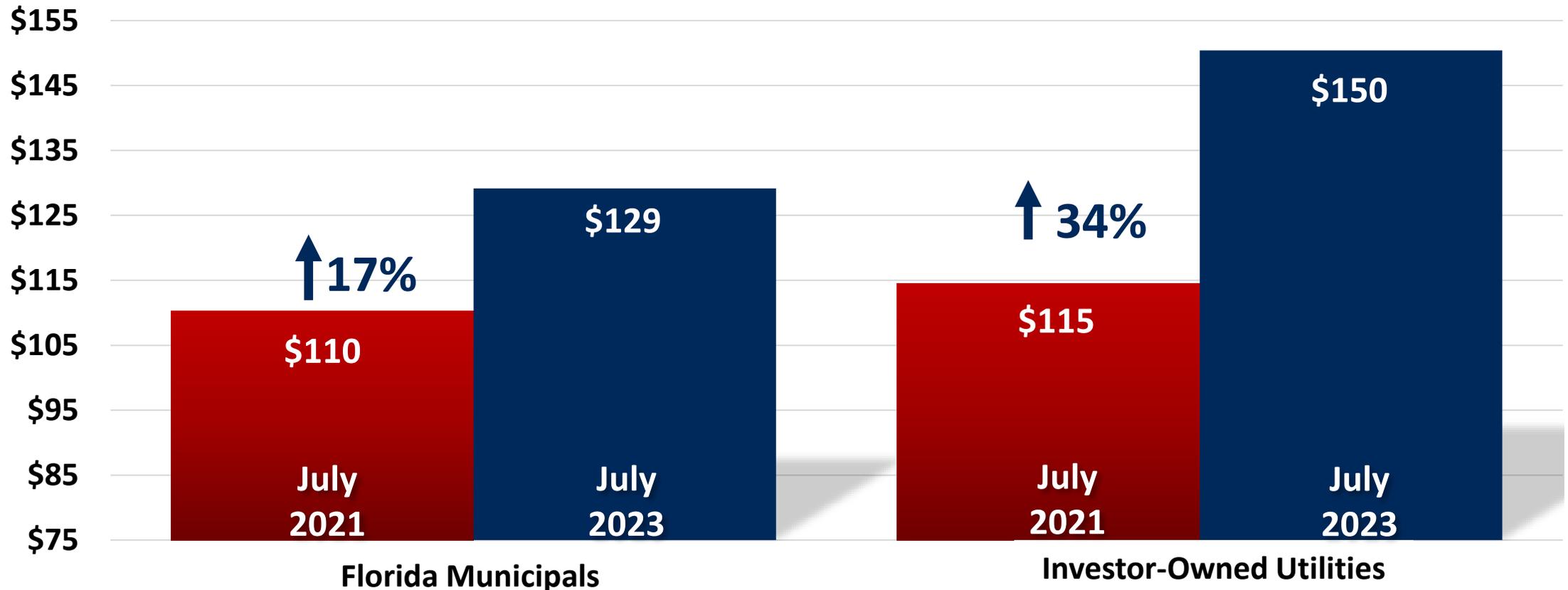
Residential Average Cost, cents per kWh



# Florida Electric Prices Up ~25% Over Last Two Years

*Price Relief Expected for Floridians in Coming Months*

1,000 kWh Residential Bill Comparison



# EPA Proposal High Risk for Natural Gas Dependent FL

## *Risk to Power Reliability and Affordability by 2032*

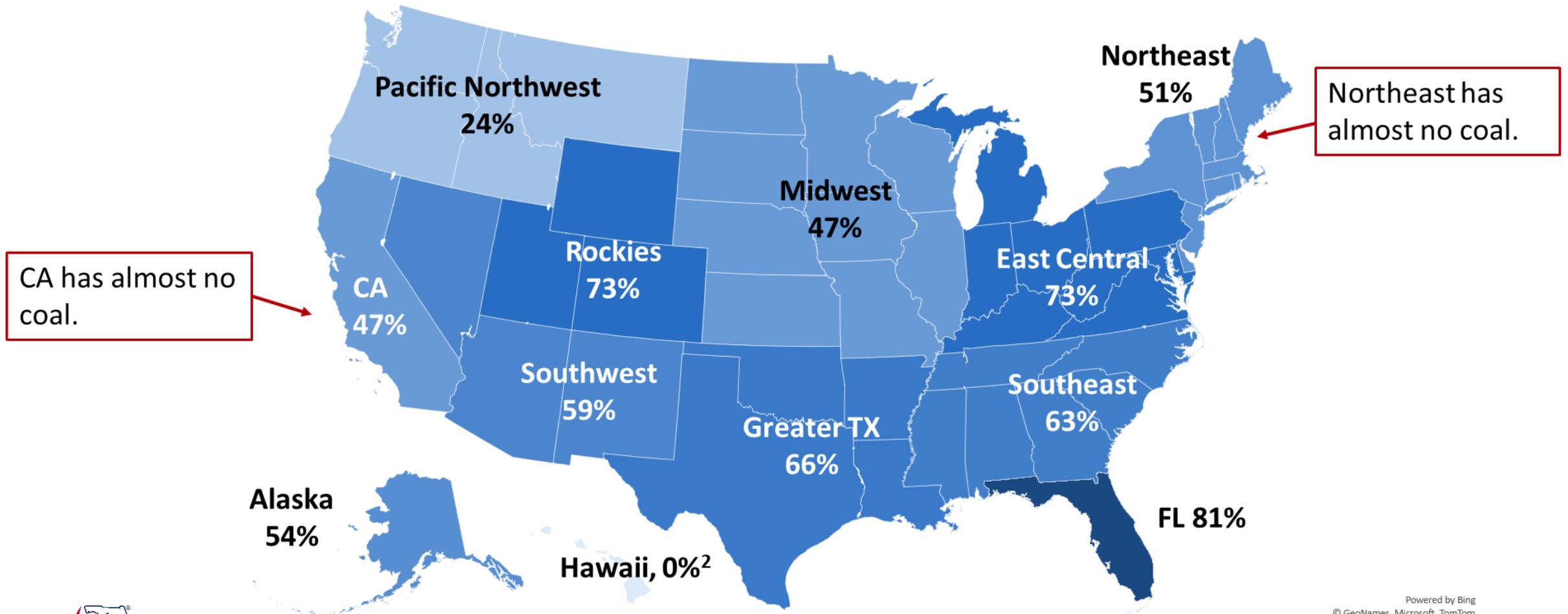
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- Complete transformation of the bulk power system by 2032
- Florida most impacted state in U.S. for both reliability and affordability
- Close most coal and dramatically reduce natural gas, 60% of U.S. generation
- EPA reductions based on technologies not economical, nor available in large scale
  - Carbon Capture & Storage (CCS) very high cost and only one operating facility
  - "Green" hydrogen blend for natural gas – in Florida, solar powered electrolysis of water for hydrogen, requiring hydrogen production facilities, pipelines and onsite hydrogen storage
- Insurmountable permitting, construction and cost implications for 2032 target
- In Florida, higher emissions: low-cost, low-emitting units (Treasure Coast) to run less, displaced by higher-cost, higher-emitting natural gas & diesel generation
- U.S. already leads the world in CO<sub>2</sub> emission reductions without any federal laws

# Challenges Ahead – EPA Proposal Restructures Grid

## *Close Most Coal Plants and Dramatically Reduce Gas Energy*

Regional Electricity Generation from Natural Gas and Coal as % of Total Generation (2022<sup>1</sup>) (%)



1 – EIA state level generation data CY 2022.  
2 – Hawaii retired the last coal plant in September 2022.

# **FRCC Utilities Note Significant Reliability Concerns**

*Potential for 8% Unserved Energy in 2032*

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**"FRCC estimates that, in 2032, the Proposed Rules could require the replacement of 23 million MWh of annual energy supply needed to serve load. This shortfall represents about 8% of FRCC's total projected demand and is equivalent to blacking out about 1.8 million residential customers for the entire year, or all residential customers for about two months."**

*FRCC Comments - EPA's Proposed CO<sub>2</sub> Rule Power Sector – July 18, 2023*

# Nationwide Concern for EPA's Proposed CO<sub>2</sub> Rule

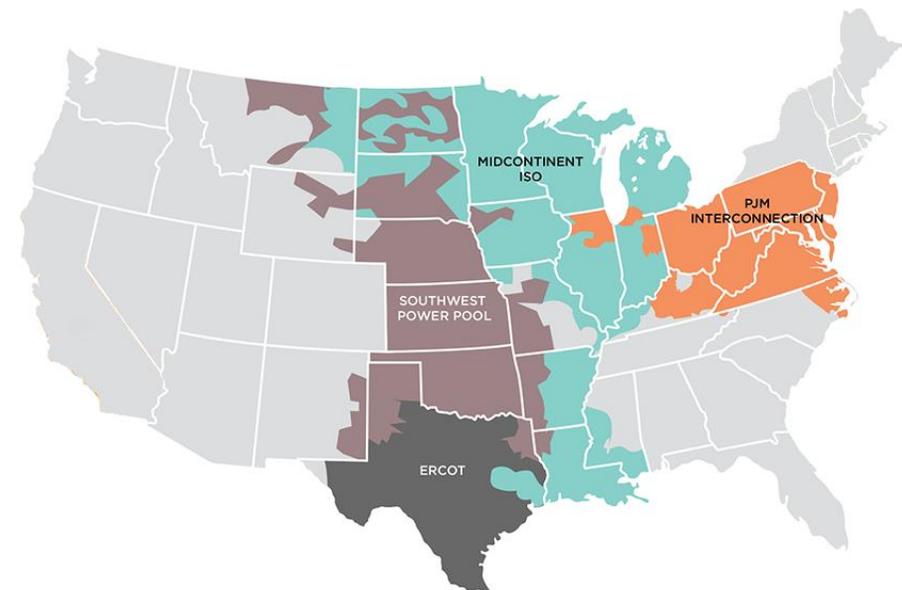
## *"In Summary, Hope Is Not an Acceptable Strategy"*

- During summer heat and winter cold peaks, fossil fuel generation is 65-75% of the generation mix
  - Winter storm Uri in February 2021: rolling blackouts in Louisiana, Oklahoma and Texas
  - Winter storm Elliot in December 2022: rolling blackouts in North Carolina, South Carolina and Tennessee
  - Summer peaks these past three weeks: natural gas and coal generation 70+% of the generation U.S.

Major U.S. Power Regions  
PJM, MISO, SPP and ERCOT  
serve 154 million

**"In summary, hope is not an  
acceptable strategy."**

Comments to EPA CO<sub>2</sub> rule, 8/8/23

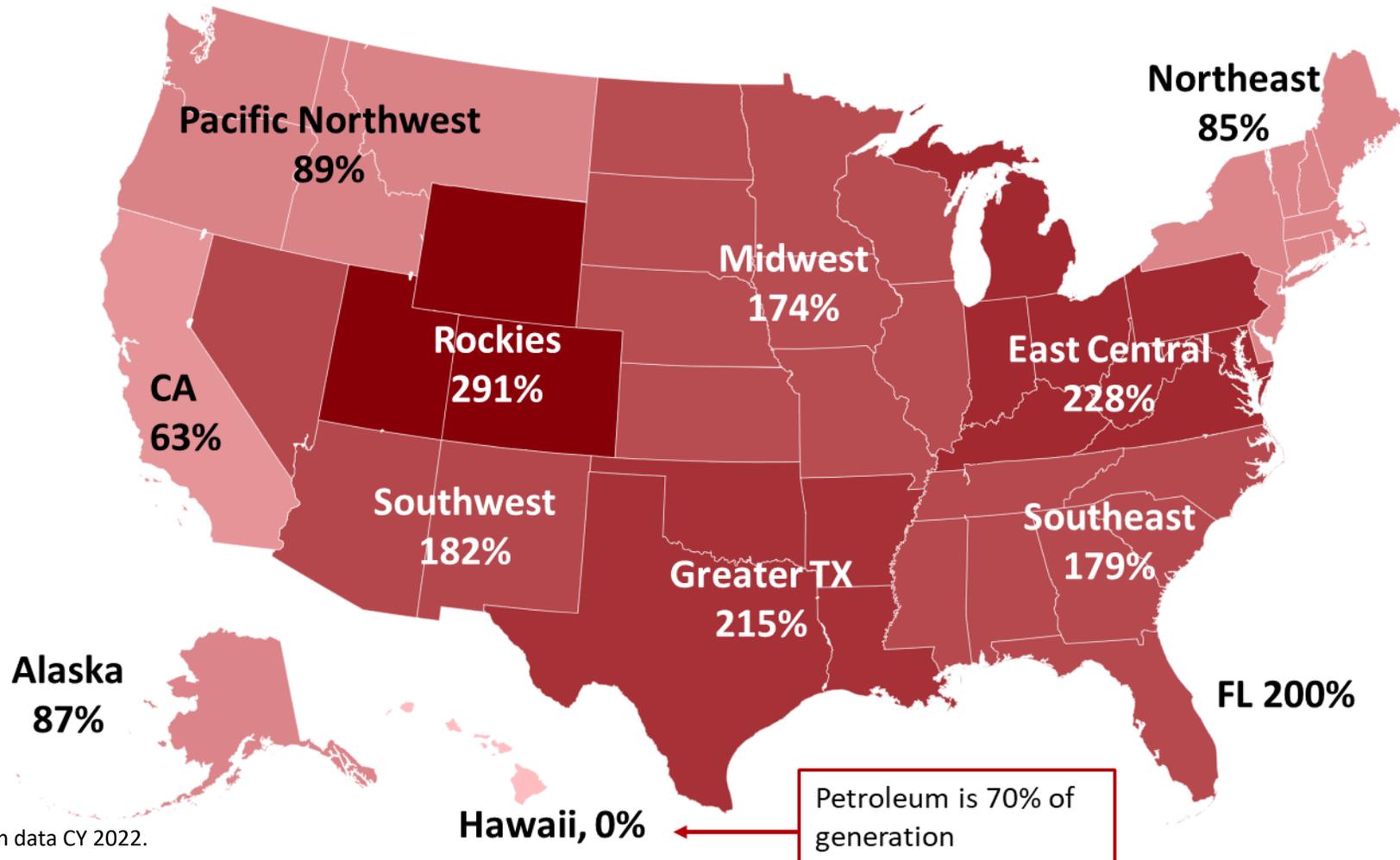


# EPA Proposal Drives High Cost for Most US Regions

## *Significant Overbuild to Replace Coal, Create Hydrogen Fuel*

Projected Regional Residential Price Increases (%)

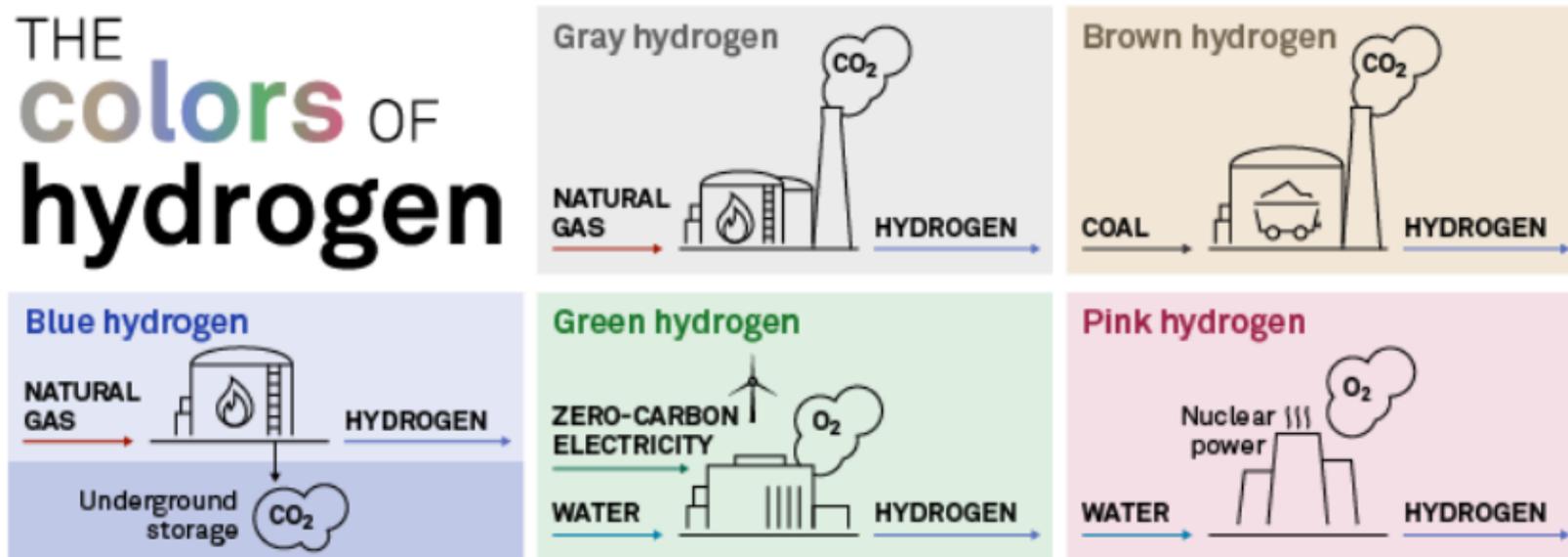
- 100% of coal converted to PV/wind and Storage
- 30% of natural gas converted to green hydrogen
  - Increasing H<sub>2</sub> blend would further increase price



# No Current Low Cost Zero Emission Hydrogen Option

## *Blue Path Alternative to Green, Both Require Infrastructure*

### THE colors OF hydrogen



As of July 26, 2022.

Design credit: Cat VanVliet

Source: S&P Global Commodity Insights

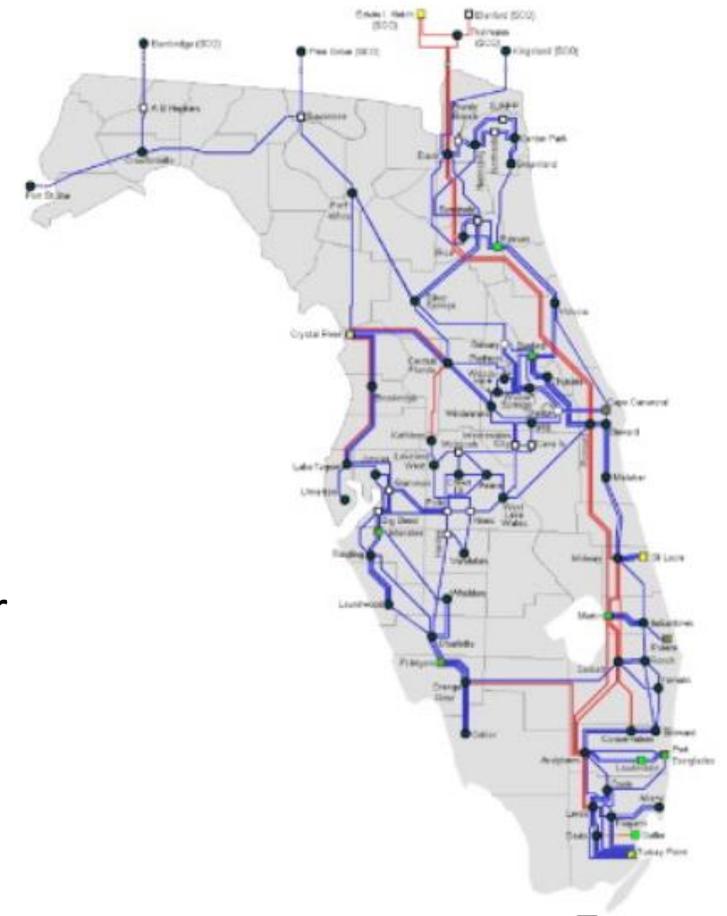
Combustors, fuel piping, welded joints, controls, and ventilation changes are required to blend hydrogen. Infrastructure to produce and store the hydrogen is not currently well defined. Steam methane reforming/CCS involved in blue option. \$10M-\$30M per facility just for investment to allow fuel blend.

- Hydrogen is the most abundant substance in the universe
- When hydrogen burns, energy is produced in the form of heat, with water as the only byproduct
- ***Here's the catch: you need energy to create free hydrogen in the first place, and that energy can come in many forms***
- Not currently efficient or low-cost

# Transmission Growth is Inevitable

## *Thermal Generation Keeps the Grid Stable*

- Additional capacity of solar/wind and batteries requires additional transmission lines since new generation will likely be sited elsewhere
- Numerous substations to be built to connect each new solar and storage site to the grid
- Grid stability requires many balancing elements to prevent blackouts
  - Synchronous condensers support grid inertia and reactive power
  - Voltage regulators and frequency response solutions needed
- EPA assumptions for transmission buildout are unrealistic



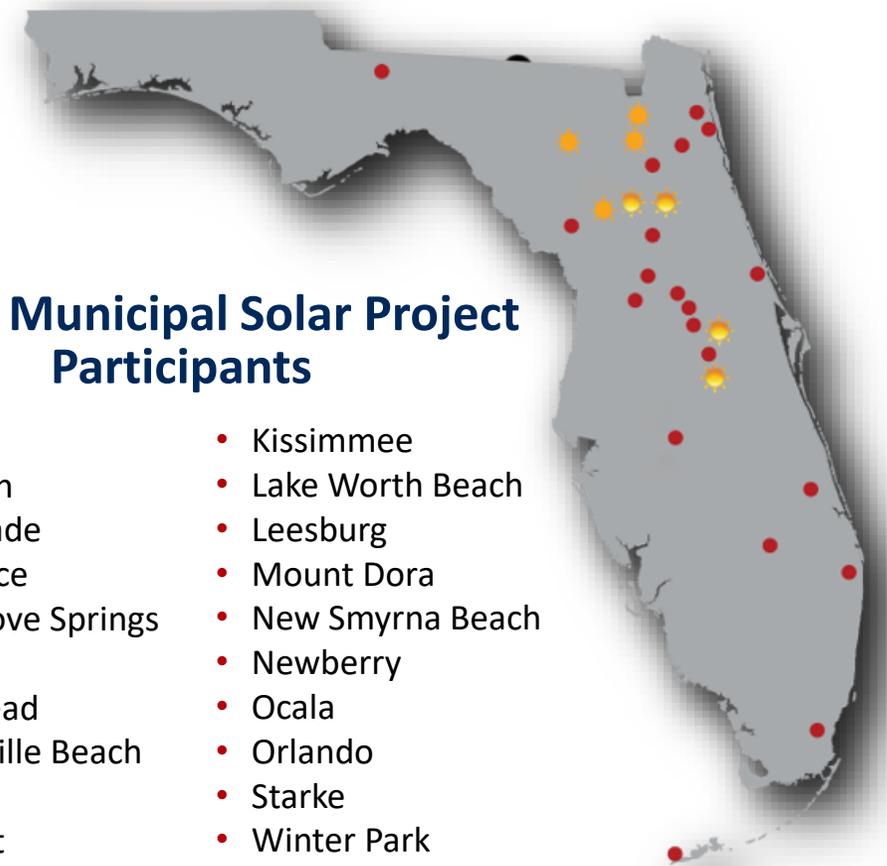
# FMSP to Provide 600 MW to 20 Florida Cities

## *Milestone Year - Signed 300 MW of New Solar Projects*

- Florida Municipal Solar Project **Phase I**
  - Two sites online totaling 150 MW
- Two **Phase II** sites for 150 MW coming in 2024-2025
- Four additional **Phase III** solar sites coming in 2025-2026 – 300 MW
- Growing solar from 1% today to 8-10% of FMIPA-ARP energy by 2027
- Large-scale solar more cost-effective
- Several cities offering solar subscription service to retail customers

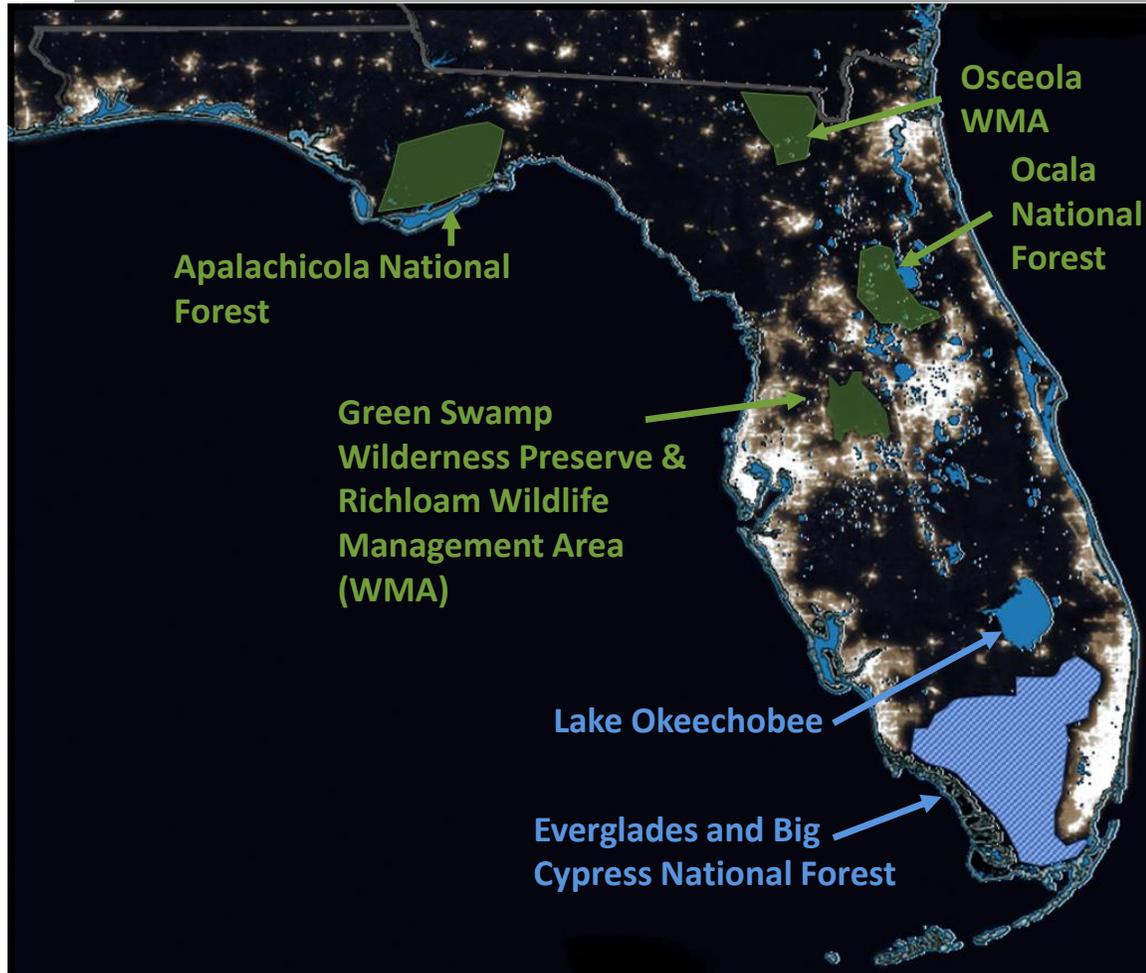
### Florida Municipal Solar Project Participants

- Bushnell
- Clewiston
- Fort Meade
- Fort Pierce
- Green Cove Springs
- Havana
- Homestead
- Jacksonville Beach
- JEA
- Key West
- Kissimmee
- Lake Worth Beach
- Leesburg
- Mount Dora
- New Smyrna Beach
- Newberry
- Ocala
- Orlando
- Starke
- Winter Park



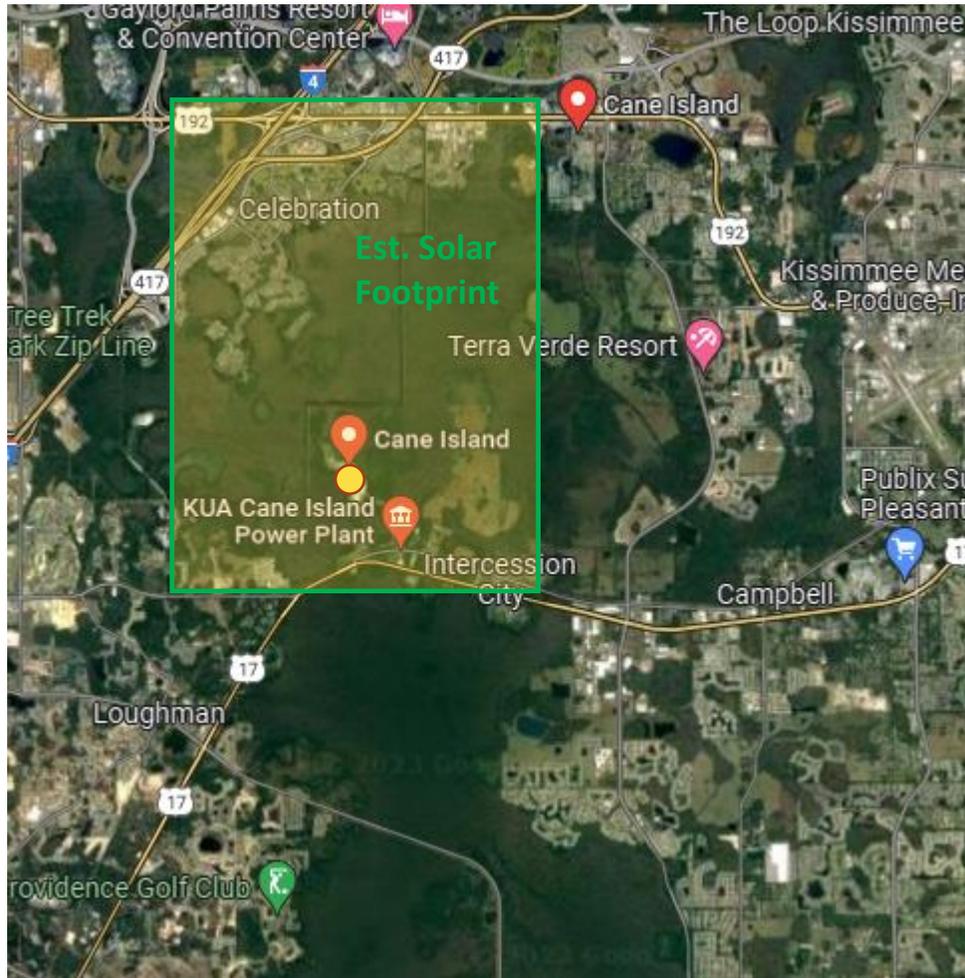
# Land Utilization Constraints Likely Higher Over Time

## *Wetland/Water Areas, Conservation Areas Not Viable for PV*



- Solar PV buildout requires dry land
- Florida contains 20% of all wetlands in the United States
- Florida is 18.5% water
- Florida has 4 million acres of conservation land (10% of FL)
  - 1.14 million acres of National Forest area
- Expect Florida and local communities to continue to prioritize protecting natural land from any development

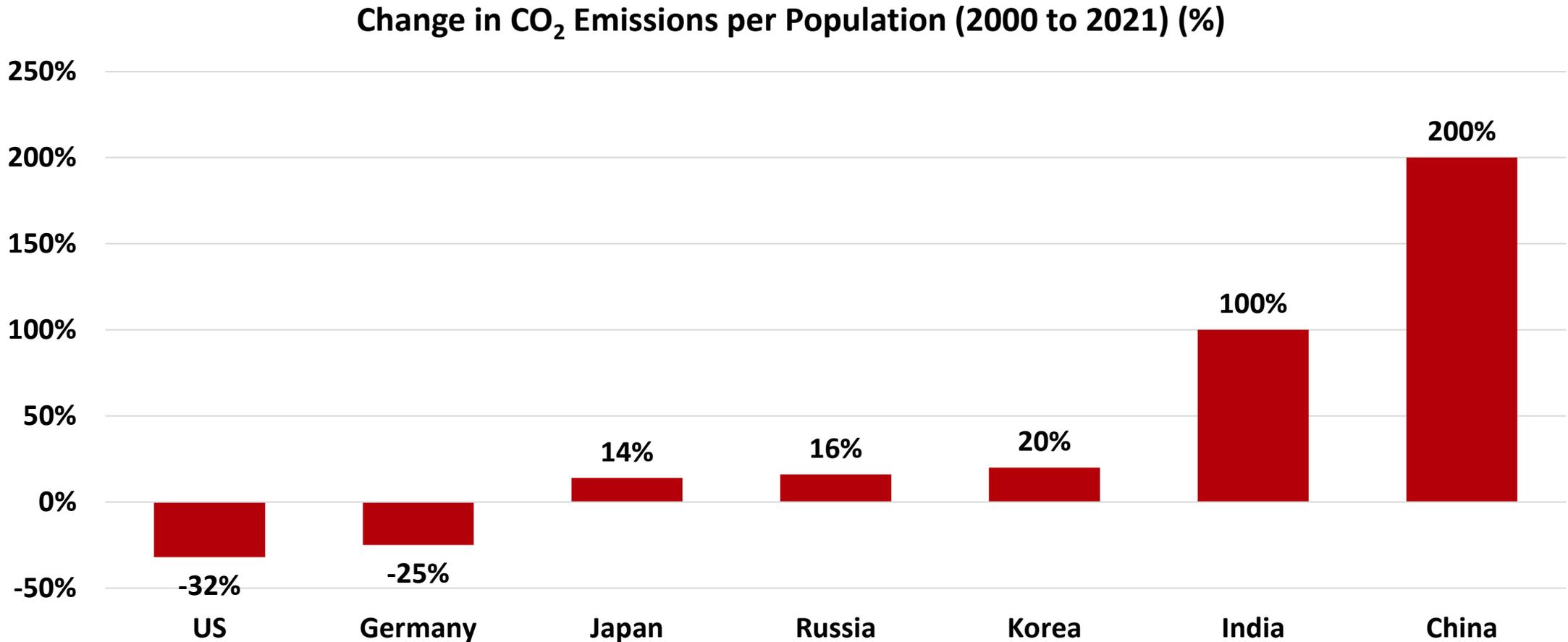
# ½ of Disney World's Footprint if Cane Island Was Solar *Capacity Factor < ½ Cane Island's, ~200x More Land Required*



- To replace 694 MWs of Cane Island:
  - 1,404 MW of solar
  - Estimated at 30% capacity factor
  - ~19 solar sites of 74.5 MWs
  - 12,638 acres vs 53 acres at Cane Island (generating facilities only)
- Challenges in Florida
  - Viability of dry land near transmission
  - Interconnection time involved
- Slightly larger footprint average in recent bids as compared to NREL average<sup>1</sup>

# US Leads World in CO<sub>2</sub> Emission Reduction Since 2000

*Without Federal Mandates, US Outpaces Europe and Others*



# Next Steps

## *Public Pressure on U.S. EPA to Seek Industry and State Input and Revise Rules*

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- EPA's Fundamental Transformation of bulk power system takes more than 77 days to study/comment
- Final rule targeted to be issued in Spring 2024
- Opportunity for pressure on U.S. EPA from Federal and State delegation - key requests:
  - Only use commercially viable and readily available technologies in proposal rule
  - Provide estimate of power cost changes from today's levels to show disparate regional impacts
  - Timelines must account for significant permitting, engineering and procurement lead times
  - Require reliability input from FERC, NERC and reliability regions before issuance
- FERC Annual Reliability Technical Conference on November 9 to include EPA's proposed rule
- Electric power supply and grid is backbone of U.S. economy and enabler of high quality of life for all
- Focus must be on affordable and reliable power for all