



# 9c BOD – FMIPA Comments on EPA's Proposal on Emissions from Power Generators

Board of Directors

July 19, 2023

# EPA Proposal Poses High Risk for Gas Dependent FL

## *Complete Transformation of the Bulk Power System by 2032*

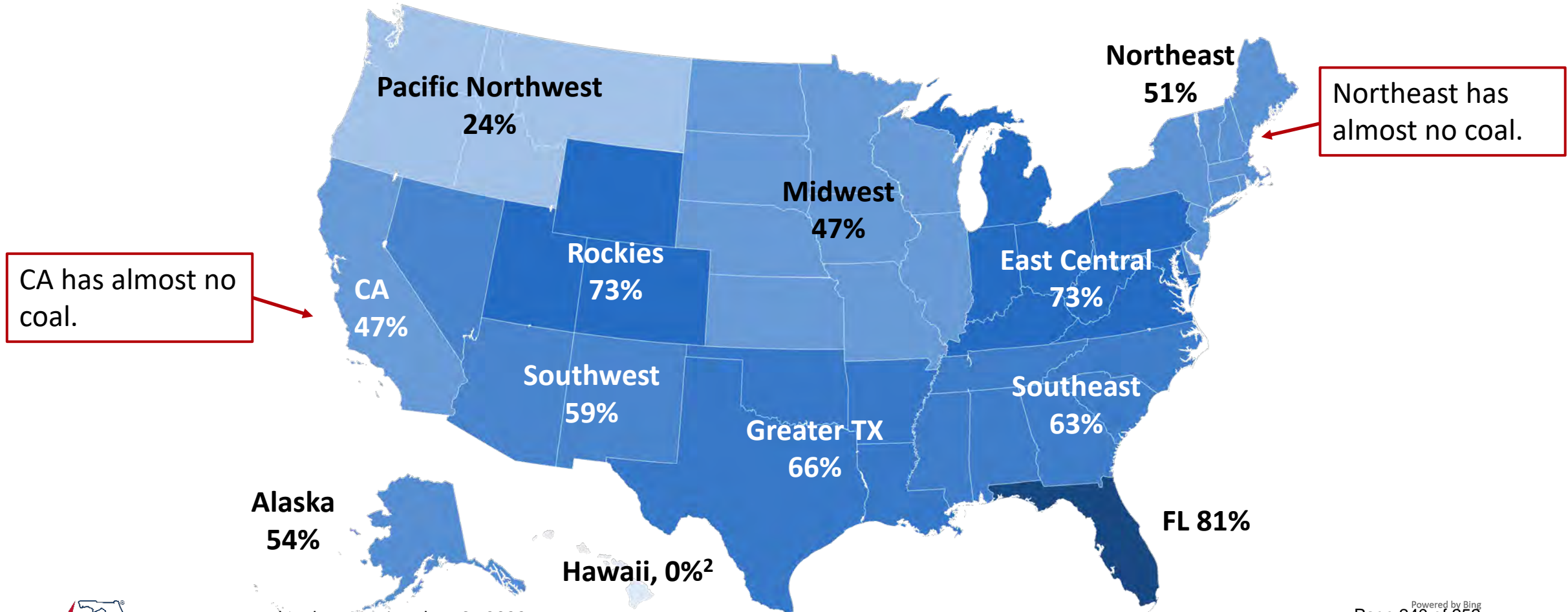
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- Florida most impacted state in U.S.
- Close most coal units and dramatically impact natural gas, together 60% of U.S. generation
- Potential 100% - 250% increase in electricity prices
- Based on technologies not economically available
  - Carbon Capture & Storage (CCS) very high cost and only operating facility
  - "Green" hydrogen requires significant overbuild of solar generation, new hydrogen production and onsite hydrogen storage - huge permitting issue
- Ignores permitting, construction lead times and costs
- Force large, low-cost and low-emitting gas units to run less, displaced by smaller, higher-emitting gas and diesel generation

# Coal/Gas Represent ~60% of US Generation, 80% FL

## *Dispatchable Generation Plays Vital Role in Reliability*

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

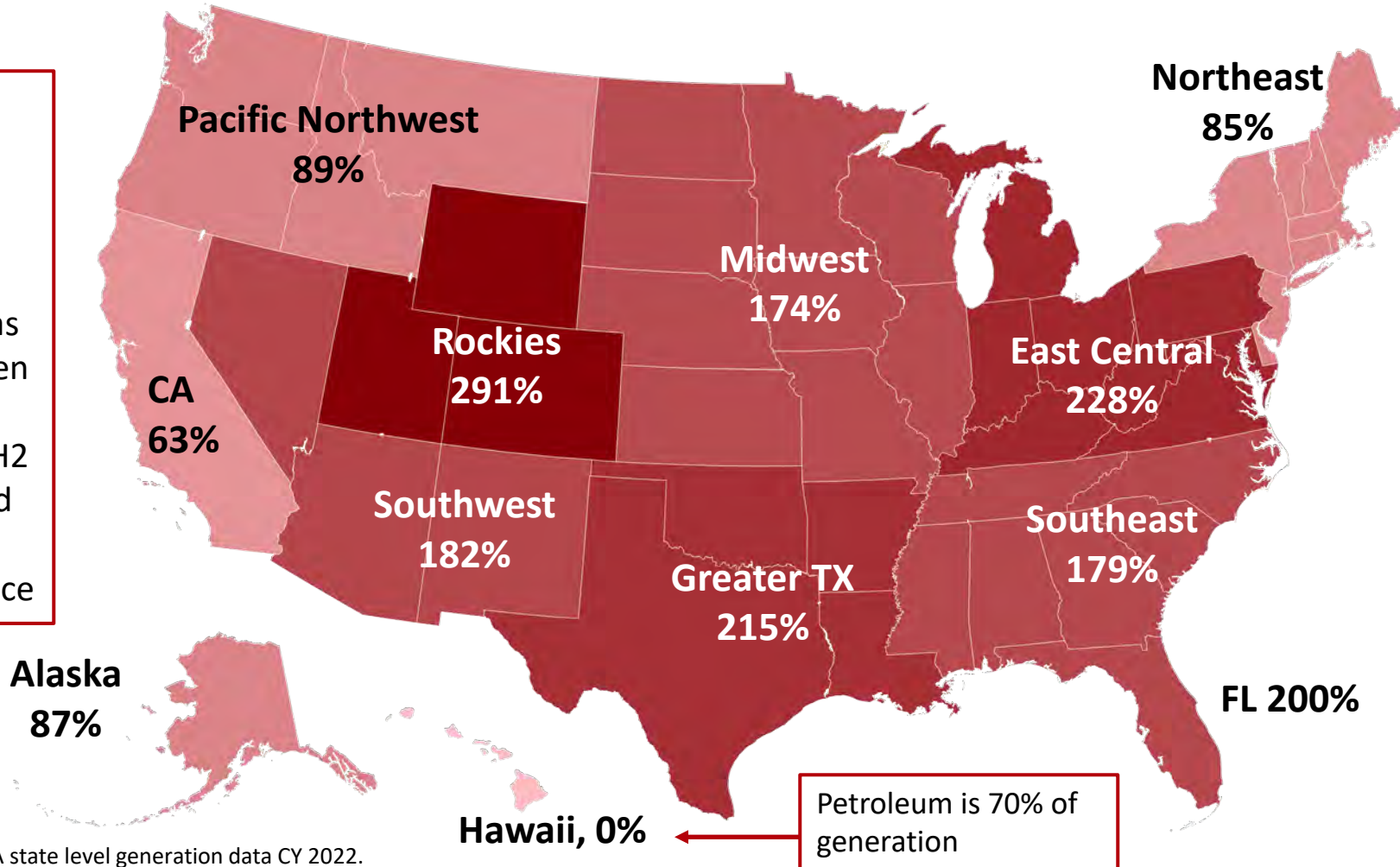


# EPA Proposal Drives High Cost for Most US Regions

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

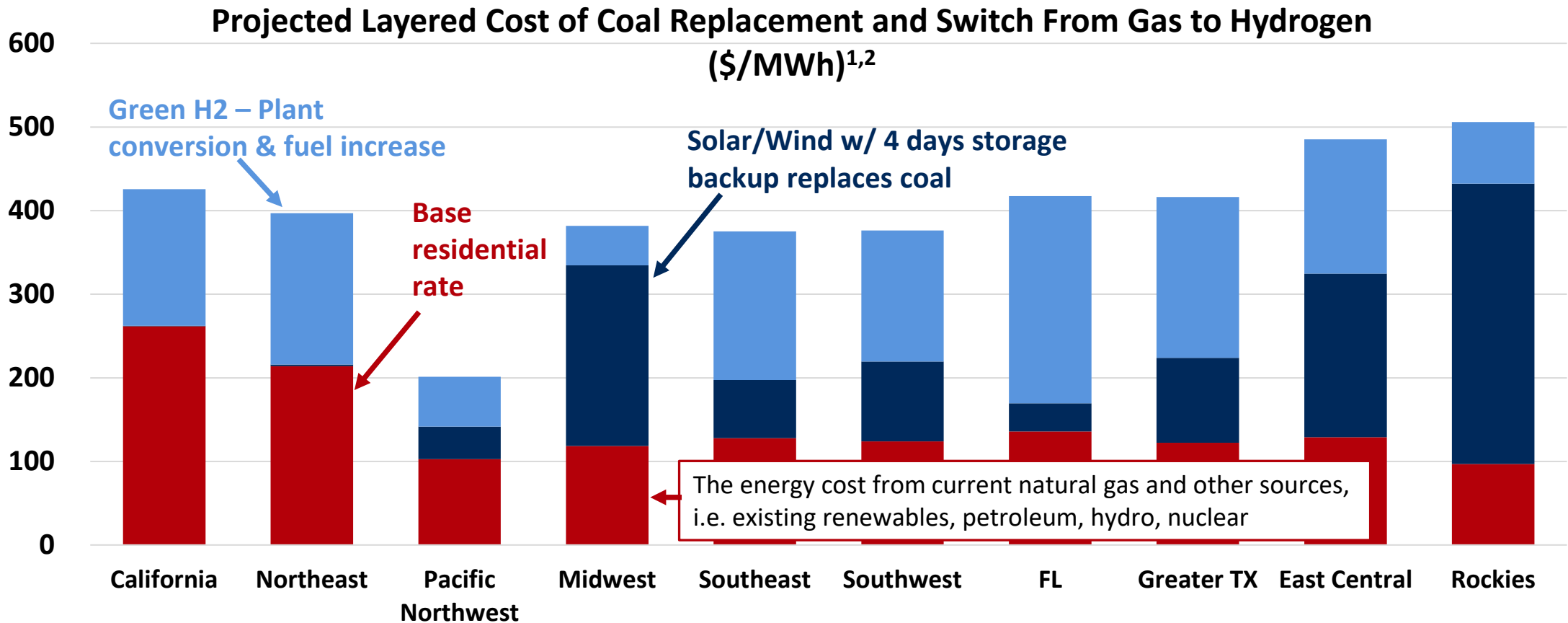
Projected Regional Residential Price Increases (%)

- 100% of coal converted to PV/wind and Storage
- 30% of natural gas converted to green hydrogen
  - Increasing H2 blend would further increase price



# Regions Most Exposed to Gas and Coal Get High Cost

## *Hydro Rich Pacific Northwest Naturally Insulated*



1 – Sources: EIA. Hydrogen and renewable prices data from independent engineer for 2023 FMPA IRP.  
 2 – Residential rates shown.

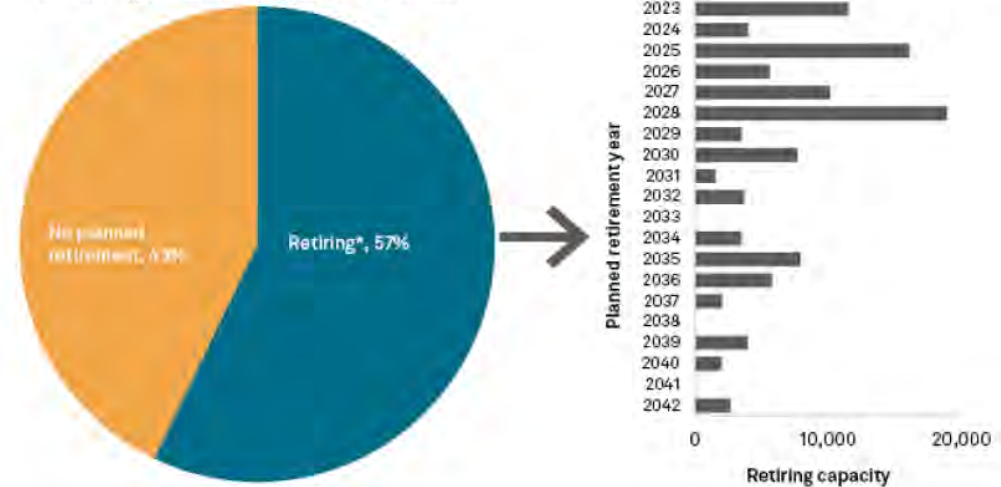
# Effectively All Coal Units Would Have to Retire

## *Leads to Overbuild Solar/Wind Plus Batteries for Reliability*

- ~200 GW of dispatchable coal in the US, with 50% slated to retire by 2035
- EPA effectively closes all coal by 2035
- FERC stated U.S. heading towards reliability “crisis” with rapid retirement of dispatchable generation; i.e. coal & gas<sup>1</sup>
- Solar/wind/storage overbuild for 4 days backup only replacing fossil generation
- Transmission additions timelines cannot meet requirements for rapid transition

US existing coal-fired capacity by retirement plans

By retirement plans  
Total existing US coal-fired capacity = 194,883 MW



Data compiled April 26, 2023.

\* Includes Trimble County's 511-MW unit 1 and 760-MW unit 2 slated for retirement in 2045 and 2066, respectively. Planned retirements include those approved by regulatory bodies and those announced for closure but still pending regulatory approval. Also includes company announcements of broader coal capacity phaseouts.

Announced retirements are compiled on a best-effort basis.

Source: S&P Global Market Intelligence.

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Analysis assumes ~379 GW of solar/wind and ~2,530 GW of current 4-hour storage required to replace retiring coal with backup.

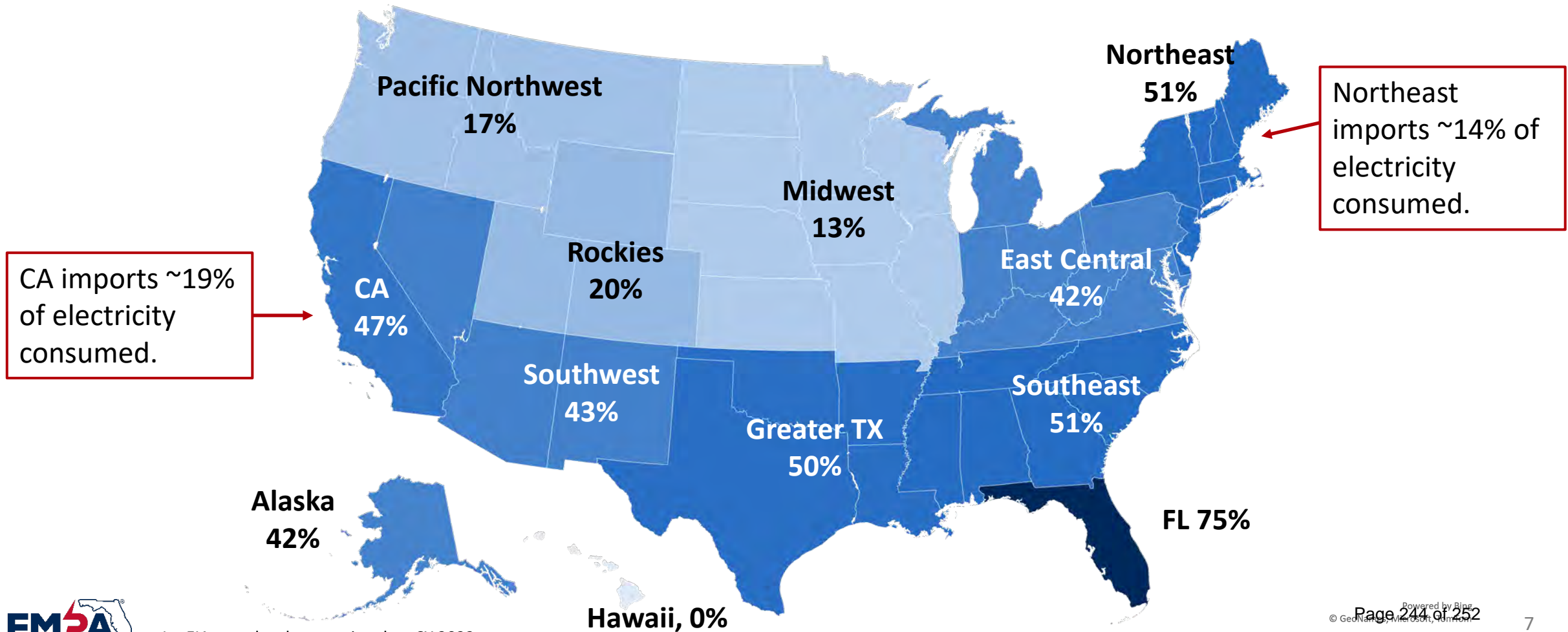
1 – Statements from the Senate Energy and Natural Resources Committee Hearing May 4, 2023



# Florida is Most Gas-Dependent State in the Country

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

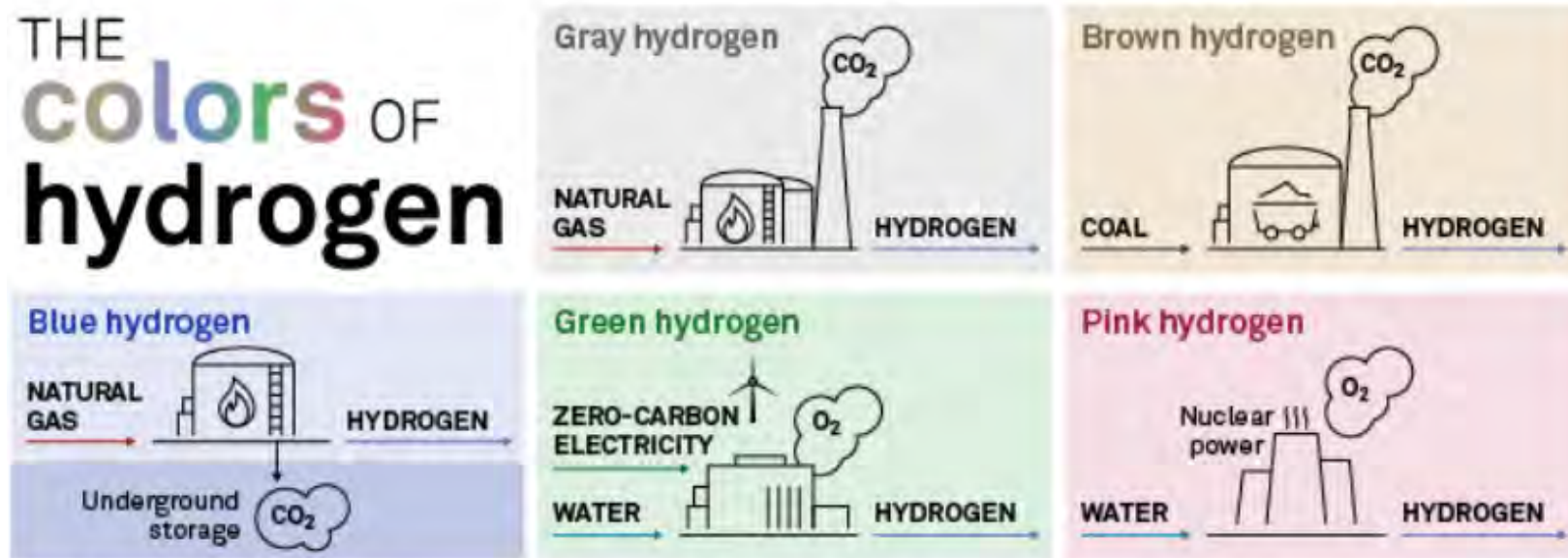
Regional Electricity Generation from Natural Gas as Percentage of Total Generation (2022<sup>1</sup>) (%)



# 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 required to blend hydrogen. Infrastructure to produce and store the hydrogen currently not well defined. Steam methane reforming/CCS involved in blue option. \$10M-\$30M per facility just for investment to allow fuel blend.

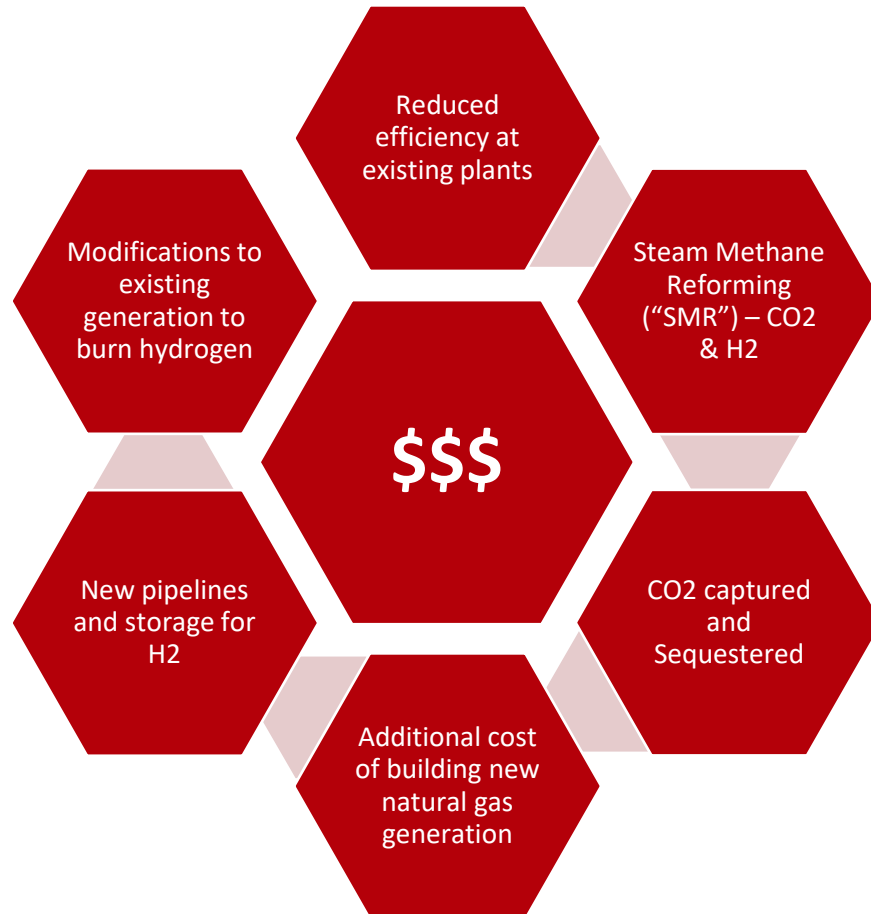
- Hydrogen is the most abundant substance in the universe
- When hydrogen burns, energy is produced in the form of heat, with water as the only byproduct
- ***Here's the catch: you need energy to create free hydrogen in the first place, and that energy can come in many forms***
- Not currently efficient or low cost
- Assumed ~\$140 per MMBtu adder for all gas MMBtu



# Will Hydrogen Be Blue w/CCS or Green w/Wind/Solar?

## *Modeled Green Path With Significant Fuel Burn Cost Adder*

### Blue Hydrogen



### Green Hydrogen



# Where Will the Land Come From In 8-10 Years?

*Vast Requirements Coupling with Increased Local Opposition\**

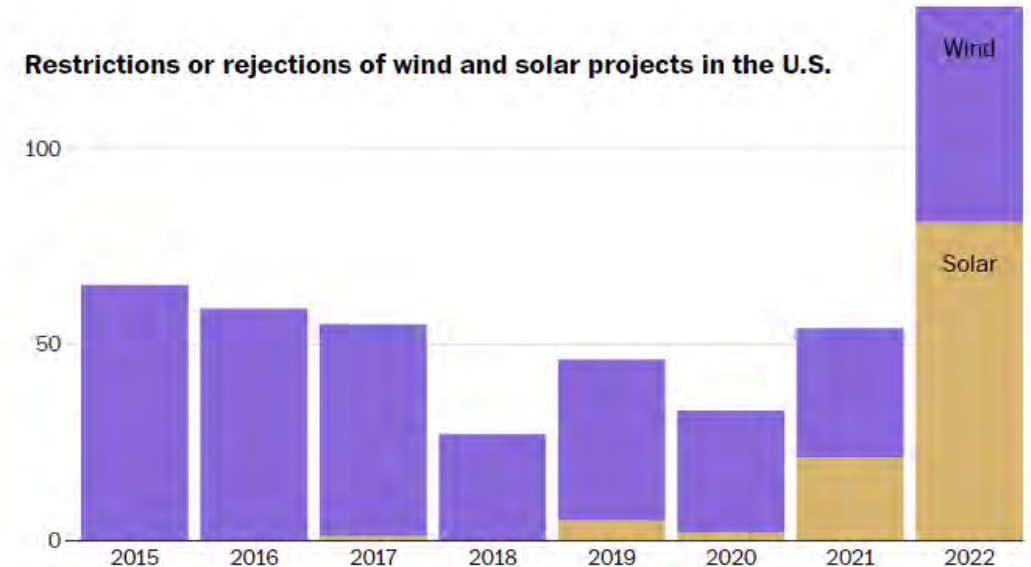
Wind turbines require more land than solar. If U.S. powered solely by wind turbines, would need ~155,000 square miles, roughly Montana



Solar farms need to cover ~30,000 square miles or roughly South Carolina



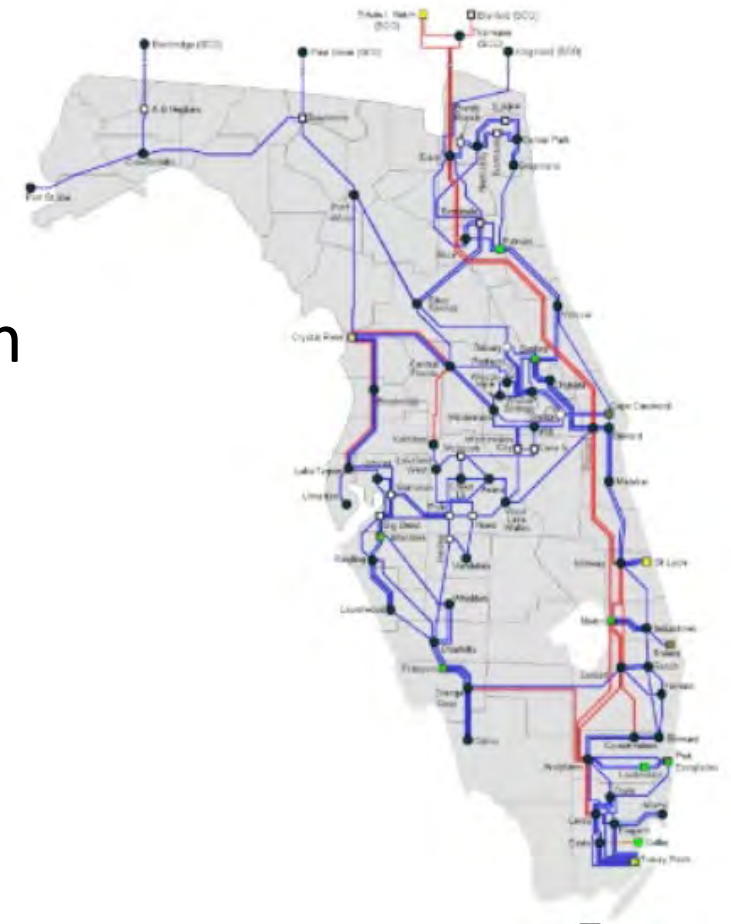
Restrictions or rejections of wind and solar projects in the U.S.



# Transmission Growth is Inevitable

## *Thermal Generation Needed to Keep the Grid Stable*

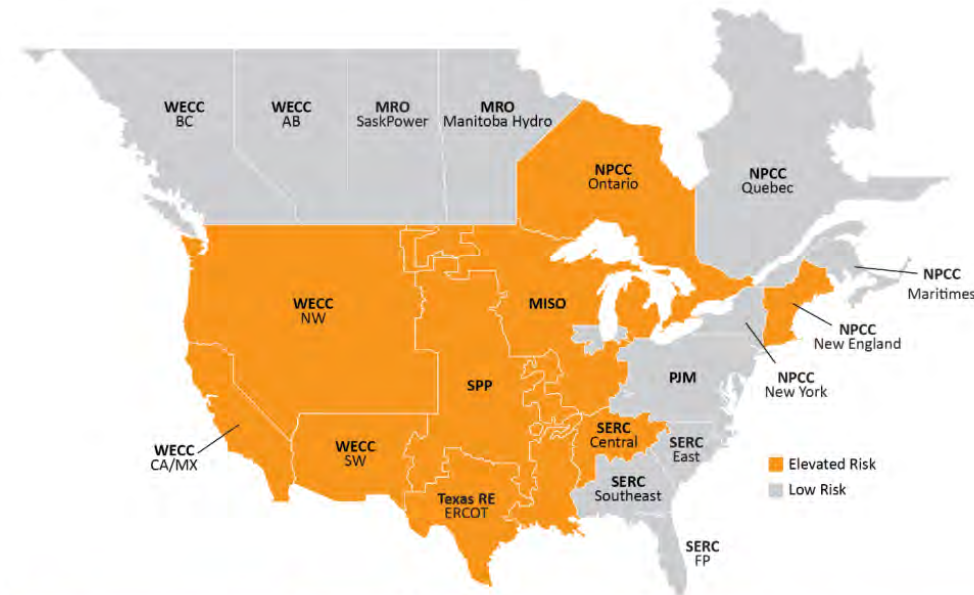
- Additional capacity of solar/wind and batteries requires additional transmission lines
  - Large areas for solar where there is no transmission
- Numerous substations to be built to connect each new solar and storage sites to the grid
- Permitting new transmission can take 5 – 10 years
- Grid stability will require many new balancing elements to prevent black outs



# NERC 2023 Assessment\* and Recent Events Align

## *Grid Resilience Challenged by Further Load Growth*

- Majority of US Grid at elevated potential for insufficient operating reserves
- Key resource adequacy concerns from NERC:
  - Wind generator performance during high demand periods (ERCOT, MISO and SPP)
  - West's reliance on regional transfers to meet late afternoon ramp as solar drops diminished
- Fuel delivery risks, EPA air regulations, transformer inventories, supply chain constraints, unexpected solar and wind tripping and transmission congestion all cited
- Above pace load growth further stresses grid



Seasonal Risk Assessment Summary	
High	Potential for insufficient operating reserves in normal peak conditions
Elevated	Potential for insufficient operating reserves in above-normal conditions
Low	Sufficient operating reserves expected

# EPA's Climate Proposal – Unrealistic, Costly & Rushed

## *Comments from Utilities and Reliability Regions Required*

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- EPA's climate proposal effectively retires all coal generation and dramatically reduces gas generation availability representing the majority of power generation
- Initial power cost impact analysis are 100 – 250+% cost increase by 2032
- Florida most exposed state to cost and reliability concerns with 75% gas generation (80+% including coal)
- EPA depends on technology not commercially viable, available and permissible in 8 years
- Plant level implementation by 2032 not achievable and reliability likely seriously jeopardized
  - U.S. economy at great risk
- Modern power grid built over 40 – 60 years, cannot fundamentally change in 8 years, longer time needed
- Stakeholders have 20 days to comment on fundamental transition of bulk power system
- FMPPA drafting comments for EPA and FL delegation and use as basis for FRCC and APPA input