



**BASIN ELECTRIC  
POWER COOPERATIVE**

A Touchstone Energy® Cooperative 

# Investing in Reliability

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Member Relations

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# Agenda

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Cooperative Difference

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Basin Electric Overview

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Planning for Growth

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Sustainability

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Investing for the Future

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What's Next?

# The Cooperative Difference

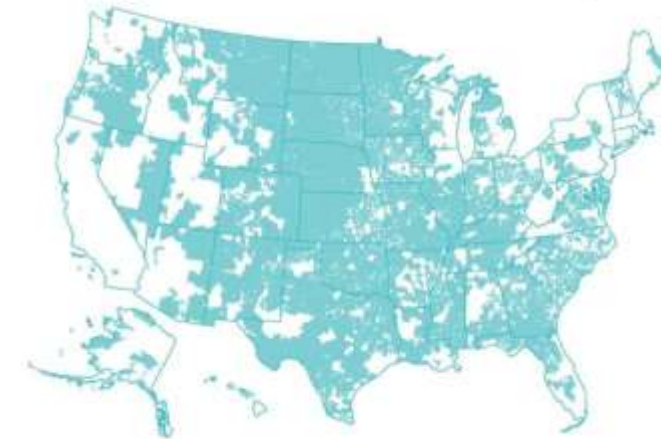
- Focused on people, not profits
- Built by and belong to the communities they serve
- Led by members from the community
- Uniquely suited to meet local needs
- 2023 J.D. Power Electric Utility Residential Customer Satisfaction Study
  - Co-ops secured 7 of the top 10 spots and the highest average score among all electric utility providers.

# America's Electric Cooperative Family

## Electric cooperatives:

- Have 42 million members / 22 million businesses
- Are present in 48 states
- Total of 896 co-ops
- Total of 832 distribution and 64 G&Ts
- Employ 73,000 people in the U.S. >16,000 lineworkers
- Own 13 % of nation's meters
- Own 42 % of nation's power lines
- Cover 56 % of the U.S. landmass
- Serve 92 % of persistent poverty counties
- Return \$ >1.3 Billion in capital credits annually

Cooperatives power  
56% of the American landscape.



# Basin Electric Snapshot

Headquartered in Bismarck, ND

139 Members in 9 States

> 3 million member-owners

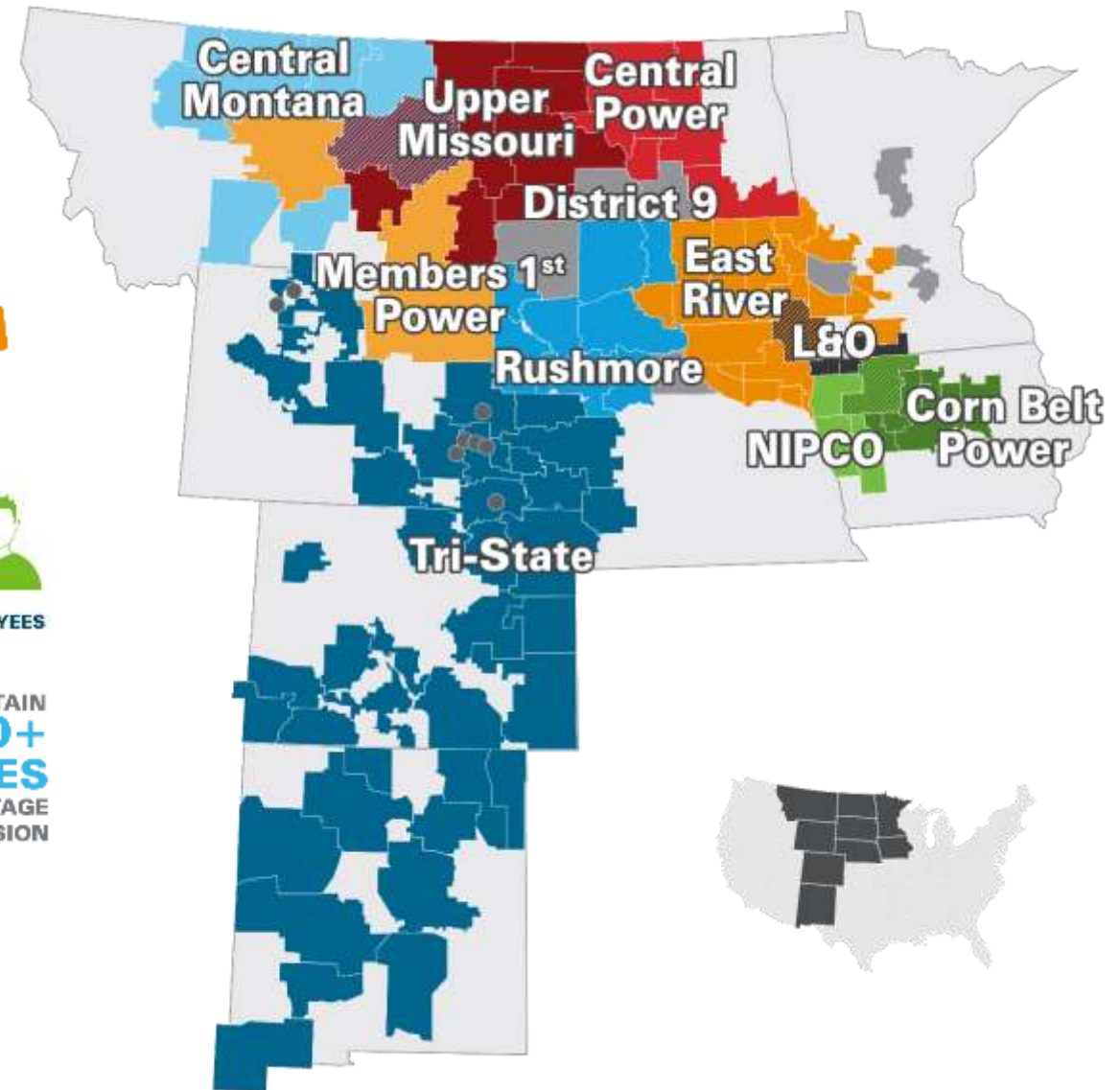
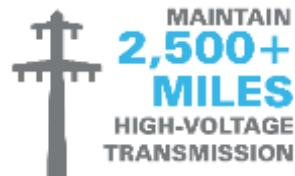
> 8,100 MW - winter capacity

Largest G&T:

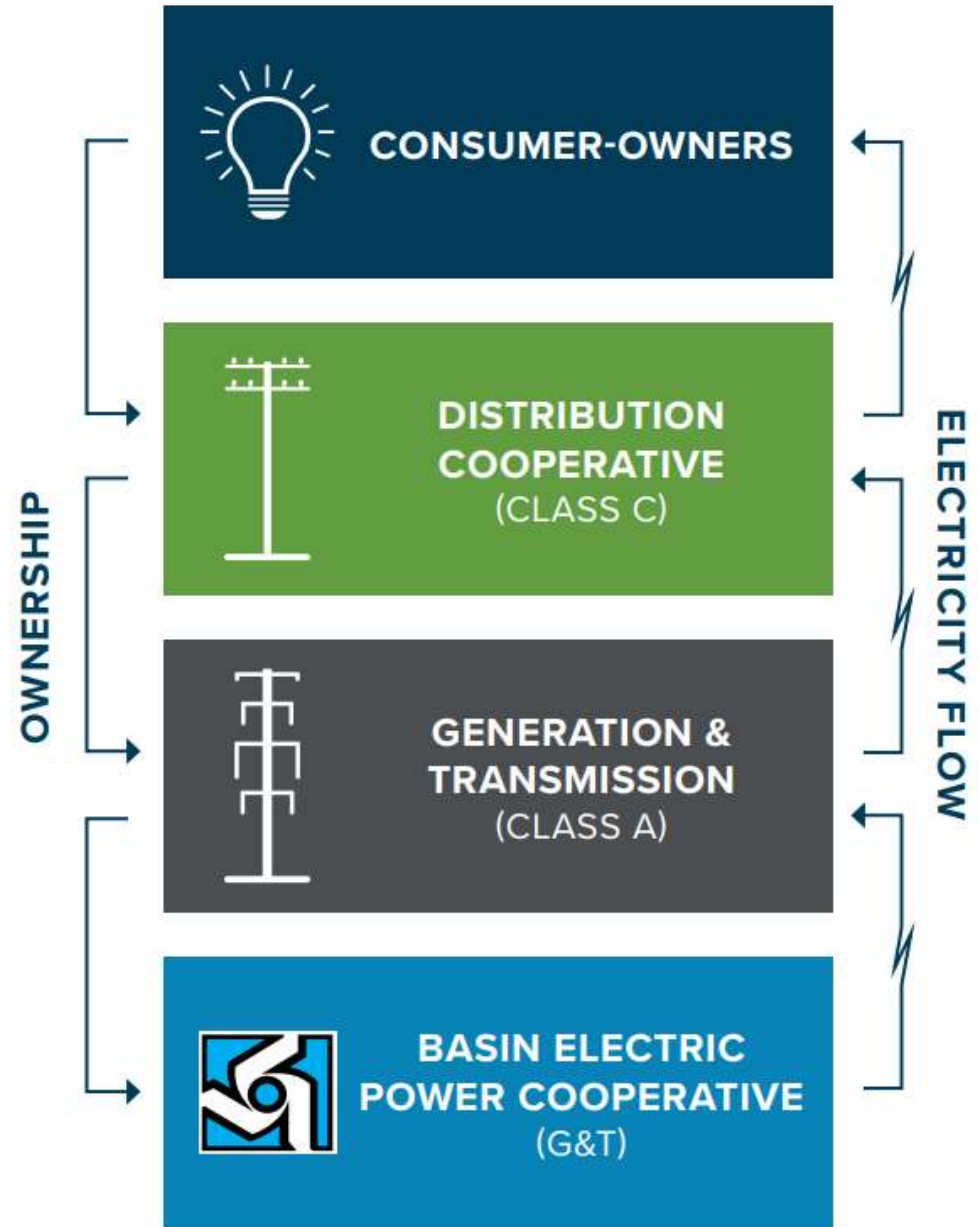
- Total MWh sales
- Member sales
- Total operating revenue
- Geographic territory

2nd largest G&T by assets

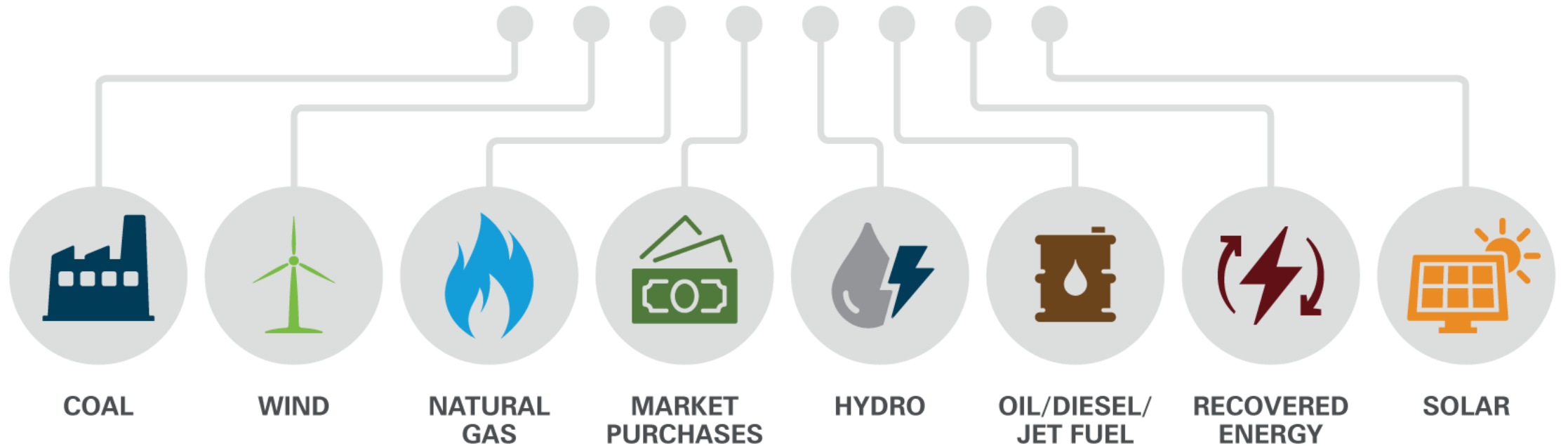
January 2024 Billing Peak Demand  
Record – 5,134 MW



# Membership Structure



# ALL-OF-THE-ABOVE ENERGY STRATEGY





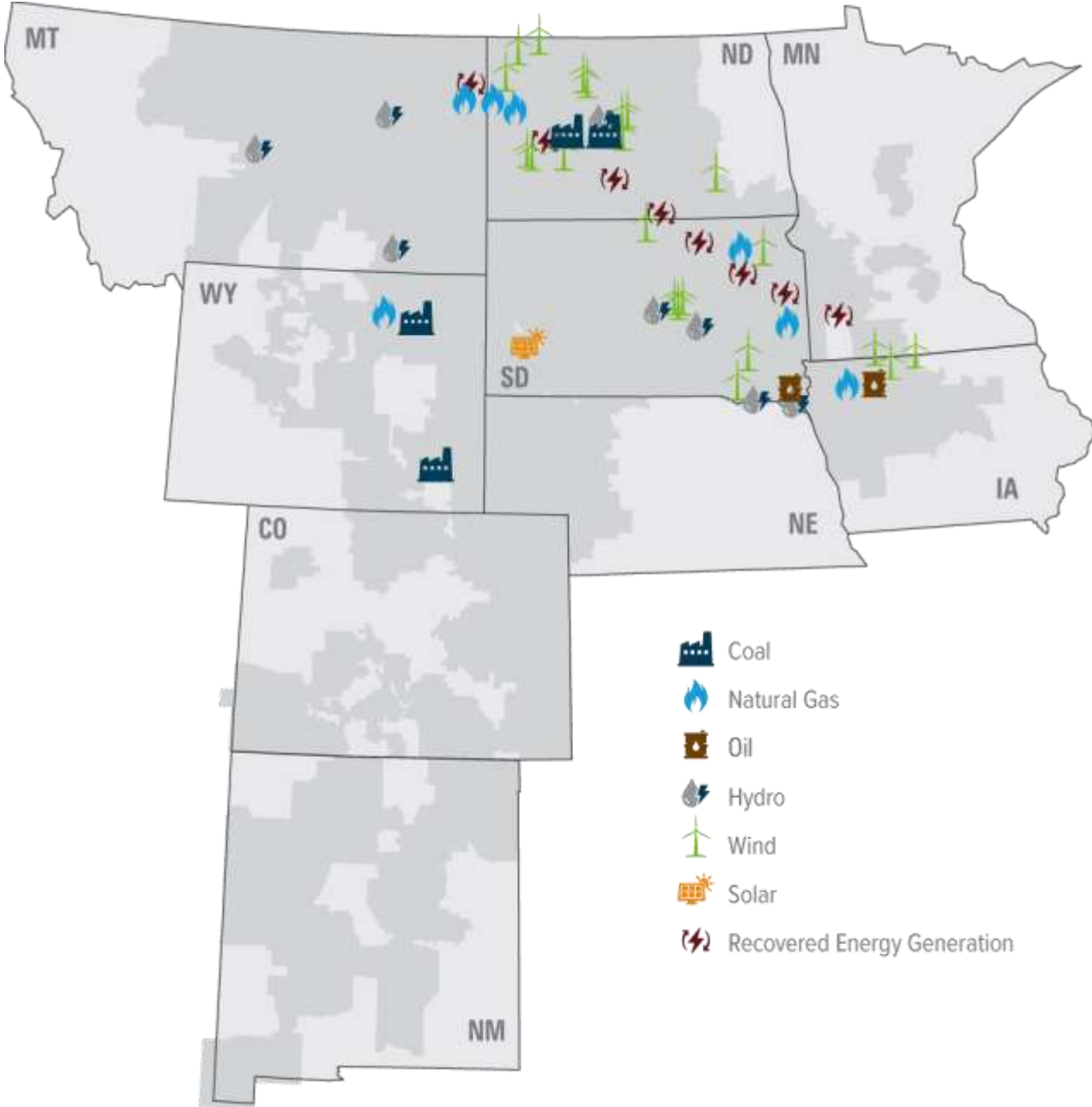
# All-of-the-Above



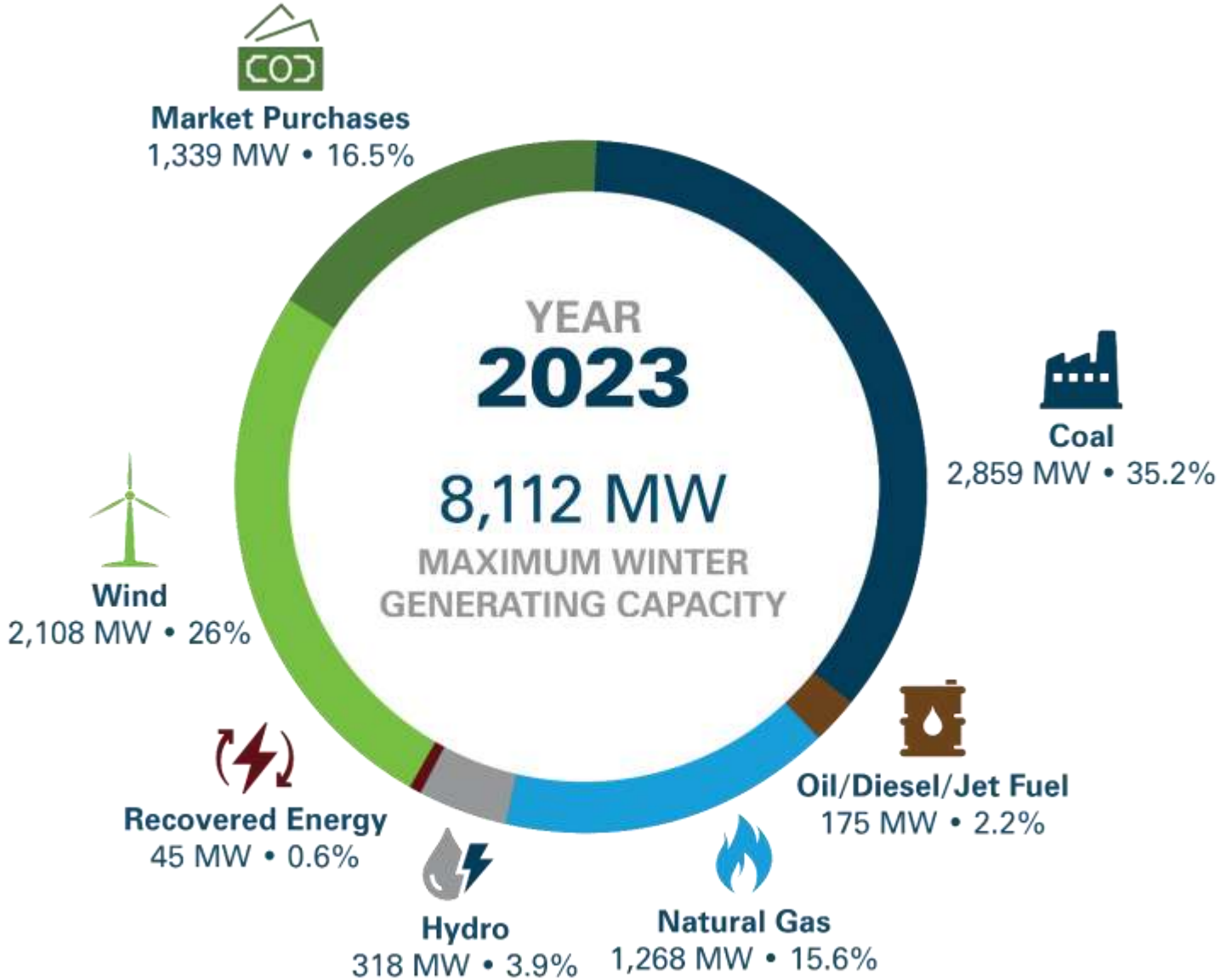
**ALL-OF-THE-ABOVE**



# Generating Resources

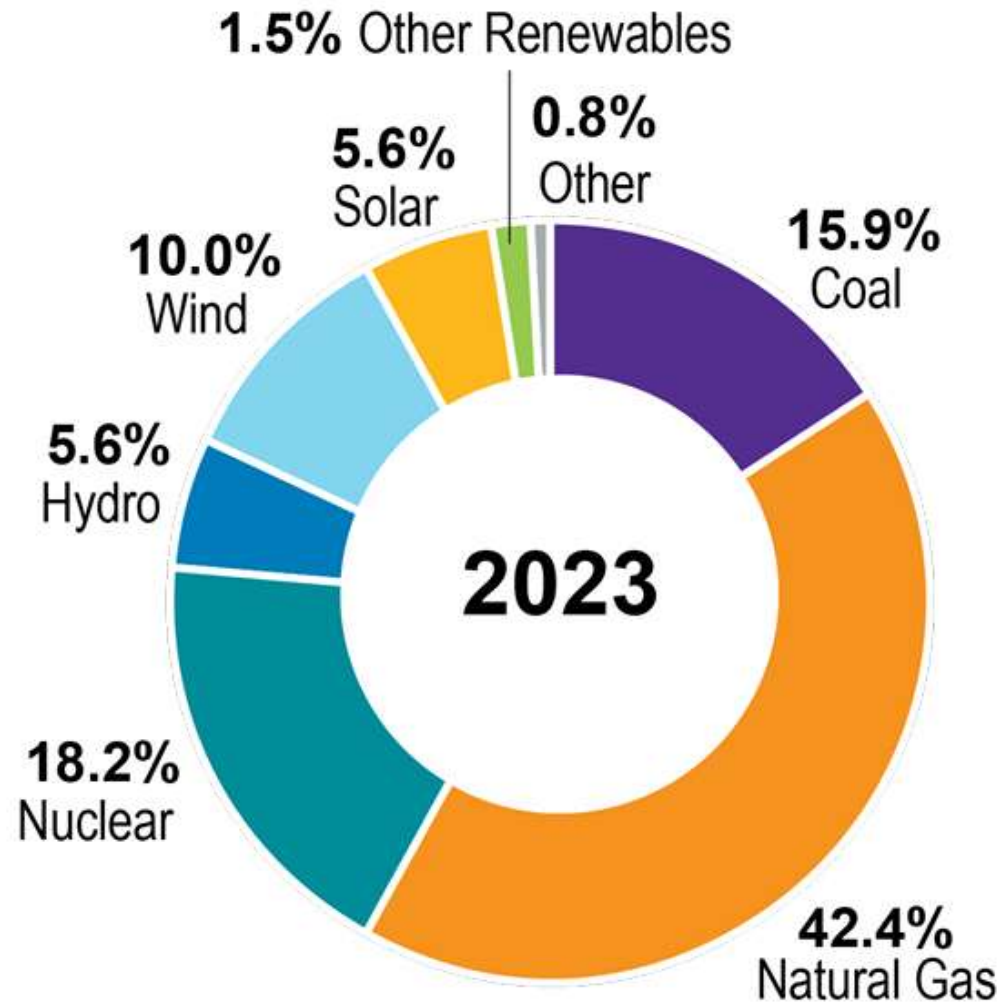


# Generating Capacity



Basin Electric's Resource Portfolio (above) consists of generation in megawatts (winter ratings) from owned facilities and purchased power contracts longer than 3 years.

# 2023 National Energy Resource Mix



\*Other Renewables\* includes geothermal and generation from biomass sources (agricultural waste, landfill gas recovery, municipal solid waste, wood, non-wood waste).

\*Other\* includes generation by fuel oil, tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

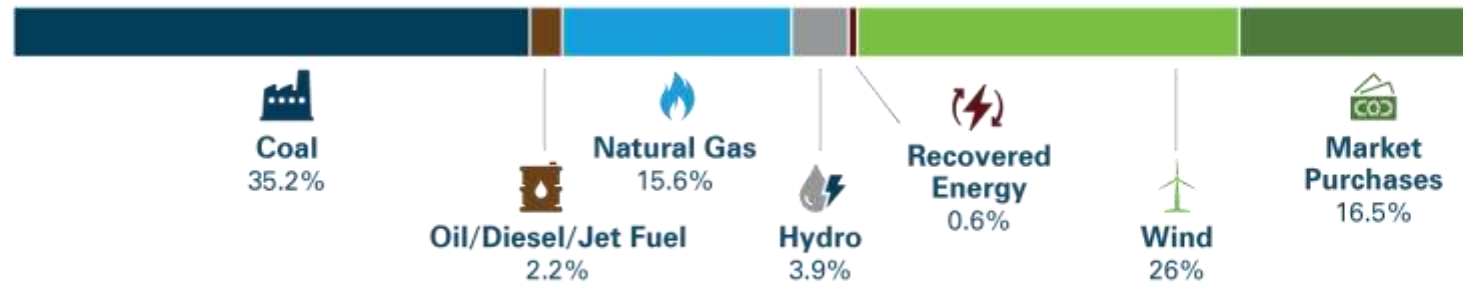
Source: U.S. Department of Energy, Energy Information Administration.

# Diverse Generation Portfolio

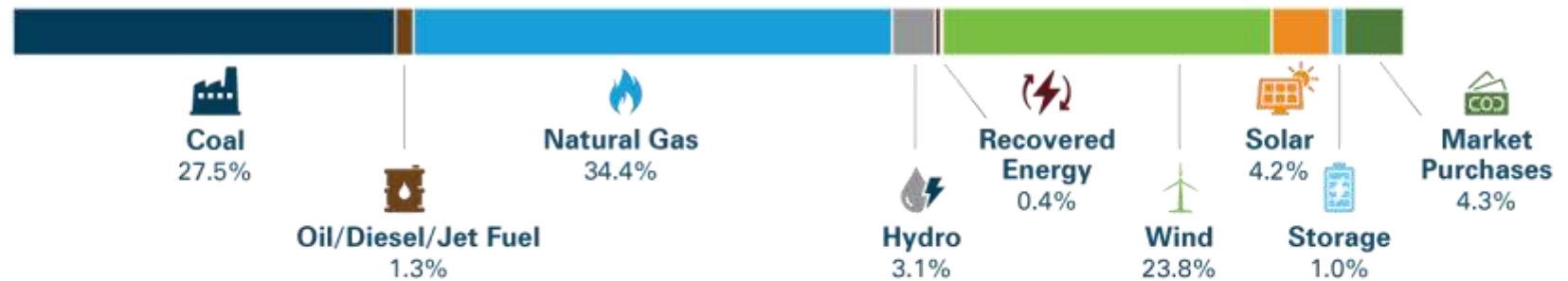
**YEAR 2000**  
2,839 MW  
MAXIMUM WINTER  
GENERATING CAPACITY



**YEAR 2023**  
8,112 MW  
MAXIMUM WINTER  
GENERATING CAPACITY



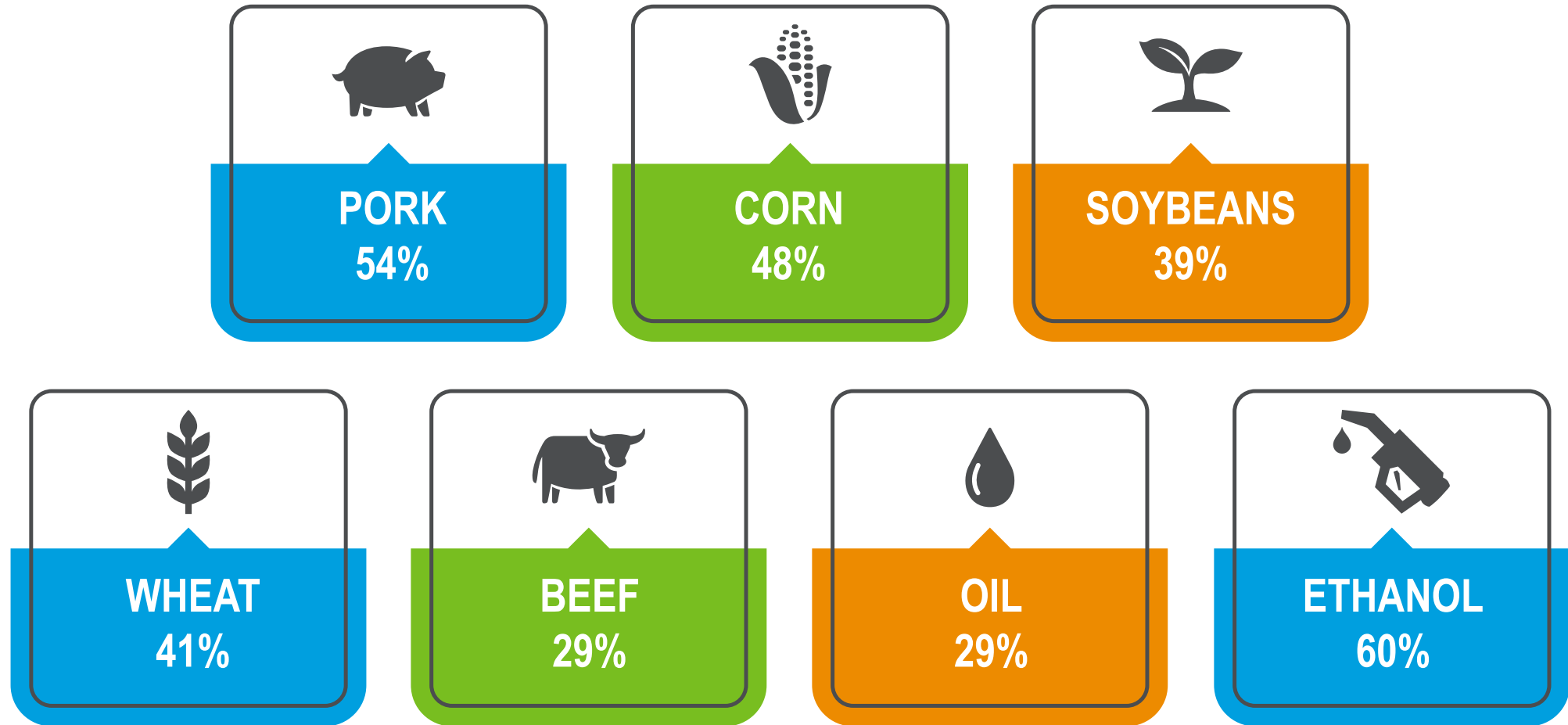
**YEAR 2030 PROJECTION**  
10,398 MW  
MAXIMUM WINTER  
GENERATING CAPACITY



Based on 2025-2034  
Financial Forecast, Case 2  
Subject to Change

# Feeding and Fueling the World

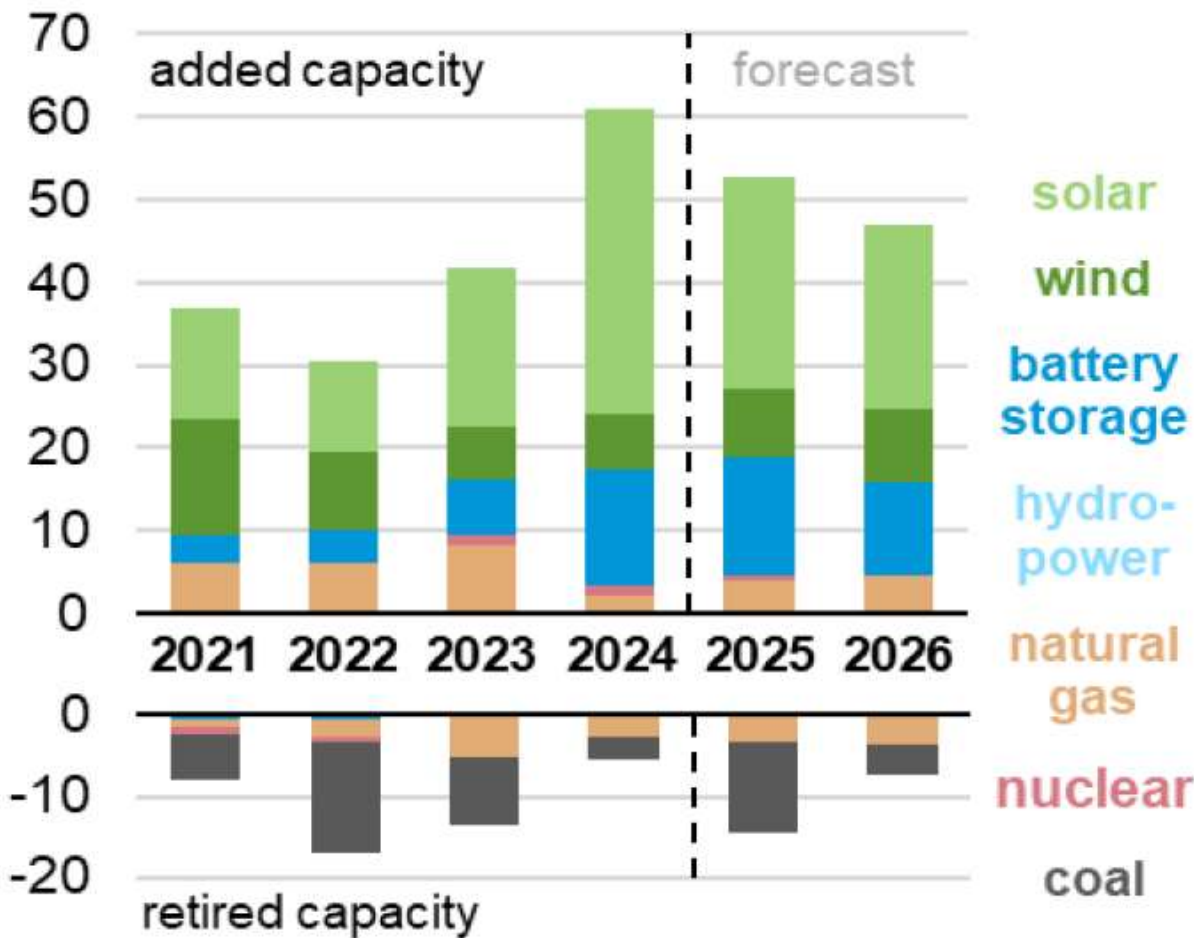
Percent of Total U.S. Production in States Served by Basin Electric



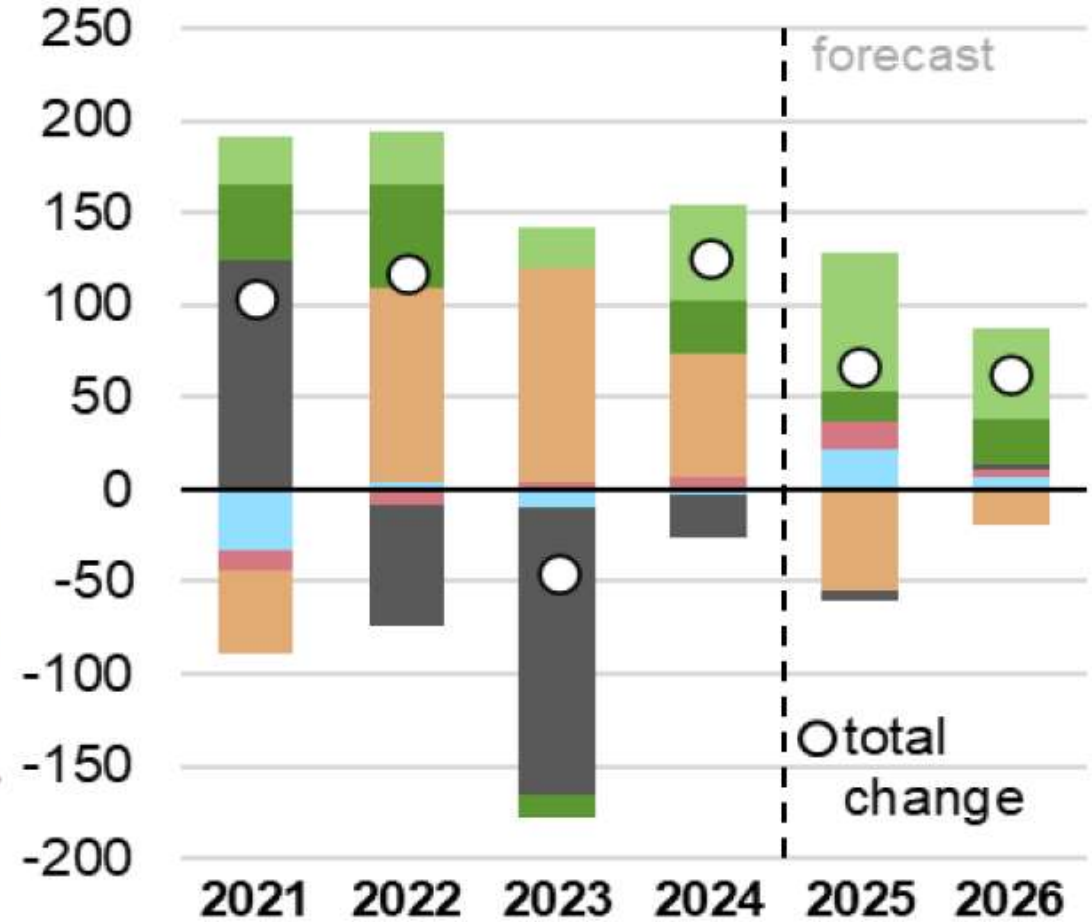
U.S. Energy Information Administration, Renewable Fuels Association, U.S. Department of Agriculture – 2023 EOY

# Annual change in U.S. electric power sector capacity and generation by source

change in capacity  
gigawatts



change in generation  
billion kilowatthours



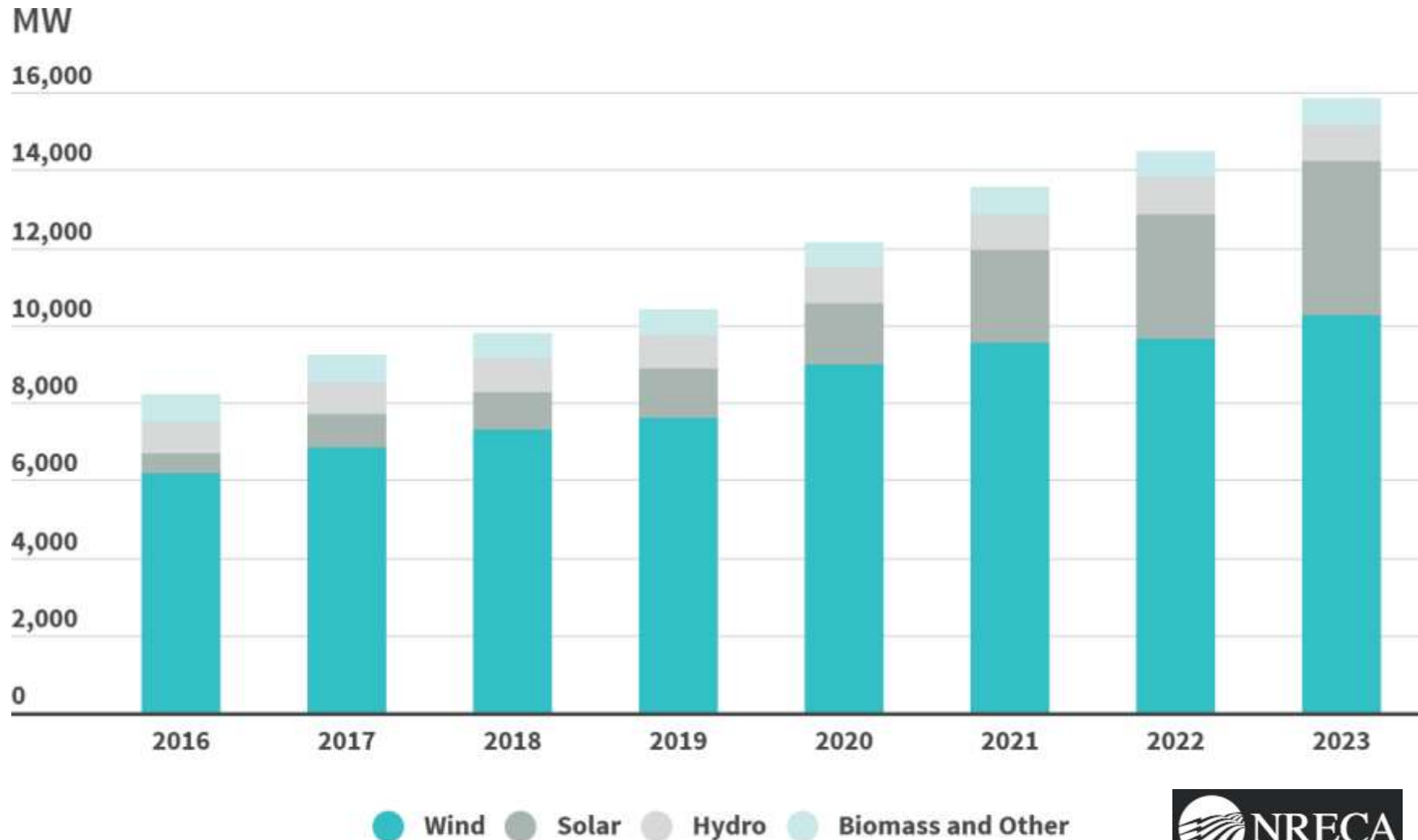
Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, January 2025

Note: Battery storage net generation is close to zero, reflecting the net effect of charging and discharging.





# Co-op Renewable Capacity Nationwide

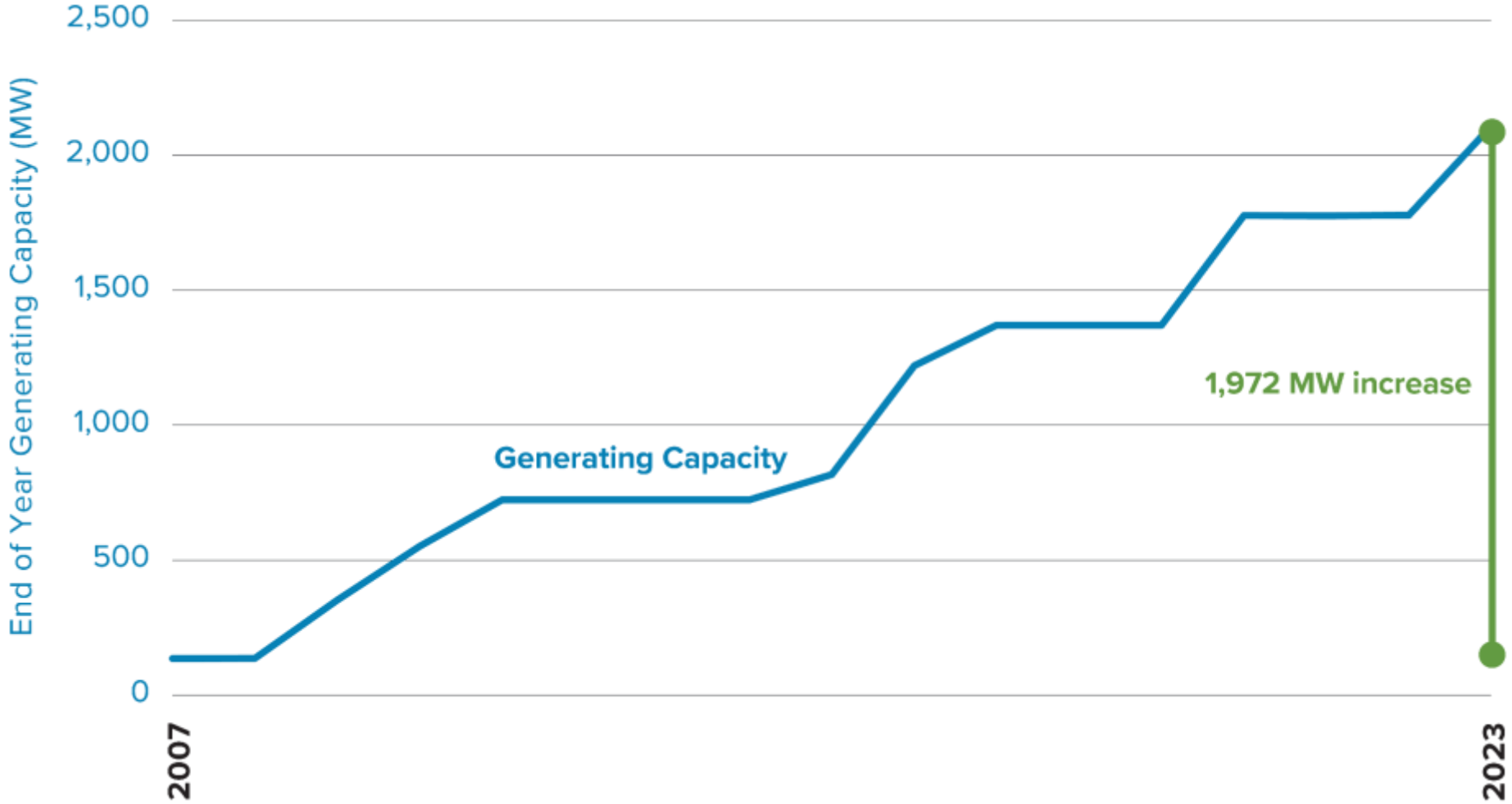


Note: Chart reflects most recent available data. Does not include federal hydro.

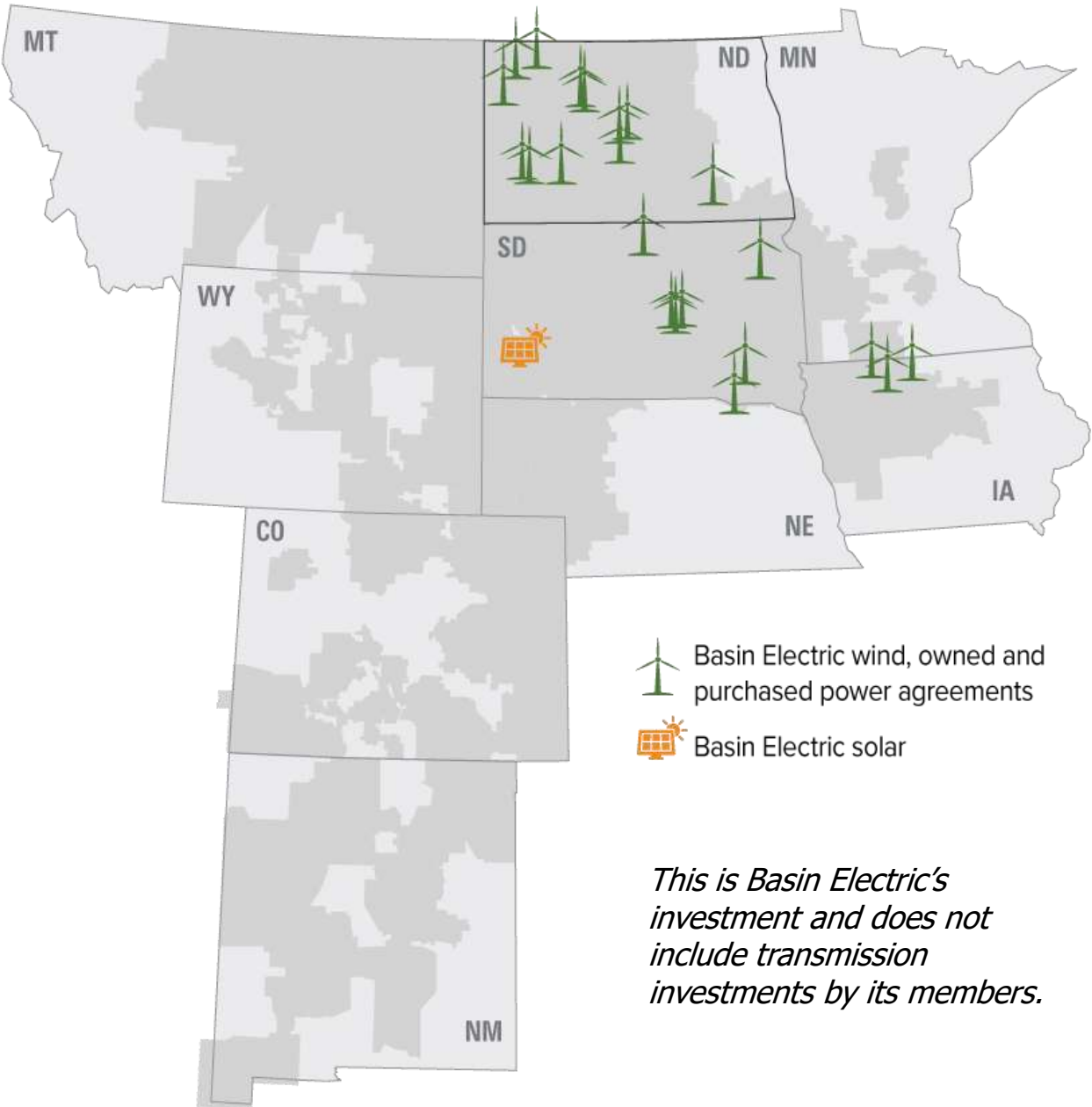




Source: NRECA analysis

# Increasing Wind Generation in Basin Electric's Portfolio



# Investing in Renewables



-  Basin Electric wind, owned and purchased power agreements
-  Basin Electric solar

*This is Basin Electric's investment and does not include transmission investments by its members.*



# Solar

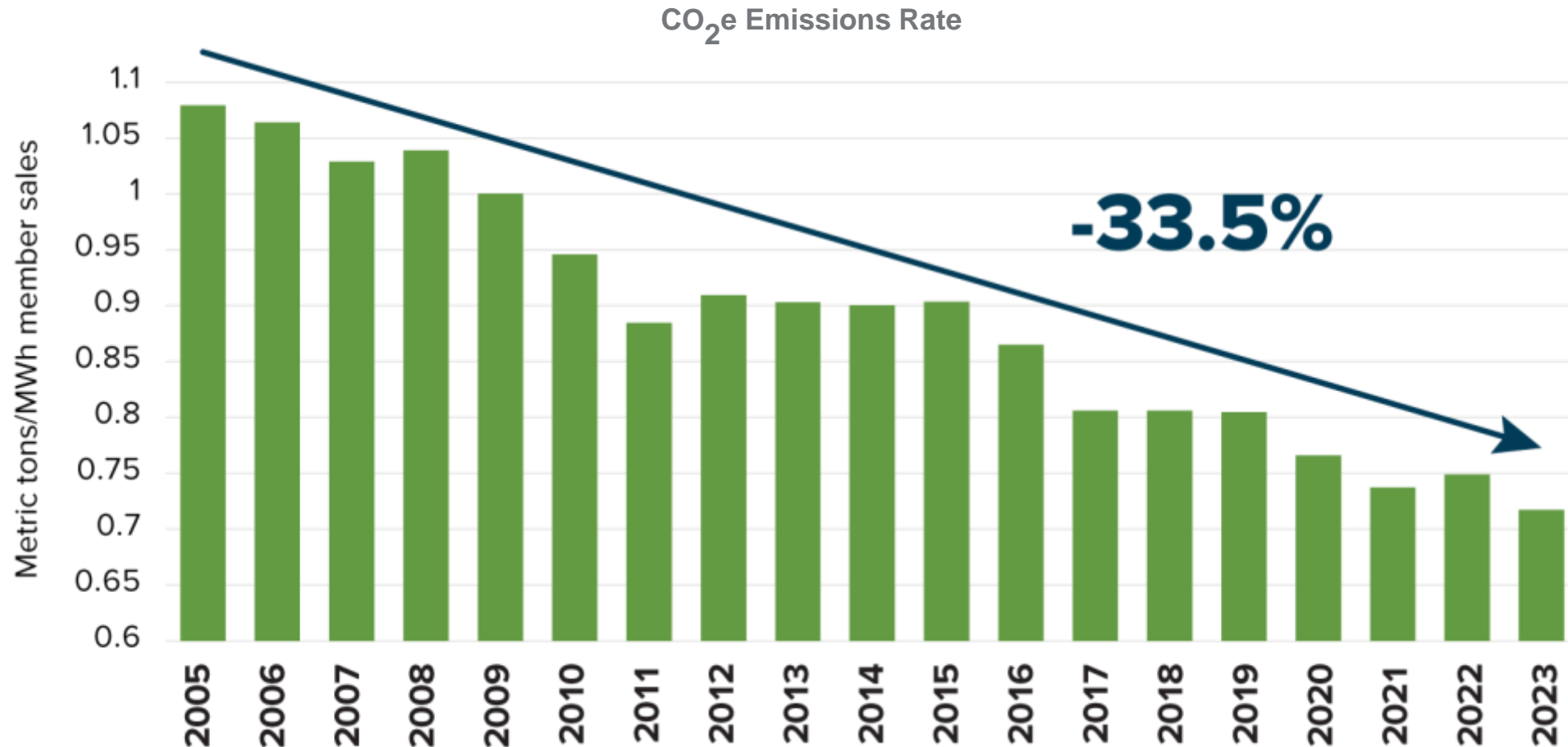
- **Wild Springs Solar** - New Underwood, SD
- 2024 – 114 of 128 MW
- PPA National Grid Renewables
- ~~• **West River Solar** - Rapid City, SD~~
- ~~• (2) 10 MW Projects (20 MW) - 2024 & 2025~~
- ~~• PPA with West River Solar (Parent: Energy of Utah)~~

Through direct investment and annual payments under renewable power purchase agreements, **Basin Electric has invested more than \$6 billion in renewable resources.**

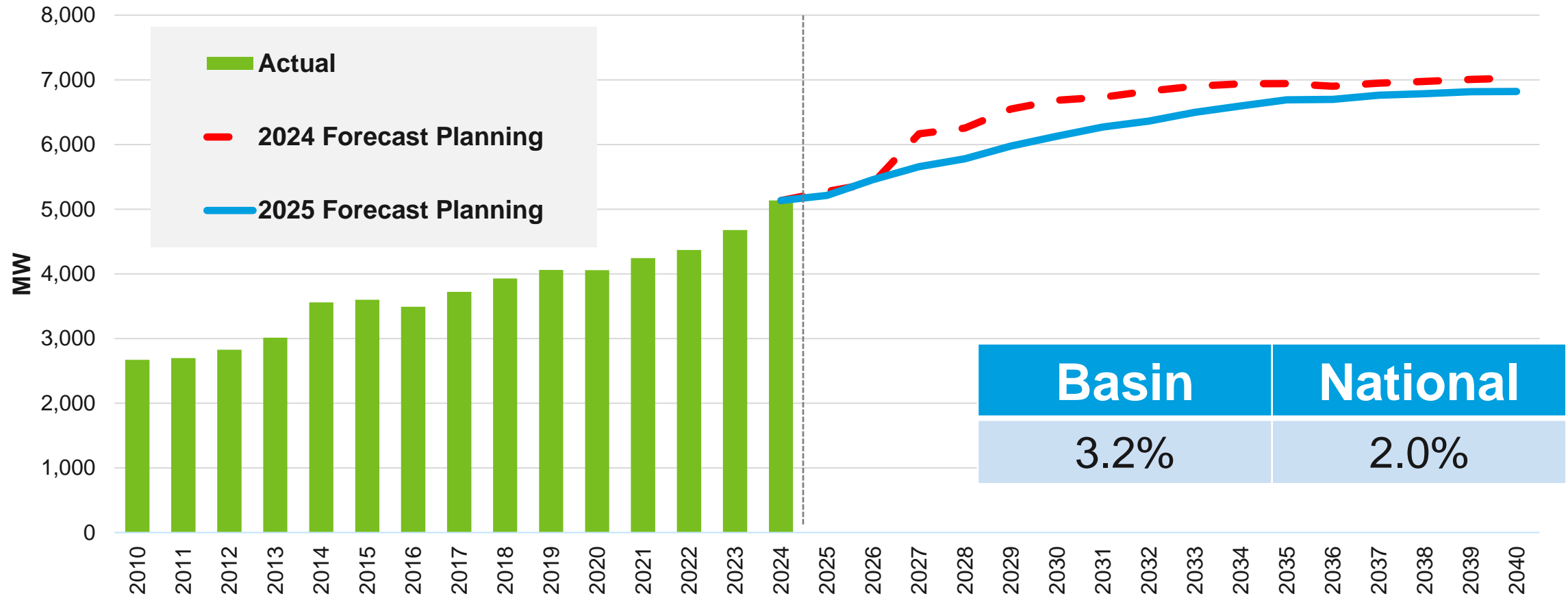
***Basin Electric has the largest renewable portfolio of any generation & transmission cooperative in the nation***

# Declining Carbon Intensity

Today, coal represents less than 40% of Basin Electric's generation portfolio. The chart below shows how the cooperative's carbon intensity has declined over time as new generation was added.



# 2025 Basin Electric Load Forecast Winter Season





# Load Growth Pipeline

Category	# of Projects	MW Load	% of Load Growth
Data Center	24	7,356	65.0%
Cryptocurrency	41	1,633	14.0%
Hydrogen Processing	38	803	7.0%
Industrial	7	489	4.0%
CO2 Capture	34	373	3.0%
Gas Compression	13	246	2.0%
Manufacturing	7	135	1.0%
Other	9	151	1.0%
Ag Processing	11	111	1.0%
Pipeline	5	75	1.0%
Oil Related	2	25	1.0%
<b>Grand Total</b>	<b>191</b>	<b>11,396</b>	<b>100%</b>
Included in Member Forecast	67	2,047	
<b>Total Above Member Forecast</b>	<b>124</b>	<b>9,349</b>	

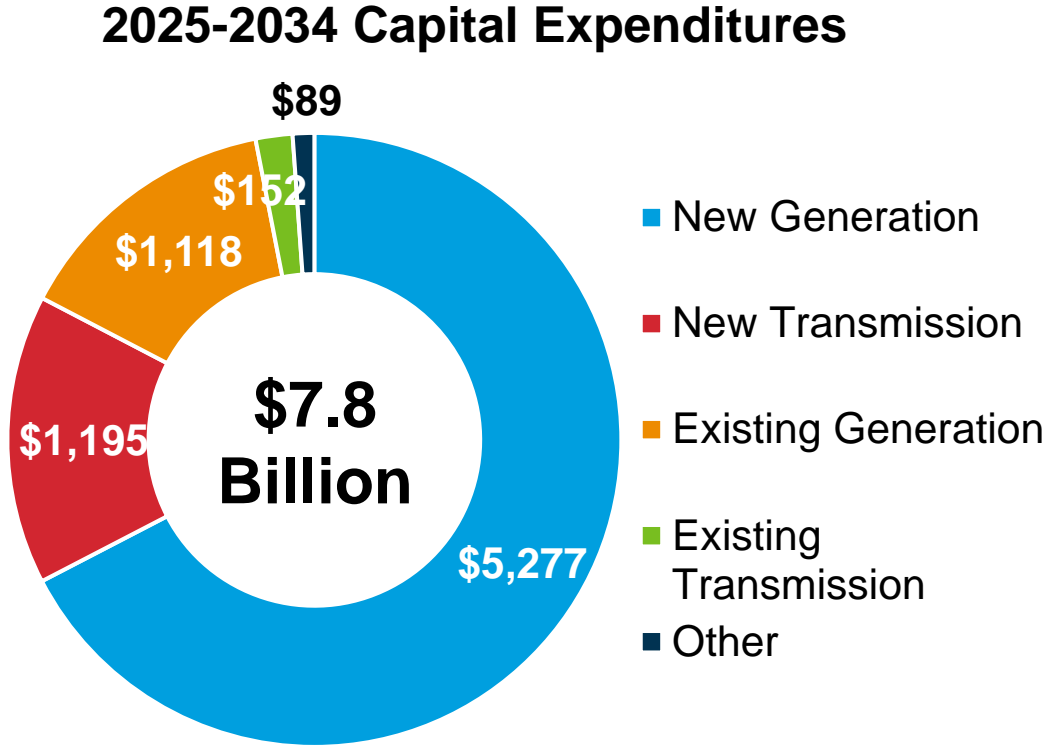
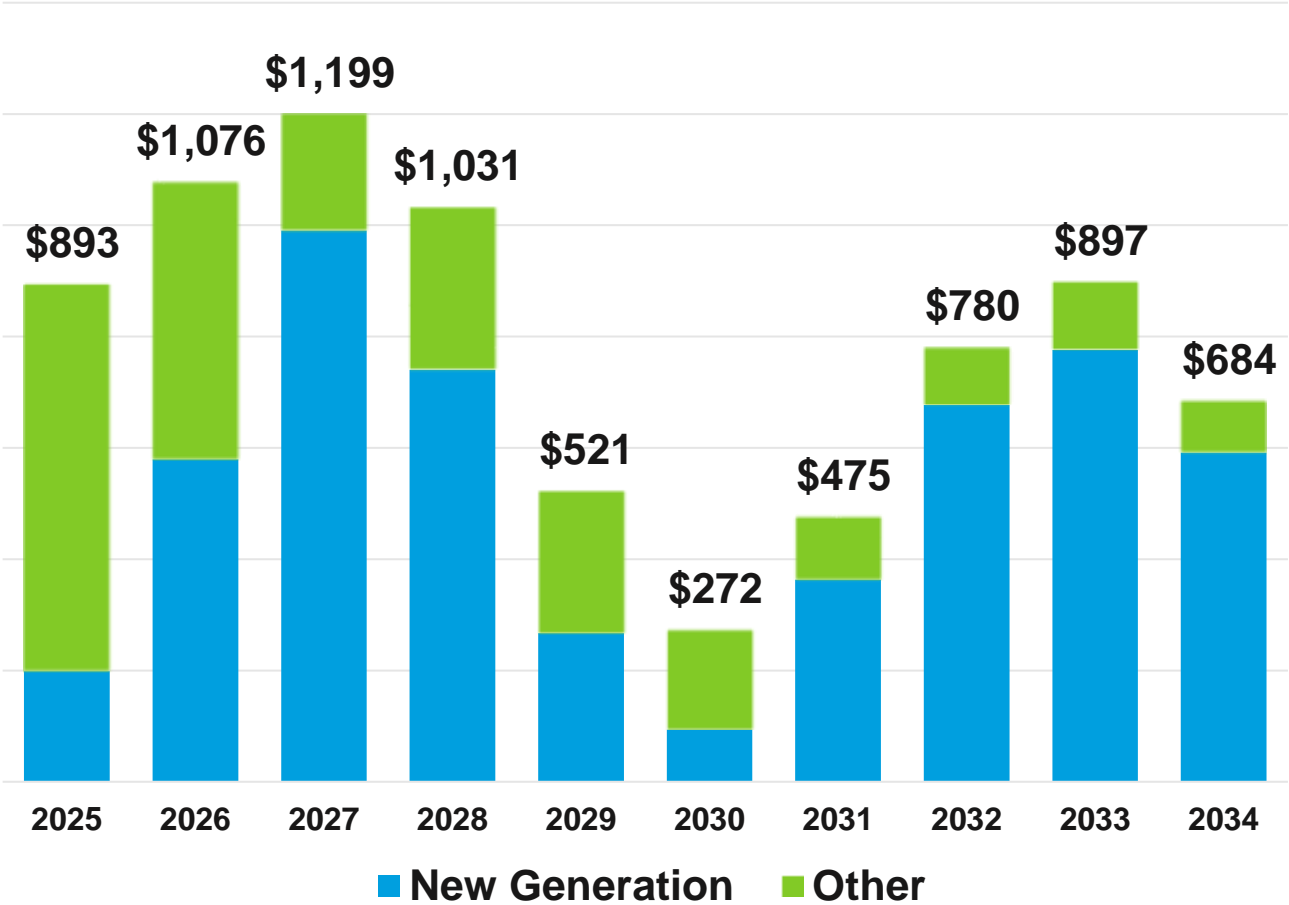
# Some Perspective on Growth

- Bismarck/Mandan ~240 MW
- Fargo/Moorhead ~560 MW
- Sioux Falls area ~600 MW



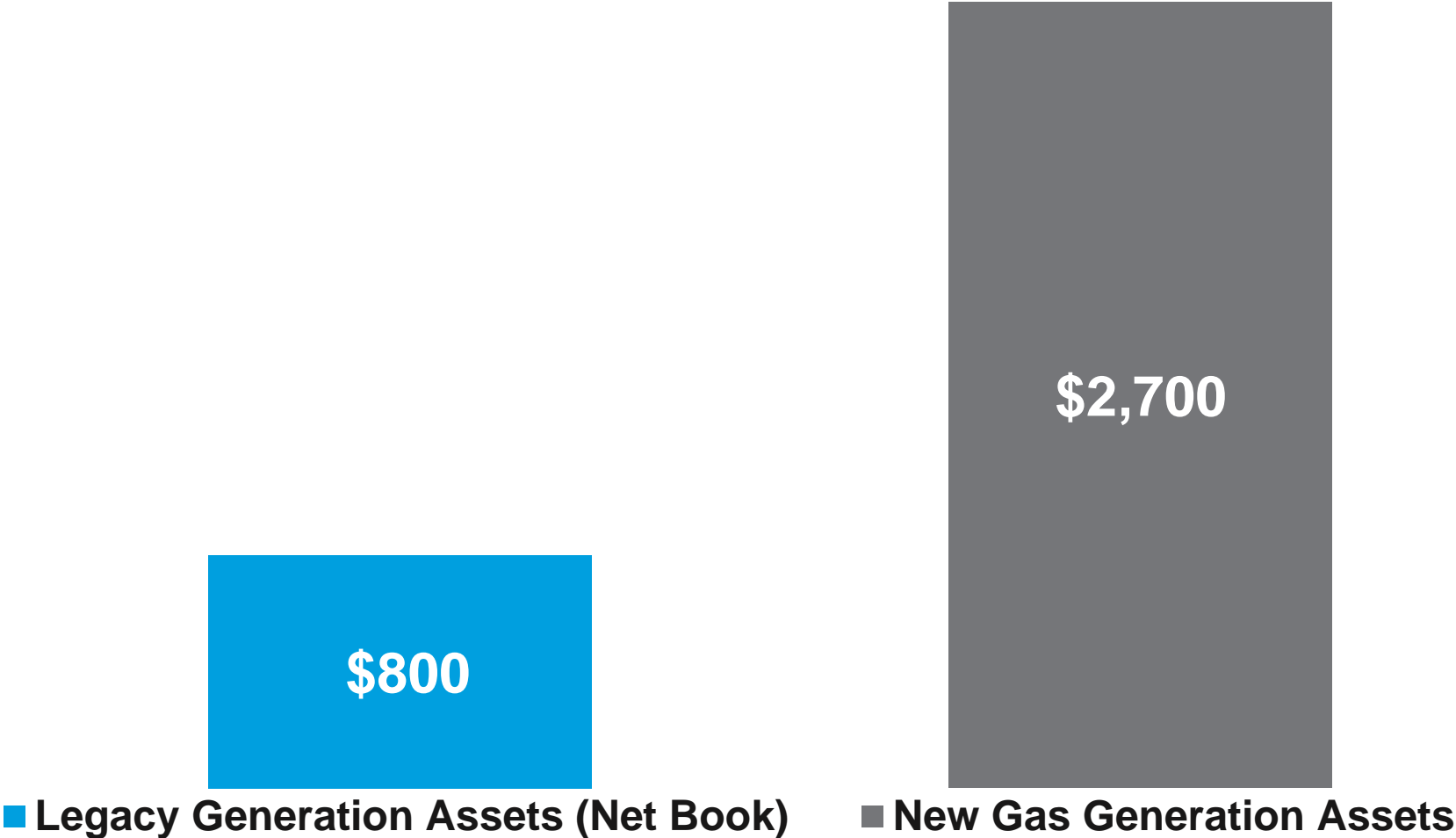
# Basin Electric Capital Expenditures - \$7.8 Billion

In Millions



# Cost of New vs Old Generation

\$ / kW Installed Cost





# Five-Year Load Growth Up Five-Fold to 128 Gigawatts

## THE ERA OF FLAT POWER DEMAND IS BEHIND US ...

Over the past two years, the 5-year load growth forecast has increased by almost a factor of five, from 23 GW to 128 GW, including Grid Strategies' estimate of recent update reports.

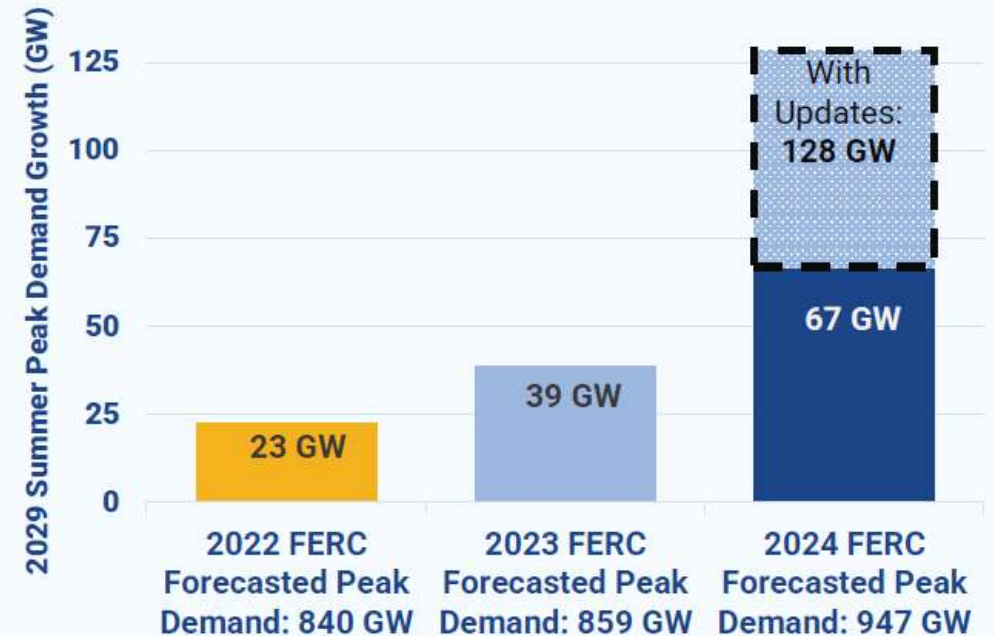
- The official nationwide forecast of electricity demand shot up from 2.8% to 8.2% growth over the next five years to 66 GW through 2029 – but with an additional 61 GW of growth in preliminary updates, **nationwide electric demand is forecast to increase by 15.8% by 2029.**
- While some of the additional growth merely reflects corrections to last year's incomplete forecast update, major changes have occurred in several regions. In particular, Texas (ERCOT) has recently added about 37 GW to its 2029 forecast – **resulting in an updated forecast of 43 GW in load growth through 2029.**

**The main drivers are investment in data centers and manufacturing. High-end sector forecasts suggest current load forecasts may not have caught up with growth.**

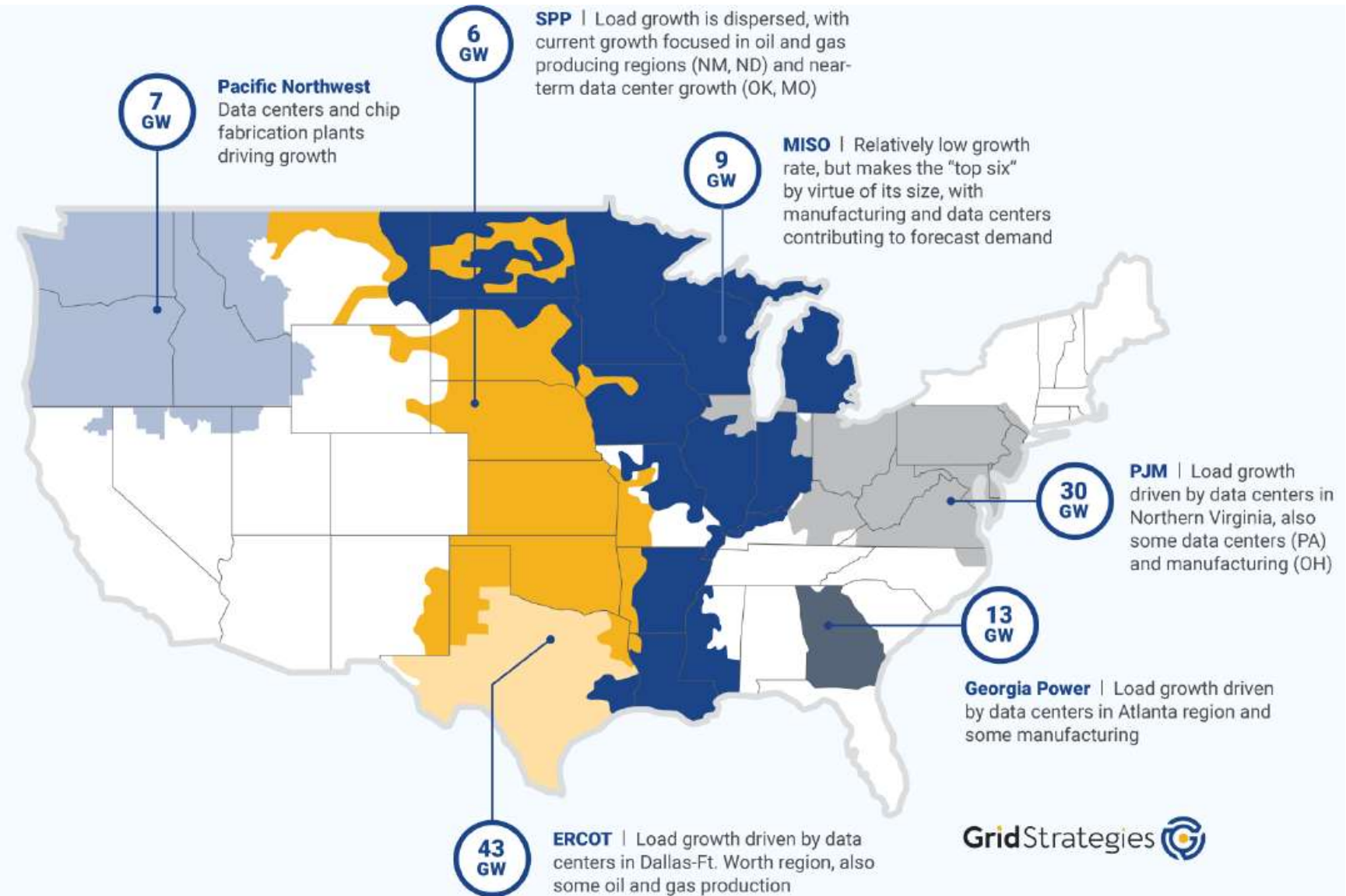
- Data center growth forecasts vary, with some tech industry analysts anticipating growth of 65 GW, while updated utility forecasts suggest over 90 GW.
- Manufacturing demand forecasts are unavailable – indicators suggest up to 20 GW growth.
- Other sources of load growth, including electrification, could be another 20 GW.

## AND THE FORECASTS ARE MORE SHOCKING ...

### 5-year Nationwide Growth Forecast



# Six Regions Driving Load Growth Through 2029





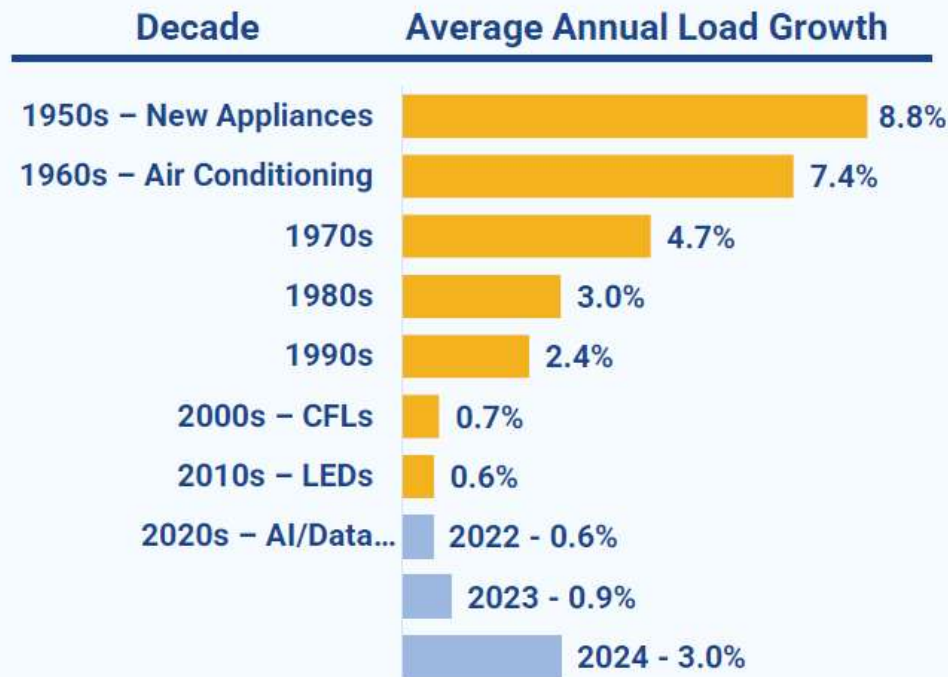
# A Scramble to Respond to Growing Load

For over two decades, the utility industry has been in a low growth period, well below 1% per year. If the updated forecast is correct, annual peak demand growth will average 3% per year over the next five years. While 3% growth may seem small to some, it would mean six times the planning and construction of new generation and transmission capacity.

Expanding the grid is critical to sustaining high load growth driven by strategic industries, meeting new large customer technology requirements, and maintaining reliability.

- Low transmission construction rates and low transfer capability between regions challenge transmission owners' ability to maintain reliability and accept all forecast power demand.
- For example, according to FERC data, the U.S. only built 55 miles of high-capacity transmission (greater than 345 kV and up) in 2023, but this trend may be reversing, as planned transmission expansion investments have increased to \$15.1 billion for 2024 compared to \$9.2 billion just two years ago.
- Additionally, certain data center technologies can respond to power variations in ways that make reliable grid operation more difficult.

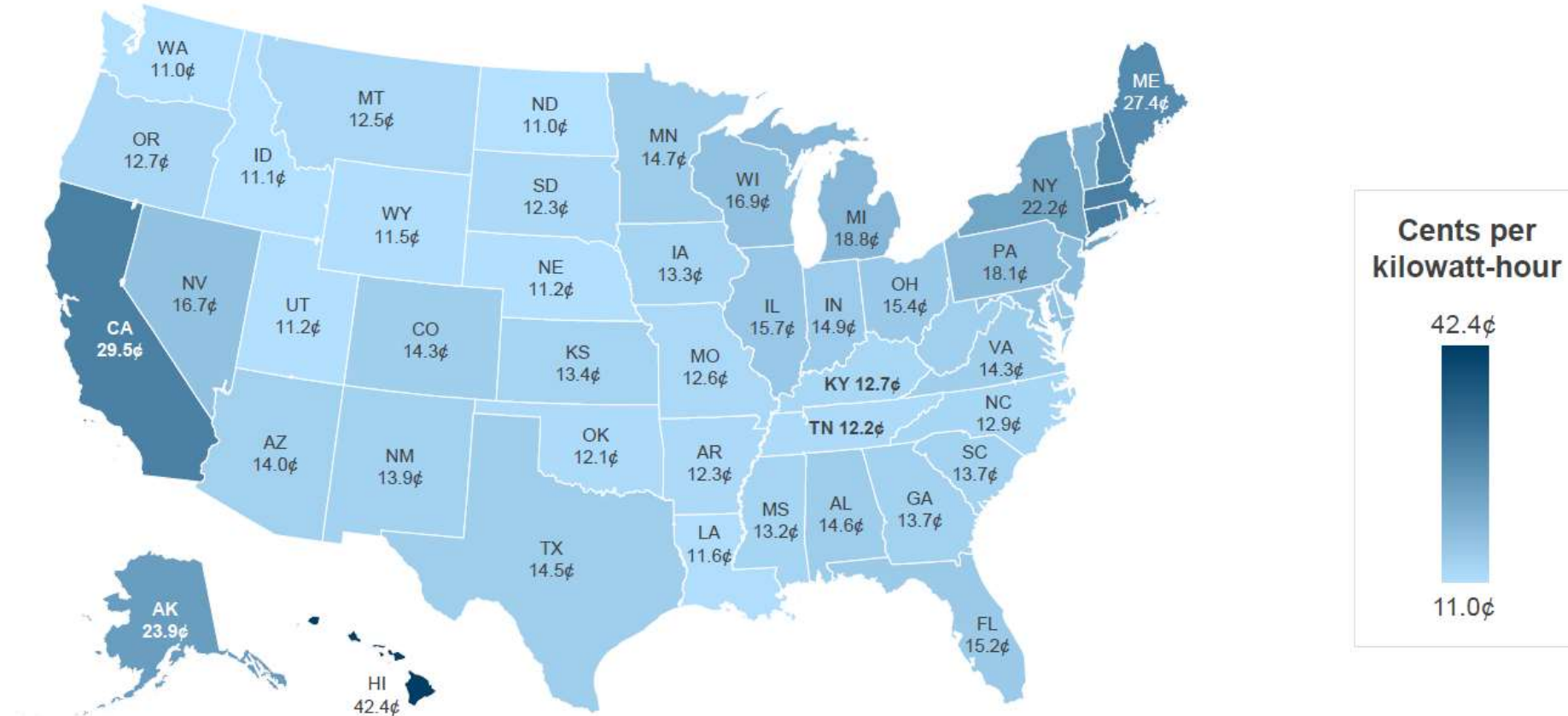
These numbers may be an underestimate – or an overestimate. **Greater uncertainty creates its own challenges**, making it difficult to agree on planning scenarios, finance manufacturing, and complete the construction of transmission and generation.



SOURCES | NERC, [2022 Long-Term Reliability Assessment](#) (December 2022), p. 20 and [Supplemental Table F](#).  
Edison Electric Institute, [EEI Industry Capital Expenditures with Functional Detail](#), published October 2021, September 2022, September 2023 and September 2024.  
Grid Strategies, [Fewer New Miles: The US Transmission Grid in the 2020s](#) (July 2024).

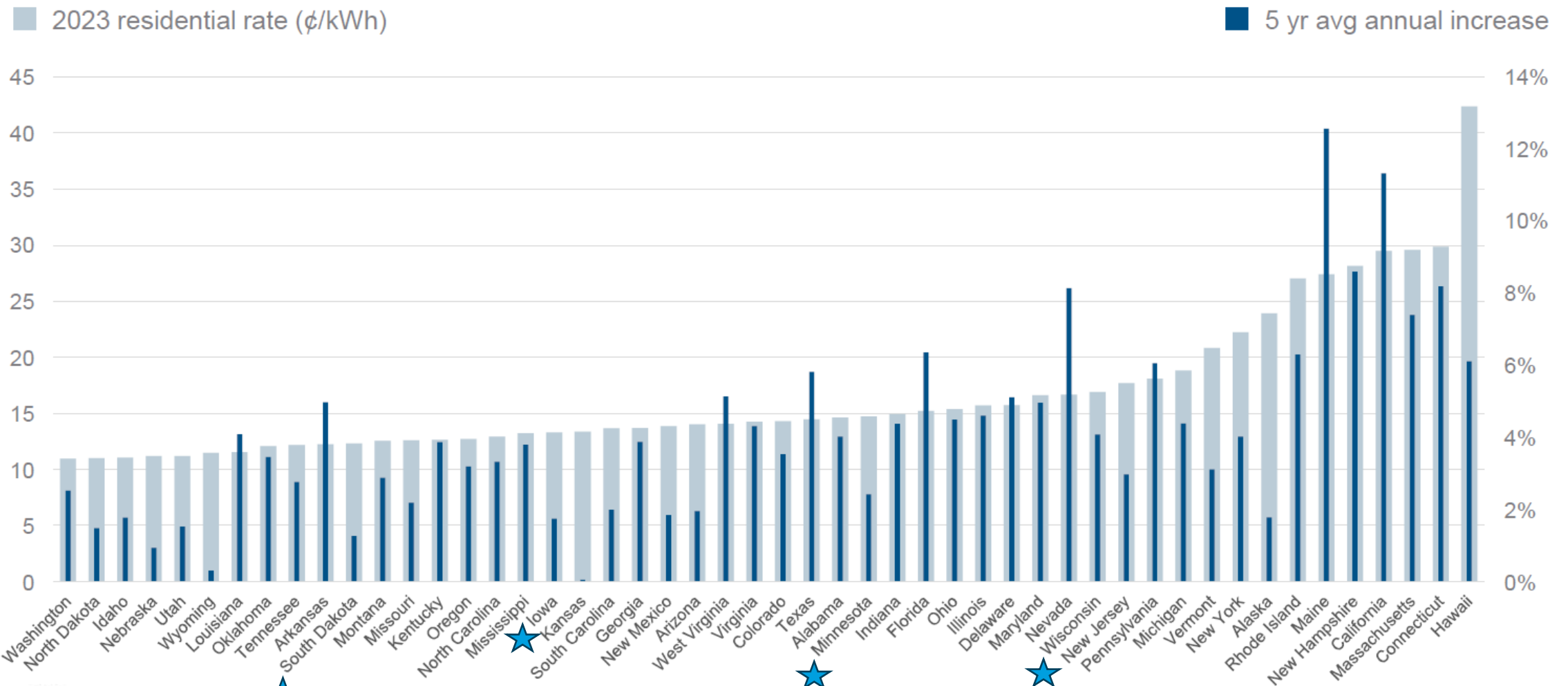
# U.S. residential rate at 16¢ per kWh (up from 12¢ five years ago)

Residential electricity prices (¢ per kWh)



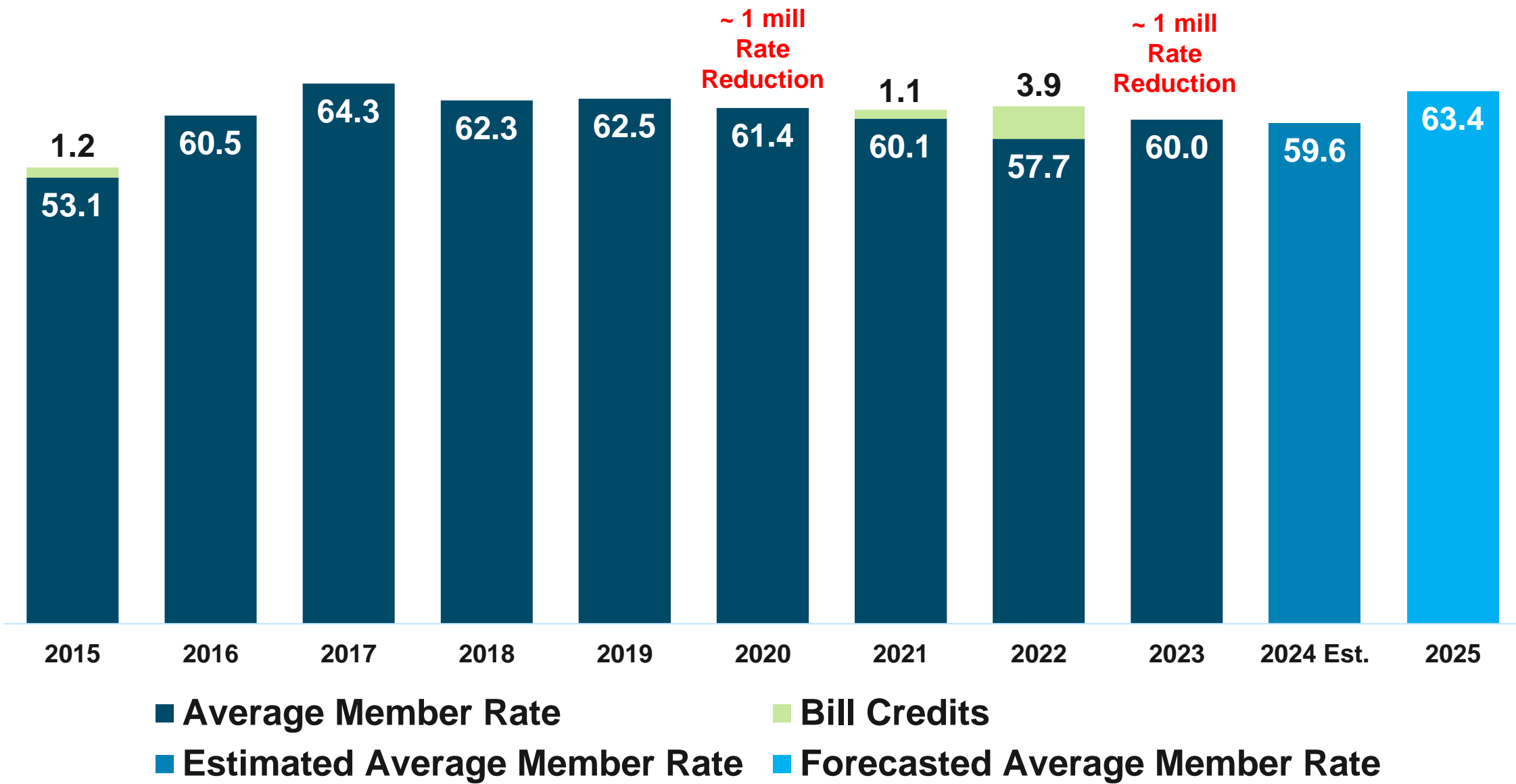
Source: EIA

# Striking the right balance (affordability and reliability)



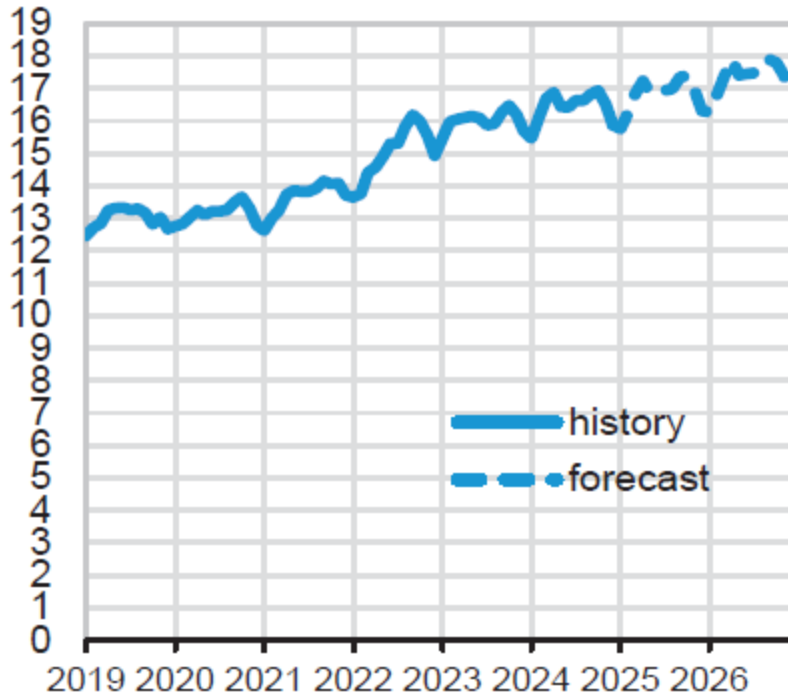
Source: EIA

# Basin Electric Average Member Rates

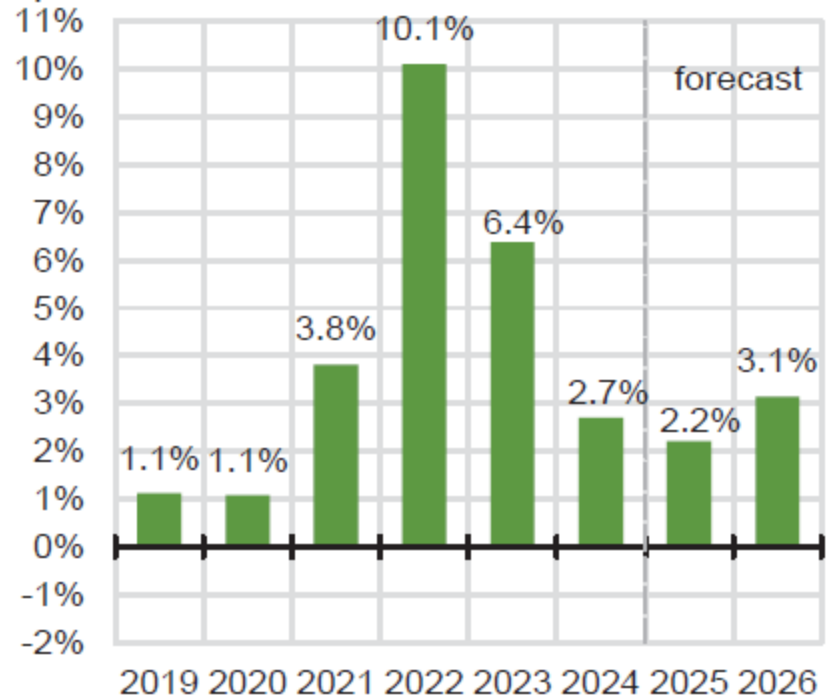


# Rates Will Continue to Increase

U.S. monthly nominal residential electricity price  
cents per kilowatthour



Annual growth in nominal residential electricity prices  
percent



Data source: U.S. Energy Information Administration, Short-Term Energy Outlook, January 2025



# Electricity is a Tremendous Value

In Iowa, the average household served by electric cooperatives spends about

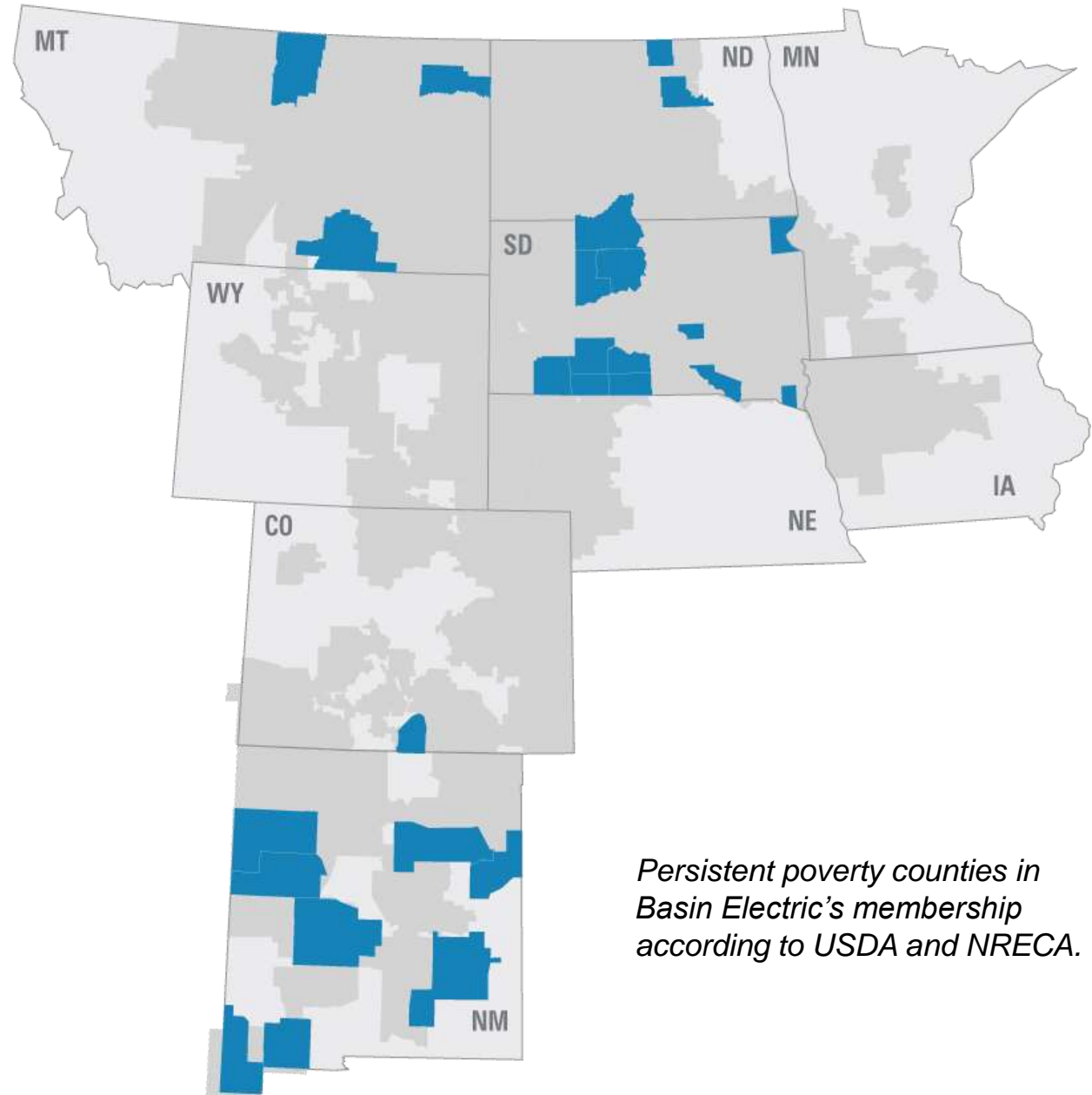
**\$5.25 PER DAY FOR ELECTRICITY**



**THAT'S CHEAPER THAN BUYING A SANDWICH OR SPECIALTY COFFEE DRINK!**

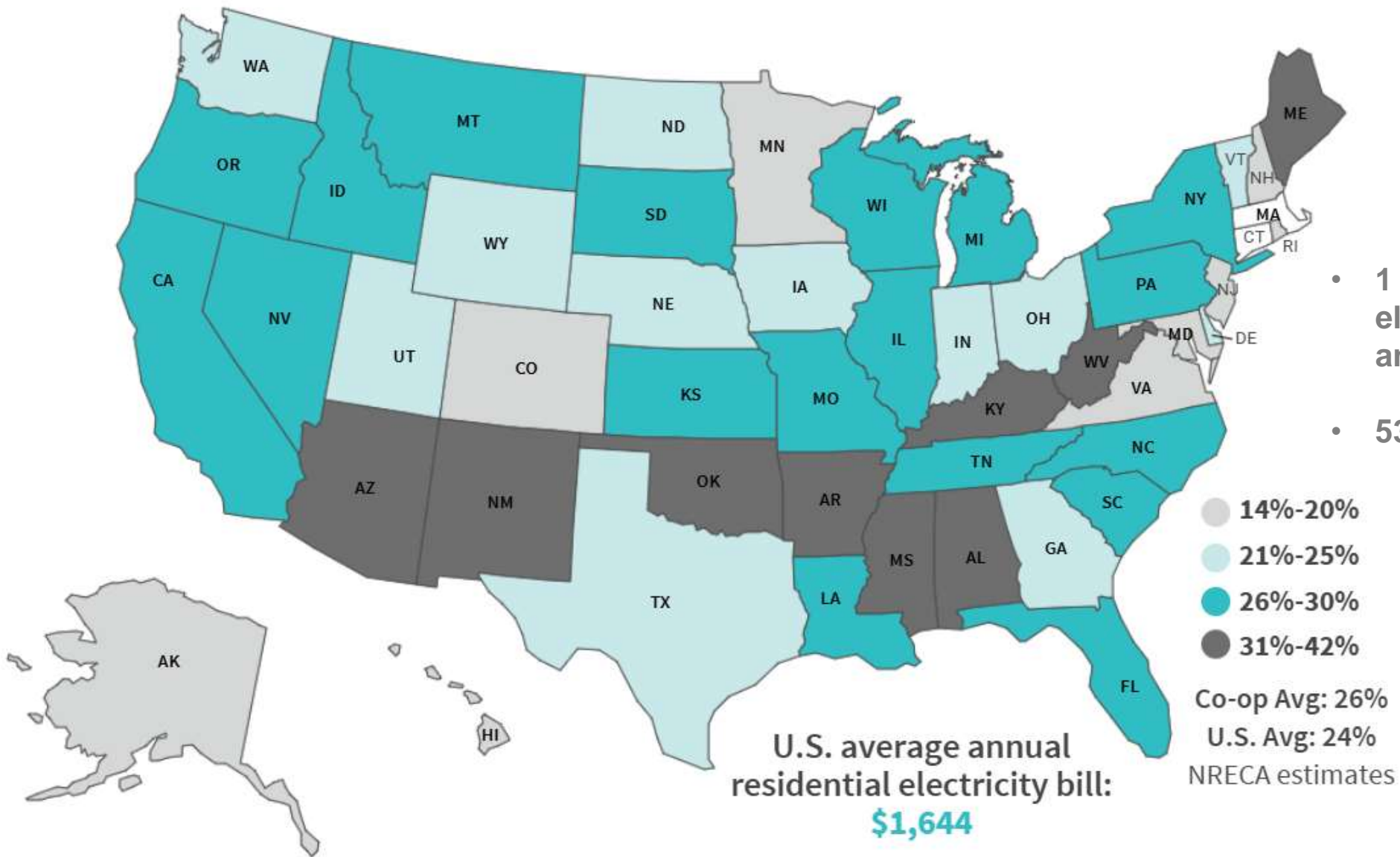


# Keeping Rates Affordable



*Persistent poverty counties in Basin Electric's membership according to USDA and NRECA.*

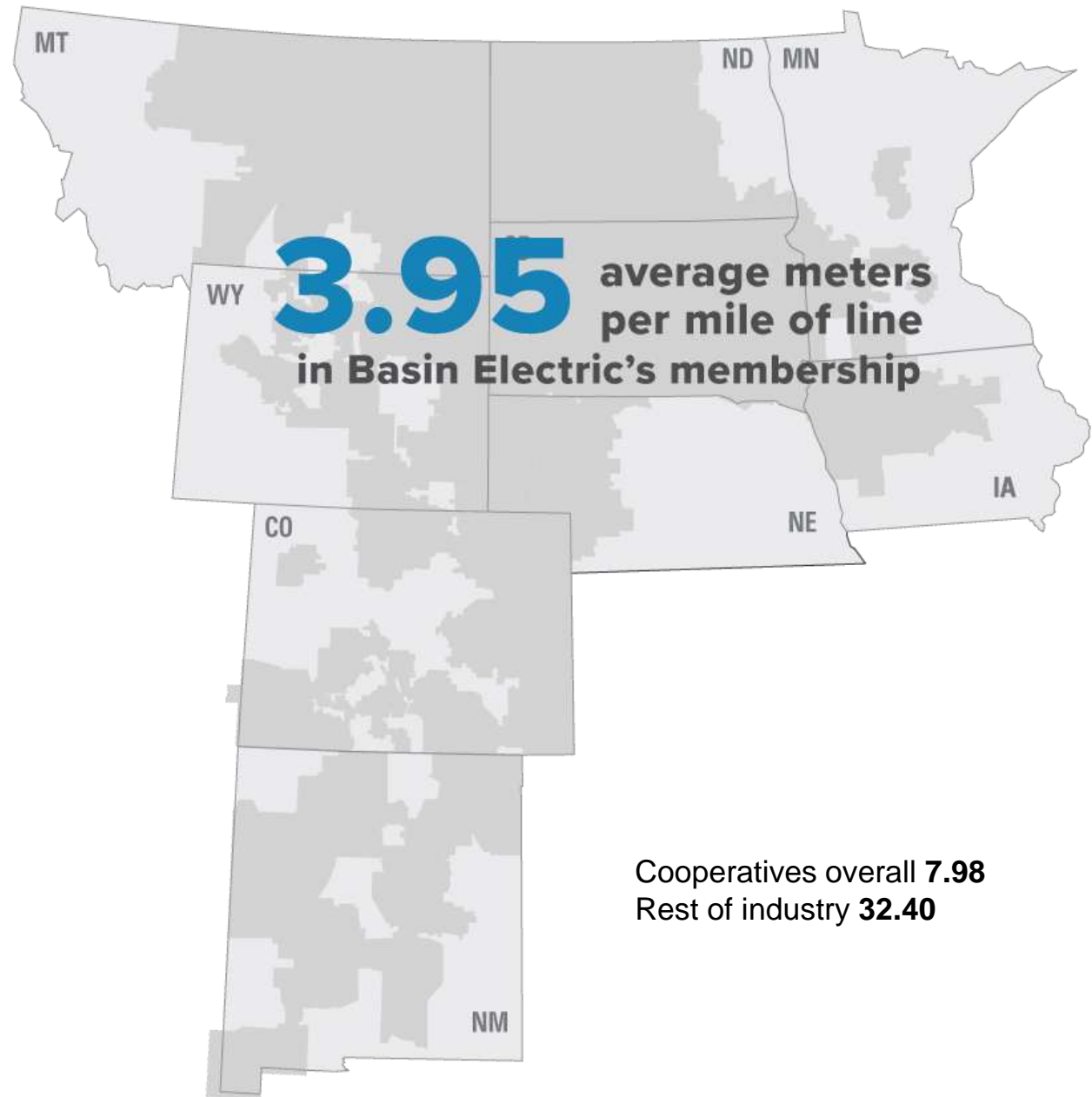
# Share of Co-op Households with Annual Income Under \$35K



- 1 in 4 households served by electric cooperatives have an annual income below \$35,000
- 53% of sales to households

Note: Map reflects most recent available data  
Source: 2022 EIA data

# Basin Electric Members Serve Areas Others Wouldn't



# Serving Member Growth

- Operate current resources reliably and economically
- Generation additions
  - Pioneer Generation Station Phase IV
    - 580 megawatts
  - Bison Generation Station
    - ~1,490 MW by 2030
- Transmission and substation additions
  - Roundup-to-Kummer Ridge 345-kV line by 2024
  - Leland Olds Station substation by 2025
  - Leland Olds Station-to-Tande 345-kV line and substation by 2026
  - Wheelock- and Tande-to-Saskatchewan 230-kV line by 2027
- Work within energy markets to access economical, reliable power





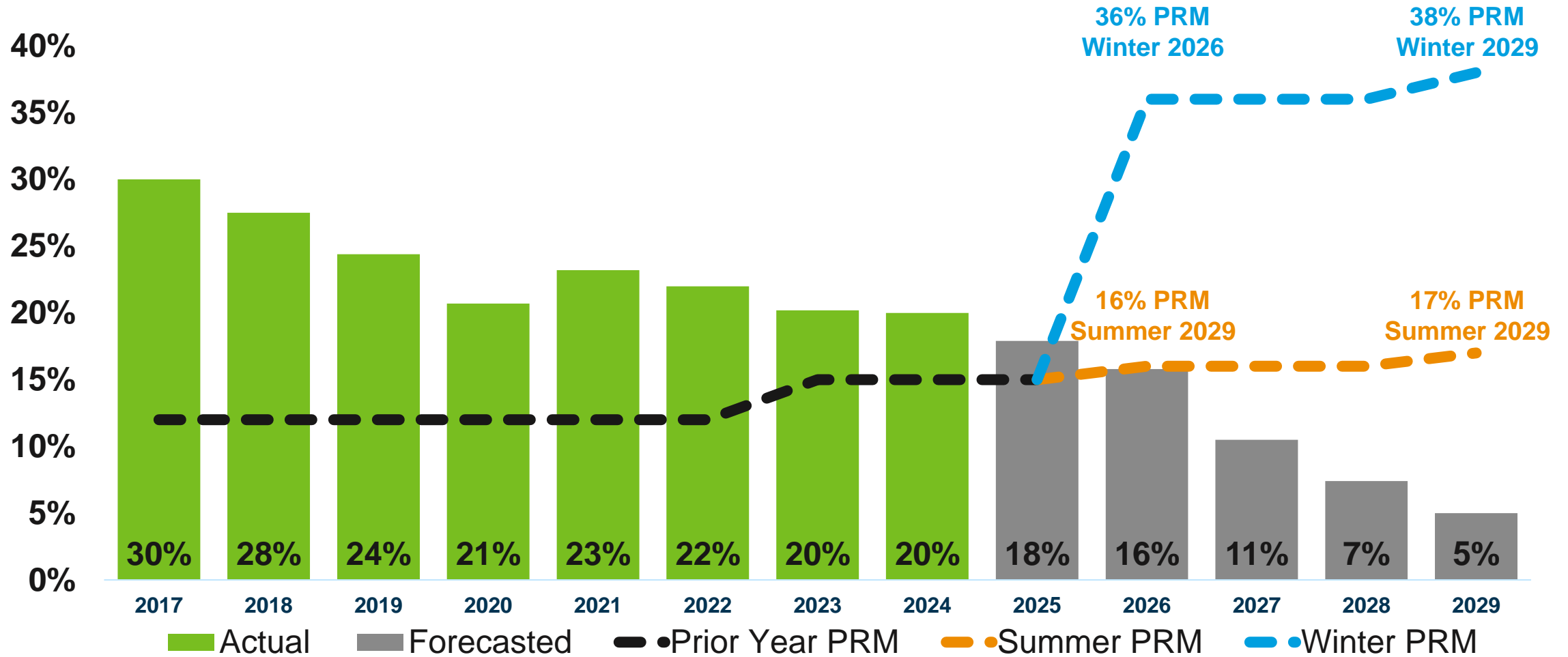
# Large Loads

- Load segmentation for new load growth
- Developing process improvements for onboarding large loads
- Developing business model for serving new large loads
  - Insulating current members from additional risk

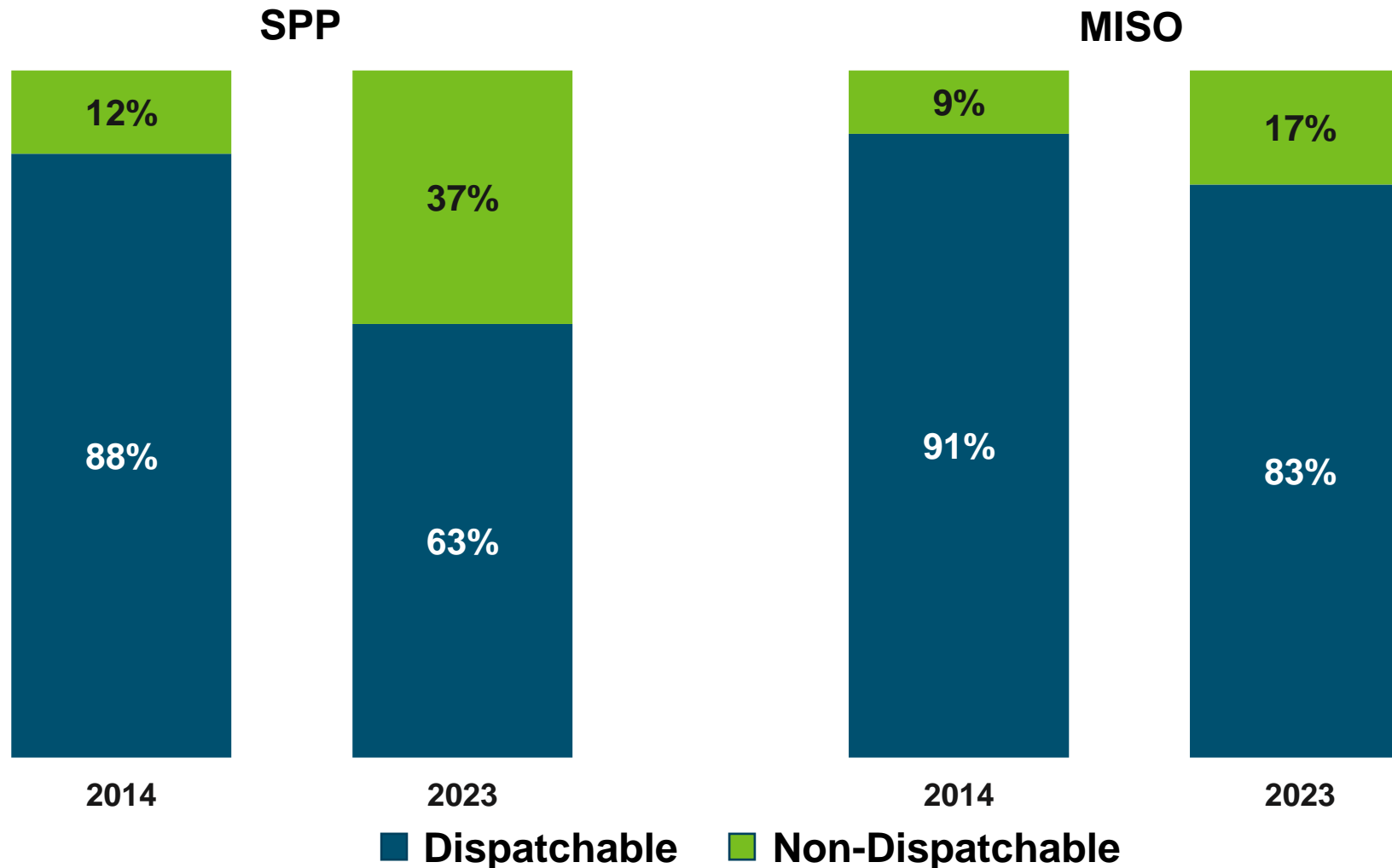




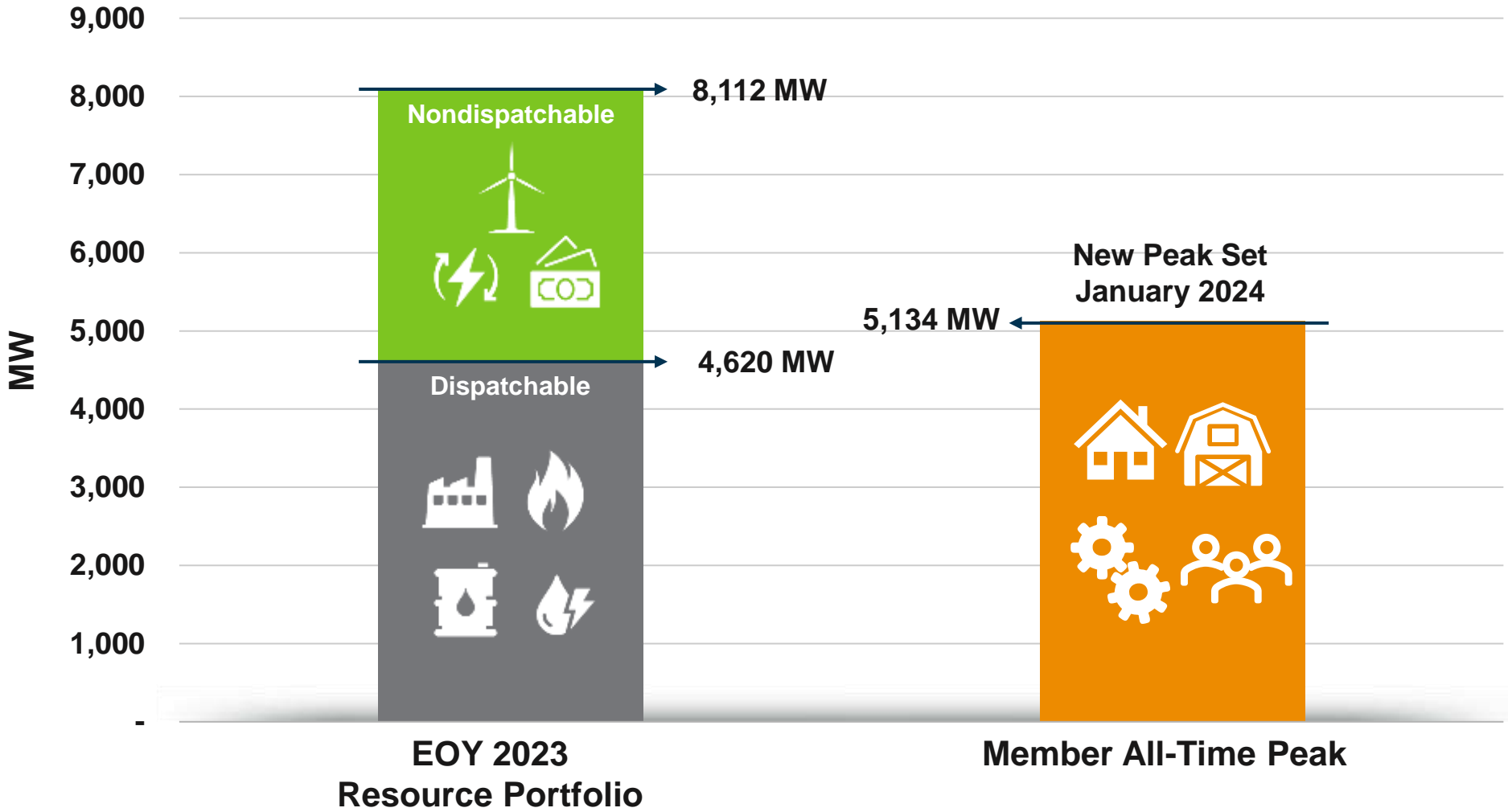
# SPP's changing Planning Reserve Margins



# Generation Energy Mix Change 2014-2023

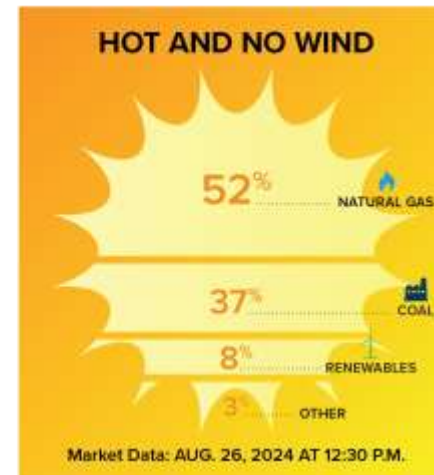
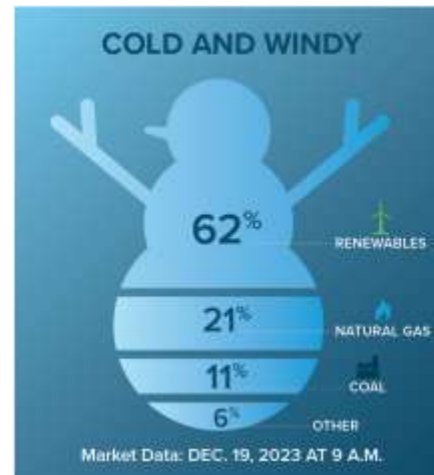
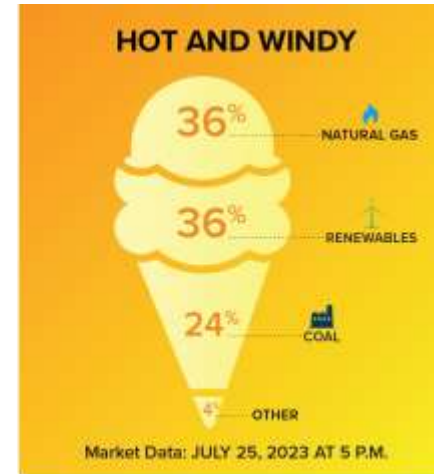
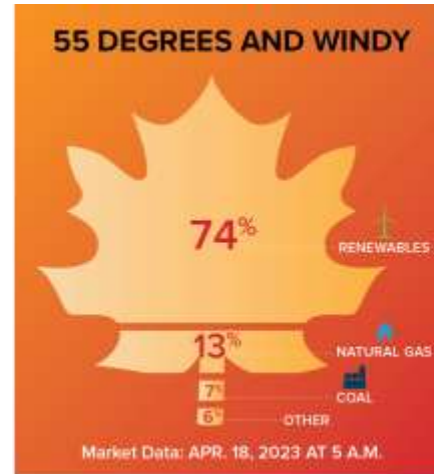
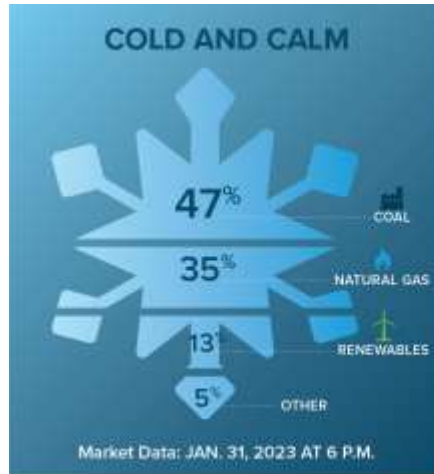


# Basin Electric Maintains Dispatchable Generation to Ensure Reliability

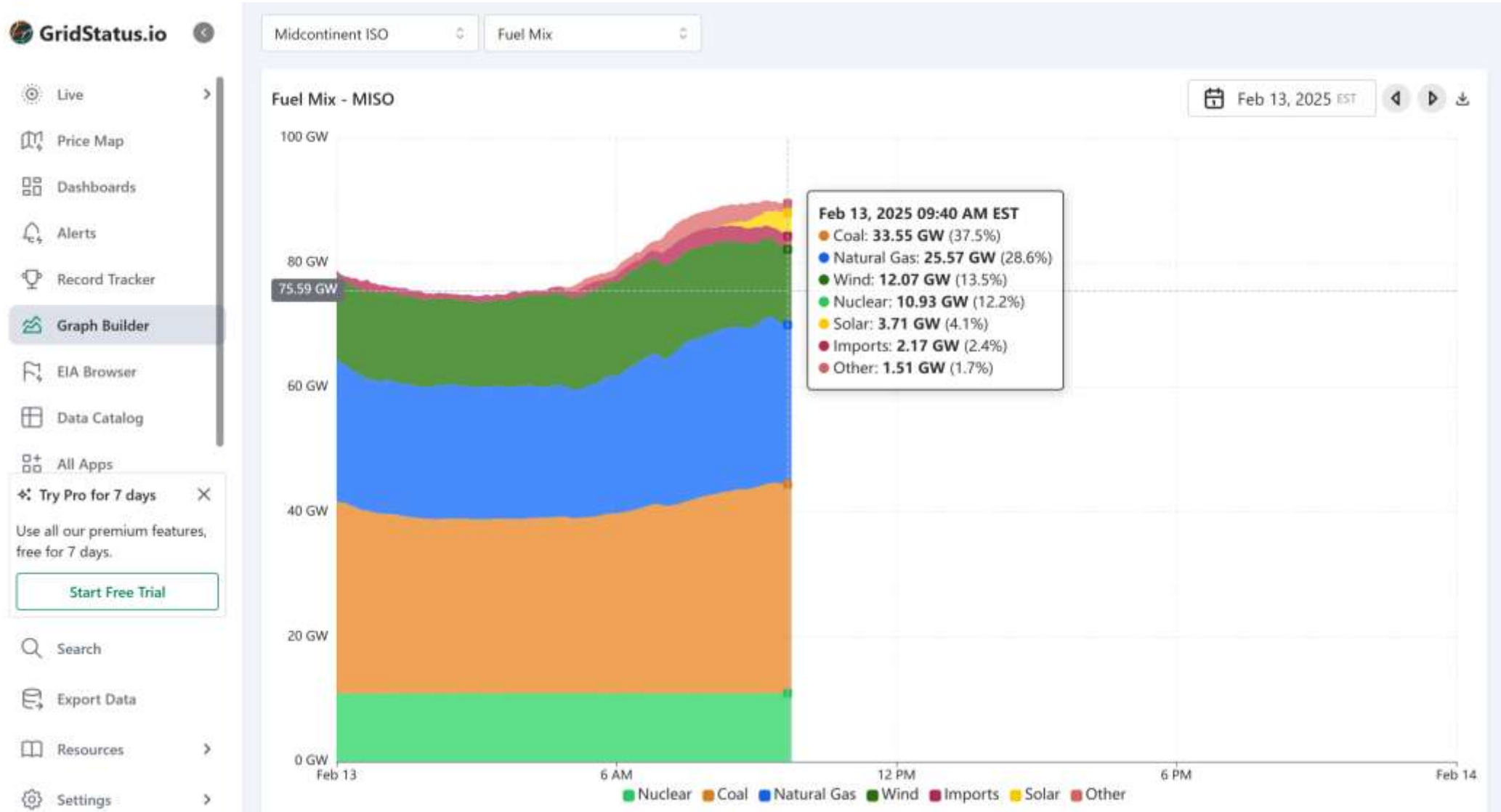


# Meeting the Demand for Electricity

The graphics below show how the power market meets member load and connects it to something everyone can relate to – the weather.



# MISO This Morning





# SPP This Morning

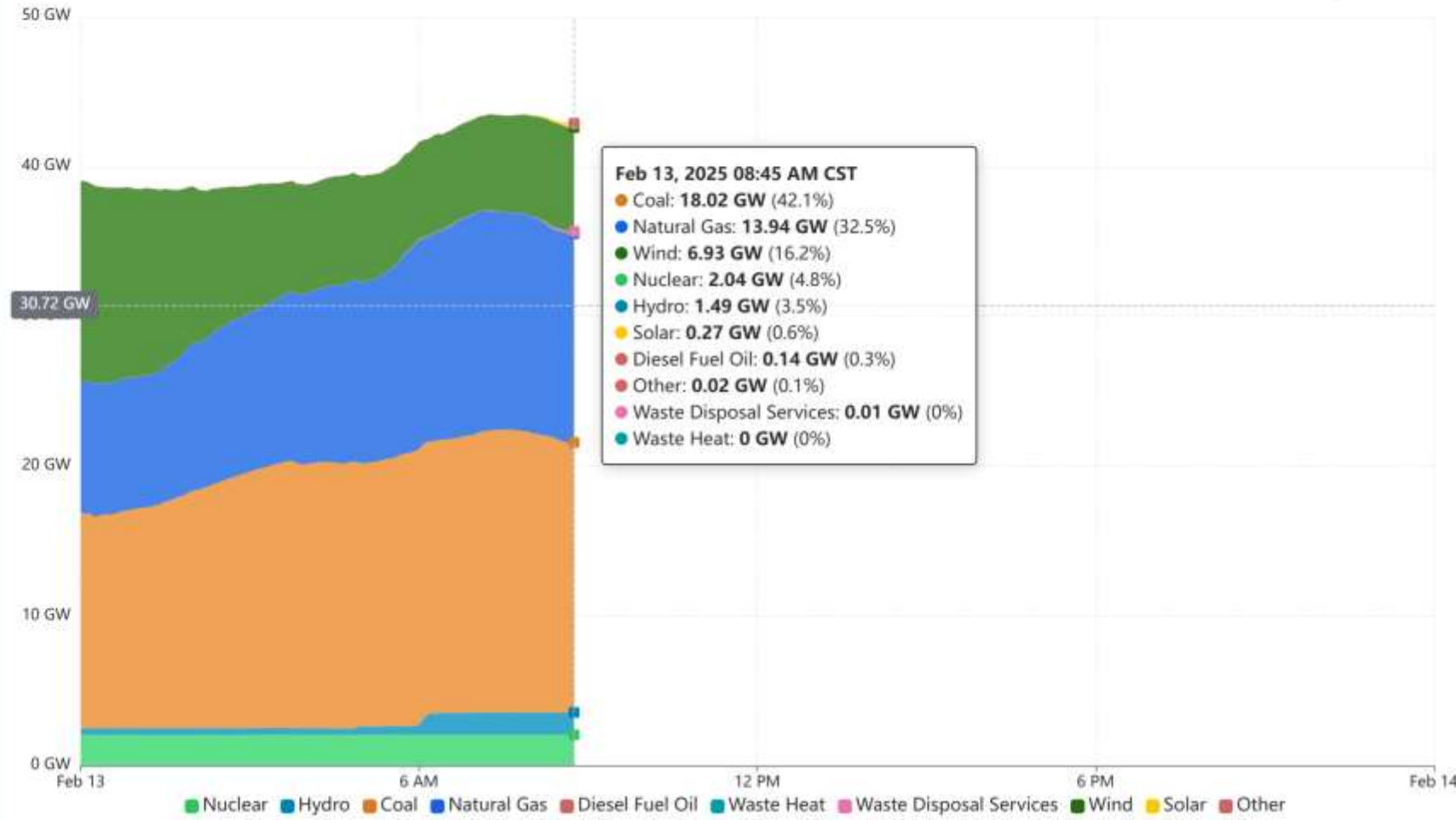
GridStatus.io

- Live
- Price Map
- Dashboards
- Alerts
- Record Tracker
- Graph Builder**
- EIA Browser
- Data Catalog
- All Apps
- Try Pro for 7 days
- Use all our premium features, free for 7 days.
- Start Free Trial
- Search
- Export Data
- Resources
- Settings

Southwest Power Pool Fuel Mix

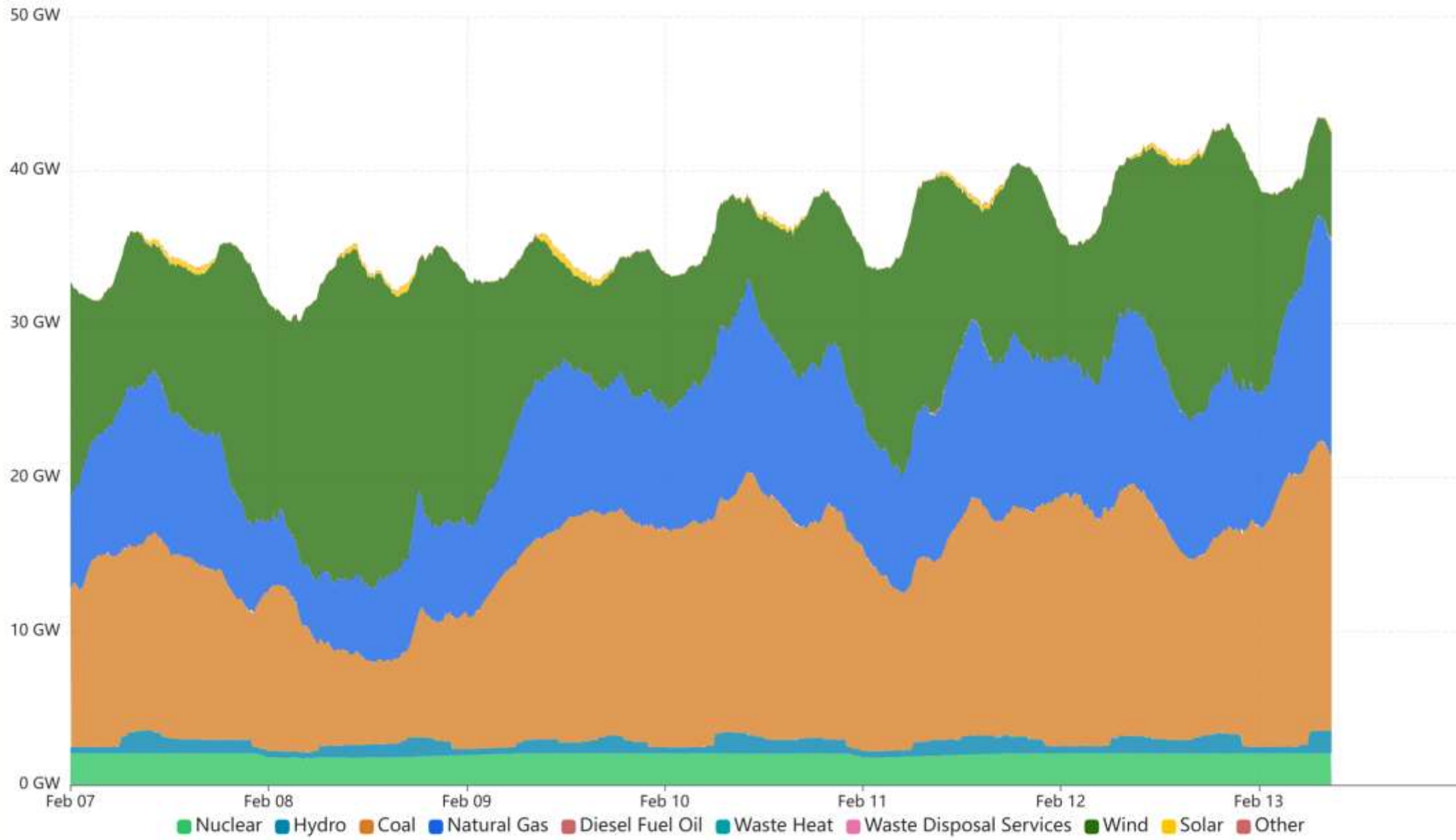
Fuel Mix - SPP

Feb 13, 2025 US/Central



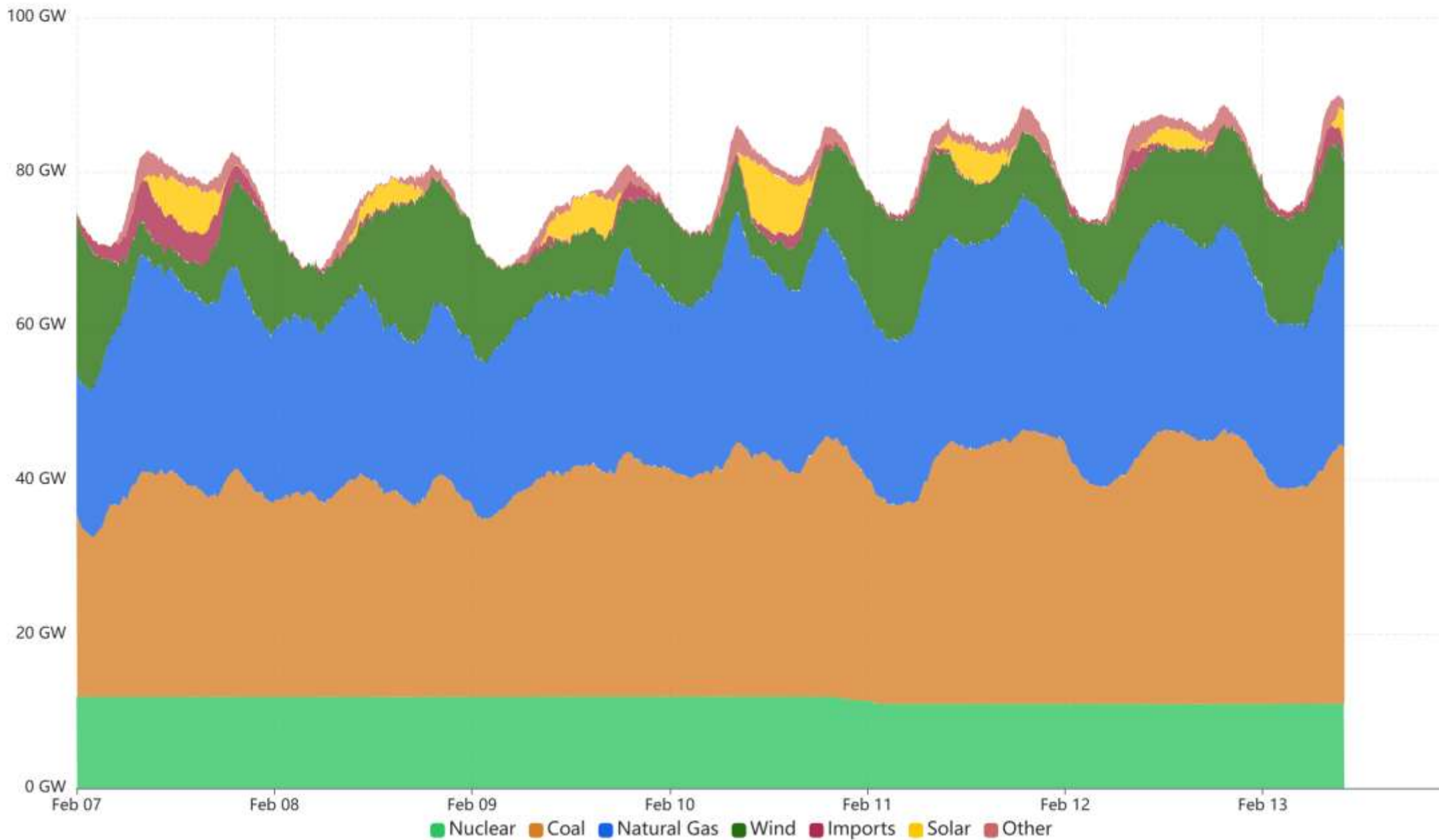
# Fuel Mix - SPP

Feb 7 - Feb 13, 2025 US/Central



# Fuel Mix - MISO

Feb 7 - Feb 13, 2025 EST



# Investing for the Future

## PGS Phase IV

- Investment Amount: \$805 million
- 600 MW Capacity – Natural Gas
- Board Approval: September 2022
- Construction began March 22, 2023
- Phase 1
  - 240 MW simple-cycle turbine
  - 108 MW of reciprocating engines
  - 15 miles 345-kV transmission
  - In service August 2025
- Phase 2
  - 240 MW simple-cycle turbine
  - In service 2026





# PGS Phase IV Reciprocating Engine Room





# Investing for the Future

## Bison Generation Station

- Investment Amount: nearly \$4 billion
- 1,490 MW Capacity – Natural Gas
- Board Approval: January 2025
- Estimated Completion Date: 2030



# Constraints to Growth

- Supply Chain
- Major equipment lead times
  - “Partnering” is becoming commonplace
- Longer material lead times
- Attracting skilled construction and trade labor force
- Increased costs of materials and labor
- Development timeline
  - Data centers – 3 Years
  - Power plants – 7 years
- Access to financing
- Rate pressure

# Generating Quality of Life

## What happens when the power goes out?

Houses start to cool off immediately.

On a -20-degree F (Fahrenheit) day (which happens more often than you'd think), a house will be cold in 6 hours and virtually uninhabitable in 12-18 hours.

Uninsulated pipes can freeze in as little as 4-6 hours.

Even if a home's heat comes from natural gas or propane, electricity is still typically necessary for it to function.



# Days Below Freezing

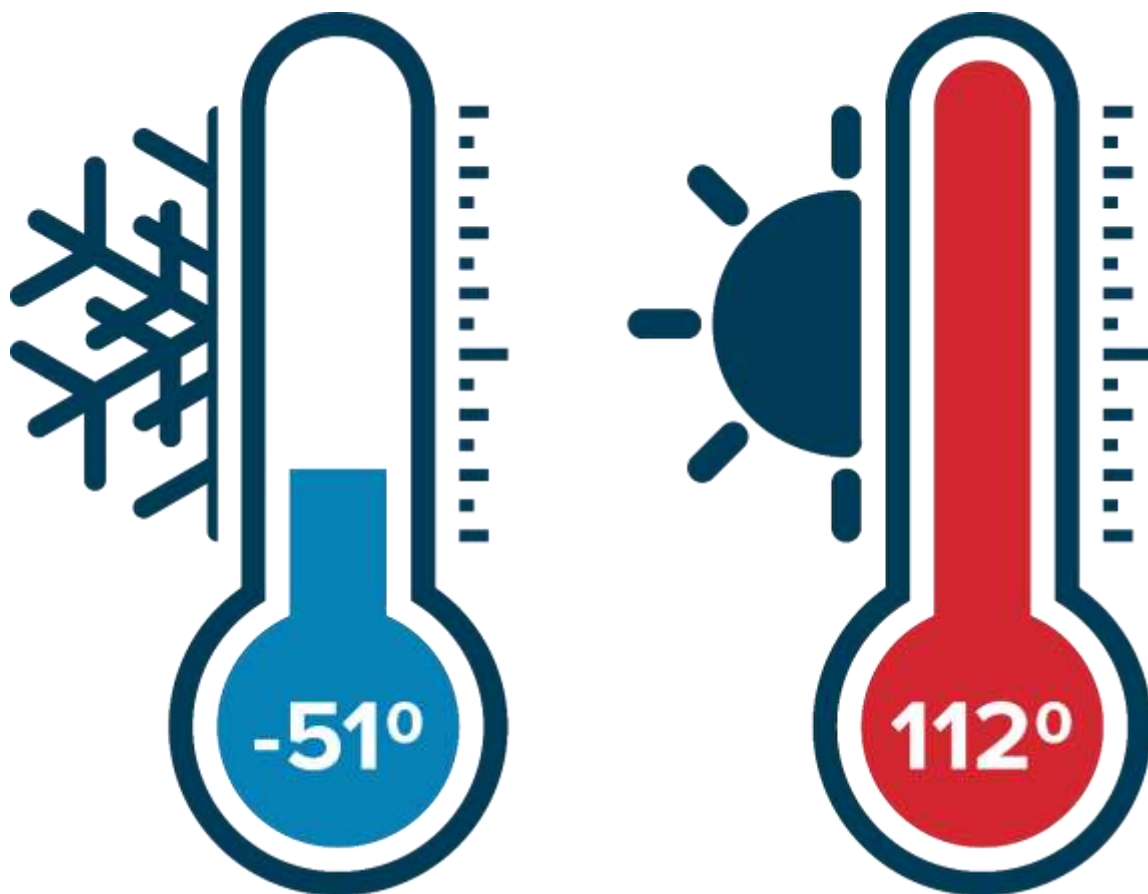


Basin Electric's Headquarters is in Bismarck, North Dakota, where it averages 182 days per year of below-freezing temperatures.

That's approximately half the year.

*Data from National Weather Service*

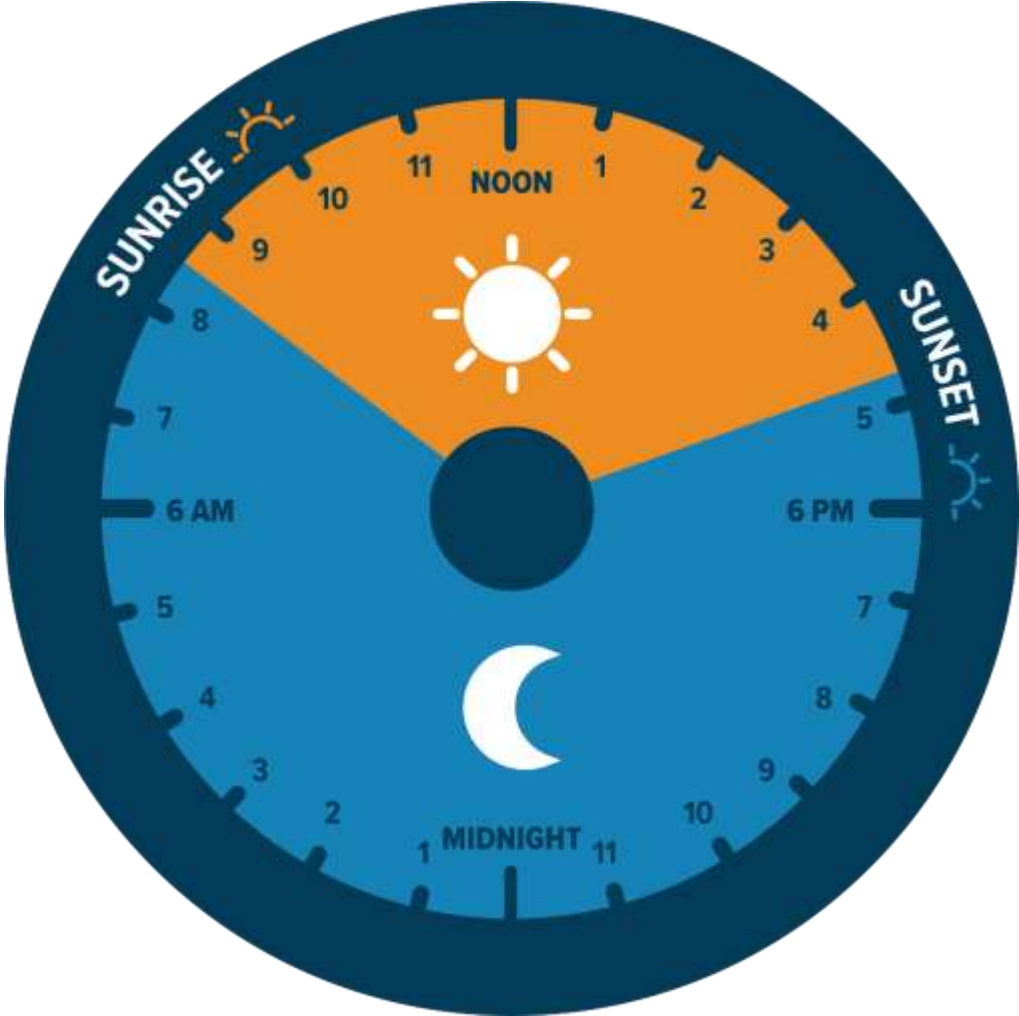
# From One Extreme to the Other



Basin Electric serves areas with extreme temperatures. In the past 20 years across North Dakota, the coldest temperature was -51° F and the highest was 112° F.

*Data from National Weather Service*

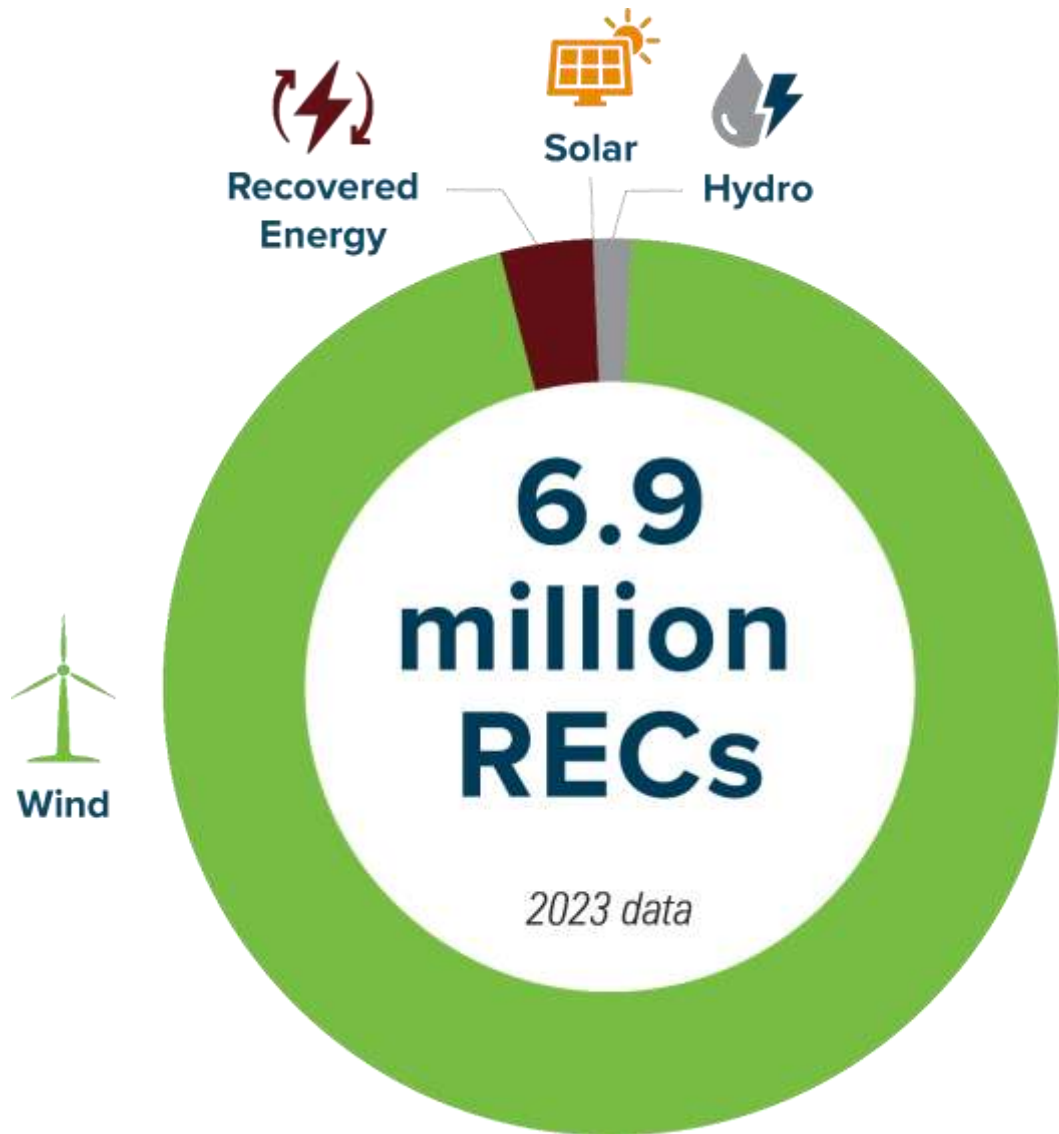
# Living in the Dark



Sunrise 8:24 a.m., Sunset 4:51 p.m.  
8 hours 27 minutes of daylight

*Data from Bismarck, North Dakota, on Dec. 21, 2023,  
the shortest day of the year.*





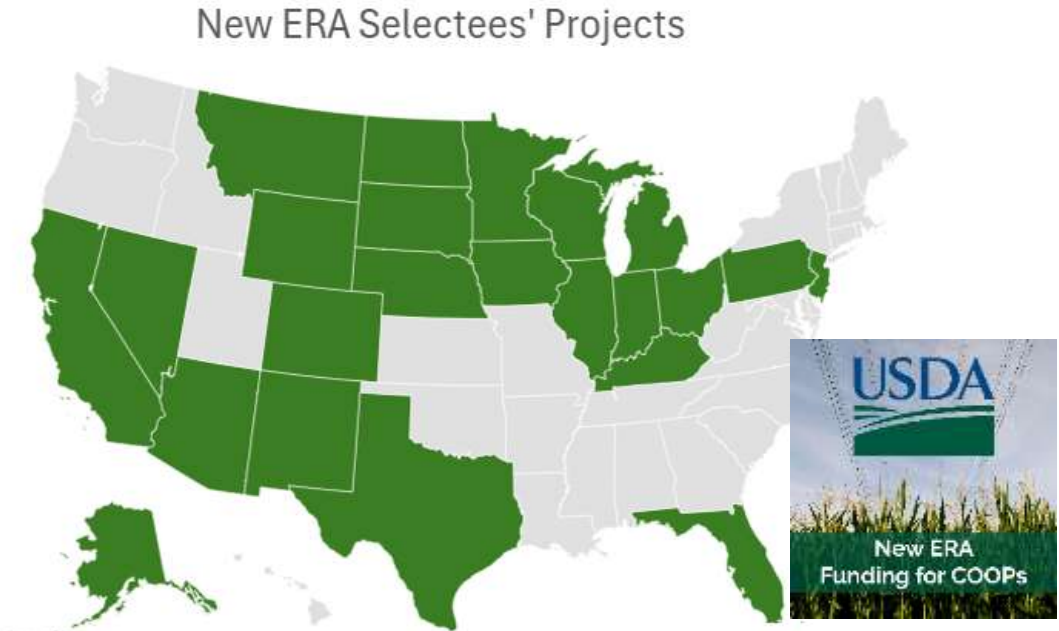
## Helping Members and Others Meet Their Renewable Energy Goals

*Basin Electric annually allocates 6.9 million RECs to our members as a result of renewable energy generation.*

# New ERA Next Steps

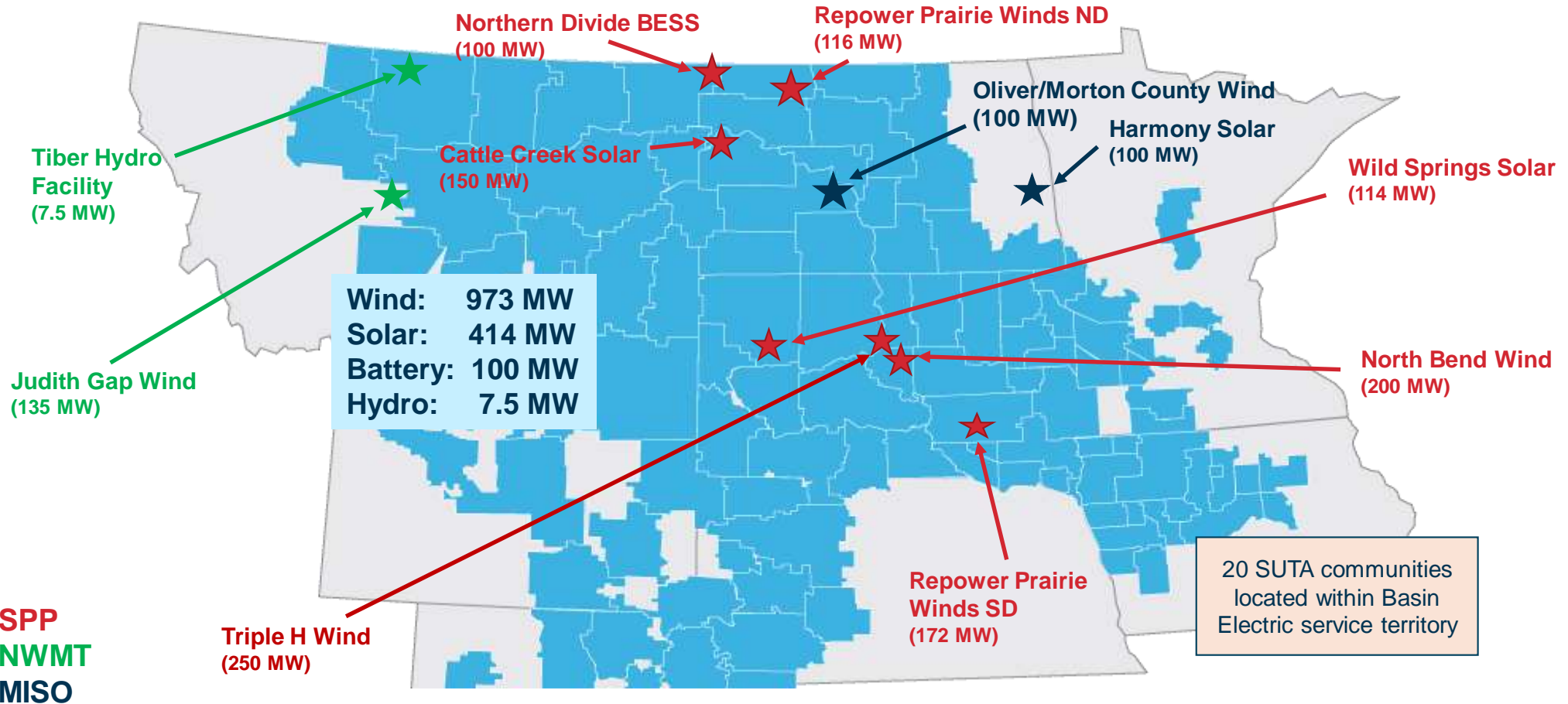
- Application submitted to RUS in August
- Received notice of awards
- Build and implement Community Benefits Plan(s) (CBP)

<p>Community and Labor Engagement</p> 	<p>Investing in Quality Jobs</p> 
<p>Diversity, Equity, Inclusion and Accessibility</p> 	<p>Justice40</p> 



# Community Benefits - System and Local

Our 11 New ERA generation projects provide GHG-reducing benefits to consumers served by Basin Electric's member cooperatives. Community benefits program development takes this into consideration with "system-wide" benefits, while also providing "project-specific" community benefits tailored to each project location



# Policy vs. Regulations

- New administration released an avalanche on day 1
  - Strong emphasis on energy
  - Declaring a national energy emergency
  - Unleash American energy and Alaska's extraordinary potential
  - Regulatory freeze pending review
  - Pausing offshore wind
  - Defeating the cost-of-living crisis
- Tariffs
- Policy provides certainty

# Carbon Reduction Targets

- Minnesota
  - Carbon free by 2040
- Wisconsin
  - Executive order “goal” to be carbon free by 2050
- Iowa
  - “Goal” of 100% renewable by 2050
- South Dakota
  - Target was 10% renewables by 2015



# Carbon Management

- Carbon capture & sequestration
  - Great Plains Synfuels Plant since 2000
- Integrated Test Center
  - Dry Fork Station
- Membrane Technology & Research FEED study
  - Dry Fork Station
- CarbonSAFE WY Phases I through III
  - Dry Fork Station
- Great Plains CO2 Sequestration Project
  - Great Plains Synfuels Plant
- Past projects
  - CarbonSAFE ND Phase II
  - Antelope Valley Station FEED study (2010)



# Nuclear

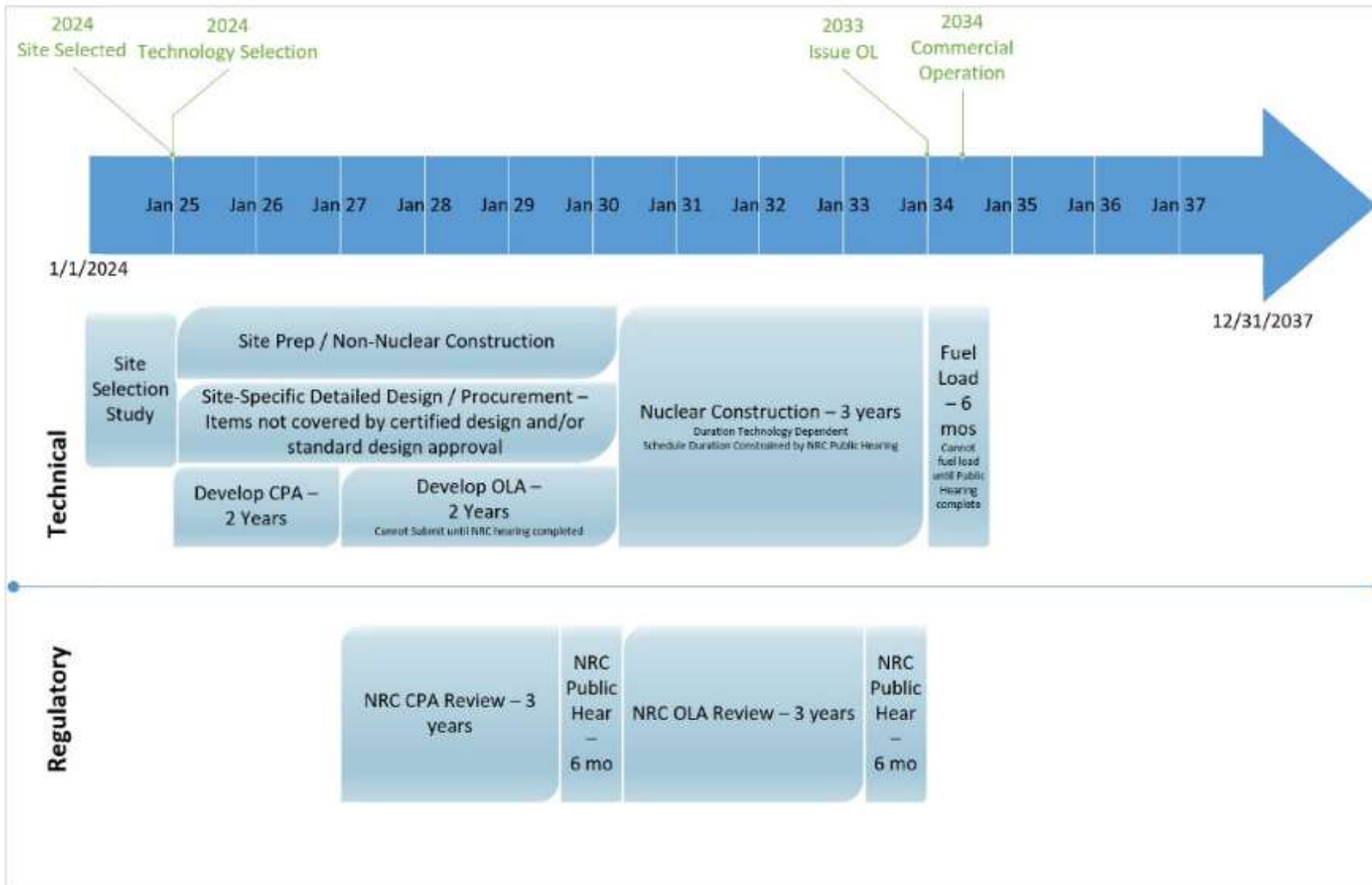
- Current landscape
  - 94 reactors, 97 GW of capacity
  - 2050 forecast: Add 200 GW
  - Existing units were built for electric utilities
- Unprecedented load growth
  - AI and data centers
  - Carbon reduction targets
  - Electrification
- Shuttered units evaluating restarts
  - 2013-2023: 12 reactors shut down
  - At least 3 considering restarts

# Cooperative Interest in SMRs

- All-of-the-above strategy
- Provides fuel diversity
- Incremental addition of capacity, matching growth
- Load following capabilities
- Zero emissions of CO<sub>2</sub>, acid gases, heavy metals, etc.
- Passively safe and hopefully easier to license than traditional nuclear reactors



# Timeline for Nuclear Deployment



# Additional Considerations

- Impacts of AI
  - Everyone is adopting AI and adapting quickly
  - AI searches require 10 times more power
  - Challenges and opportunities
- Microgrids
- EV adoption



# Battery Storage (BESS)

- Utility scale
- Residential scale

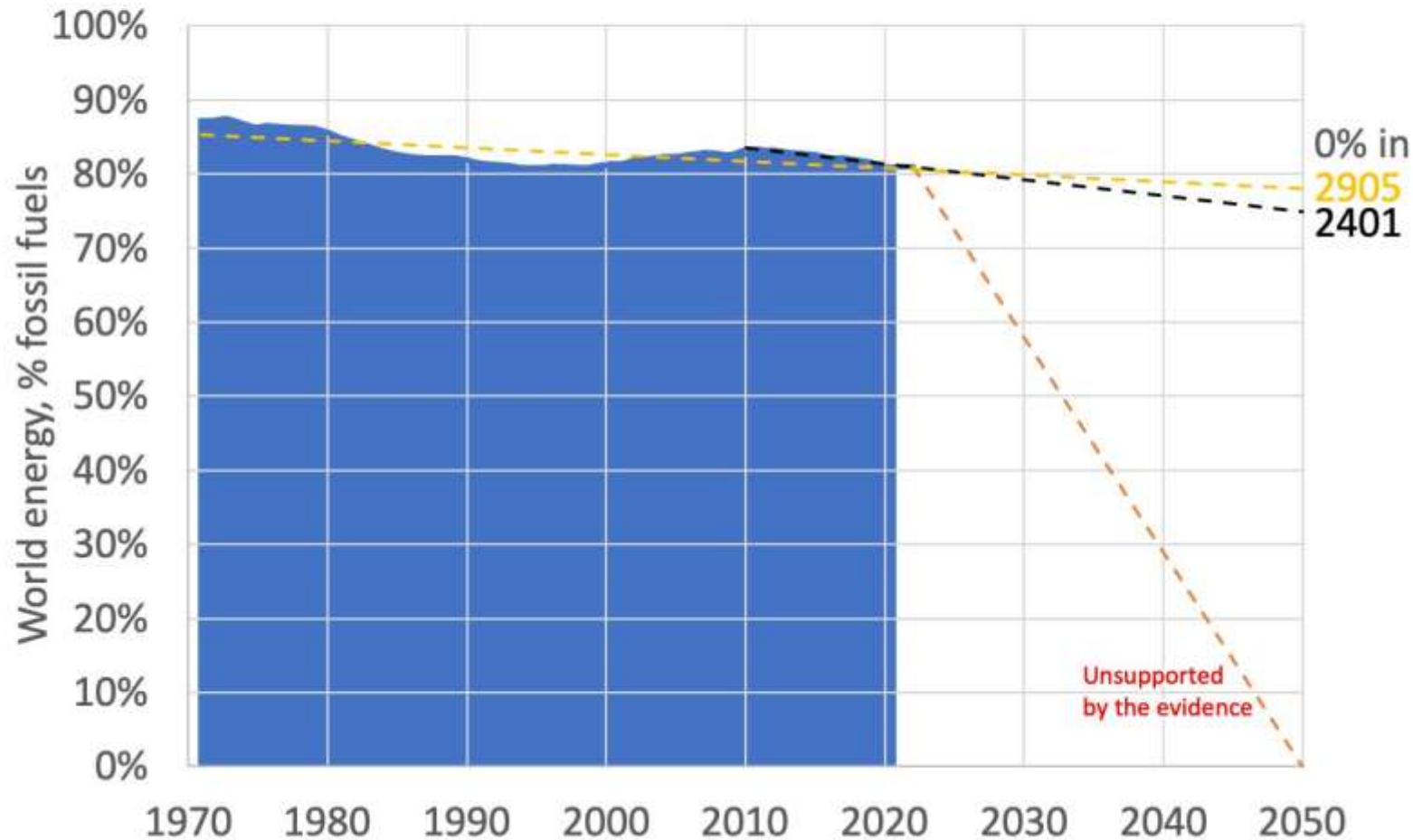


# No Quick End for Fossil Fuels

Everyone claims a supposed green transition, with zero fossil fuels by 2050

In reality, fossil fuels still provide 81% of global energy in 2022

Fossil fuels *decline so slowly* that zero will take 4-9 centuries



Percent of world energy (not just electricity) from fossil fuels; International Energy Agency World Energy Balances, <https://www.iea.org/data-and-statistics/data-product/world-energy-statistics-and-balances>, 1971-2022, least-square trendlines from 2010-22 and 1971-2022, extrapolated to 2050 and to zero, x.com/BjornLomborg

# Factors to Watch

- **Strong investment in power**
  - Investments in all types of generation will continue
  - Fossil fuel retirements will likely be delayed
- **Strong outlook backed by new administration**
  - New administration commitment to support power buildout keeps outlook strong
- **Power market is stressed**
  - Challenges across the supply chain, labor and EPCs
- **Costs will continue to rise**
  - Suppliers will be squeezed, and large load developers will absorb all available capacity
- **Stay ahead: plan and secure projects early**
  - Utilities need to be way out in front, planning projects, locking in equipment and engaging EPCs for commitment to build

# Innovation

## The Adjacent Possible....

**The “adjacent possible” can be defined as “the set of possibilities available to individuals, communities, institutions, organisms, productive processes, etc., at a given point in time during their evolution”**



# NIMBY is Real !!!

- Not In My Back Yard
- Seeing this across all project types



Camino Solar & Manzana Wind - California



# Put it in pencil....



# Sustainability Report



# Thank You

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