

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

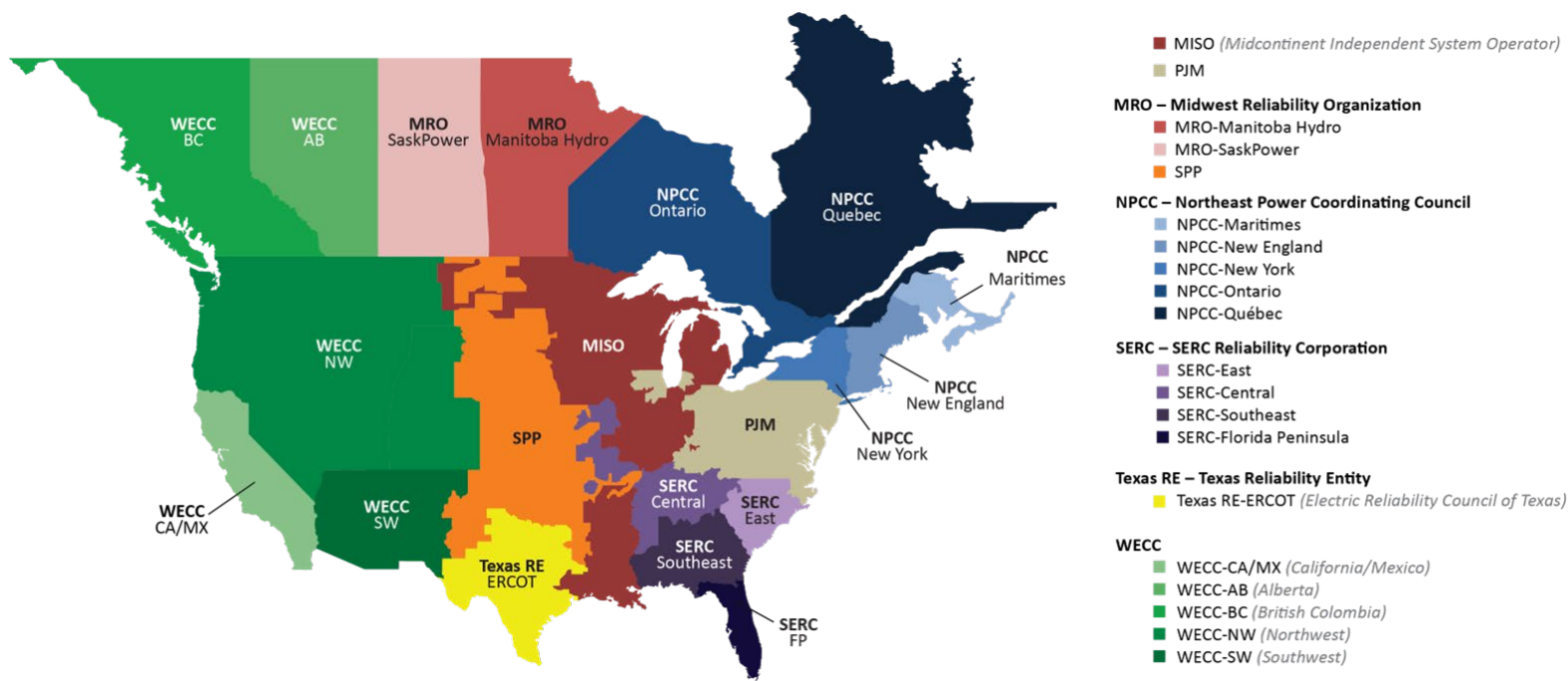
# 2023 Long-Term Reliability Assessment Overview

Mark Lauby, Senior Vice President and Chief Engineer  
Joint Meeting of the FERC and NRC  
January 25, 2024

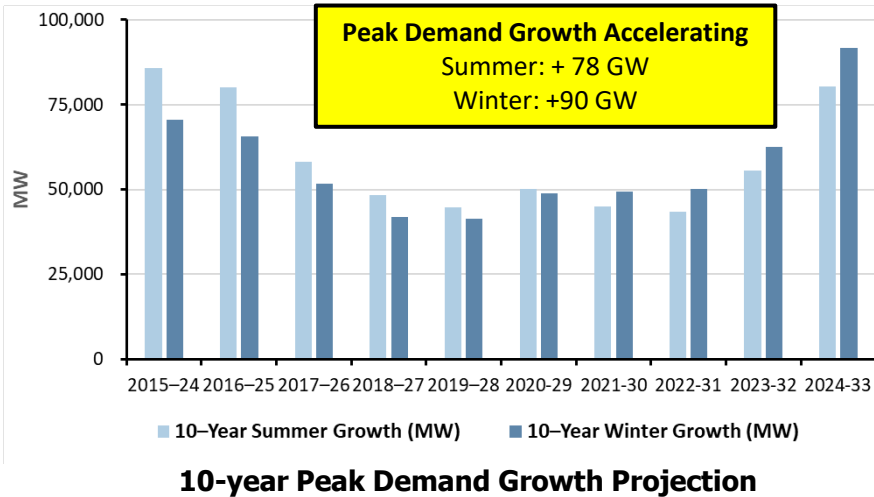
**RELIABILITY | RESILIENCE | SECURITY**



- 10-year assessment of resource capacity and energy risks
- Uses industry's demand and generation forecasts and transmission projections
- Coordination and Review with Regions and Stakeholders
- Includes emerging issues that can impact future reliability



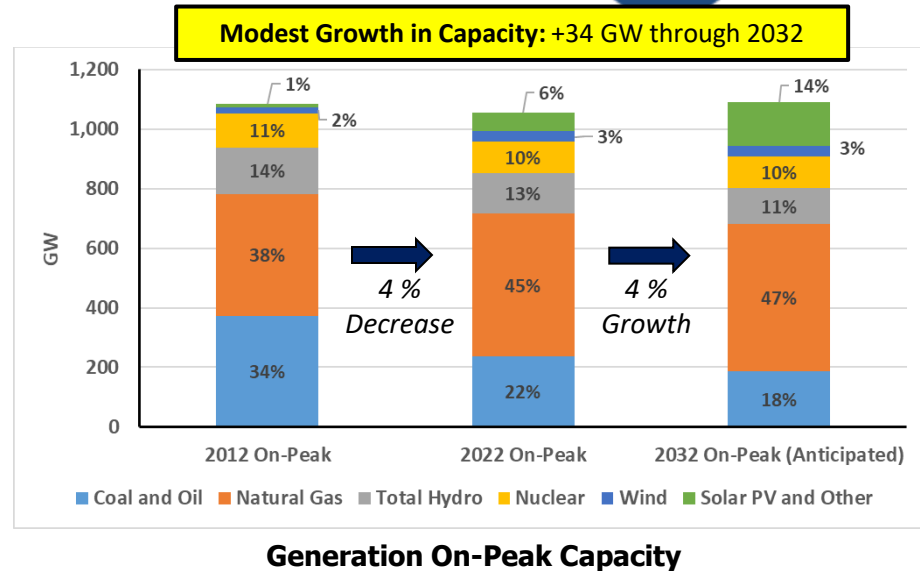
# Past...Present...Future



## Demand

- Highest demand and energy growth rates in recent years
- Northeast and Southeast become winter peaking in late years
- New load behavior is changing daily load profile, challenges operational forecasting

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## Supply

- Total capacity growth of 34 GW over next 10 years (additions – retirements)
- Most additions are Solar (69 GW)
- Retirements: 83 GW through 2033
- Anticipated additions and retirements reflect current planning

# LTRA Risk Assessment Criteria

Resource capacity and energy risks are assessed for Years 1 – 5\* in all assessment areas using the following criteria:

## High Risk

- Supply shortfall can occur in **forecast conditions**
  - Historical peak demand and resource performance
- Indicators
  - Reserve margins fall below RML
  - Loss of Load Expectation (LOLE) exceed 1-day-in-10 years
- Extreme conditions are also likely to result in shortfall

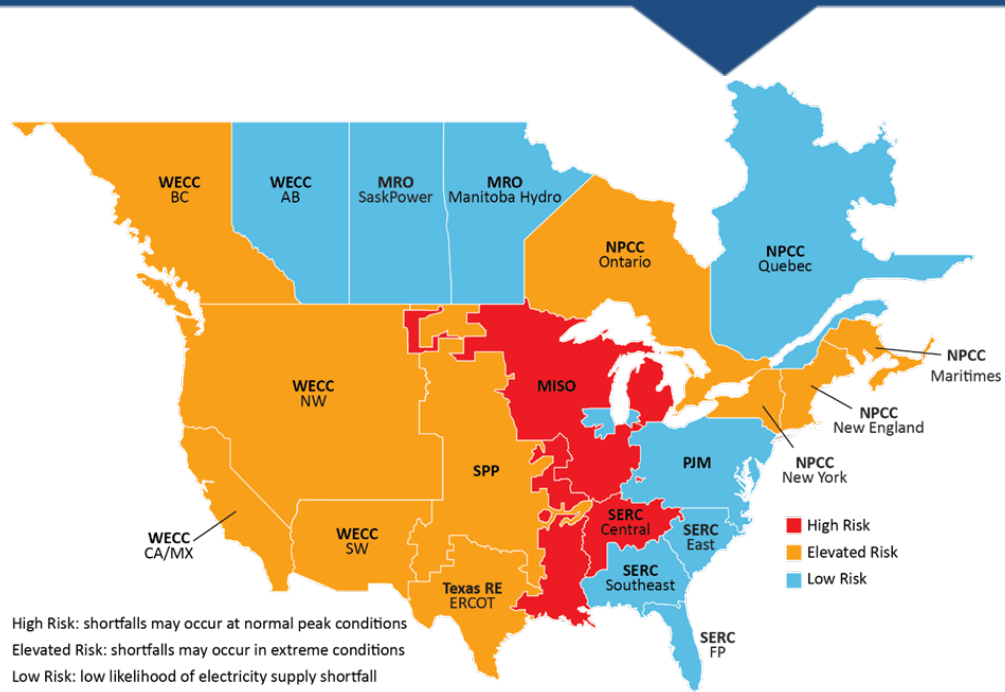
## Elevated Risk

- Supply shortfalls are likely in **extreme conditions** only
  - Extreme high demand or abnormal low resource output
- Indicators
  - LOLE expected but less than 1-day-in-10 years
  - Unserved energy expected
  - Supply risks found in studies of extreme conditions

\*Resource adequacy trends are reported for years 6 - 10

# 2023 LTRA Findings

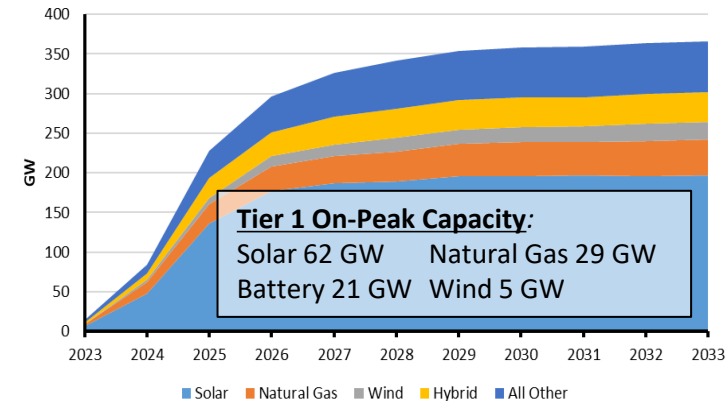
- Growing number of areas face capacity and energy risks in the next 10 years
  - Generator retirements expected before sufficient replacement resources will be in service
  - Energy risks identified in areas where future resource mix is not balanced between dispatchable and variable energy resources
- **Higher demand forecasts, additional generator retirements, and changing resource mix contribute to expanding risk area**



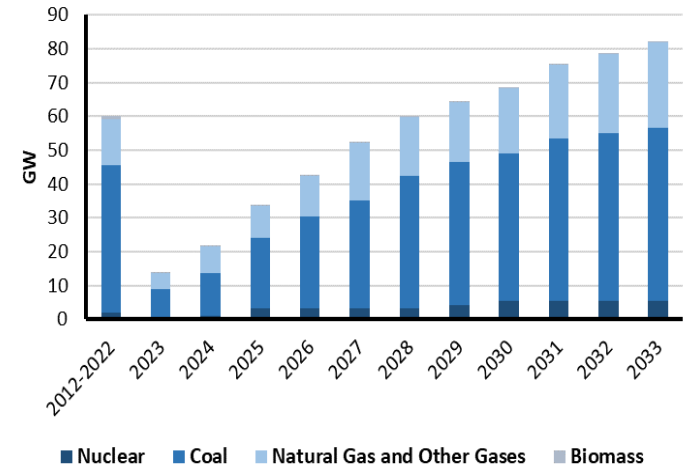
Risk Area Summary 2024-2033

# Changing Resource Mix

- Resource changes in the LTRA Risk Assessment (through 2033):
  - 117 GW of new resource additions (Tier 1)
  - 83 GW of fossil-fired and nuclear generator retirements
  - Reflects additions and retirements with the highest confidence
- More resources in early planning (Tier 2)
  - Solar, battery, and wind
- More fossil-fired retirements are likely
- Imbalance of generator retirements and resource additions challenges the ability to serve growing demand



**Tier 1 and 2 Resource Additions**

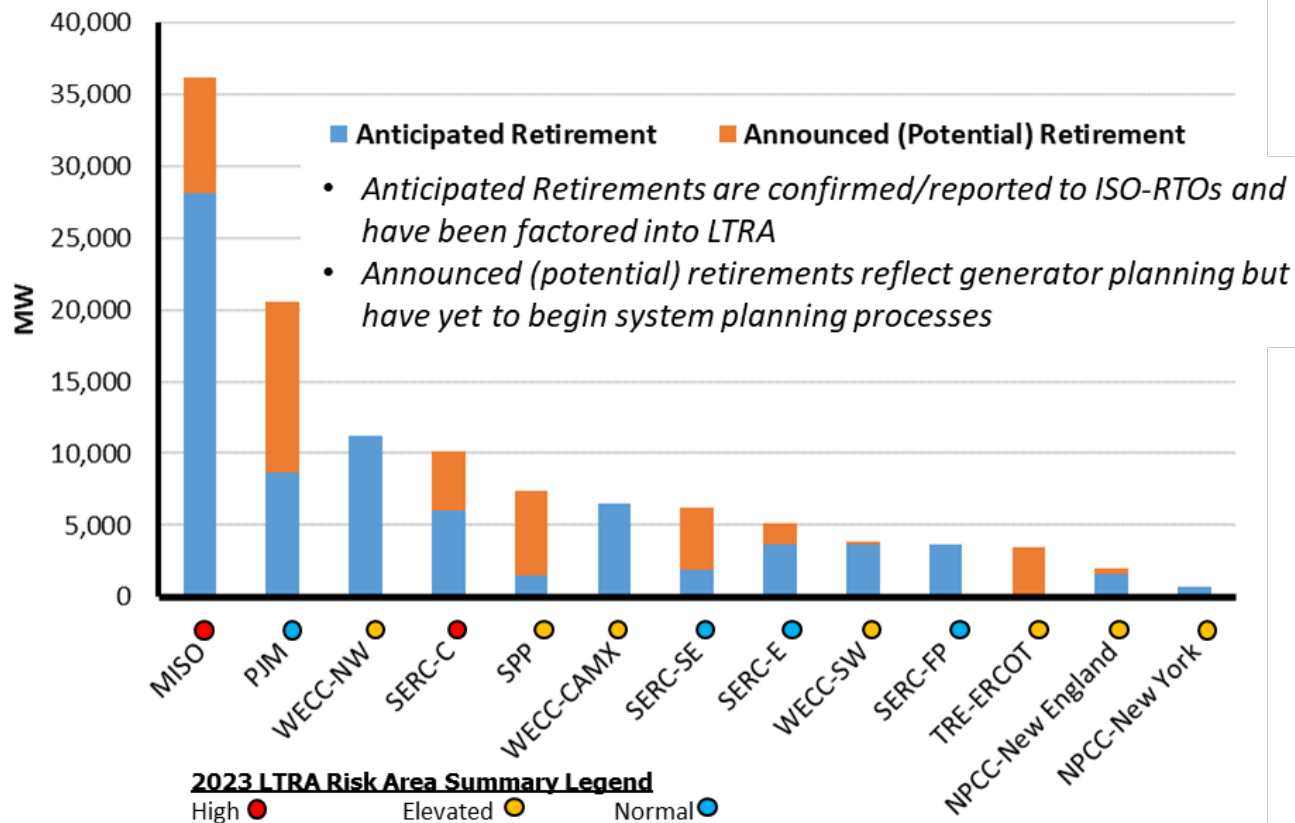


**Anticipated Generation Retirement Capacity**



# Generator Retirements Analyzed

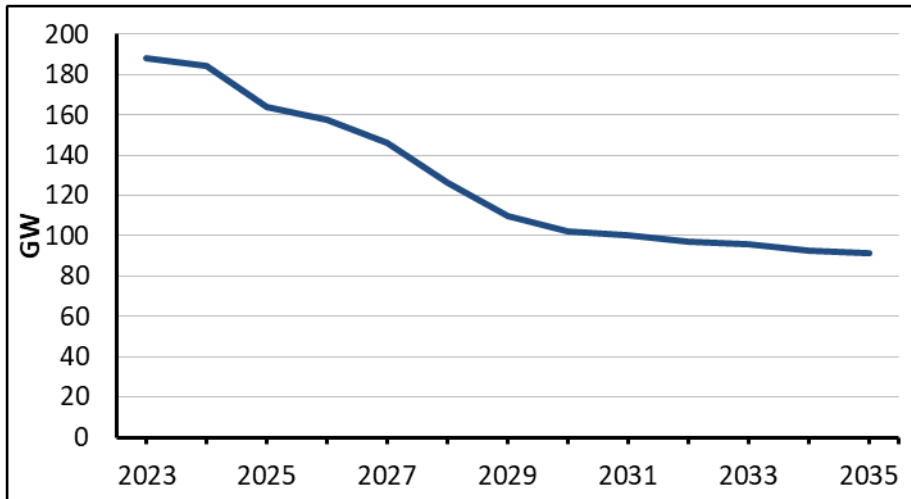
- Many areas where future capacity and energy shortfalls are projected are facing additional generator retirements



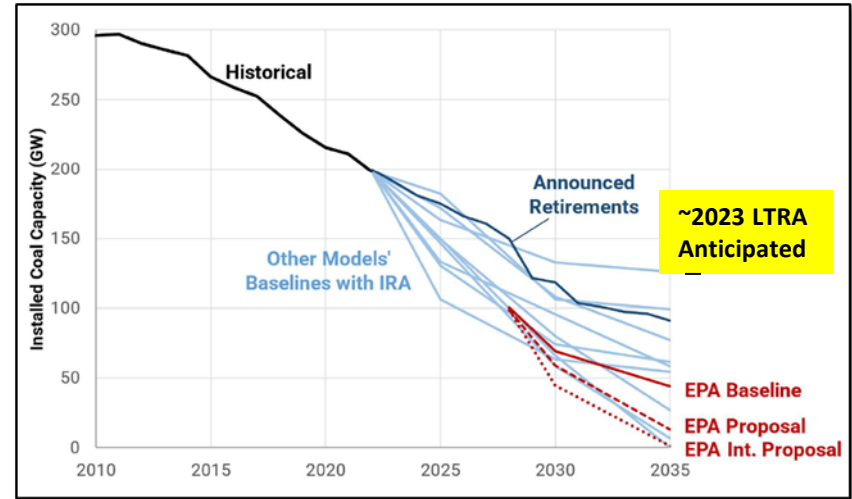
**Anticipated and Potential Generator Retirement Capacity through 2033**

# Generator Retirement Scenarios

- Proposed EPA regulations under Clean Air Act Section 111 to address carbon emissions from fossil-fired generators would result in an increase in generator retirements
- Regulations that have the potential to accelerate generator retirements or restrict operations must provide flexibility to support grid reliability



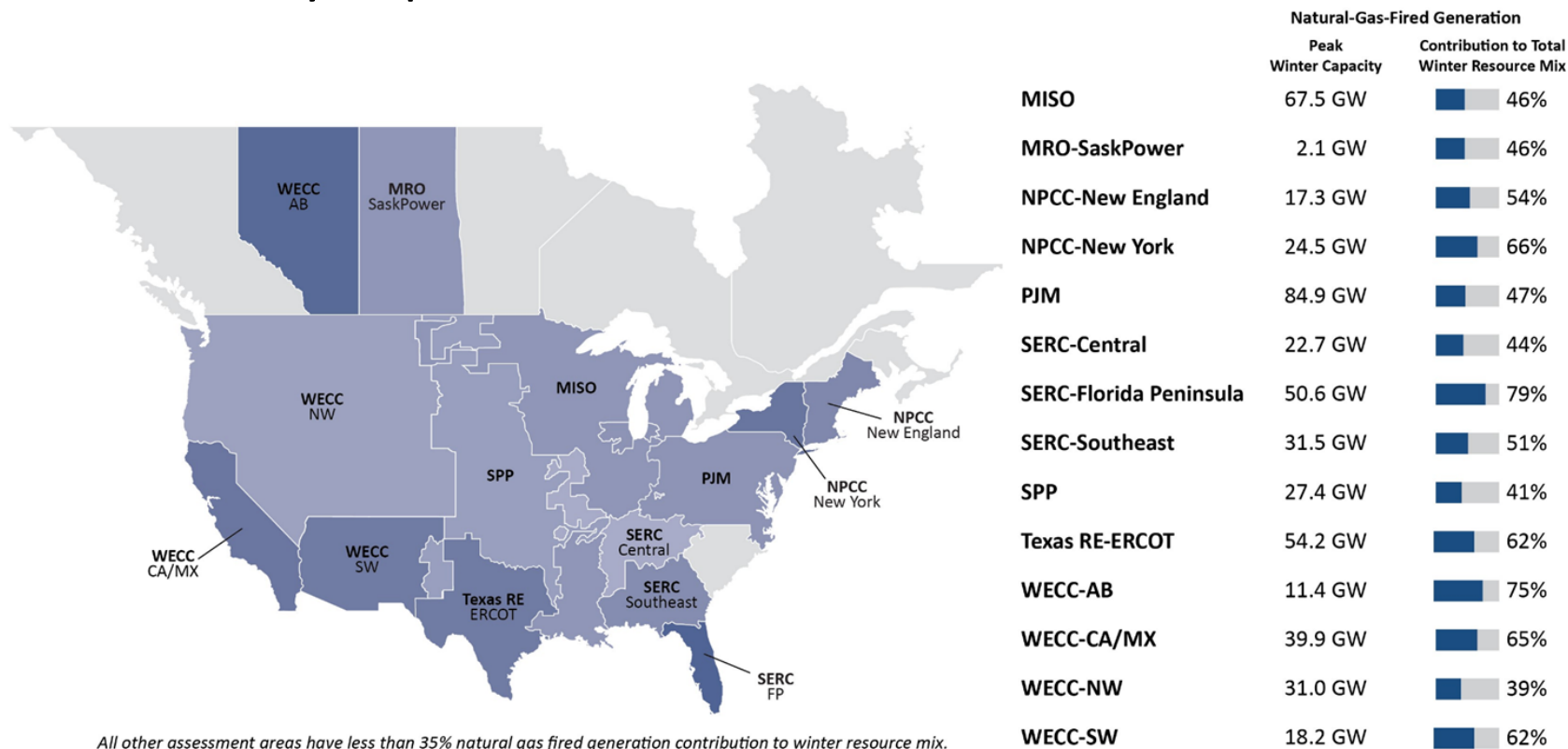
**BPS Coal-Fired Generation Capacity—United States Only**  
(Source: EIA)



**BPS Coal-Fired Generation Capacity in Various Scenarios—United States Only**  
(Source: EPRI Comments on US EPA GHG Rule, 2023)



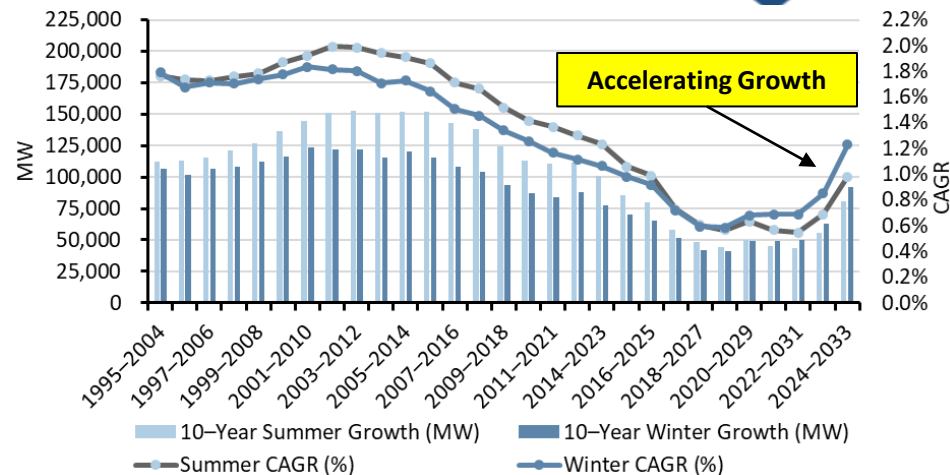
- Natural gas fuel is essential for winter reliability
- Weather-related generator and fuel system failures can widen the reliability impact of extreme winter events



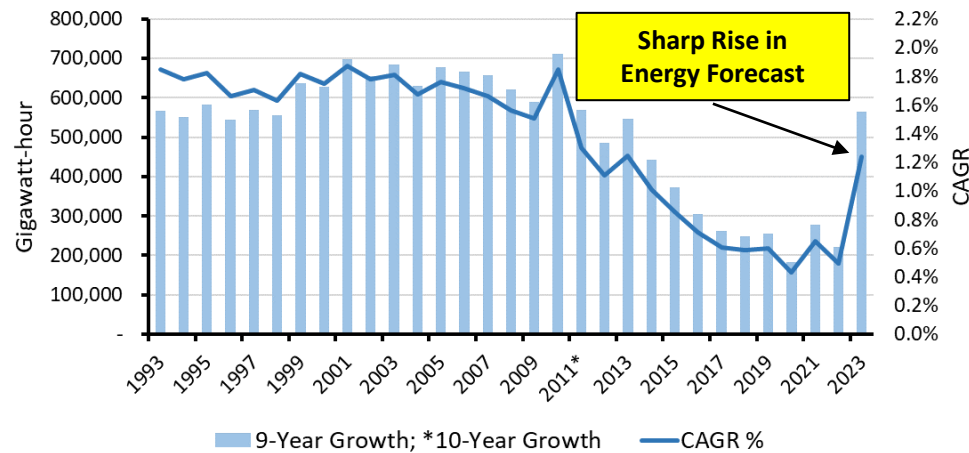
## Natural-Gas-Fired Generation Capacity Contributions to 2023–2024 Winter Generation Mix

# Rising Demand and Energy Needs

- Sharp Rise in Demand and Energy Growth Forecasts since *2022 LTRA*
- Forecasts are being shaped by electrification, growth in electric vehicles (EV), and commercial/industrial loads
- Resource and transmission system planners must **anticipate potential for accelerating growth**



**10-year Summer and Winter Peak Demand Growth**



**Net Energy for Load Growth**

## **The 2023 LTRA contains actionable recommendations to meet accelerating demand growth as grid transformation continues**

1. Add new resources with needed reliability attributes, manage retirements, and make existing resources more dependable
2. Expand the transmission network to deliver supplies from new resources and locations to serve changing loads
3. Adapt BPS planning, operations, and resource procurement markets and processes for a more complex power system
4. Strengthen relationships among policymakers and reliability stakeholders



# Questions and Answers