NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

2021-2022 Winter Reliability Assessment

NARUC Gas Committee
December 13, 2021

Mark Olson, manager, Reliability Assessment

RELIABILITY | RESILIENCE | SECURITY




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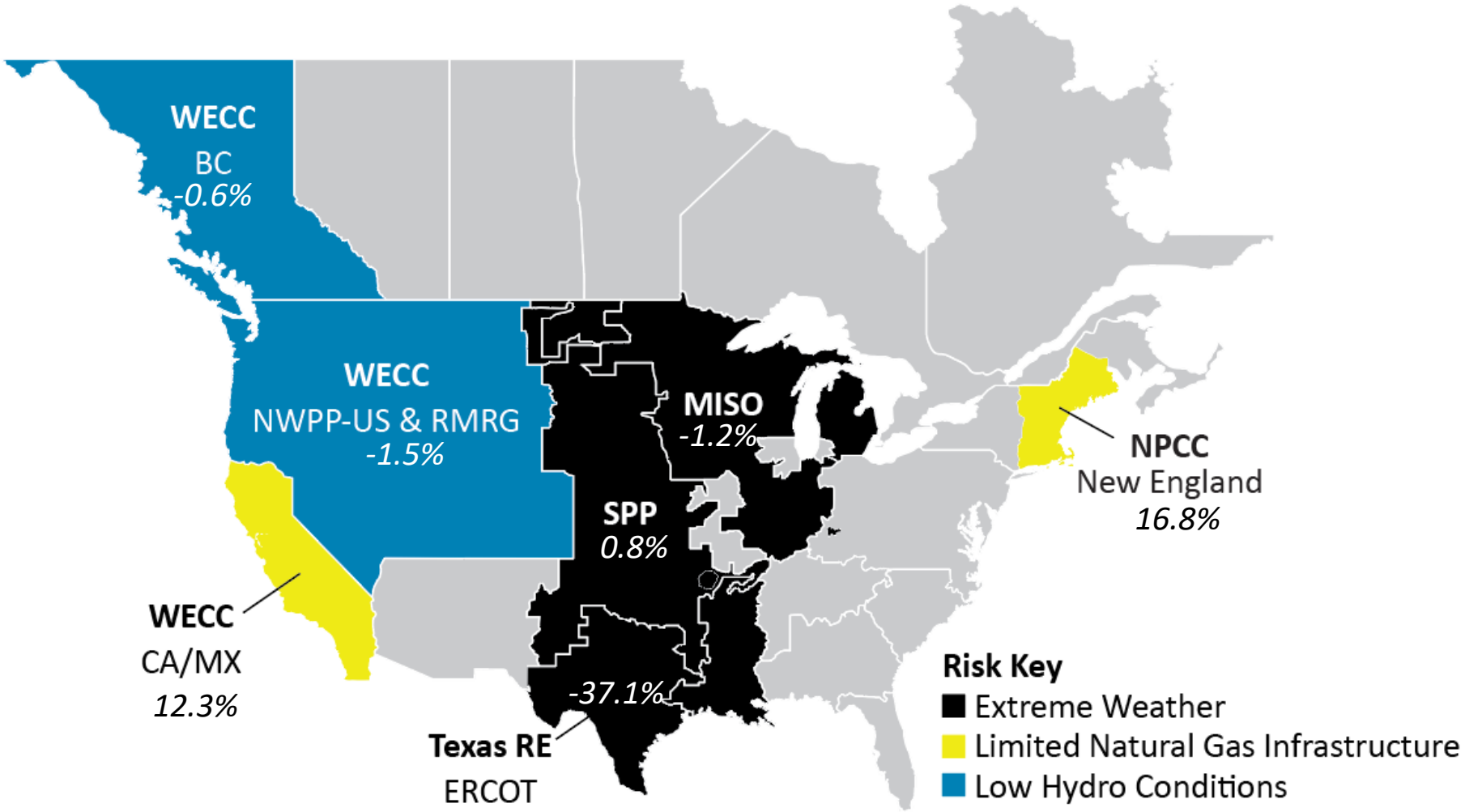
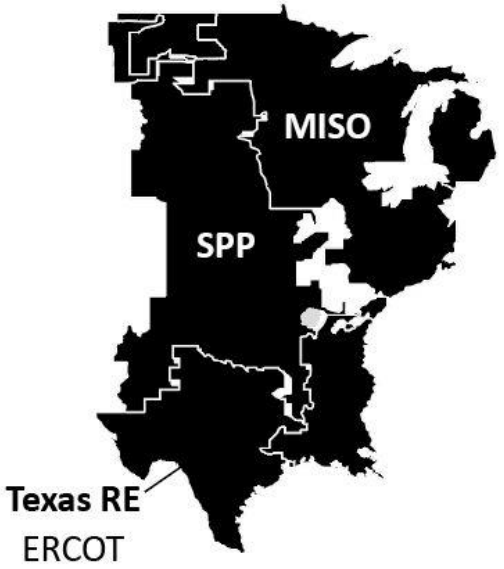
Risk Assessment



Percentages indicate the projected reserve margin under extreme conditions

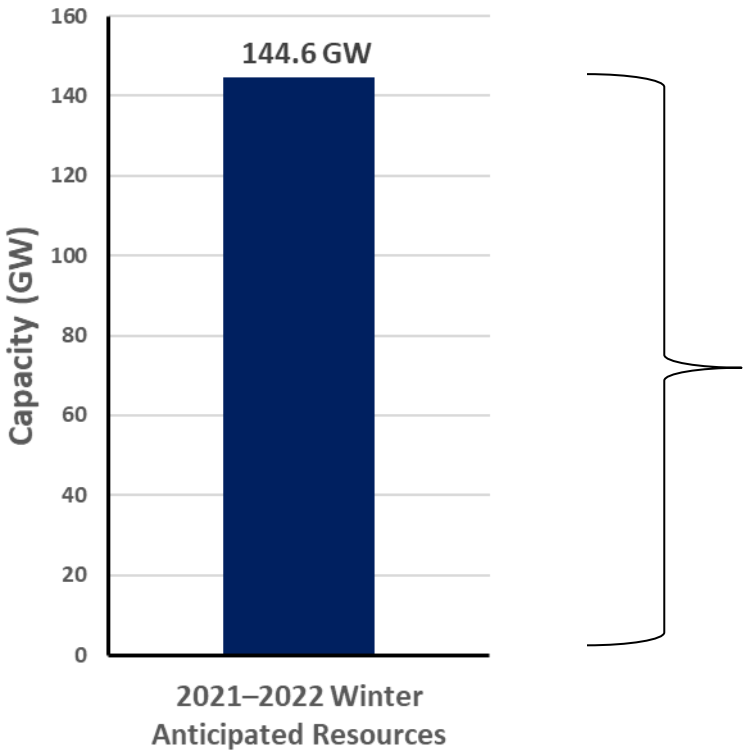
Extreme Weather Risk Analysis

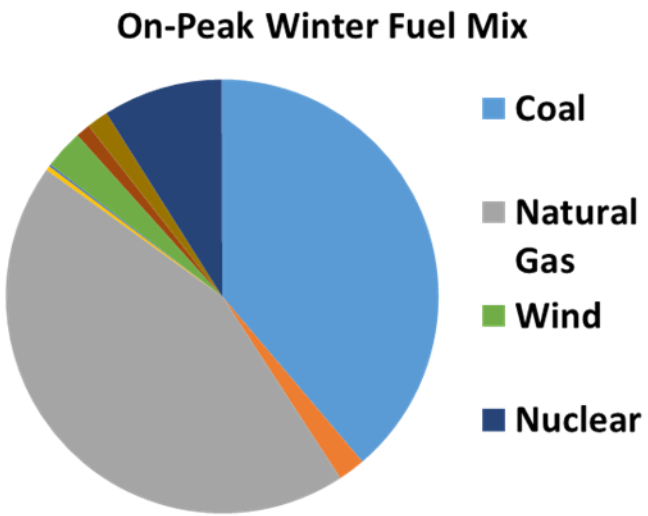
- Planned reserves based on average peak conditions can give a false indicator of risk
- NERC analyzed extreme weather risk factors
  - Higher demand levels than normal peak
  - Reduced supply due to generator outages, fuel limitations, and low temperature performance
- Analysis uses generator performance data from extreme weather events



MISO Winter Resources

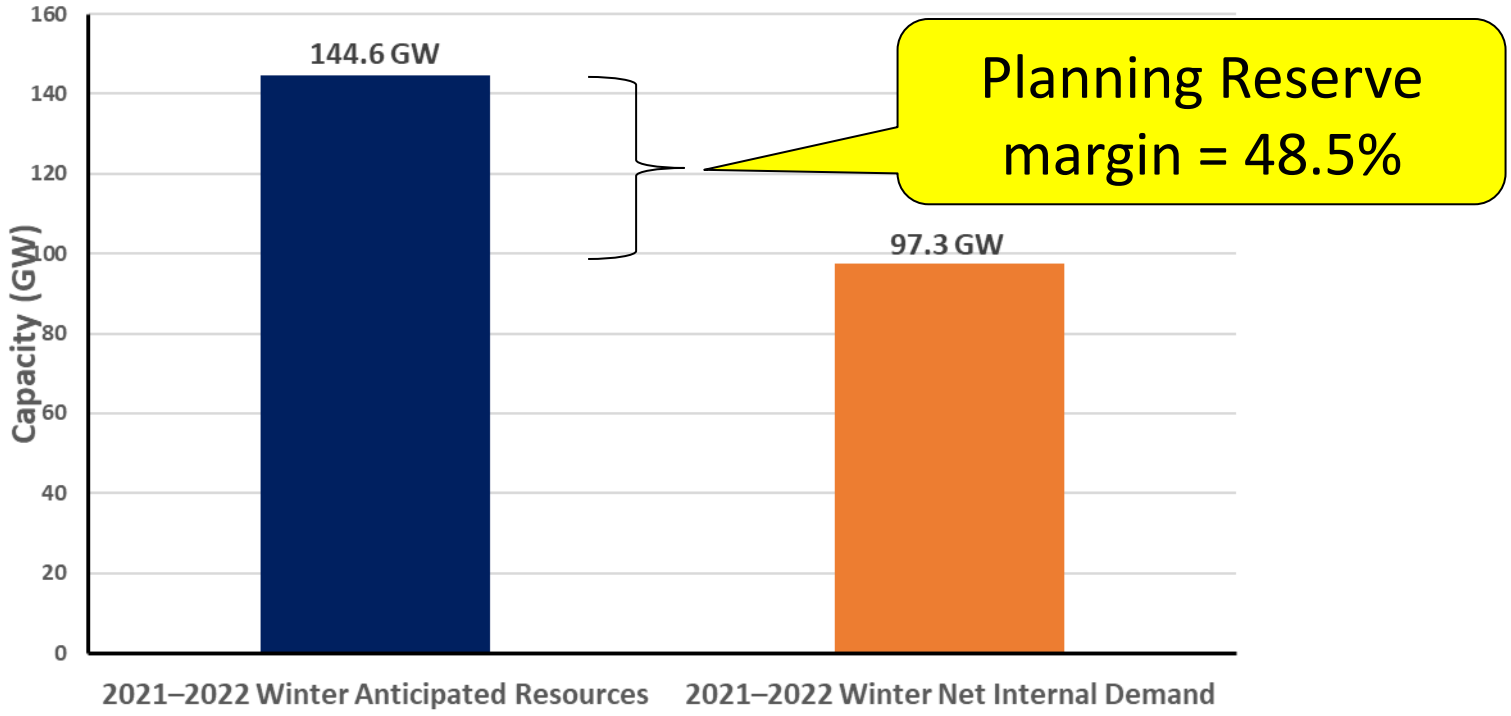
- Natural gas-fired generators provides 44% of the on-peak generation mix in MISO
  - 94% Thermal 3% Wind 3% Hydro
  - Wind contribution: 3.8 GW (17% of nameplate wind capacity)





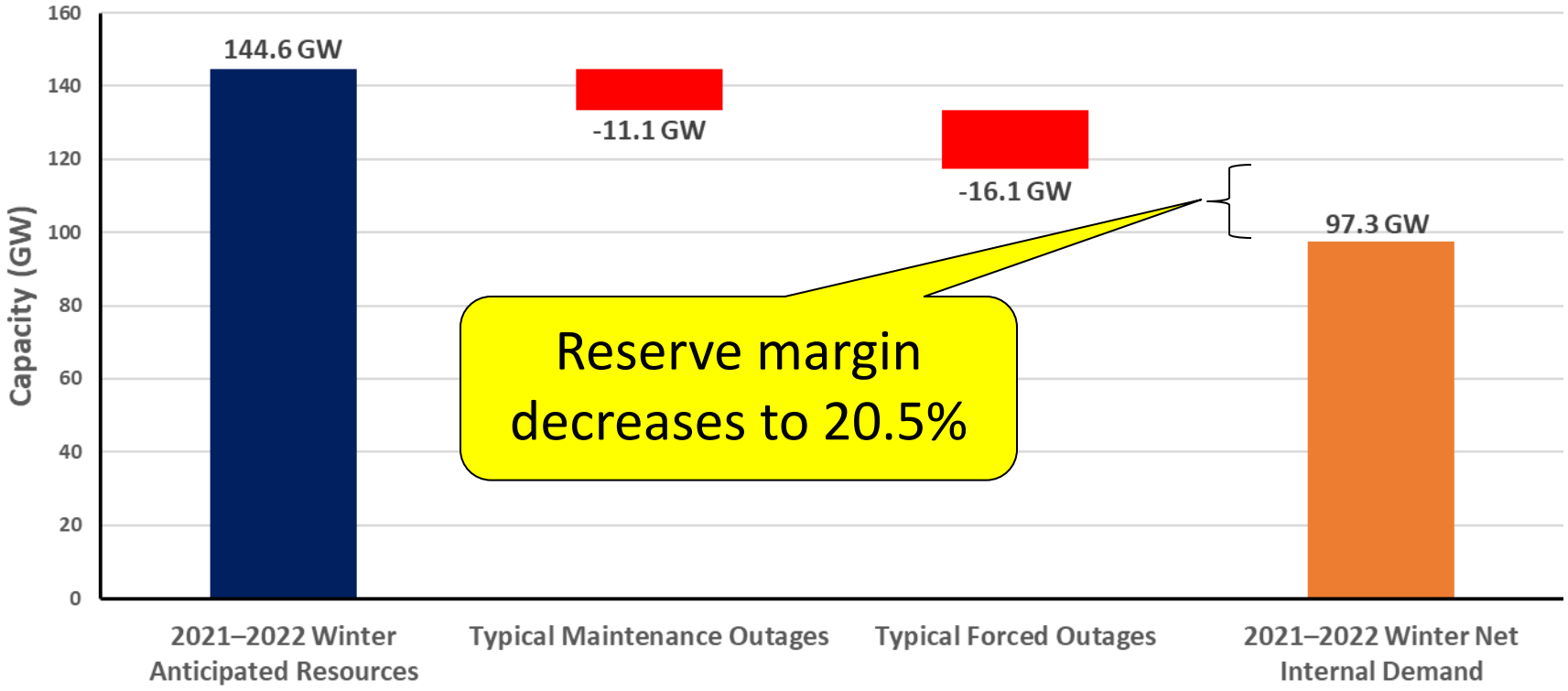
MISO Reserve Margin

- Winter reserve margins exceed the MISO Reference Margin Level (18.3%)
- Resources are sufficient for normal winter peak demand



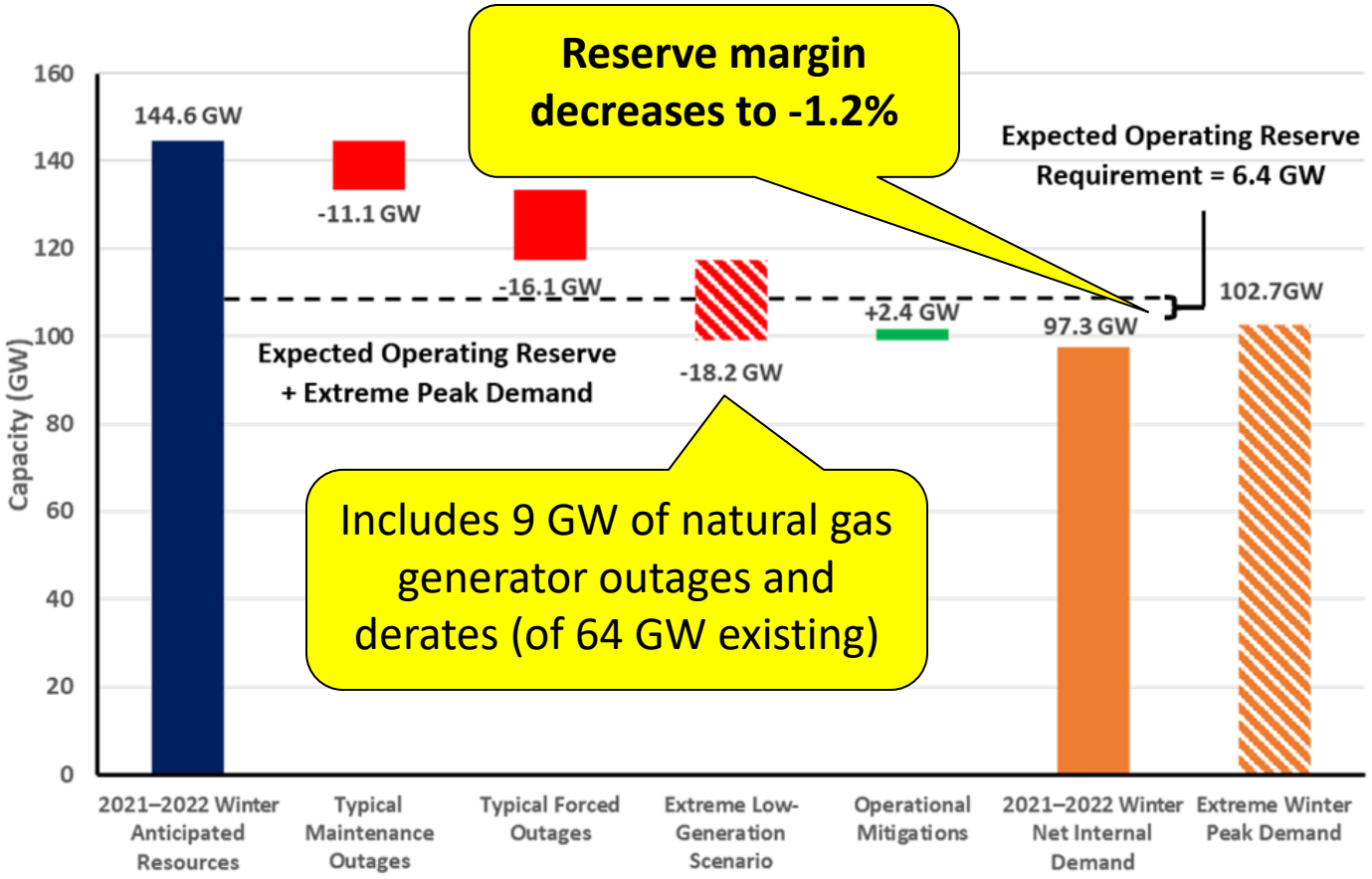
MISO Reserve Margin

- Resources are sufficient even with normal generator outages



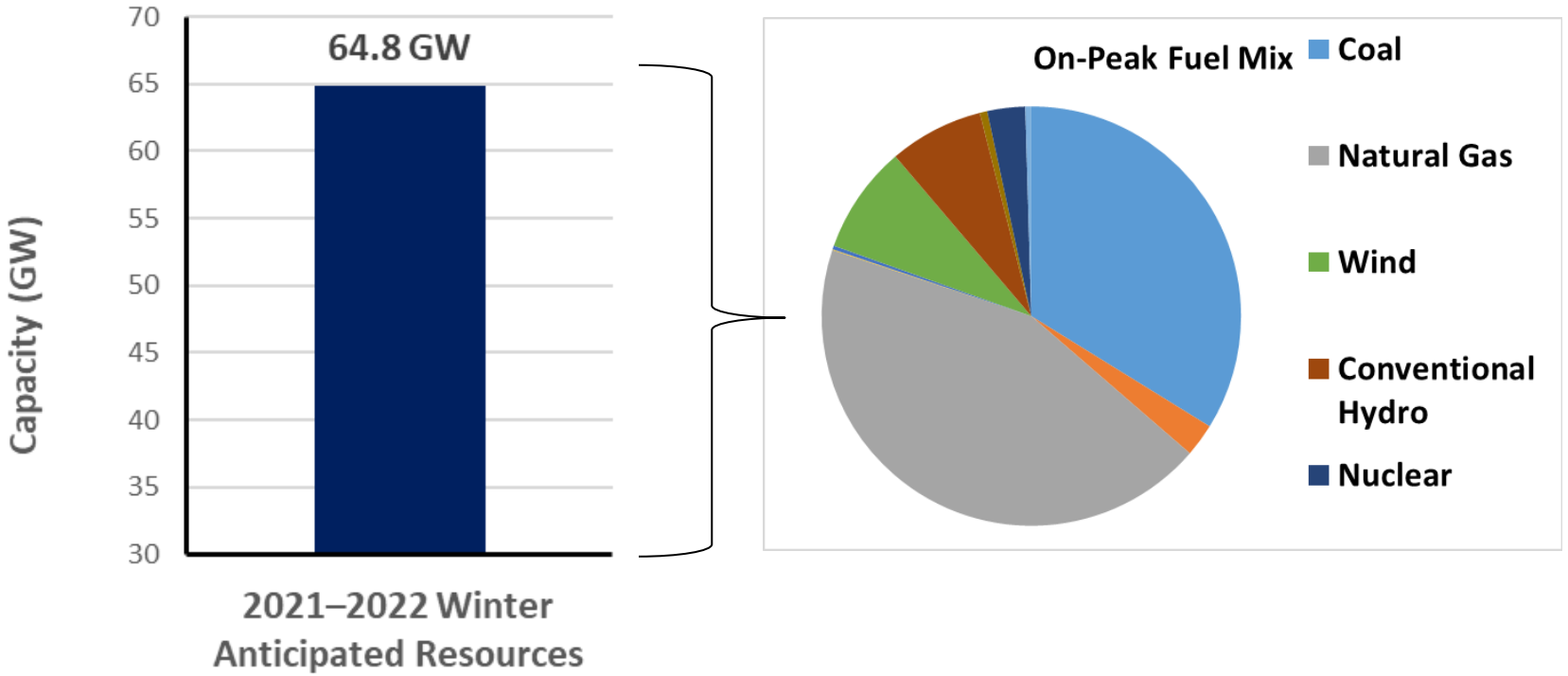
MISO Reserves – Extreme Conditions

- Increased electricity demand and reduced supplies due to generation outages and derates results in a **shortfall**



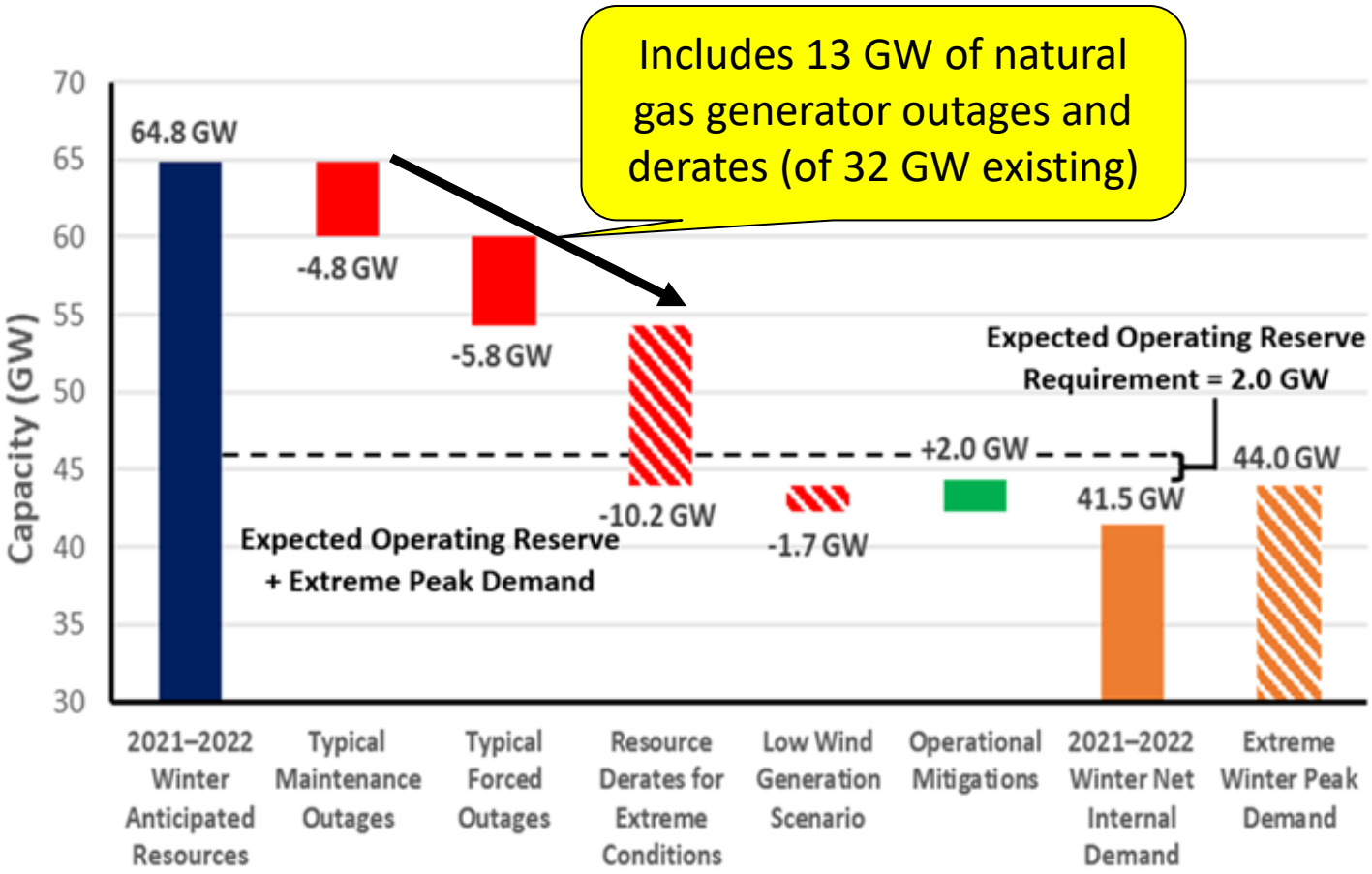
SPP Resources

- Resources are sufficient for normal winter peak demand
  - 56.4 % winter reserve margin exceeds the SPP Reference Margin Level



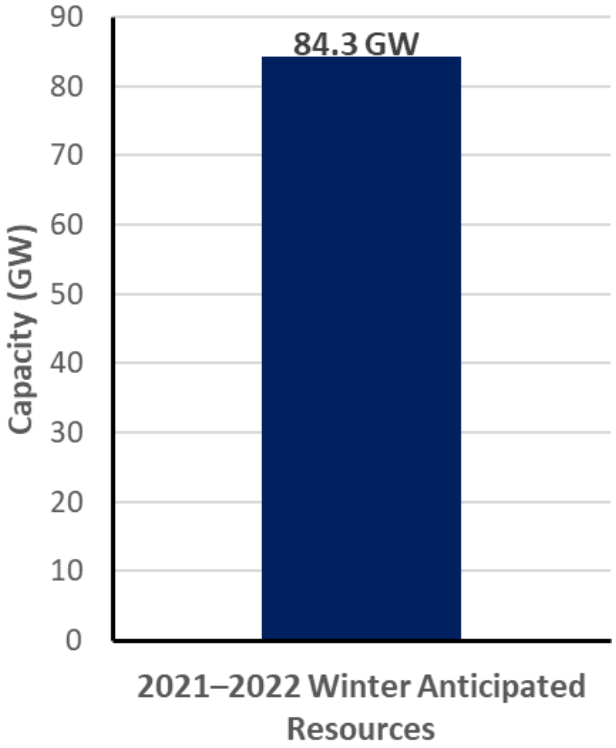
SPP Reserves – Extreme Conditions

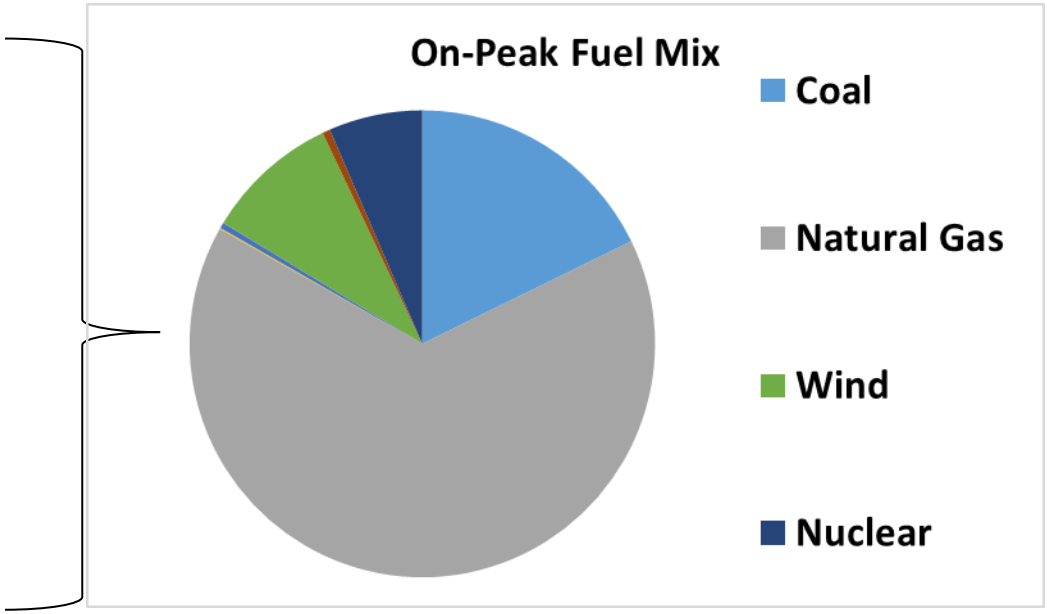
- Shortfall occurs with high generation outages/derates and extreme demand



ERCOT Resources

- Resources are sufficient for normal winter peak demand
  - 41.9 % winter reserve margin exceeds the ERCOT Reference Margin Level
- Peak demand increased 8% since winter 2020-2021





ERCOT Reserves – Extreme Conditions

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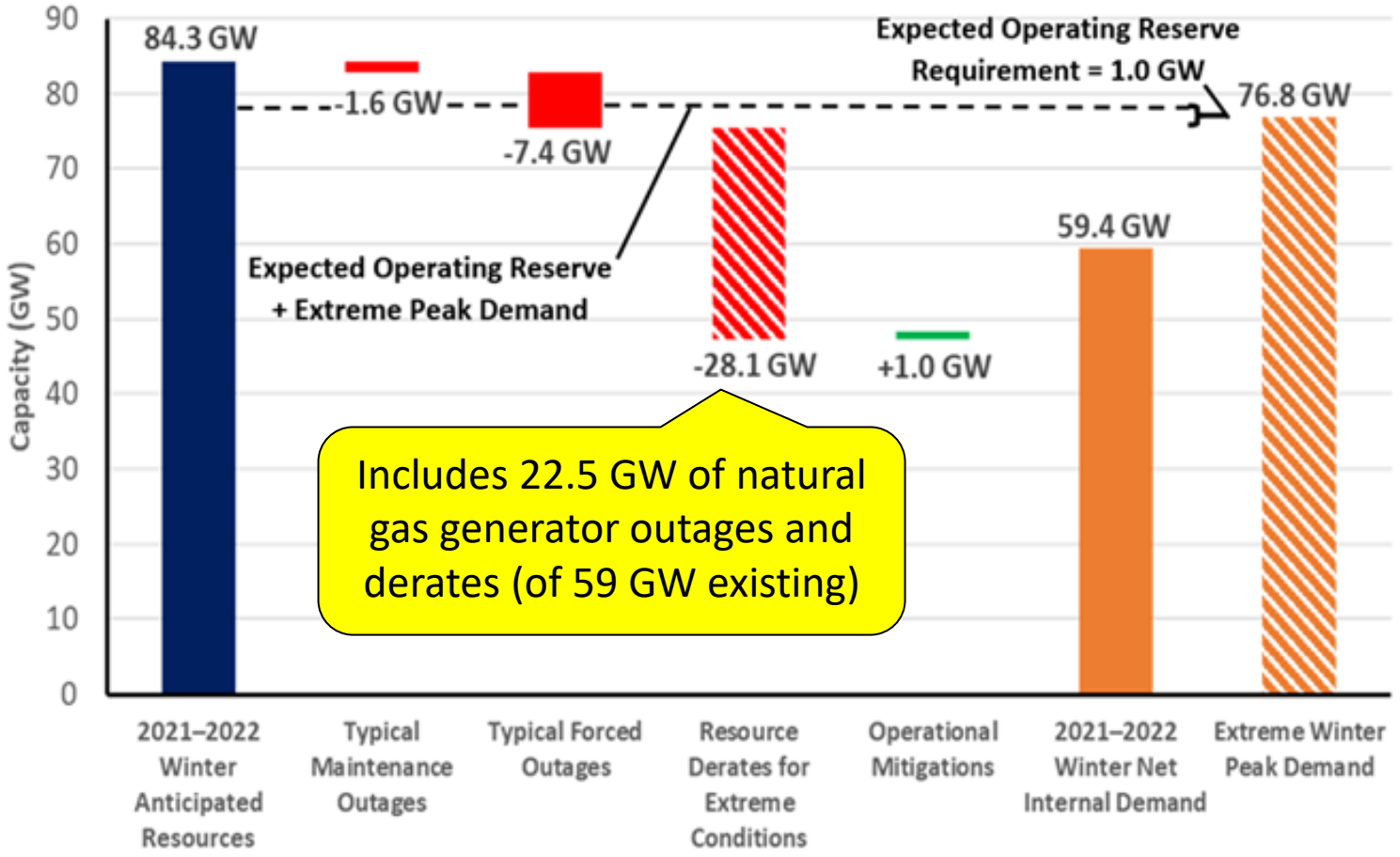

Natural Gas Infrastructure Risk Areas

- Limited natural gas infrastructure to serve electric generation in extreme conditions
- Southern California – limited storage and lack of redundant supply pipelines
  - Ruptured pipeline is reducing flow into California
  - Mitigating with increased storage at Aliso Canyon
  - Prolonged cold presents risk to electric generation
- Continuing drought in the West has caused low hydro conditions which increase reliance on natural gas generation

California-Mexico

Natural Gas Infrastructure Risk Areas

- New England – pipeline constraints during extreme cold temperatures
  - Simultaneous demand for natural gas for heating homes and operating electric generators
  - Other fuels (oil or LNG) substituted but supplies are limited
- Current inventories of oil and LNG are low
- Pandemic-related supply chain issues or extreme weather could limit deliveries

ISO New England

NERC Alert – Extreme Cold Weather Operations

- NERC issued an advisory to owners and operators in August
- Included mandatory questions to help NERC evaluate the Bulk Electric System's winter readiness
- Key takeaway: Grid operators should prepare their operating plans to manage supply shortfalls in extreme winter weather

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Recommendation to Industry

Cold Weather Preparations for Extreme Weather Events

Initial Distribution: August 18, 2021

Two[1] extreme cold weather[2] events have occurred in the past four winter seasons. The February 2021 extreme cold weather event stressed the need to ensure the safe, resilient, and reliable operation of the Bulk Electric System. The recent extreme cold weather events across large portions of North America have highlighted the need to assess current operating practices and identify some recommended improvements, so that system operations personnel are better prepared to address these challenges. The events have caused major interruptions to resources, transmission paths and ultimately, end-use customers. This alert will assist in determining the winter readiness of Reliability Coordinators (RCs), Balancing Authorities (BAs), Transmission Operators (TOPs), and Generator Owners (GOs).

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Status:	**Acknowledgement Required by Midnight Eastern on August 23, 2021** **Reporting Required by Midnight Eastern on September 17, 2021**
	PUBLIC: No Restrictions More on handling >>
Instructions:	This Level 2 NERC Alert provides specific recommended actions that NERC registered entities should consider in response to a particular issue. Pursuant to Rule 810 of NERC's Rules of Procedure[3], NERC registered entities shall (1) acknowledge receipt of this advisory within the NERC Alert System, and (2) report to NERC on the status of their activities in relation to this recommendation (as provided below). For U.S. entities, NERC will aggregate the responses and provide an anonymized report to the Federal Energy Regulatory Commission. This Level 2 NERC Alert is not the same as a Reliability Standard nor does it create a mandatory obligation to take the recommended actions. Your organization will not be subject to penalties for failure to implement the recommendations. Issuance of this recommendation, however, does not alter the requirements of any approved Reliability Standard nor excuse the failure to follow the practices discussed in the recommendation if such failure

[1] The two Extreme Cold Weather events are January 2018 and February 2021
[2] Extreme Cold Weather as define in the Polar Vortex Review dated September 2014; Extreme Cold Weather conditions occurred in lower latitudes than normal, resulting in temperatures 20 to 30° F below average.
[3] https://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx

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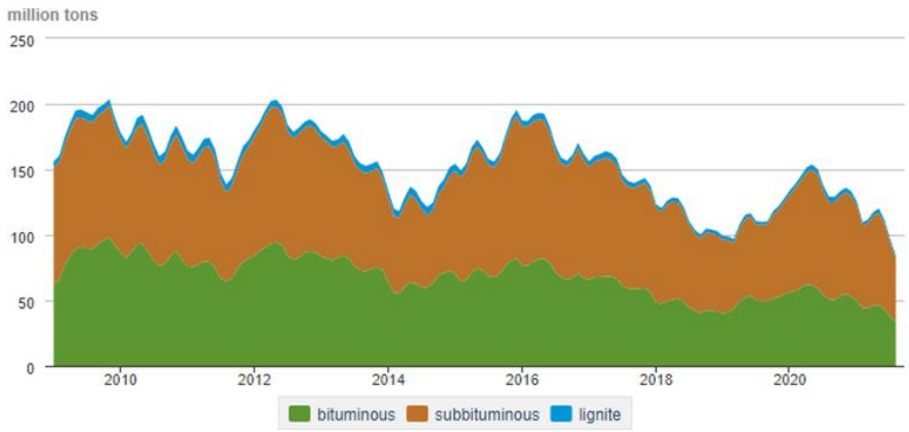
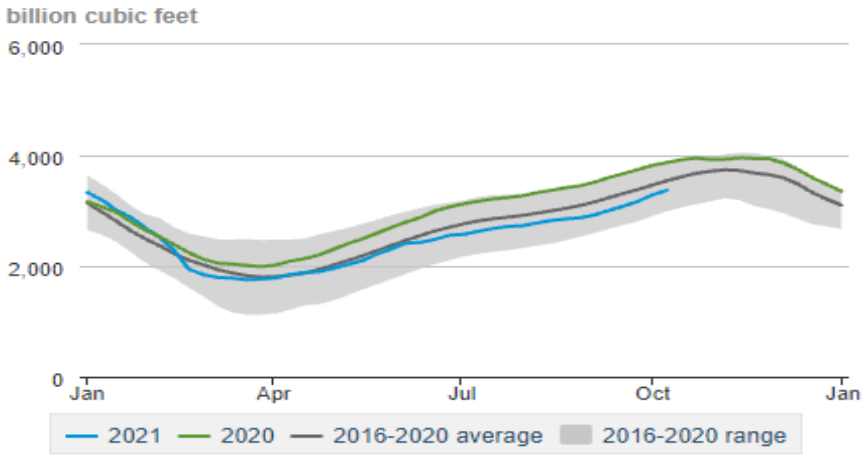
Alert Posted on NERC.com

Fuel Availability

- Coal stockpiles have declined rapidly in the last few months
- Natural gas in storage is below average levels for upcoming winter
- Grid operators are monitoring fuel levels closely
- No BPS impacts are currently identified



Coal Stocks by Type



Gas in Storage

Source: EIA

Recommendations

To reduce the risks of energy shortfalls on the BPS this winter:

- Generators should take proactive steps to prepare for winter conditions and communicate with grid operators.
- Grid operators should prepare to implement cold weather operating plans, conduct drills, and poll generators for fuel and availability status.
- Load-serving entities should review critical loads to prevent inadvertent disruptions and ensure alert systems are in place to prepare their customers.
- Regulators should support requested environmental waivers.

Questions and Answers