

# DOE Electricity Advisory Committee Meeting

Federal Energy Regulatory Commission

Washington D.C.



FEDERAL ENERGY  
REGULATORY COMMISSION

888

- **2022 Winter Storm Elliott Inquiry Findings**
- **Gas-Electric Coordination Since Winter Storms Uri and Elliott**

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**February 13, 2024**



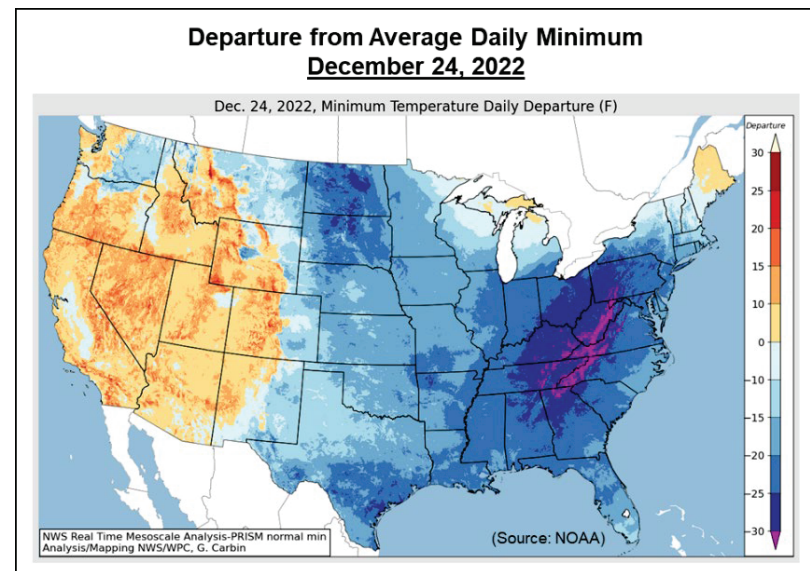
# Disclaimer

*The views expressed herein are ours, and do not necessarily reflect the views of the Commission, individual Commissioners, Commission staff, or individual Commission staff members.*



# Winter Storm Elliott's Effects on Grid Reliability - December 24

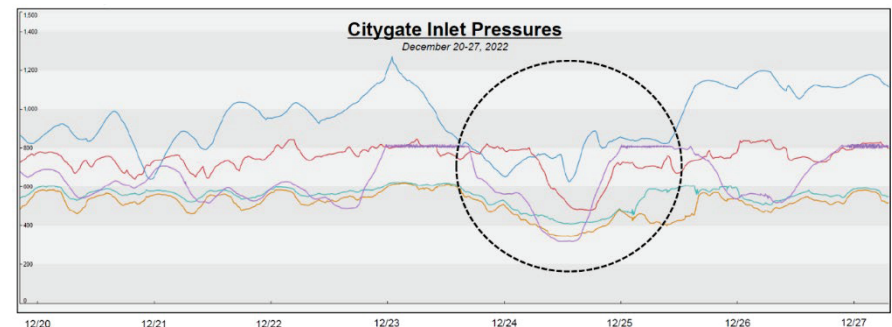
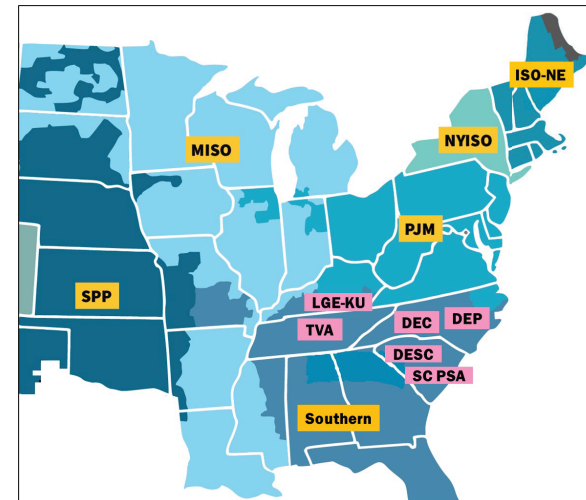
- ❑ Unprecedented unplanned electric generation outages of **90,500 MW**, at worst point (150 percent of URI outages)
- ❑ Including generation already on outage, 127,000 MW (**18 percent**) of the U.S. portion of the anticipated resources in the Eastern Interconnection were unavailable
- ❑ FERC/NERC Joint Inquiry initiated on **December 28, 2022**





# Electric Firm Load Shed and Internal Gas System Emergency

- ❑ December 24: Largest ever controlled firm load shed recorded in the history of the Eastern Interconnection (5,400 MW)
- ❑ Consolidated Edison (NY) Gas Operations – On December 24, 2022, experienced reliability-threatening delivery pressure decreases and declared an internal Gas System Emergency

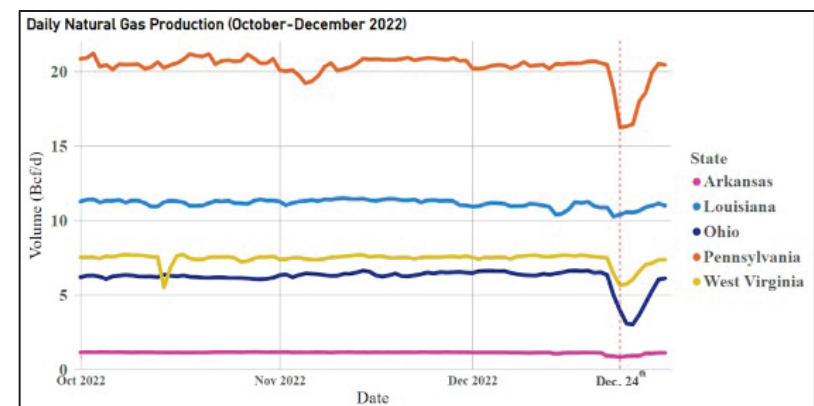
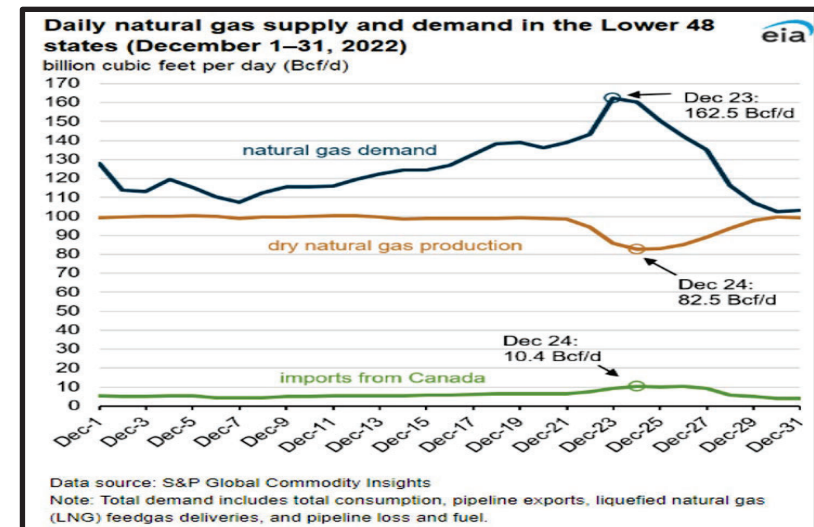






# Natural Gas Production Decline

- ❑ Natural gas demand peaked close in time to when production reached its low point
- ❑ Marcellus and Utica Shale formations experienced greatest declines, dropping by 23 and 54 percent, respectively. They include the states with the greatest gas production volume declines during the Event: Ohio, Pennsylvania, and West Virginia.





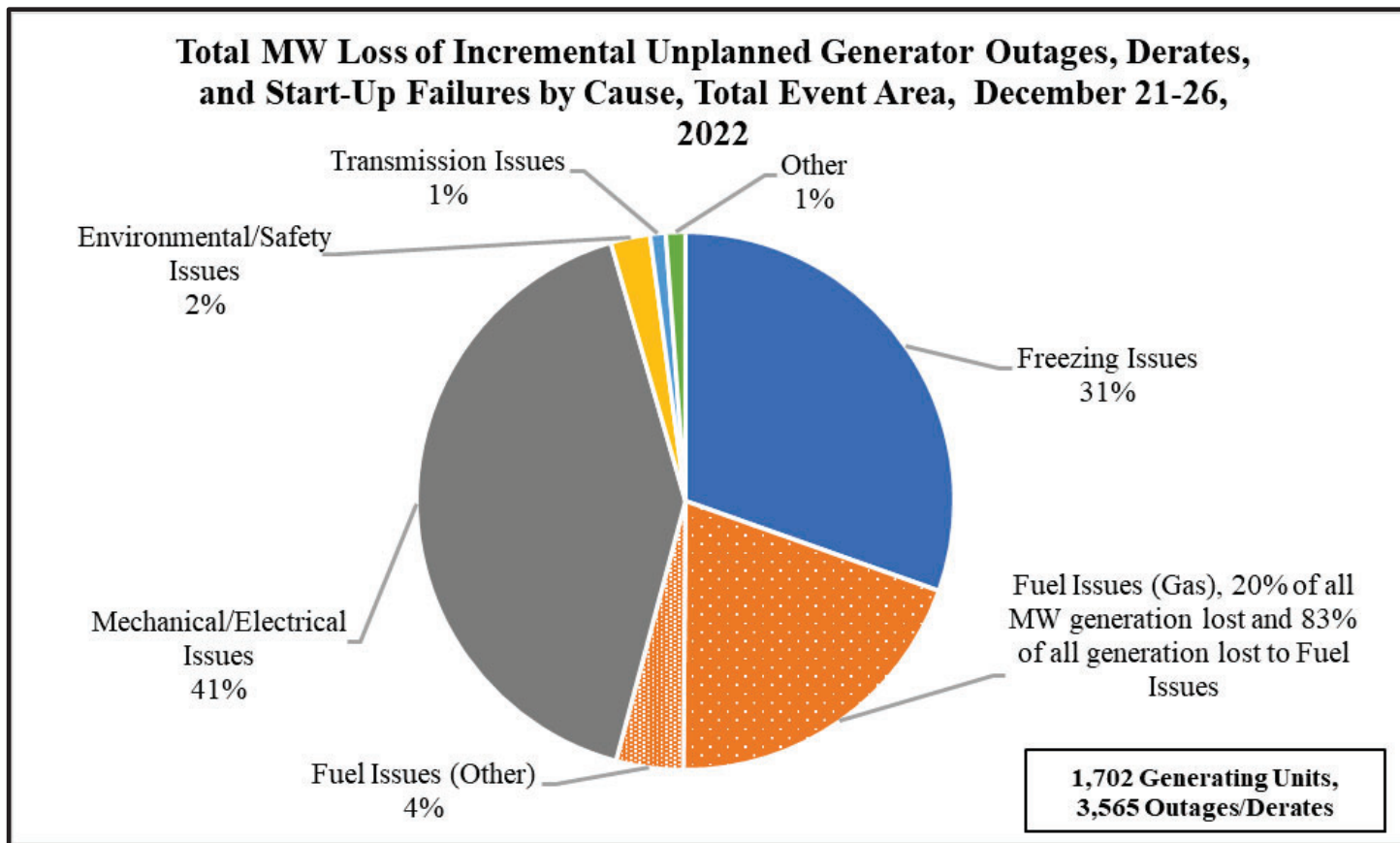
# Similarities to Past Extreme Cold Weather Events

- ❑ **Fifth** event since 2011 in which cold weather-related unplanned generating unit outages jeopardized bulk-power system reliability

	2011 Event	2014 Event	2018 Event	2021 Event	2022 Event
Significant levels of incremental unplanned electric generating unit losses with top causes found to be mechanical/electrical, freezing, and fuel issues.	✓	✓	✓	✓	✓
Significant natural gas production decreases occurred, with some areas of the country more severely affected.	✓			✓	✓
Short-range forecasts of peak electricity demands were less than actual demands for some BAs in event area.	✓		✓	✓	✓
Significant natural gas LDC outages or near miss	✓				✓



# Causes of Generation Shortfalls





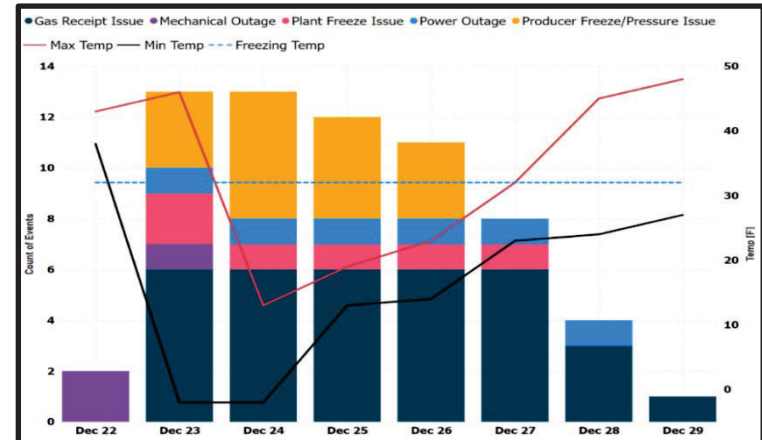
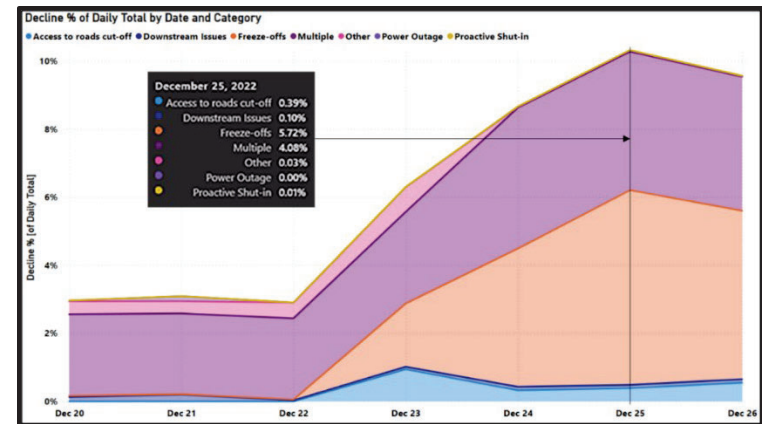
# Causes of Natural Gas Production Declines

## ❑ Production Infrastructure

- Wellhead freeze-offs, other equipment freezing (ranged from 16 to 55 percent of the production event causes for December 23 through December 25)
- Poor road conditions due to storm/cold weather, preventing maintenance

## ❑ Processing Facility Operating Issues

- Reduction in receipt (production) volume (ranged from 71 to 84 percent of the processing facility event causes for December 22 through December 26)
- Processing plant disruptions and outages caused by freezing and mechanical issues (up to 16.6 percent)







# Elliott Report (October 2023): 11 Recommendations

- ❑ Categories of recommendations include improvements to:
  - Generator Cold Weather Reliability
  - Natural Gas Infrastructure Cold Weather Reliability
  - Gas-Electric Coordination Cold Weather Reliability
  - Electric Grid Operations Cold Weather Reliability
- ❑ Where appropriate, recommendations include timeframes for implementation/initiation
- ❑ The full report can be found at: <https://www.ferc.gov/news-events/news/ferc-nerc-release-final-report-lessons-winter-storm-elliott>



## Recommendation 7:

- ❑ One or more studies to analyze whether additional natural gas infrastructure is needed to support the reliability of the electric grid and meet the needs of natural gas local gas distribution companies, especially during coincident peaks due to prolonged, abnormally cold weather
- ❑ “selected National Laboratories from the Department of Energy” identified as the “ideal” independent research group to perform the studies due to technical expertise and DOE’s investment in modeling the U.S. natural gas and electric infrastructure (e.g., NAERM).



# Other Natural Gas-Electric Coordination Recommendations

- ❑ **Elliott Report (2023)** recommended:
  - Repeated Uri recommendation that Congress and states address the need for natural gas infrastructure reliability rules on freeze protection
  - Regional natural gas communications coordinators; and improvements in communication during extreme cold weather events
  
- ❑ **Uri Report (2021)** recommended:
  - Forum to discuss natural gas-electric harmonization issues (became the NAESB Gas-Electric Harmonization Forum)
  - Congress and states require natural gas infrastructure facilities to implement and maintain cold weather preparedness plans
  - Multiple voluntary measures for natural gas facilities to protect against freezing



# Natural Gas-Electric Coordination Actions Since Uri, Elliott

## ❑ **Post-Uri Report:**

- Commission hosted New England Winter Gas-Electric Forum (**2022**)
- NAESB Gas-Electric Harmonization Forum and report (20 recommendations) (**2022-2023**)

## ❑ **Post-Uri and Elliott Reports:**

- NAESB planning for revisions to Gas / Electric Coordination Business Practice Standards to improve communication among operators and natural gas production facilities (**2024-**)
- NARUC Gas-Electric Alignment for Reliability (GEAR) working group (**2024-**)



Questions?