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The February 2021 Cold Weather Outages in Texas and the South Central United States – Gas and Electric Interdependencies

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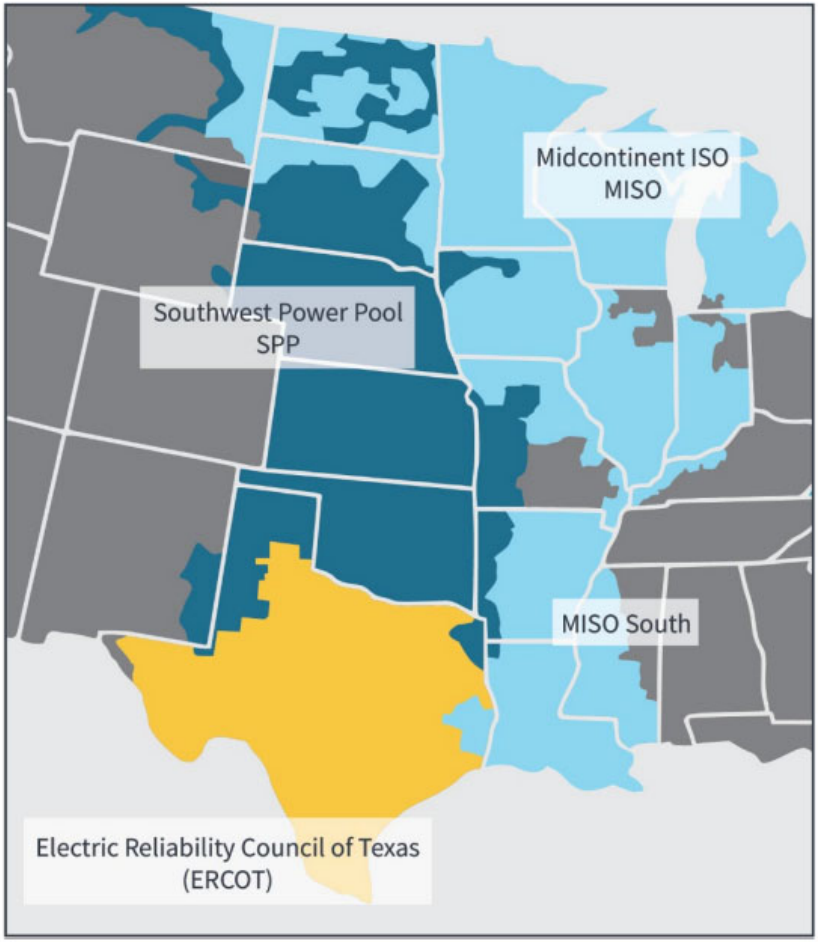
Kiel Lyons, Senior Manager, Compliance Assurance
Thomas Coleman, Chief Technical Advisor

RELIABILITY | RESILIENCE | SECURITY




The Event

- Event occurred between February 8 and February 20, 2021
- Significantly impacted South Central U.S.
- Deteriorating conditions would lead to lowest temperatures of the event on February 15th & 16th
- Unprecedented 65,622 MW of unplanned generation outages.



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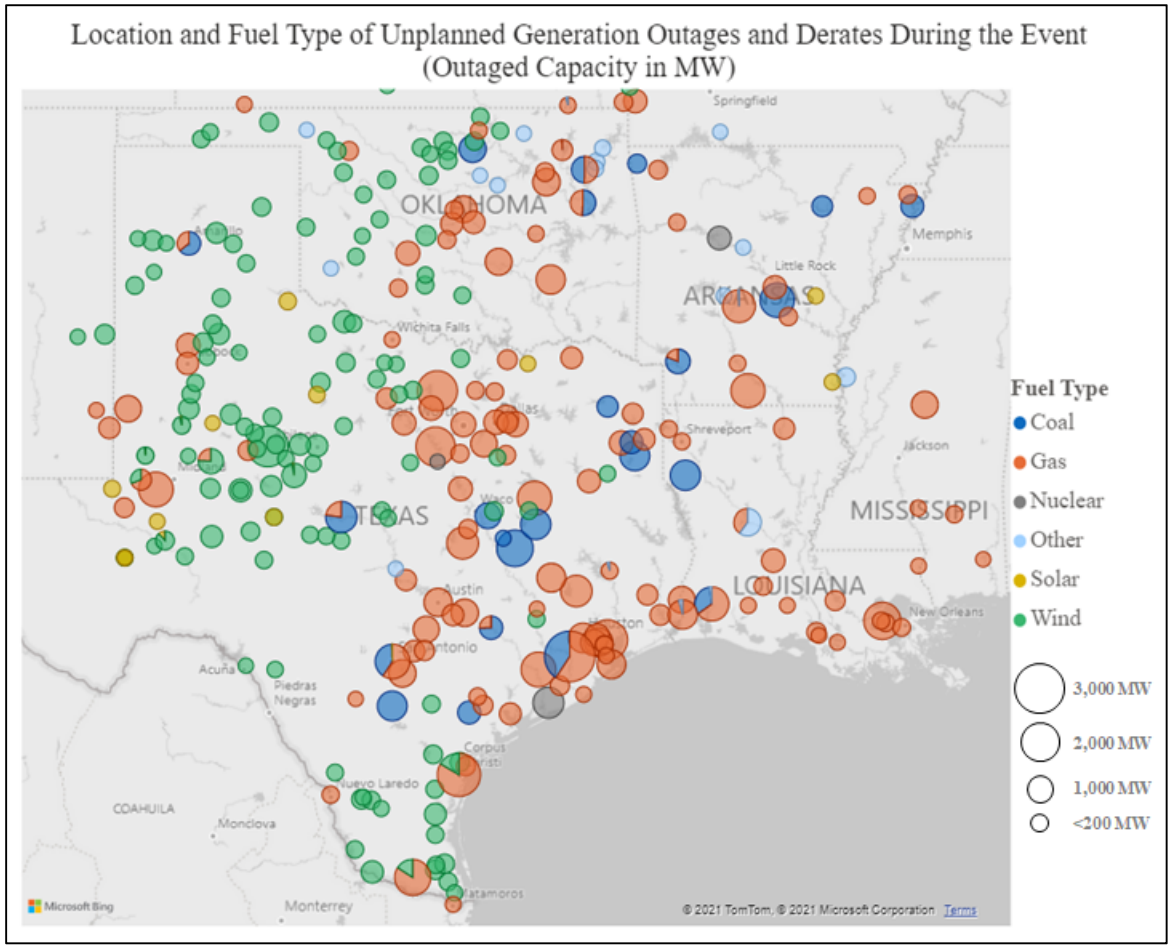
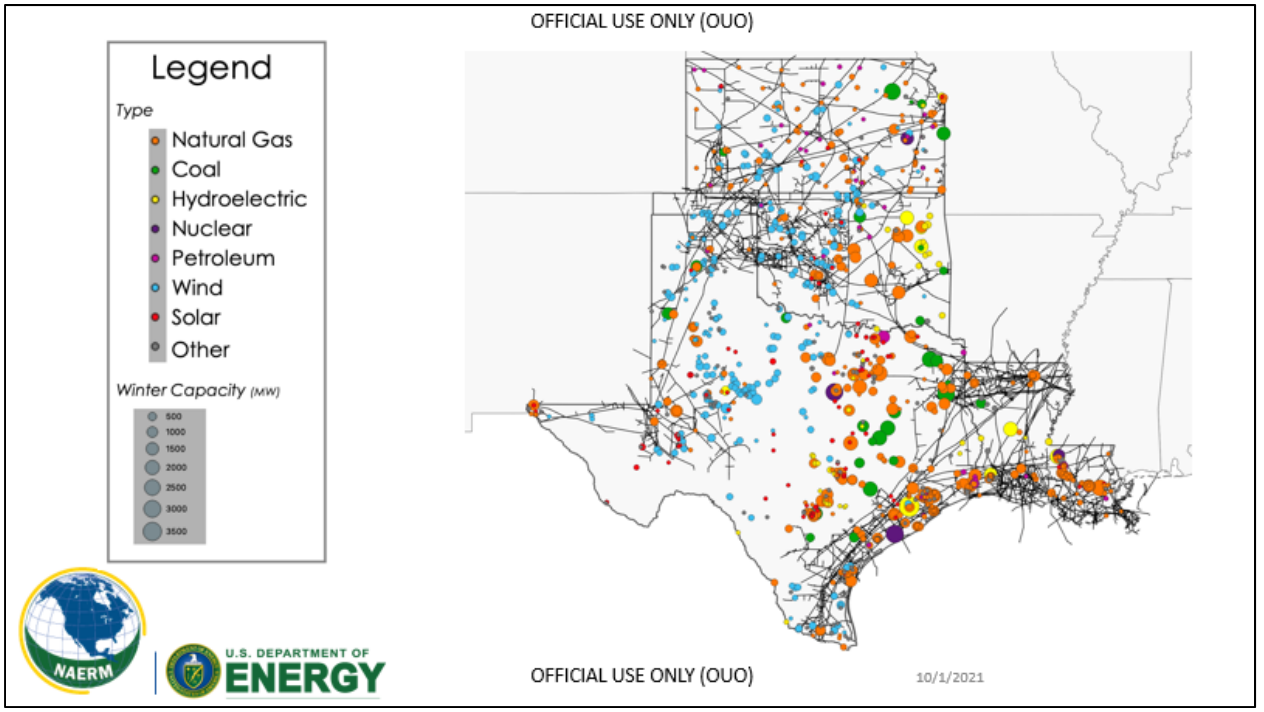
The Event

- Significant impacts on natural gas production
- Largest firm load shed event in U.S. history (23,418 MW), third largest in quantity of outaged MW of load (August ’03 and August ‘96 blackouts).
- Fourth cold weather event in the past 10 years which jeopardized bulk-power system reliability.

Significant Natural Gas Unit Outages



Electric/Gas Interdependency Texas and S Central United States



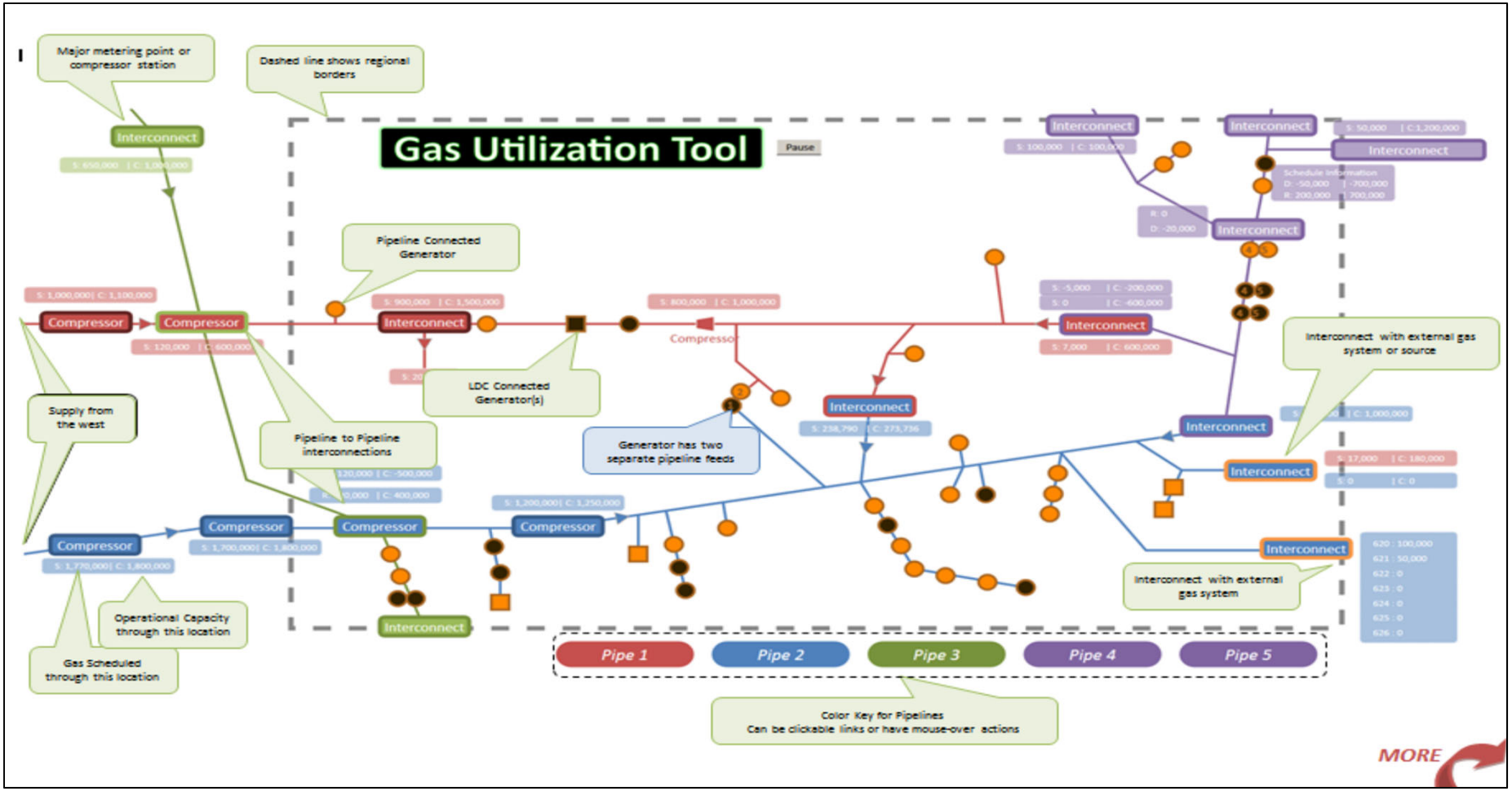
Natural Gas Preparation

- Winterization
- Line Pack
- Storage
- Operational Flow Orders
- Black-Start testing of natural gas fired units

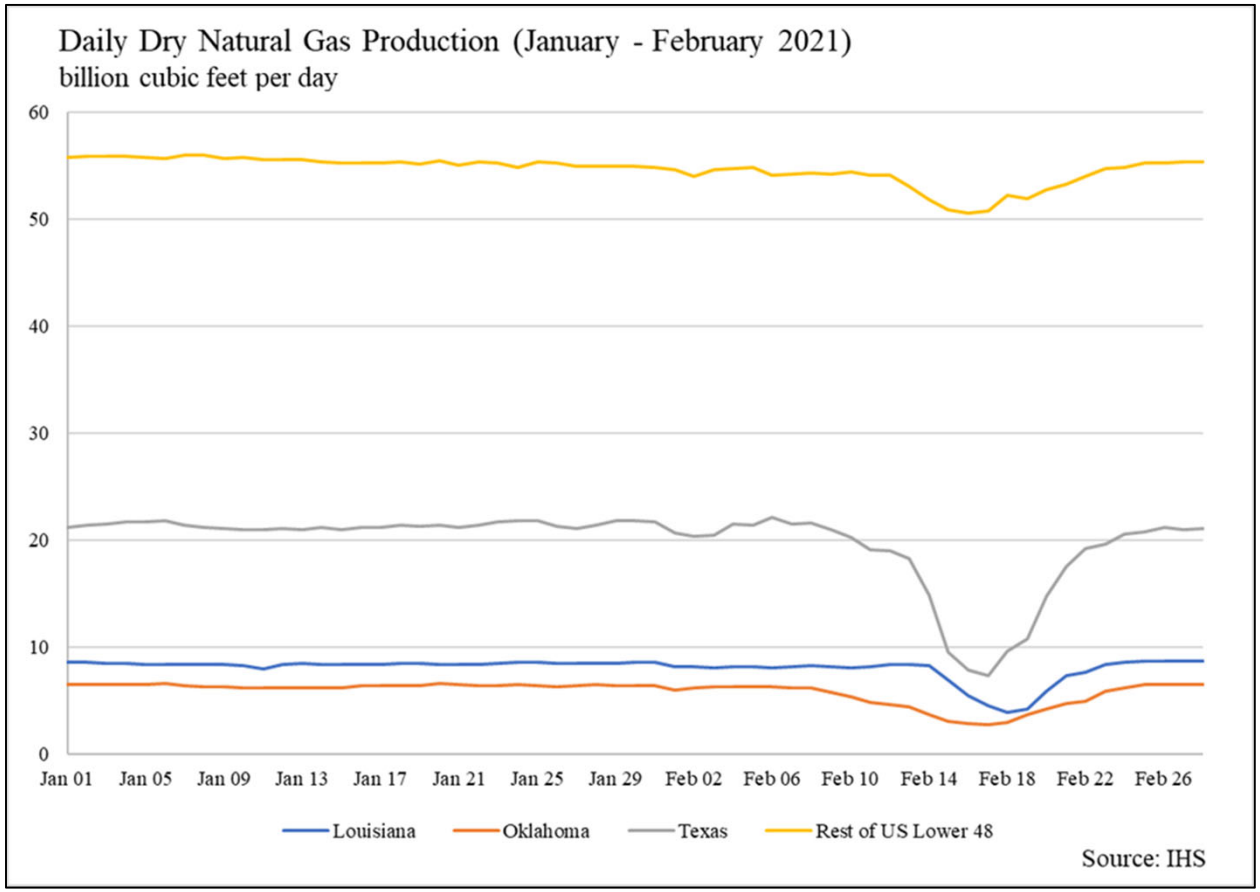
ISO-NE Gas Utilization Tool

- The Gas Utilization Tool developed in-house by ISO-NE staff, allows ISO-NE operations personnel to monitor the New England regional interstate pipeline system and provides real-time gas-electric system interface situational awareness by incorporating publicly-available interstate pipeline EBB data, gas schedules for individual generating units (nominations and long/short positions) and other pertinent information.

ISO-NE Gas Utilization Tool



Decline in Natural Gas Production



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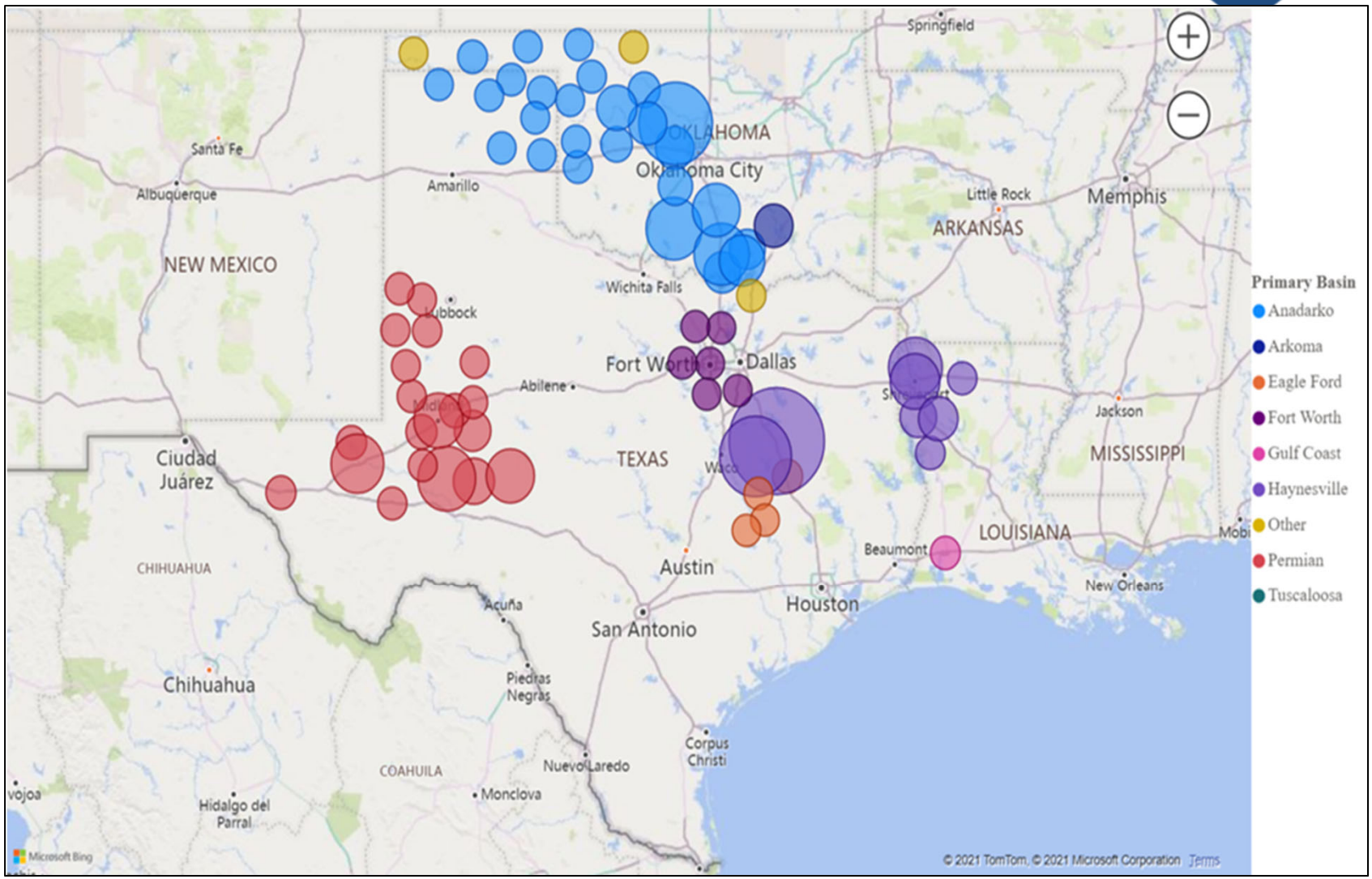
Production Outages by Basin



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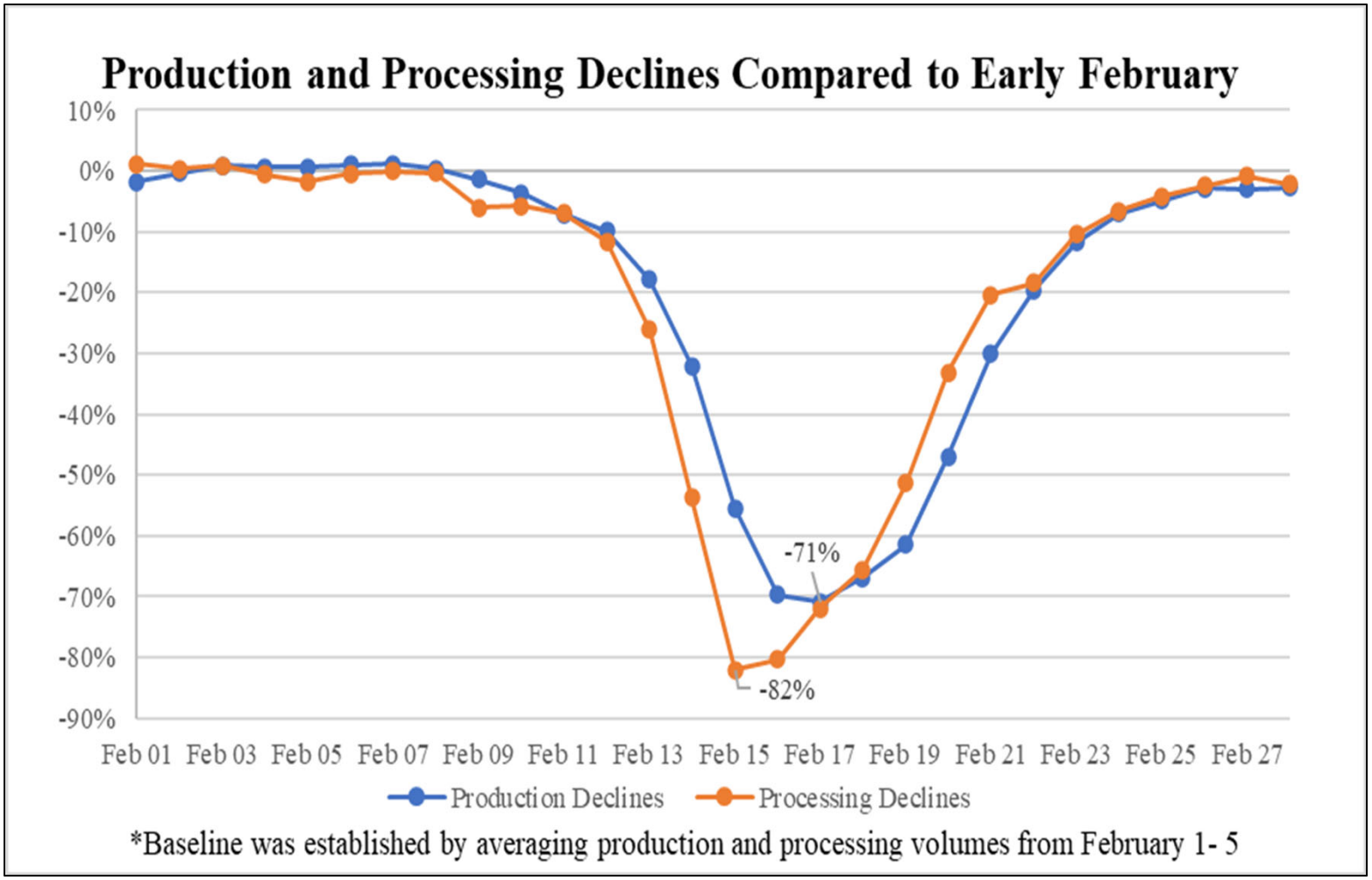
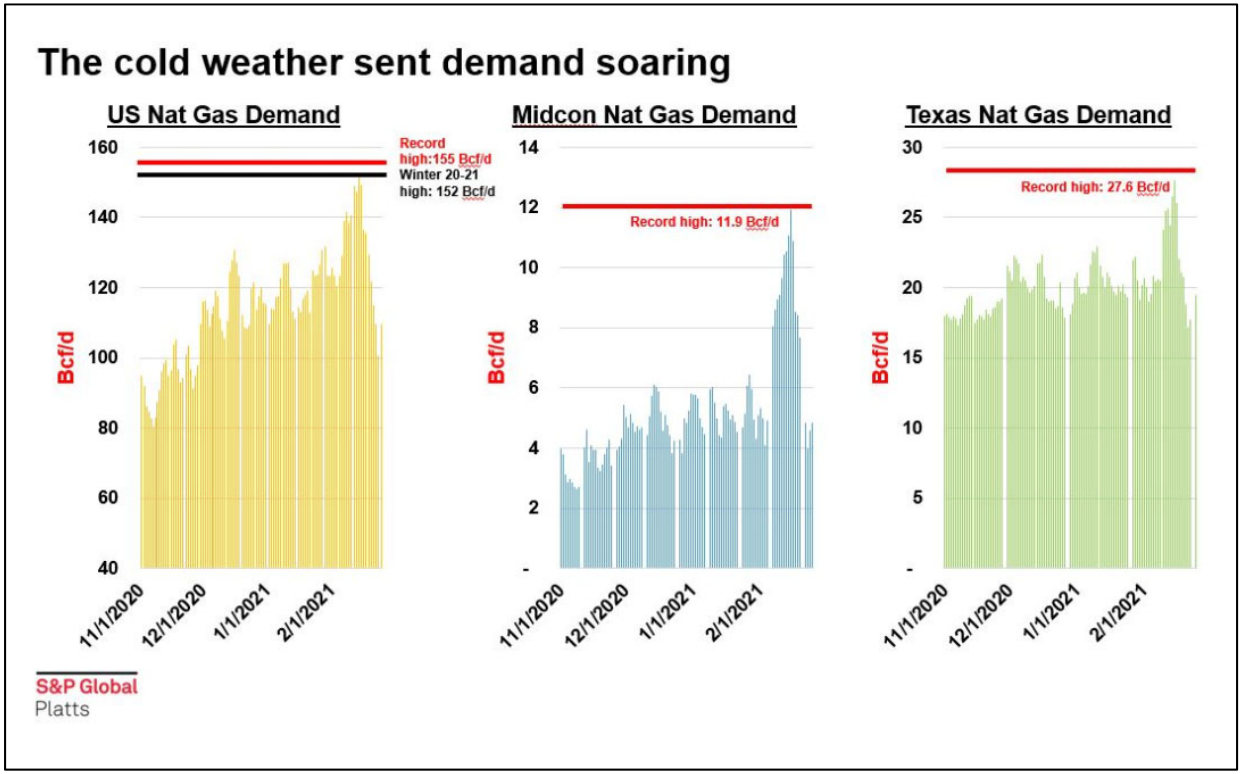
Production Declines



Natural Gas Consumption

Natural Gas Consumption by End Use			
	January 2021 (Bcf)	February 2021 (Bcf)	Percent Change
Residential - LA	6.9	7.4	7.3%
Residential - OK	13.0	13.9	7.0%
Residential - TX	39.0	50.6	29.9%
Commercial - LA	3.6	3.9	9.1%
Commercial - OK	7.5	8.2	9.4%
Commercial - TX	24.5	25.7	4.9%
Industrial - LA	101.9	83.7	-17.9%
Industrial - OK	20.3	13.8	-32.2%
Industrial - TX	176.7	116.1	-34.3%
Electric Power - LA	20.9	22.6	8.0%
Electric Power - OK	21.4	21.7	1.4%
Electric Power - TX	119.4	124.9	4.6%
(Source: EIA)			

Increased Natural Gas Demand



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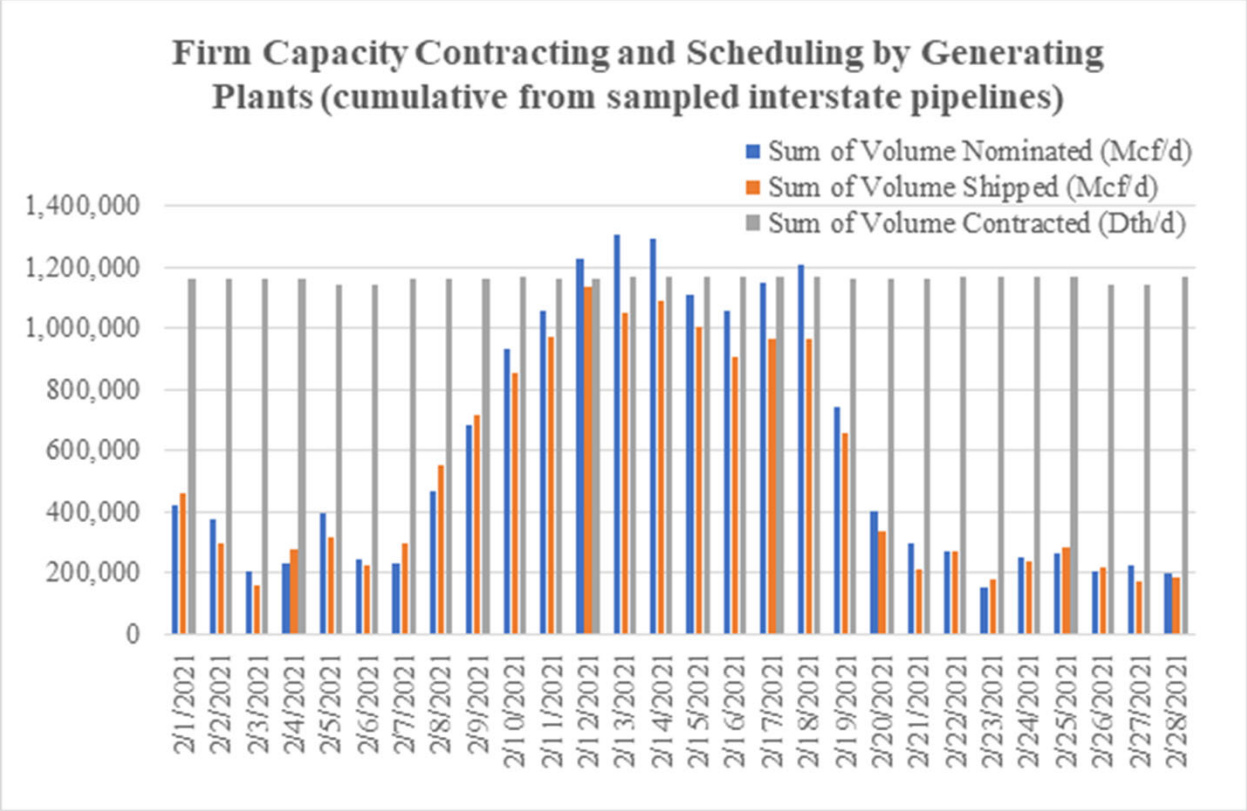
Firm Capacity Vs Scheduling

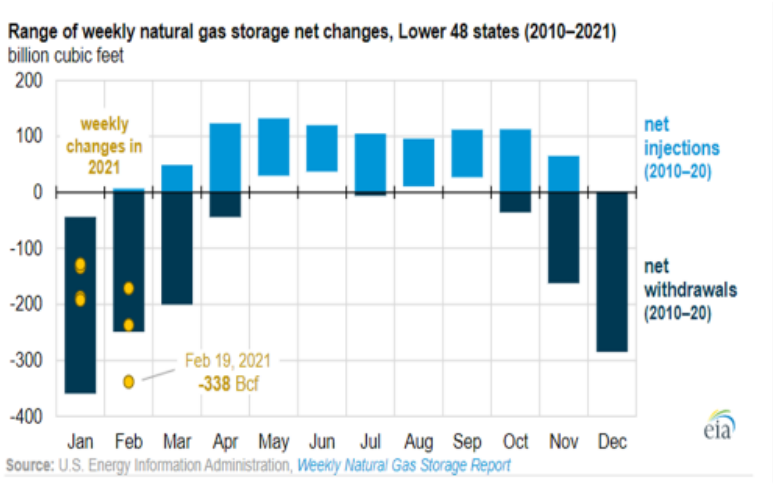


Storage Withdrawals

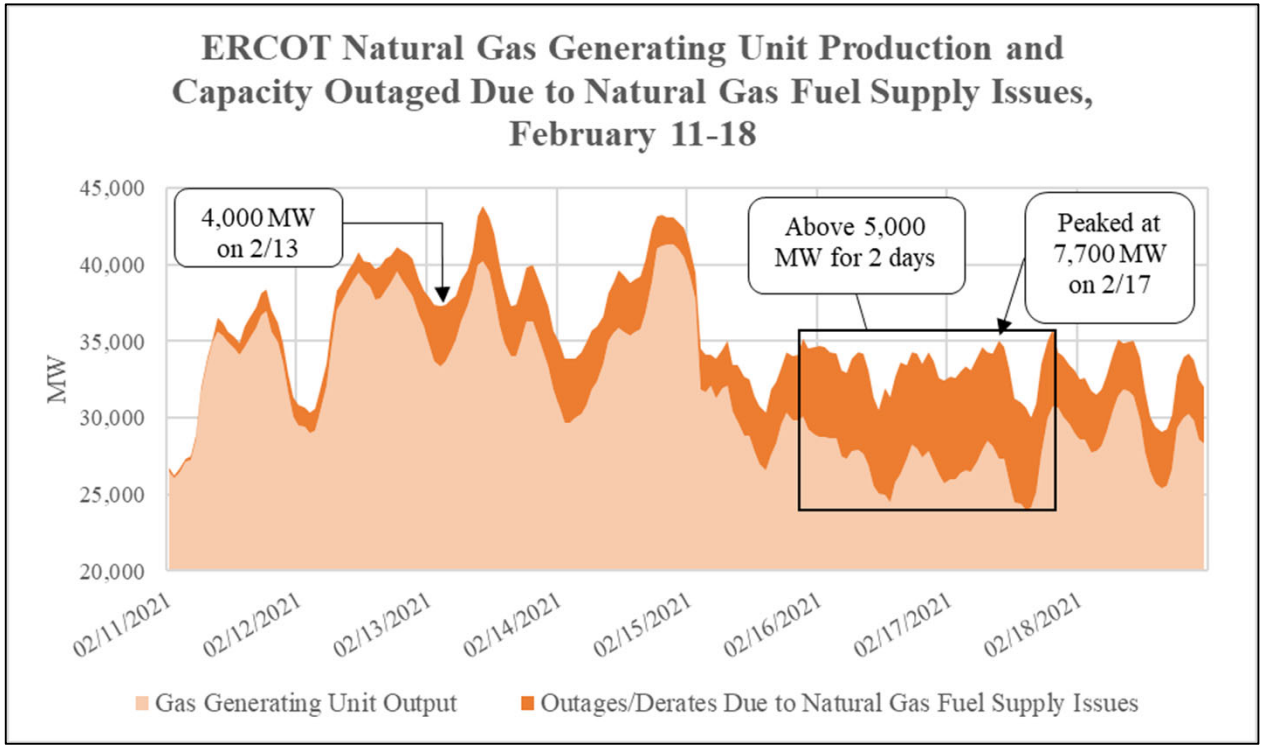
CUI

Storage

- Significant demand for natural gas in mid-February led to the second-largest reported withdrawal of natural gas from storage in the United States, according to the U.S. Energy Information Administration's (EIA)
- Storage withdrawals reached 338 billion cubic feet (Bcf) in the week ending February 19, 2021, nearly three times the average withdrawal for mid-February, according to EIA
- A record amount of natural gas, 156 Bcf, was withdrawn during the week ending February 19, 2021 in the South Central region, which includes Texas.



ERCOT Natural Gas Outages



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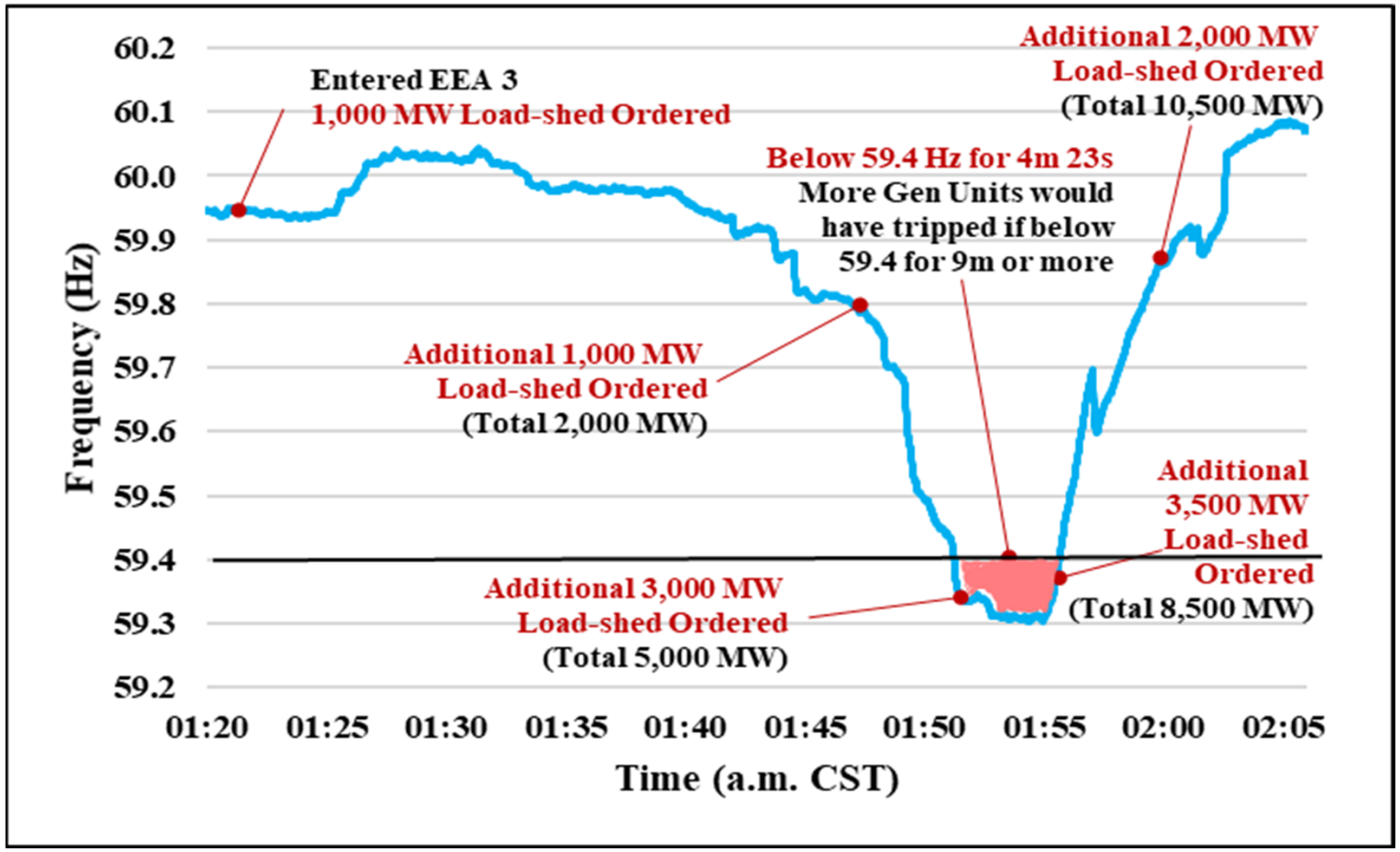
ERCOT System Frequency



Texas SB 3

- Development of a new "power outage alert" (with coordination among several agencies including the PUCT and Department of Transportation (to use its highway messaging signs).
- Creation of a new "Texas Energy Reliability Council," with the purpose of fostering better communication between the natural gas and electric industries. Its members include the Chairs of the Texas Railroad Commission and PUCT, ERCOT, and members from the natural gas and electric industries, as well as other energy and industrial sectors.
- Creation of a committee to map the electricity supply chain "in order to designate priority electricity service needs during extreme weather events" (and update said map yearly).

Texas SB 3 Continued

- Requiring gas supply chain facilities identified on the electricity supply chain map and directly serving natural gas generating units to "implement measures to prepare to operate during a weather emergency,"
- Develop a communication system between critical infrastructure sources, the PUCT and ERCOT to ensure that electricity and natural gas supplies in the electricity supply chain are prioritized to those sources during an extreme weather event.
- Requiring the PUCT and RRC to collaborate on rules for designating natural gas facilities and entities as critical electric customers or critical gas suppliers.

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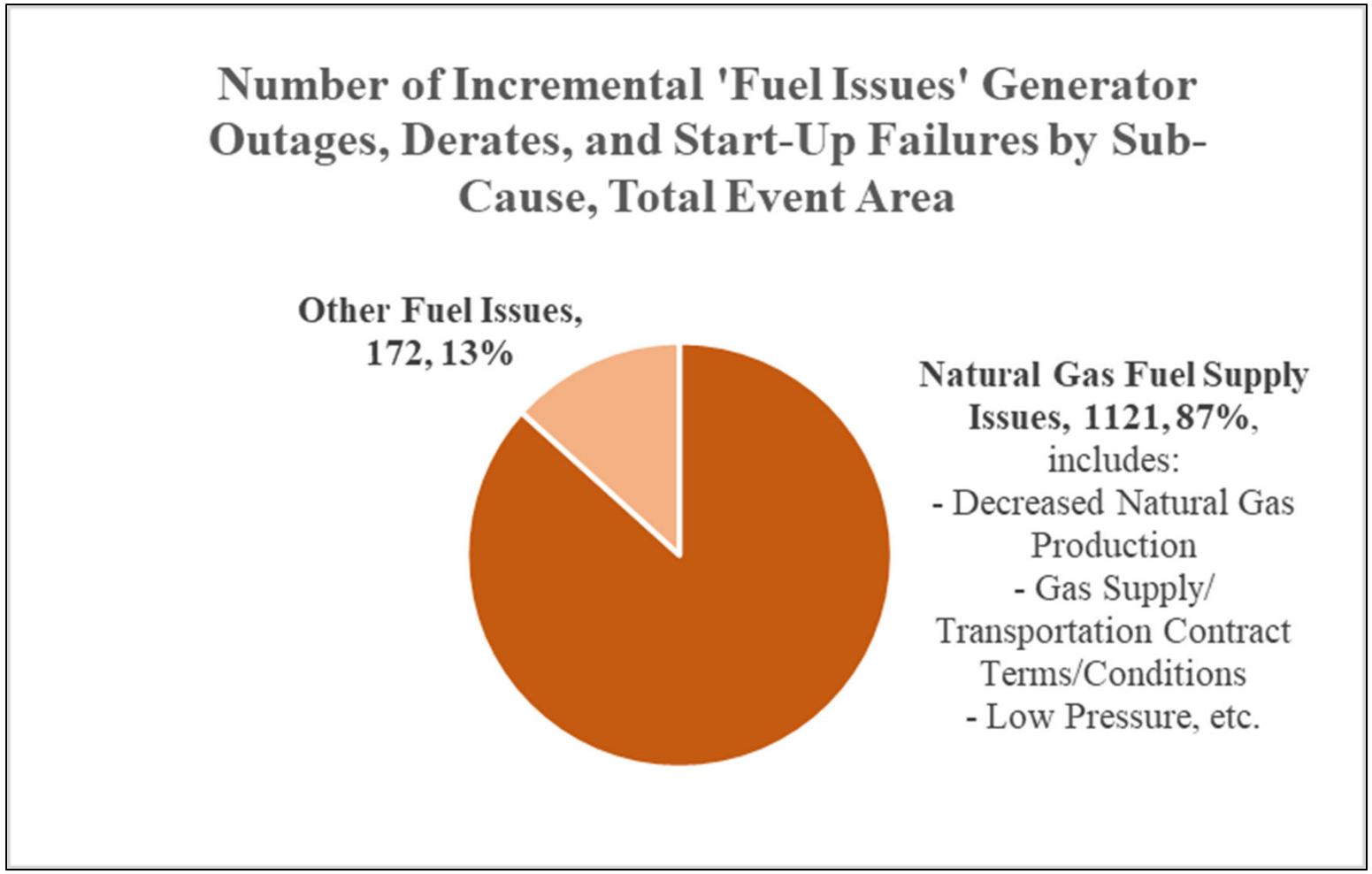
Texas SB 3

- Requiring that utilities provide retail customers with information about involuntary load shedding, and how to apply to become a critical care retail customer or other protected class of retail customer.
- Adding new rules regarding how to conduct firm load shedding, including that the PUCT examine whether entities complied with their load shed plans, and providing for at least one load shed drill each in the summer and winter.
- Requiring procurement of competitive "ancillary or reliability services" to ensure reliability during extreme heat and extreme cold weather and during times of low wind or solar; winter resources required to include on-site fuel storage, dual-fuel capability or "fuel supply arrangements to ensure winter performance for several days."

Natural Gas Related Issues



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Key Recommendations

- Reliability Standards should be revised to address cold weather issues
- Markets should develop appropriate cost recovery mechanisms
- Technical Conference on improving Winter readiness
- Mandatory winterization for natural gas infrastructure
- Forum with natural gas industry to ensure reliability of natural gas system for BES reliability
- Generators should convey limitations (ie FT v IT) to Balancing Authorities
- Reserve margins should be reconsidered
- Upgrading SCADA controls

Key Recommendations Cont'd

- Enhance Emergency Centers
- Evaluate intermittent resource forecasting improvements
- Demand Side Management and Energy Efficiency

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Questions and Answers