

February 2021 Texas Event



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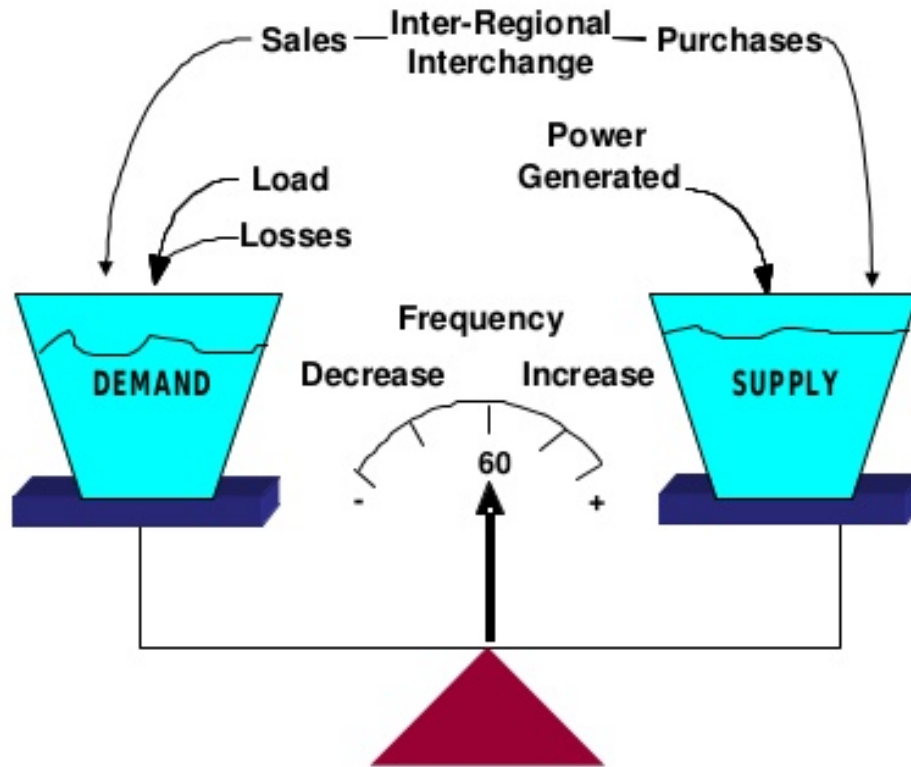
Electric Reliability Council of Texas Area

Preceding Events

2021 Cold Weather Event

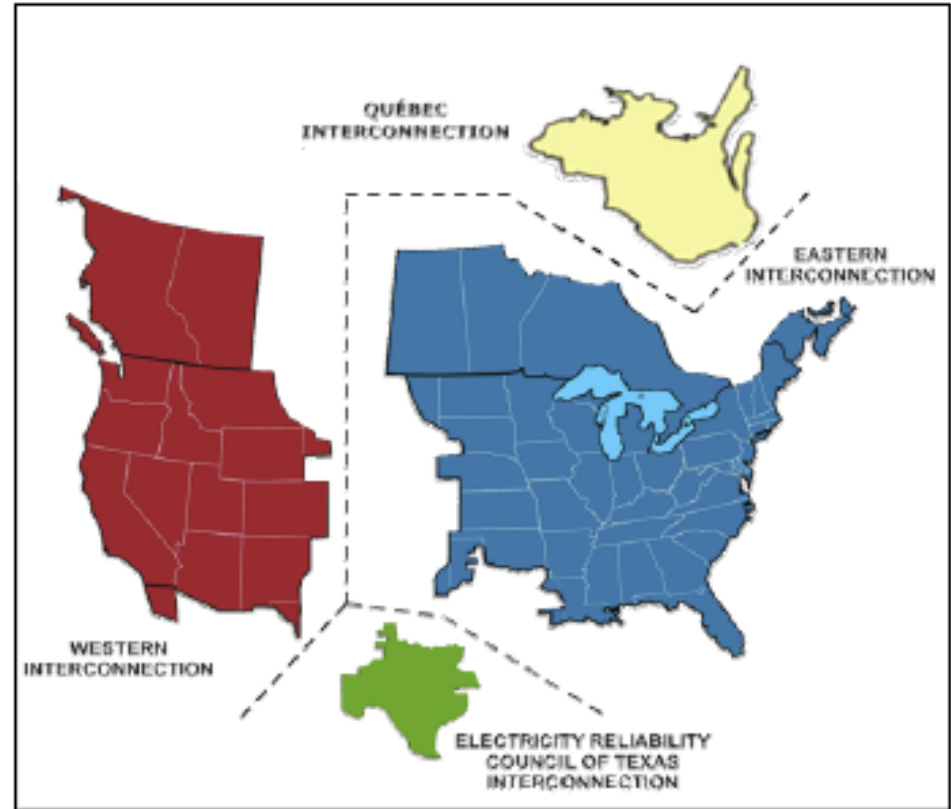
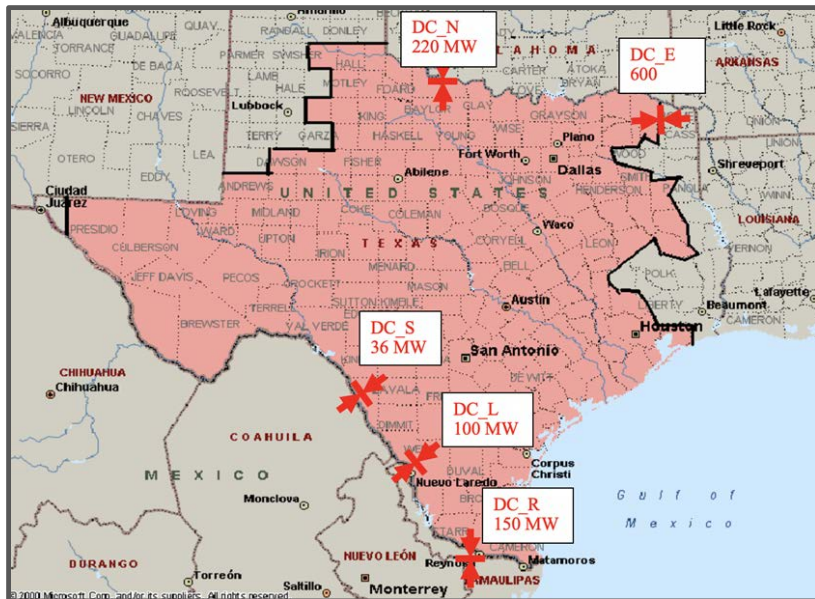
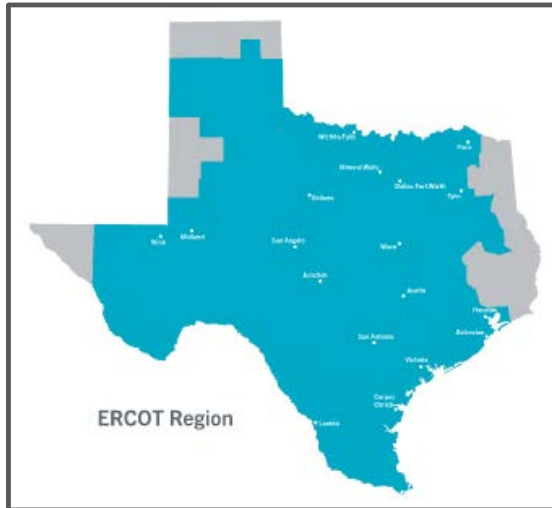
New England's Posture

System Frequency - Supply and Demand



Source: *Balancing and Frequency Control, A Technical Document*
Prepared by the NERC Resources Subcommittee

Electric Reliability Council of Texas (ERCOT)

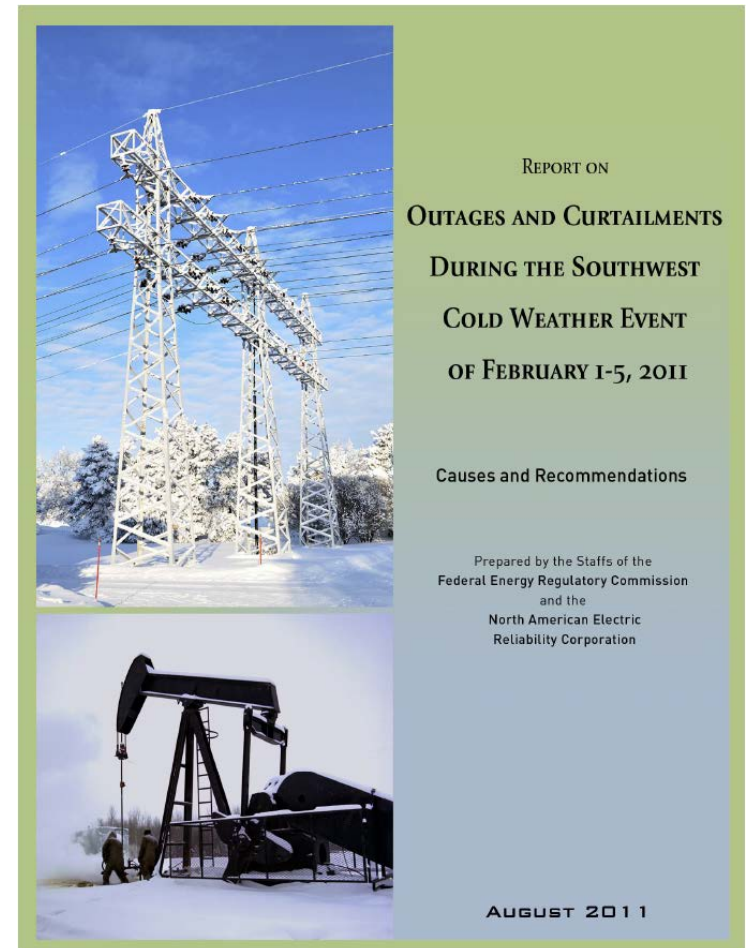


Source: North American Electric Reliability Corporation

History 2011 – Southwest Cold Weather Event



- February 1-5, 2011
- Unusual cold weather for the region
- Effected multiple areas
 - Included ERCOT
 - Loss of generation
 - Load shed



History 2011 – Southwest Cold Weather Event

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

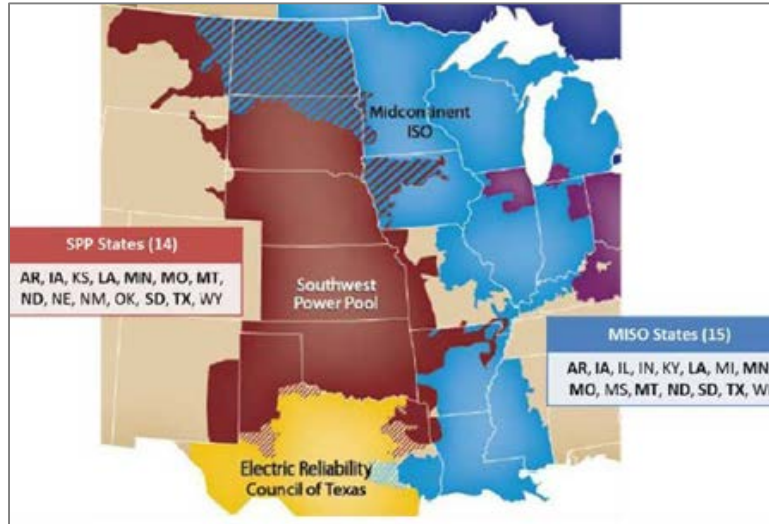
Event Report Findings

Condition	Consequences
Coldest Texas weather since 1989	Single-digit sub-freezing temperatures for more than 100 hours with sustained winds of 30–40 mph
New ERCOT winter peak demand record	56,344 MW (with a second record set the following week)
ERCOT capacity affected	17.6 percent of total ERCOT winter 2011 capacity out at February 2 peak
225 units tripped, derated, or failed to start (February 1–3)	Except for nuclear facilities, all power plant types including coal/lignite, simple-cycle gas, combined-cycle gas, and wind resources experienced problems.

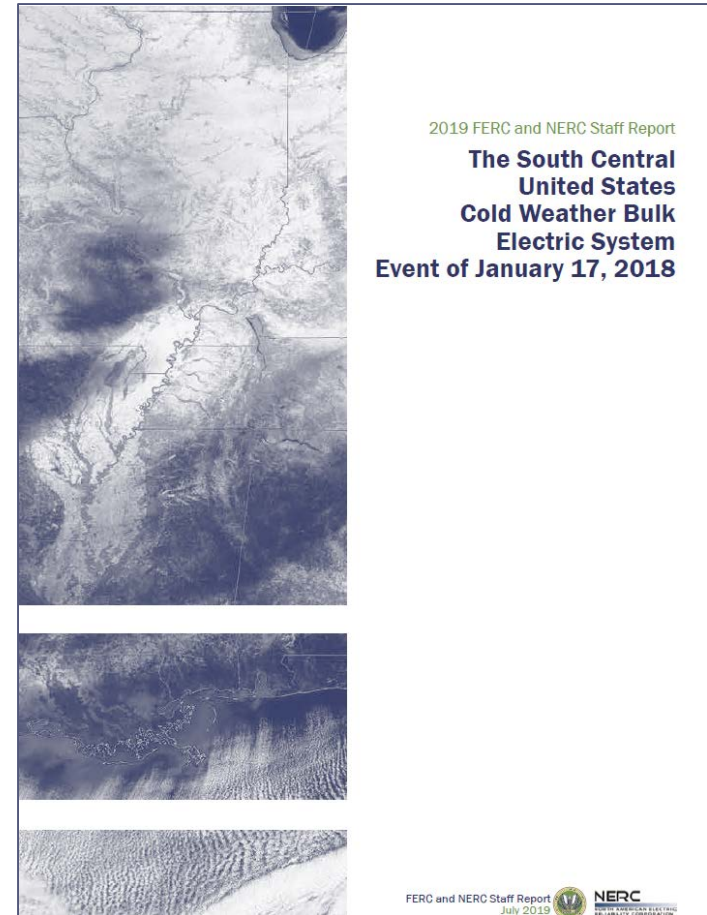
Outcome

NERC developed and released *Reliability Guideline: Generating Unit Winter Weather Readiness* in December of 2012

History 2018 – South Central Cold Weather Event



- January 15-19, 2018
- Unusually cold weather for the region
- Effected multiple areas (excluding ERCOT)
- Natural gas dependency highlighted

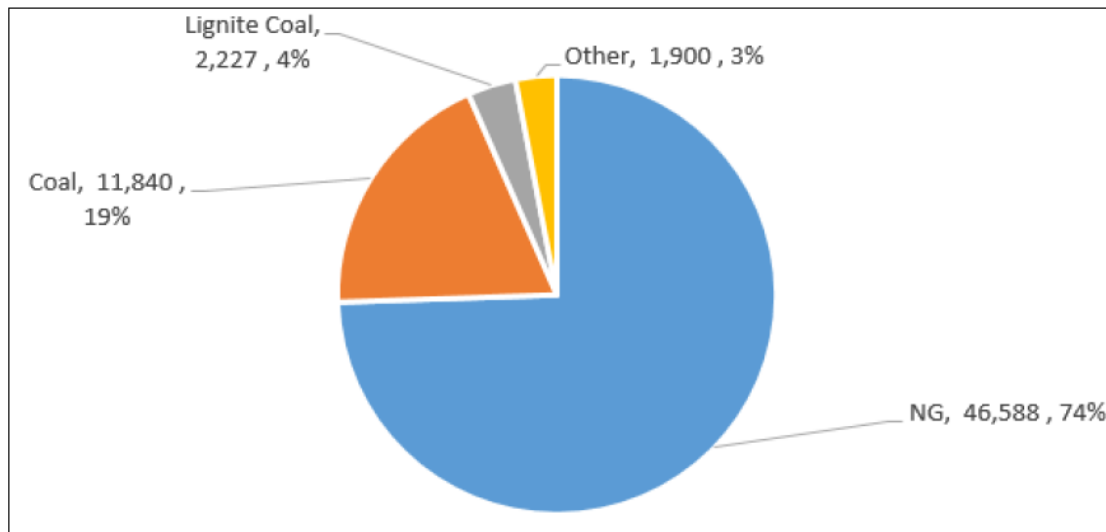


History 2018 – South Central Cold Weather Event

Findings

- Failure to properly prepare or “winterize” generation
- Gas supply issues

Figure 48: January 15-19, 2018 – Fuel Type for Unplanned Generation Outages and Derates due to Freezing Issues, for Event Area (by MW of Generation)

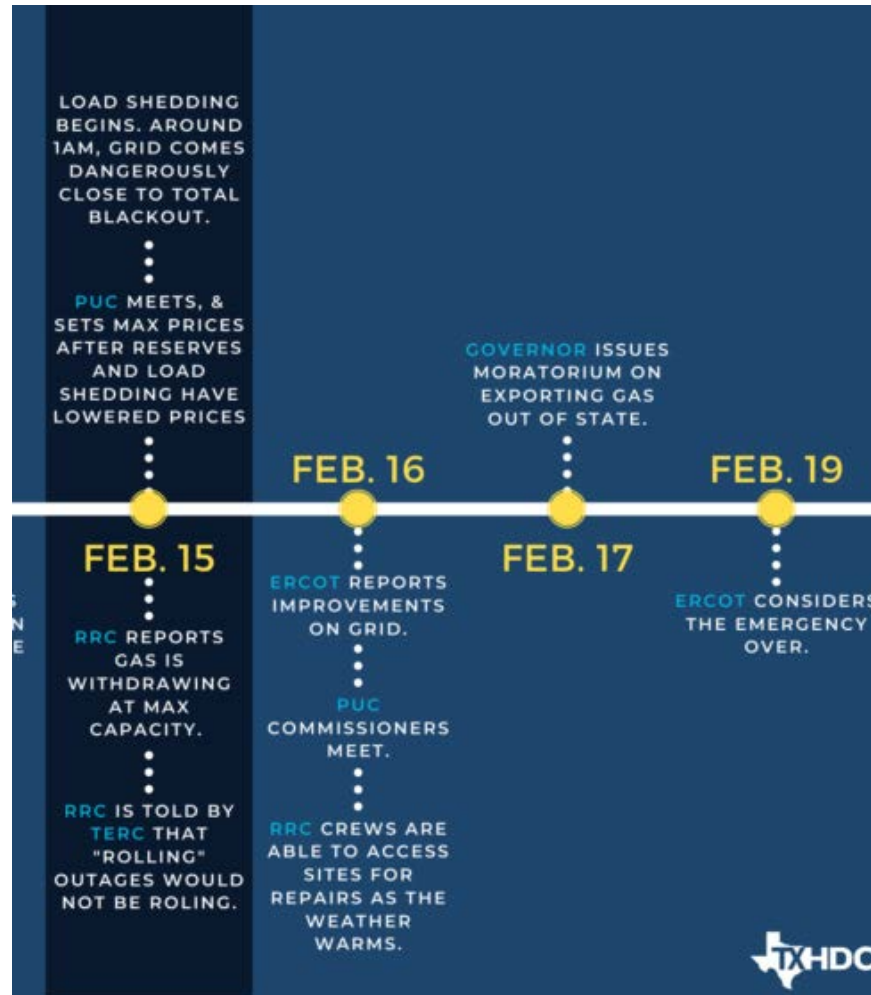


Source: FERC and NERC Staff Report

Outcome

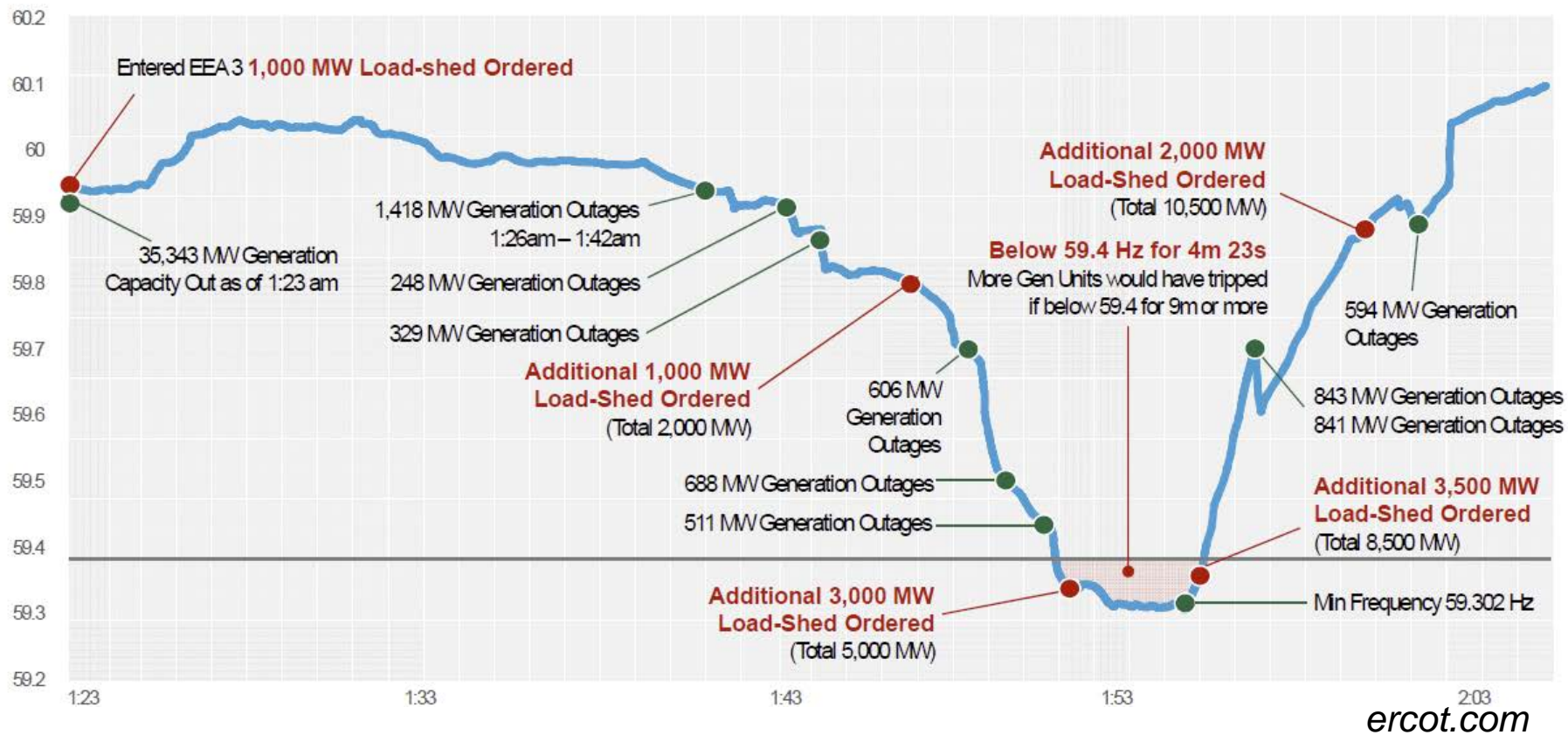
Develop or enhance cold weather NERC Standards

February 2021 – Texas Event



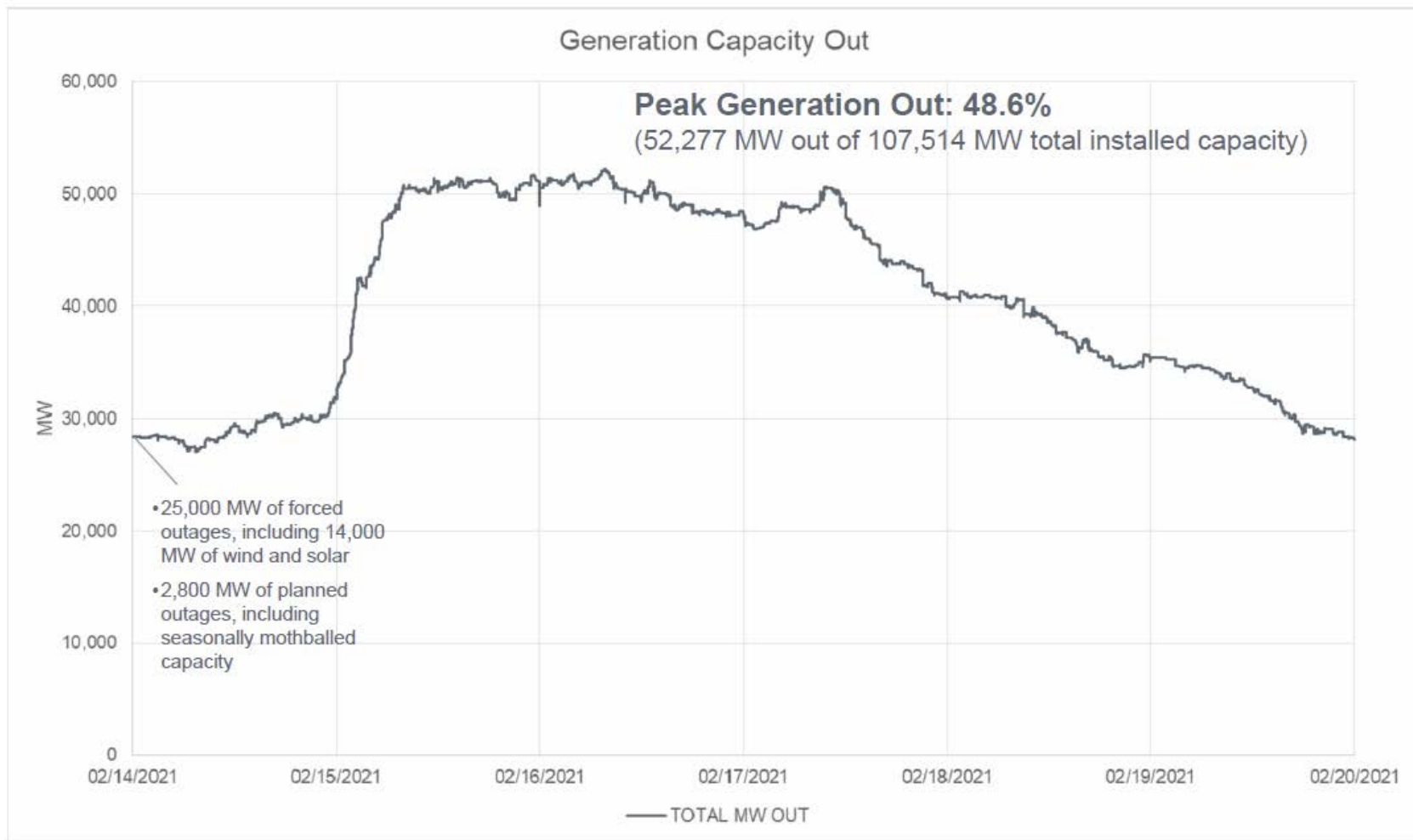
February 2021 – Texas Event

Rapid Decrease in Generation Causes Frequency Drop



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Generation Capacity Out February 14 – 19, 2021

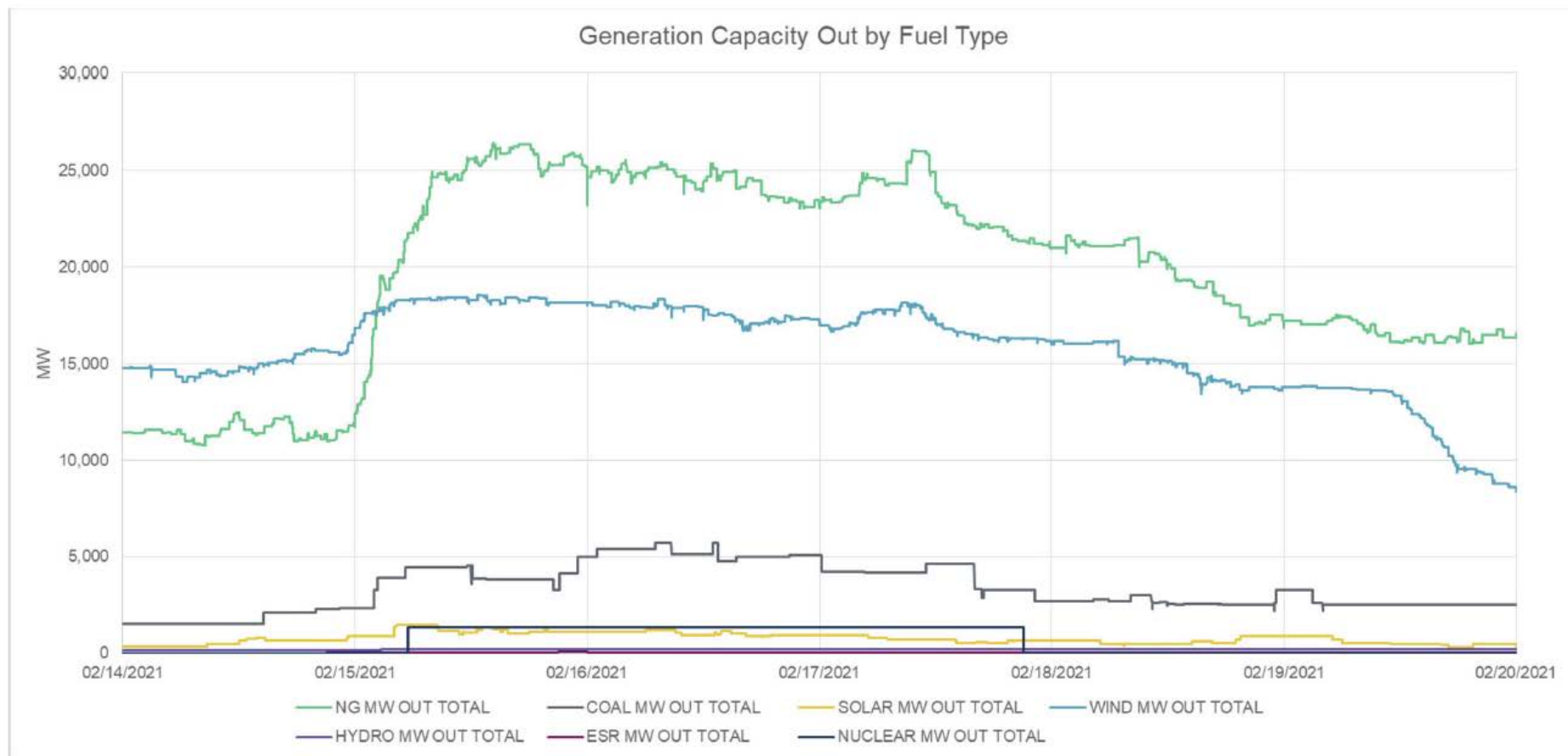


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Generation Capacity Out by Fuel Type



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WINTER STORM 2021

Texas was "seconds and minutes" away from catastrophic monthslong blackouts, officials say

texastribune.org

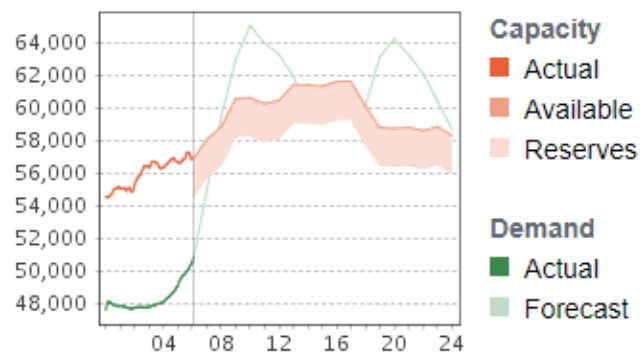


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TODAY'S OUTLOOK



Current Demand: 50,832 MW

Last Updated: Feb 18, 2021 - 06:04

GRID CONDITIONS



EEA 3
Rotating Outages in Progress

Operating Reserves: 3,384 MW

Last Updated: Feb 18, 2021 - 06:04

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February 2021 – Texas Event

2011 vs. 2021 Event Comparison

	2011	2021
Maximum generation capacity forced out at any given time (MW)	14,702	52,277
Generation forced out one hour before start of EEA3 (MW)	1,182	2,489
Cumulative generation capacity forced out throughout the event (MW)	29,729	46,249*
Cumulative number of generators outaged throughout the event	193	356
Cumulative gas generation de-rated due to supply issues	1,282	9,323
Lowest frequency	59.58	59.30
Maximum load shed requested (MW)	4,000	20,000
Duration load shed request (hours)	7.5	70.5
Estimated peak load (without load shed)	59,000	76,819

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February 2021 – Texas Event

Outcome

- FERC and NERC investigation

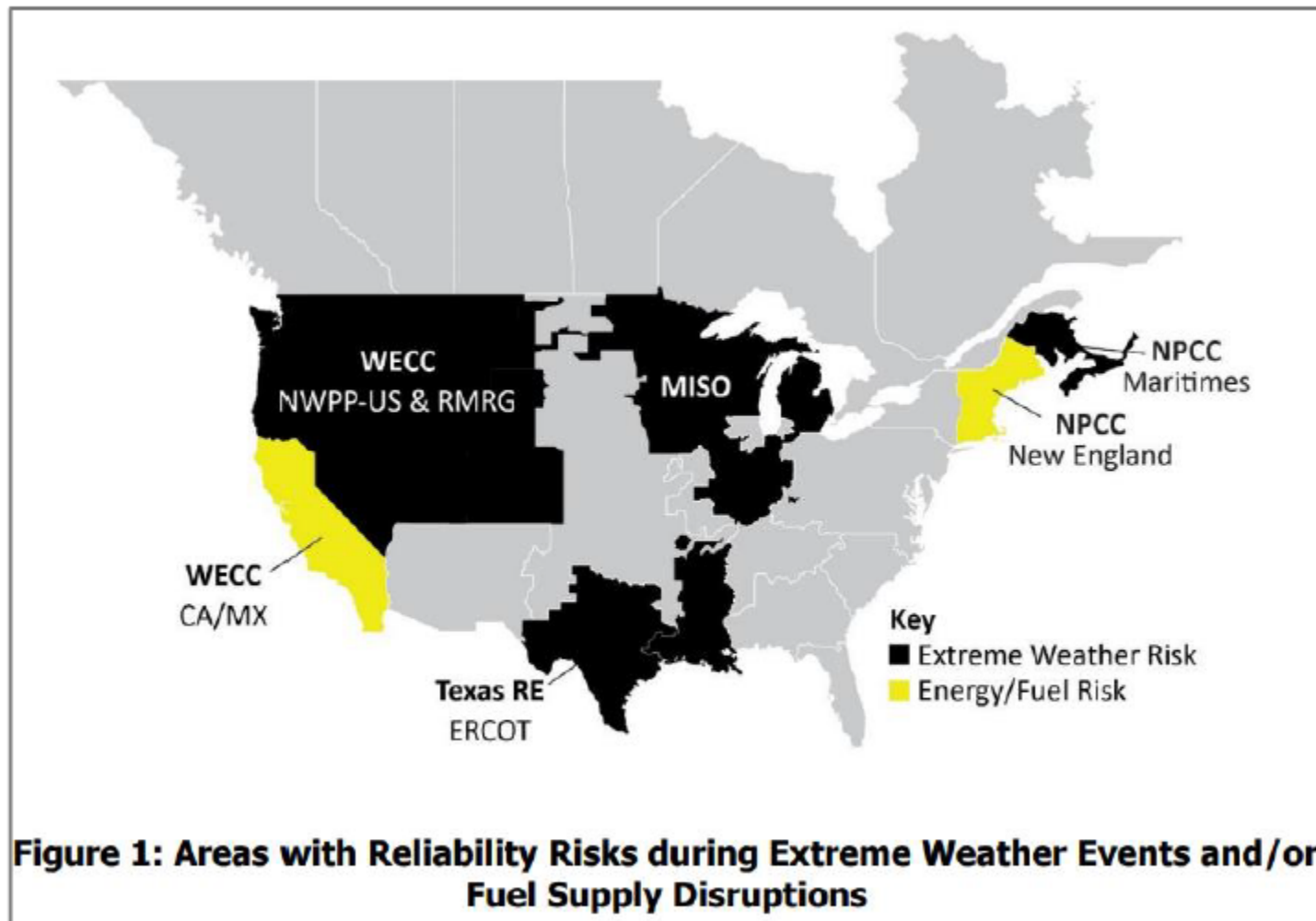
Jim Robb, NERC CEO

- Extreme weather exposed weakness
 - Appropriate design basis for weatherization
- Coal and Fuel Oil units are retiring, natural gas is becoming more relied upon
- Electric and natural gas dependency needs to be fully understood
 - Natural gas systems not winterized
 - Natural gas compressors were not identified as critical and were shed
- More transmission is likely necessary
- Seasonal and Annual assessments have identified this risk
- Texas pivoting from “who to blame” to “how to fix”

New England's Posture – Cold Weather Event



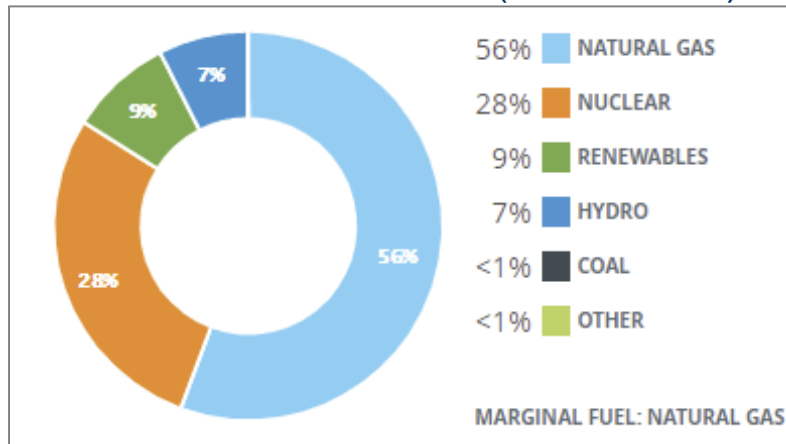
New England's Posture – Cold Weather Event



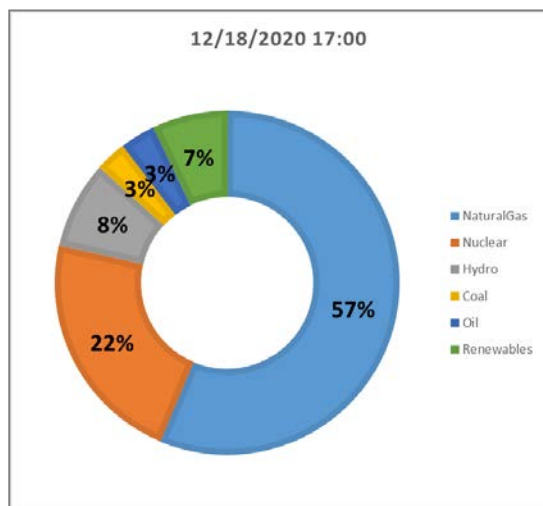
Source: [2020/2021 Winter Reliability Assessment](#), NERC.

New England's fuel mix (12/25/17 – 1/9/18)

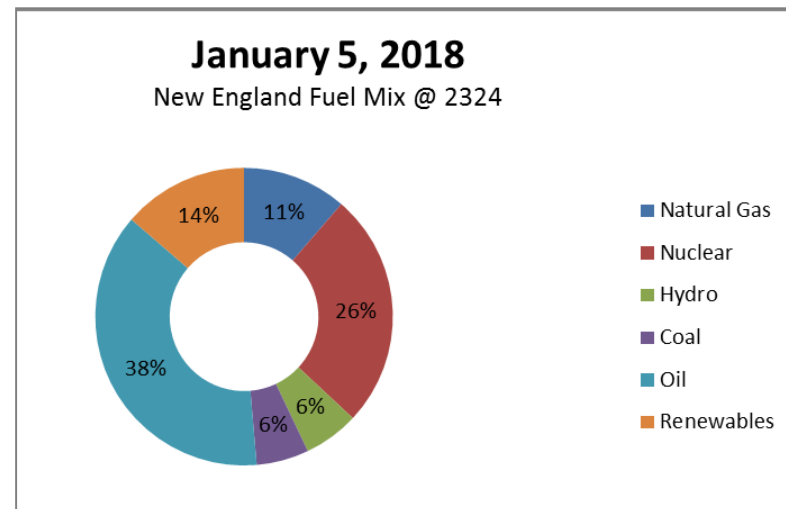
3/18/2021 Generation (14,500 MW)



12/18/2020 Generation (18,880 MW)

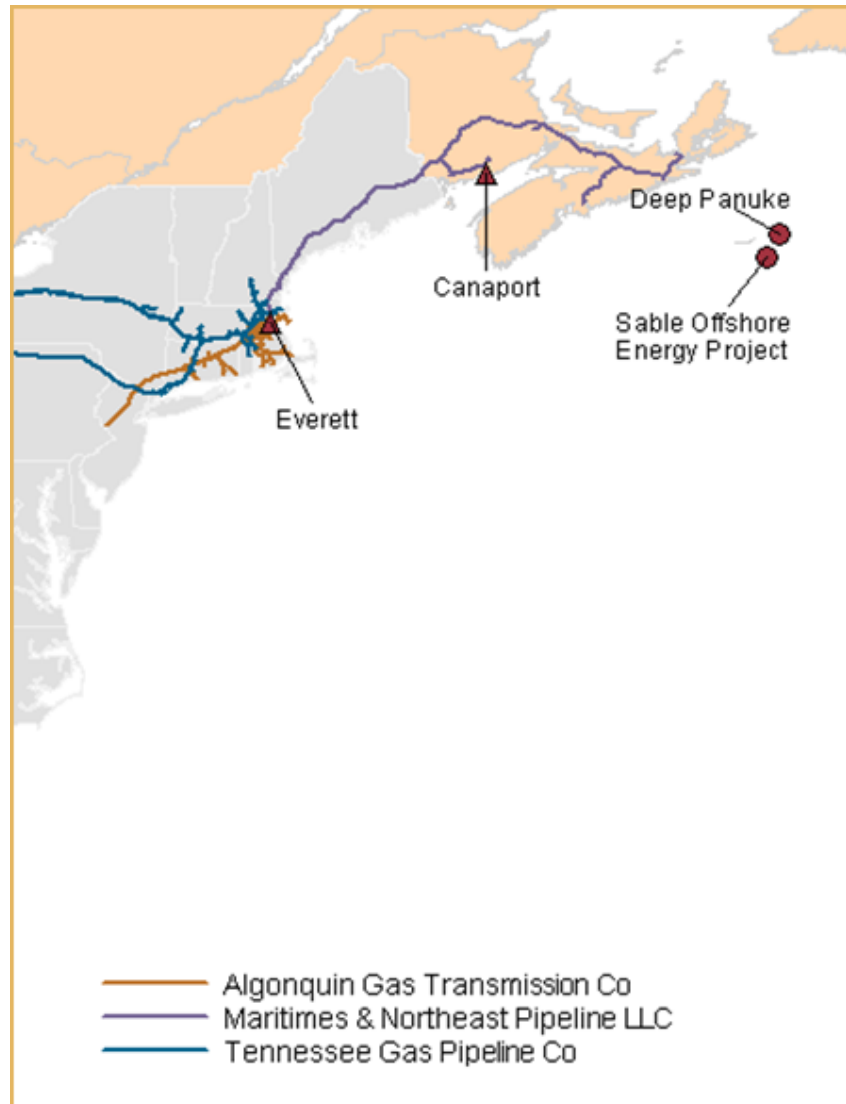


“Cold” NE Generation (18,000 MW)



Data source: <https://www.iso-ne.com/isoexpress/>

New England's Natural Gas Pipelines



<https://www.eia.gov/naturalgas/review/deliverysystem/2013/>

New England's Cold Weather Preparedness

- **ISO-NE active monitoring of natural gas supplies**
- **Encourage dual fuel generation**
- **Pay for Performance**
- **Inventoried Energy Program**

The Texas event was significant.

Reliance on natural gas presents an ongoing risk to NE during extended cold weather events when firm gas supplies are not guaranteed for generation.

Questions?