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April 27, 2021

MEMORANDUM

TO: Council Members and Power Staff

FROM: Brian Dekiep, Senior Energy Analyst: Montana office

SUBJECT: Update on February 2021 Power and Weather events in Texas

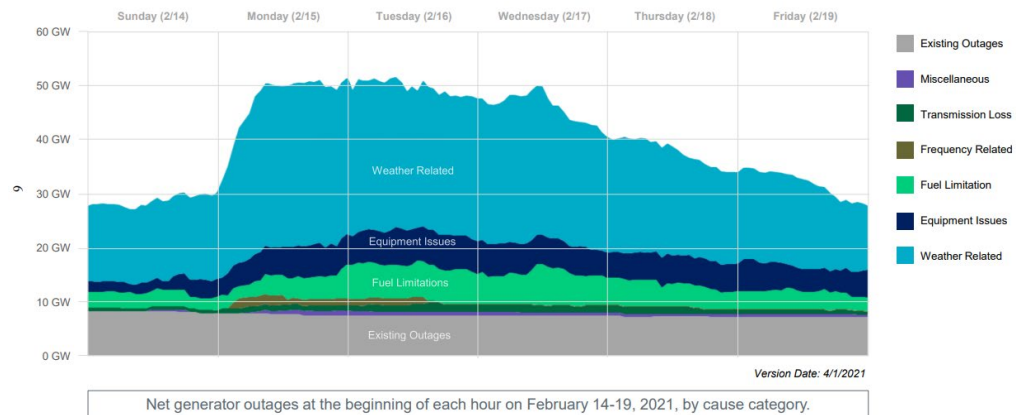
BACKGROUND:

Presenter: Beth Garza: Former Independent Market Monitor Electric Reliability Council of Texas. Senior Fellow with R Street's Energy & Environmental Policy Team.

Summary: In February 2021, the state of Texas suffered a major power crisis as a result of a series of severe winter storms sweeping across the United States.

As Texas faced record-low temperatures this February, the state's electric grid operator Electric Reliability Council of Texas (ERCOT) had to implement emergency operations and extremely high-power prices as the power supply and load became unbalanced. These conditions resulted in forced curtailment of load and blackouts in many areas of the state, leaving millions without access to electricity during record cold conditions. Blackouts extended from several hours for some and days for others. Many have called for investigations into ERCOT and the root cause of the power outages. Many factors contributed to the events and outages including, record cold temps, inaccurate load forecasts, lack of equipment weatherization leading to frozen (generation, supply lines and production equipment).

Net Generator Outages and Derates by Cause (MW) February 14 – 19, 2021



PUBLIC



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http://www.ercot.com/content/wcm/lists/226521/51878_ERCOT_Letter_re_Preliminary_Report_on_Outage_Causes.pdf

ERCOT which is independent from other parts of the US grid, manages the flow of electric power to more than 26 million Texas customers -- representing about 90 percent of the state's electric load. As the independent system operator for the region, ERCOT schedules power on an electric grid that connects more than 46,500 miles of transmission lines and 710+ generation units. It also performs financial settlement for the competitive wholesale bulk-power market and administers retail switching for 8 million premises in competitive choice areas. ERCOT is a membership-based 501(c)(4) nonprofit corporation, governed by a board of directors and subject to oversight by the Public Utility Commission of Texas and the Texas Legislature. Its members include consumers, cooperatives, generators, power marketers, retail electric providers, investor-owned electric utilities, transmission and distribution providers and municipally owned electric utilities. (<http://www.ercot.com/about>)

Beth Garza is a senior fellow with R Street's Energy & Environmental Policy Team. Prior to joining R Street, Beth served as the director of the Electric Reliability Council of Texas Independent Market Monitor from 2014 through 2019 after serving as the deputy director since 2008. In this role, she was responsible for monitoring market participant activity, evaluating wholesale market operations and recommending improvements to the wholesale market design. Over the course of her 35-year career in the electric utility industry, Beth has held a variety of leadership roles in generation and transmission planning, system operations, regulatory affairs and market design for both regulated and competitive entities. Her previous employers include Nextera and Austin Energy. Beth is a graduate of the University of Missouri and is a registered professional engineer in the State of Texas. (<https://www.rstreet.org/>)

What Happened in Texas?

NWPCC

May 5, 2021

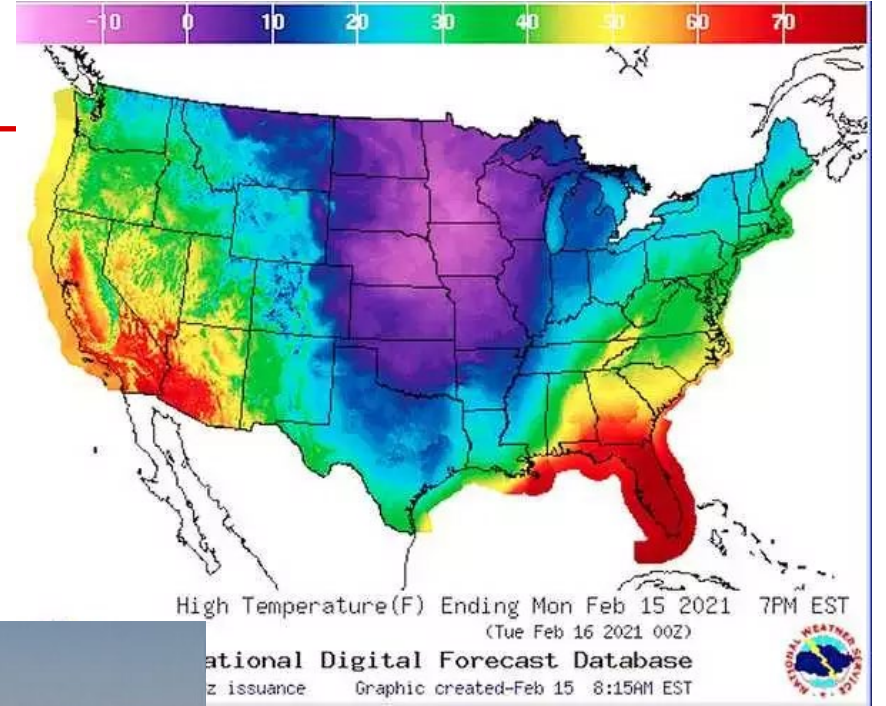
Beth Garza

R Street Institute



Free markets. Real solutions.

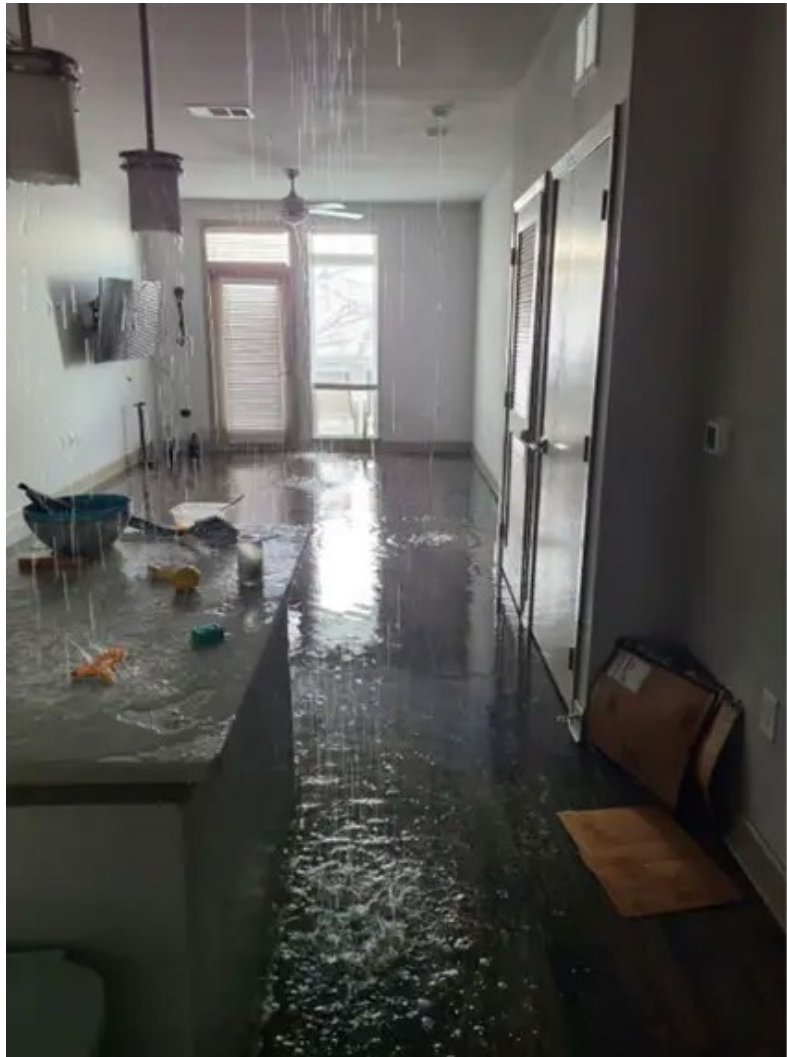
Weather



Weather - Electricity



Weather – Electricity – Water

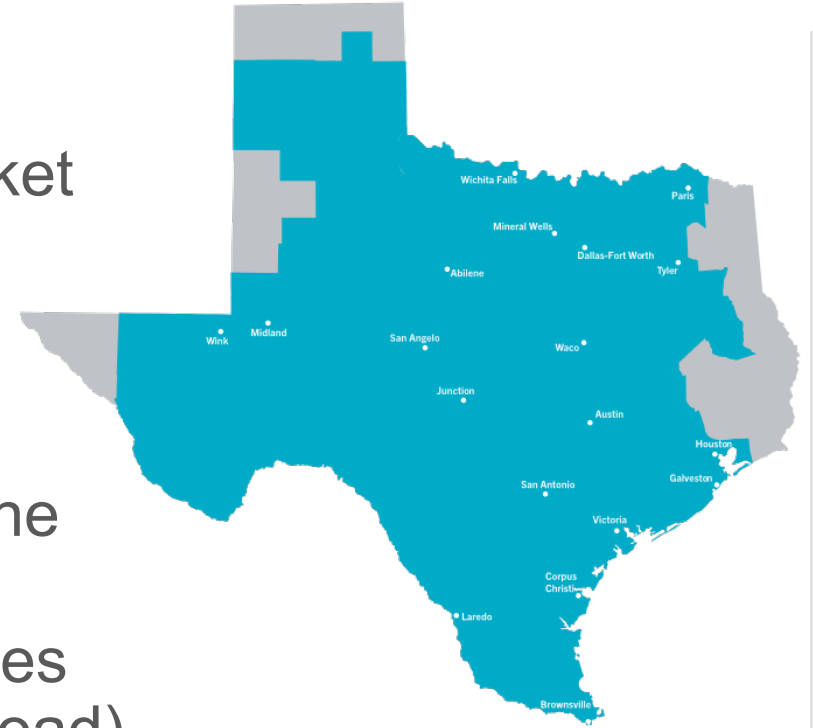


Weather – Electricity – Water – Financial



Key aspects of the ERCOT region

- Limited interties
- No FERC jurisdiction over market operations or outcomes
- FERC/NERC/TRE oversight of reliability standards
- Retail competition for most of the region since 2002.
 - Municipals and Co-operatives are exempt (~25% of total load)
- Large consumers of electricity across customer classes
 - Typical residential consumption 10-12 MWH/year, ~ 10cents/kWh total cost



Free markets. Real solutions.

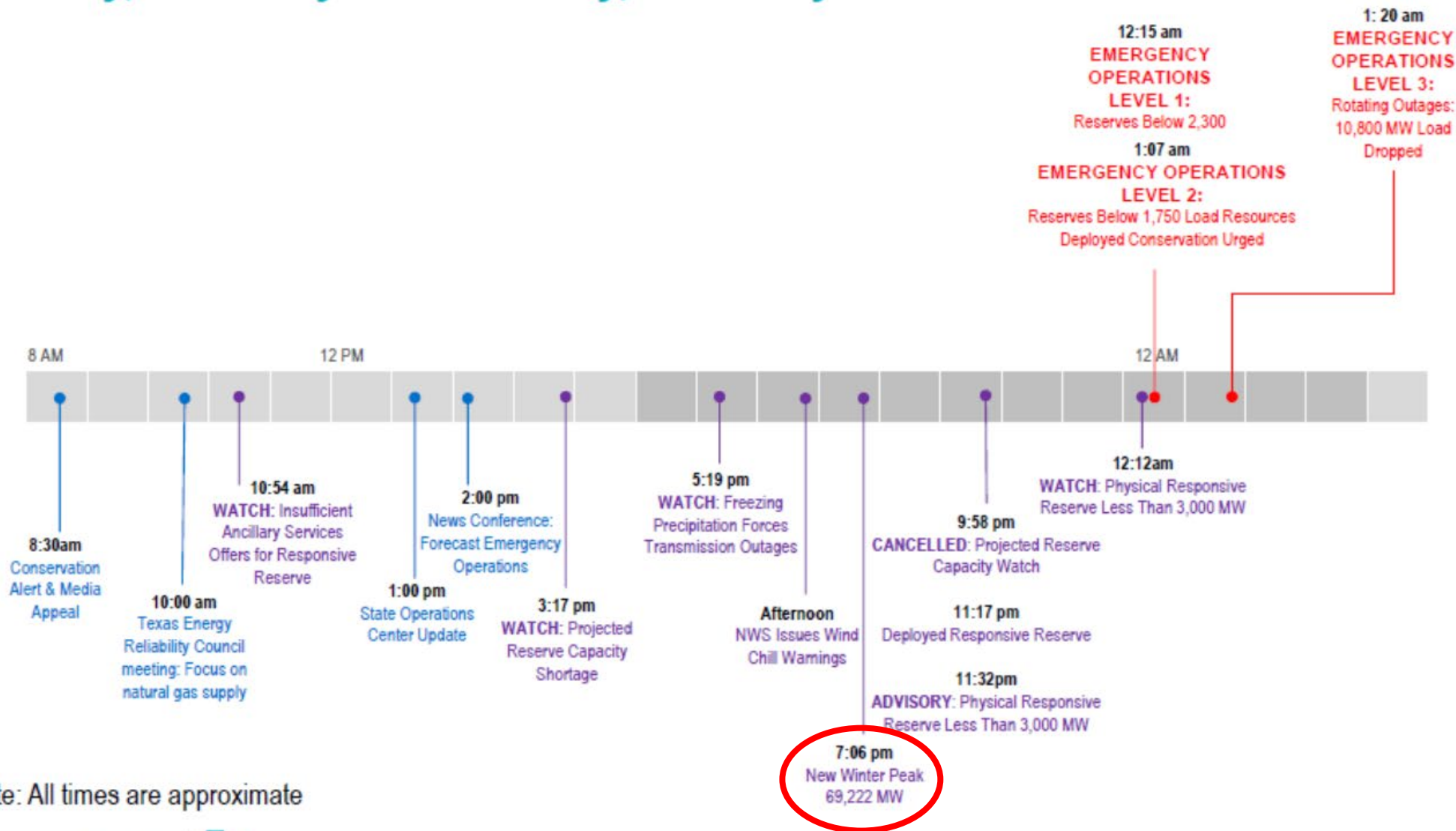
Key aspects of the ERCOT market and organization

- Energy only
 - No market for installed capacity
 - Load serving entities have no requirement to own or procure installed capacity
- Decentralized capacity commitment
- Relatively large Ancillary Service requirements
 - ~ 5 GW +/- 10%
- Potential for very high wholesale electricity prices
 - Offer cap set at \$9,000 per MWh
- 1800+ market participants in one of seven segments – including consumers: Res / Comm / Ind
- Hybrid Board of Directors, includes ERCOT CEO, and PUC Chair, reps from each market segment, and unaffiliated members.



Free markets. Real solutions.

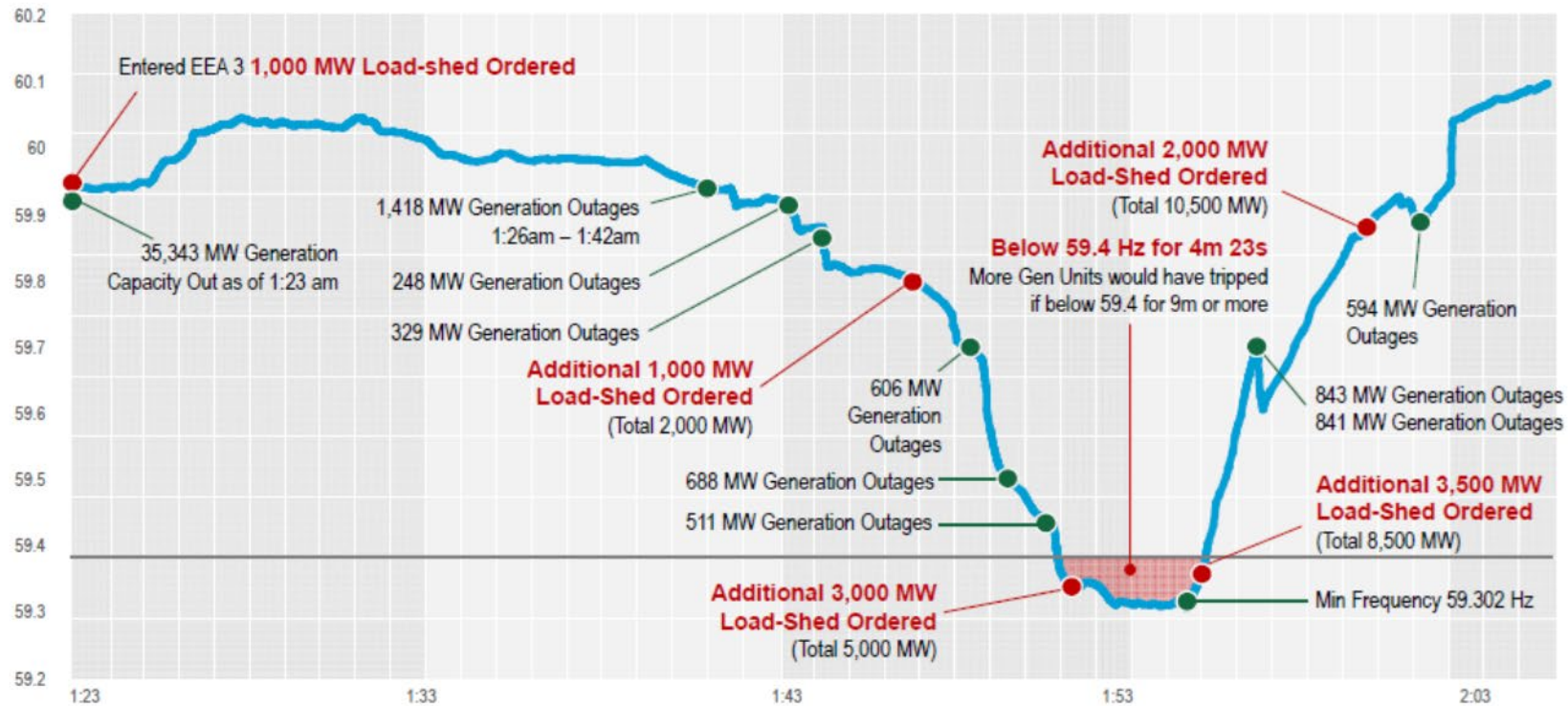
Sunday, February 14 – Monday, February 15



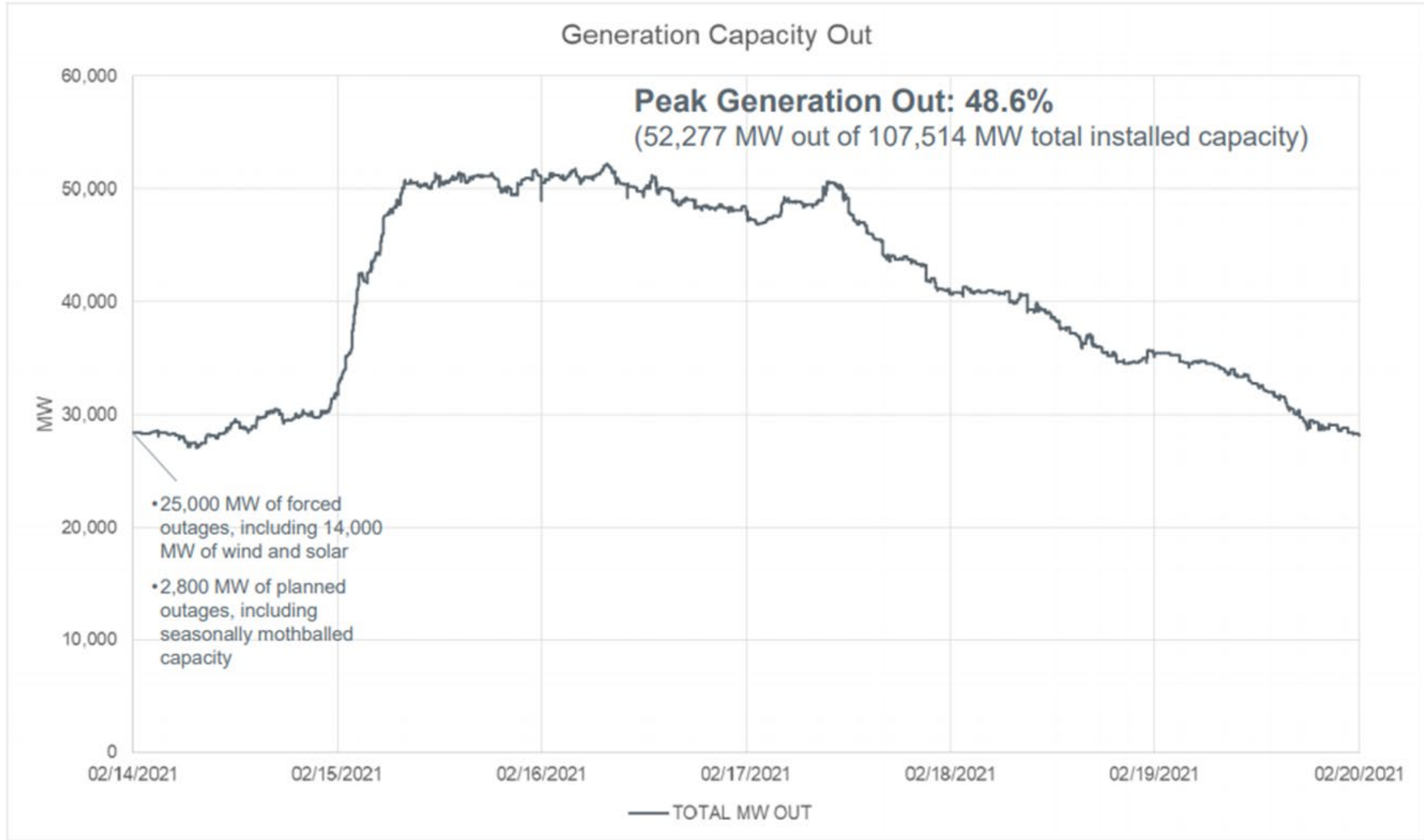
Note: All times are approximate



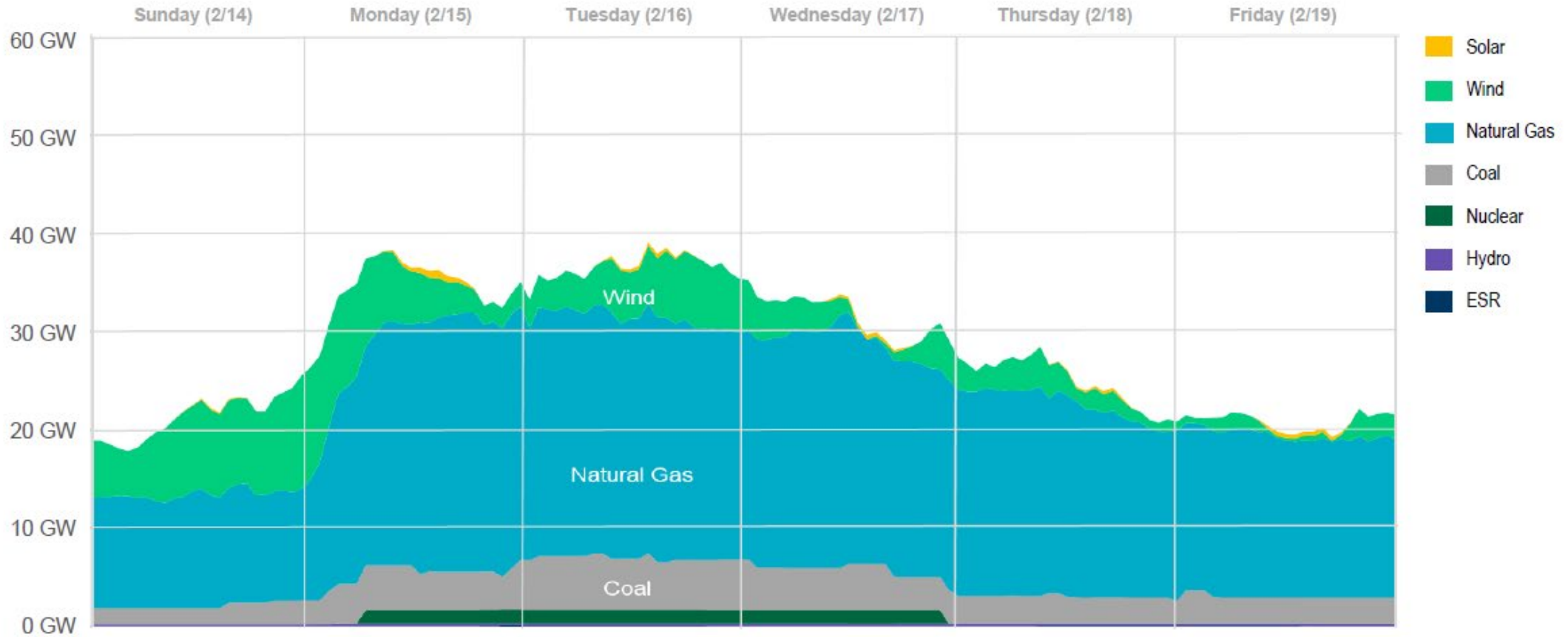
Rapid Decrease in Generation Causes Frequency Drop



Generation Capacity Out February 14 – 19, 2021



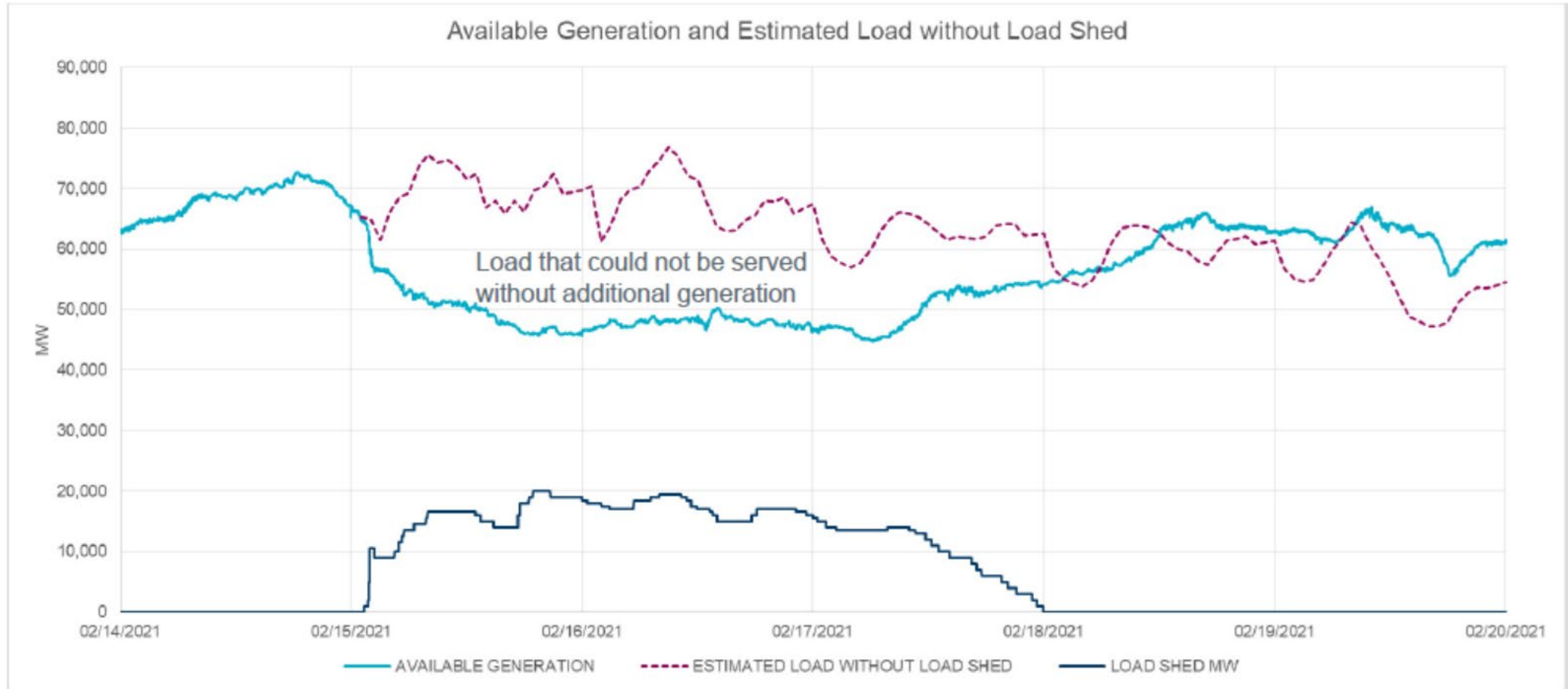
Net Generator Outages and Derates by Fuel Type (MW)



Version Date: 4/22/2021

Wind and solar MW values based on estimated lost output due to outages and derates from slides 15 and 16.

Available Generation and Estimated Load Without Load Shed



Available Generation shown is the total HSL of Online Resources, including Quick Starts in OFFQS. The total uses the current MW for Resources in Start-up, Shut-Down, and ONTEST.

Simple Explanations

- Winter preparation was insufficient
 - Electricity, natural gas, water, roads, individuals
- Increased co-dependence of electricity and natural gas systems
- Inability for distribution utilities to rotate electricity outages, forcing curtailment burden to not be broadly shared
- Inappropriate reliance on market forces for the duration of emergency operations

Personnel Fallout

- All three PUC Commissioners resigned
 - Two new appointees now seated
- All five unaffiliated Board members 'resigned'
 - Chair and Vice Chair vacant
- ERCOT CEO ousted
 - Interim now in place

Financial Fallout

- ERCOT owed ~\$3B / participants short-paid
 - Current default uplift process insufficient (\$2.5M /month)
- Countless lawsuits and bankruptcies
 - Brazos Co-op: Chapter 11, ~\$1.8B owed to ERCOT
 - Rayburn Co-op teetering, ~\$0.6B owed to ERCOT
 - PUCT Complaints / Appeals of PUCT action(s)
 - Suits against ERCOT / Sovereign immunity unclear
 - Contractual disputes of all types
 - San Antonio sued 16 natural gas suppliers “price gouging”



Possible Legislative Changes

- ERCOT Board members must live in Texas
 - Unaffiliated members -> political appointees
- More stringent winterization requirements
 - Funded?
 - Penalties
 - Natural gas fuel facilities included?
- Securitization
 - Natural gas utilities / electric co-ops / broader
- Additional costs assigned to Intermittent Renewable Generators
- Weather Alert / Improved Communications
- Dispatchable generation requirement

Better Changes

- Increased investment in demand side – insulation & repair
- Shared legislative oversight of natural gas and electricity
- PUCT consider installed capacity requirement of some type
- PUCT consider when and how to stop and restart electricity market
- ERCOT require all entities to have securitized collateral

Thank you!

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