ERCOT MONTHLY

NOVEMBER 2024

A RECAP OF KEY INFORMATION FROM THE PREVIOUS MONTH, A LOOK AT THE UPCOMING MONTH, AND A SNAPSHOT OF ADDITIONAL KEY ITEMS

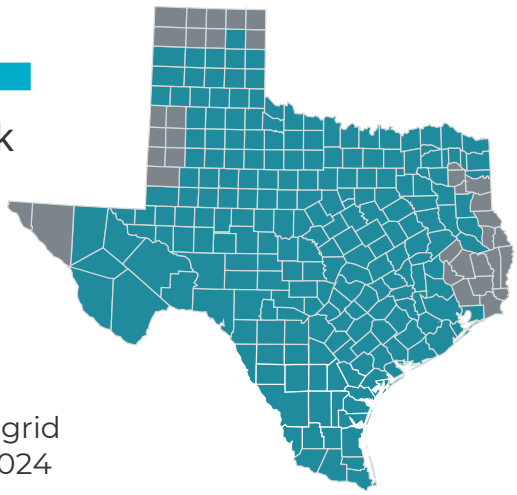
Contents

October 2024

Look Back

72,659* MW

October 2024 peak demand record



71,234 MW

October 2023 for comparison

ERCOT procured **$22.4** million in **Ancillary Services** for grid reliability in October 2024

Wholesale pricing was slightly **lower** than this time last year

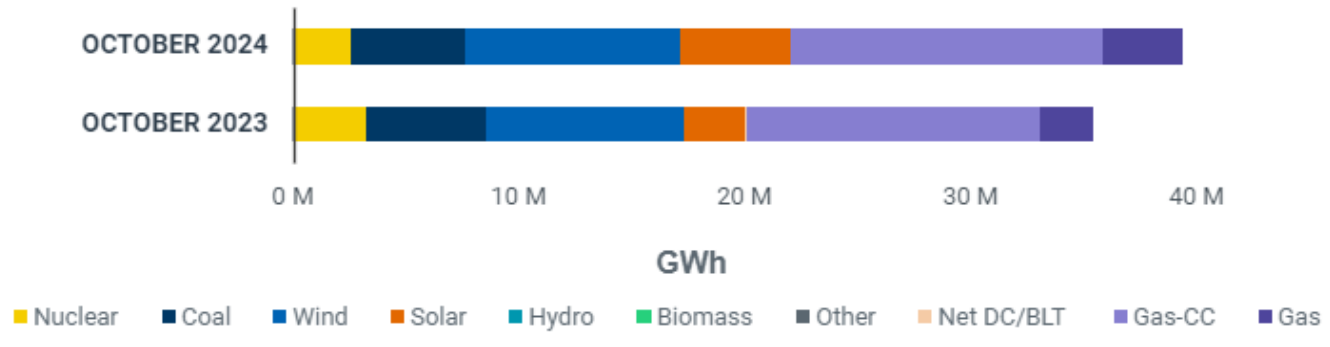
*unofficial until final settlements

20,750 MW
Solar generation
October 1

26,275 MW
Wind generation peak
October 29

4,056 MW
Battery generation record
October 7

October Energy Generation Comparison 2023 vs. 2024



Winter Outlook

Key Winter Takeaways

- New generation in ERCOT has grown by more than 10,000 MW since last summer.
- ERCOT's Weatherization and Inspections team is focused on winter weatherization.
- ERCOT is working with Market Participants on winter preparedness.
- For the majority of the day, ERCOT has little to no risk of declaring an EEA.

December & January Monthly Outlook for Resource Adequacy

For our Winter preview, we look at both the December and January Monthly Outlook for Resource Adequacy (MORA) reports. Probabilistic modeling results indicate a low risk of having to declare an Energy Emergency Alert (EEA).

In December, hourly probabilities peak at 4.90% for 7-8 p.m. CST, although 8-9 p.m. is close behind at 4.80%. In January, hourly probabilities peak at 8.51% for 7-8 a.m. CST. This time frame is also the forecasted peak load hour for January. Another increase in hourly load, with an accompanying increase in EEA risk, occurs for 5-10 p.m.

The ramping down of solar production contributes to the higher EEA risk during the early evening hours. There is some EEA risk throughout the nighttime and early morning hours. This risk pattern is influenced by recent and forecasted additions of large loads, such as data centers, that are expected to operate on a continuous "24x7 hour" basis, and, thereby, flatten the hourly load pattern from what is seen historically for the winter months.

The full reports can be found on our Resource Adequacy webpage.

Dec	Chance of Normal System Conditions	EMERGENCY LEVEL	
		Chance of an Energy Emergency Alert	Chance of Ordering Controlled Outages
Hour Ending (CST)	Probability of CAFOR being above 3,000 MW	Probability of CAFOR being less than 2,500 MW	Probability of CAFOR being less than 1,500 MW
1 a.m.	98.90%	0.79%	0.66%
2 a.m.	98.84%	0.89%	0.79%
3 a.m.	98.72%	0.95%	0.79%
4 a.m.	98.63%	1.06%	0.89%
5 a.m.	98.63%	1.09%	0.97%
6 a.m.	98.24%	1.38%	1.24%
7 a.m.	97.90%	1.75%	1.54%
8 a.m.	96.95%	2.51%	2.35%
9 a.m.	97.68%	1.79%	1.63%
10 a.m.	98.55%	1.08%	0.92%
11 a.m.	99.23%	0.56%	0.50%
12 p.m.	99.55%	0.22%	0.18%
1 p.m.	99.78%	0.14%	0.09%
2 p.m.	99.92%	0.05%	0.04%
3 p.m.	99.93%	0.02%	0.02%
4 p.m.	99.89%	0.02%	0.02%
5 p.m.	99.80%	0.06%	0.04%
6 p.m.	96.89%	1.24%	0.84%
7 p.m.	94.94%	2.30%	1.61%
8 p.m.	91.36%	4.90%	3.94%
9 p.m.	92.13%	4.80%	3.91%
10 p.m.	93.35%	3.88%	3.08%
11 p.m.	96.98%	1.36%	0.87%
12 a.m.	99.46%	0.17%	0.09%

Note: Probabilities are not additive.

Jan	Chance of Normal System Conditions	EMERGENCY LEVEL	
		Chance of an Energy Emergency Alert	Chance of Ordering Controlled Outages
Hour Ending (CST)	Probability of CAFOR being above 3,000 MW	Probability of CAFOR being less than 2,500 MW	Probability of CAFOR being less than 1,500 MW
1 a.m.	98.21%	1.45%	1.31%
2 a.m.	98.70%	0.87%	0.76%
3 a.m.	98.65%	0.93%	0.80%
4 a.m.	98.69%	0.89%	0.75%
5 a.m.	98.41%	1.11%	0.99%
6 a.m.	98.10%	1.49%	1.38%
7 a.m.	95.93%	2.81%	2.46%
8 a.m.	87.56%	8.51%	7.12%
9 a.m.	94.36%	3.69%	3.13%
10 a.m.	97.93%	1.35%	1.16%
11 a.m.	99.48%	0.27%	0.22%
12 p.m.	99.62%	0.20%	0.16%
1 p.m.	99.82%	0.11%	0.09%
2 p.m.	99.94%	0.02%	0.01%
3 p.m.	99.95%	0.01%	0.00%
4 p.m.	99.90%	0.02%	0.02%
5 p.m.	99.83%	0.06%	0.05%
6 p.m.	97.97%	0.98%	0.63%
7 p.m.	93.93%	2.82%	2.08%
8 p.m.	93.02%	3.65%	2.78%
9 p.m.	96.29%	1.95%	1.65%
10 p.m.	96.12%	2.14%	1.67%
11 p.m.	98.79%	0.54%	0.41%
12 a.m.	99.64%	0.19%	0.14%

Note: Probabilities are not additive.

NERC Winter Readiness Assessment

North American Electric Reliability Corporation's (NERC) 2024 Winter Reliability Assessment (WRA) report, published November 14, states that, from a national perspective, all areas look to have adequate resources for normal winter peak-load conditions. However, a risk for shortages does exist, mainly due to:

- Prolonged, large winter storms, which can lead to big increases in demand.
- Freezing that can impact generation supply and facilities.
- Renewable generation facing limitations in winter.

NERC highlighted ERCOT's Firm Fuel Supply Service (FFSS).

"ERCOT introduced firm fuel supply service to address fuel-related outages that can occur when natural gas supplies are limited."

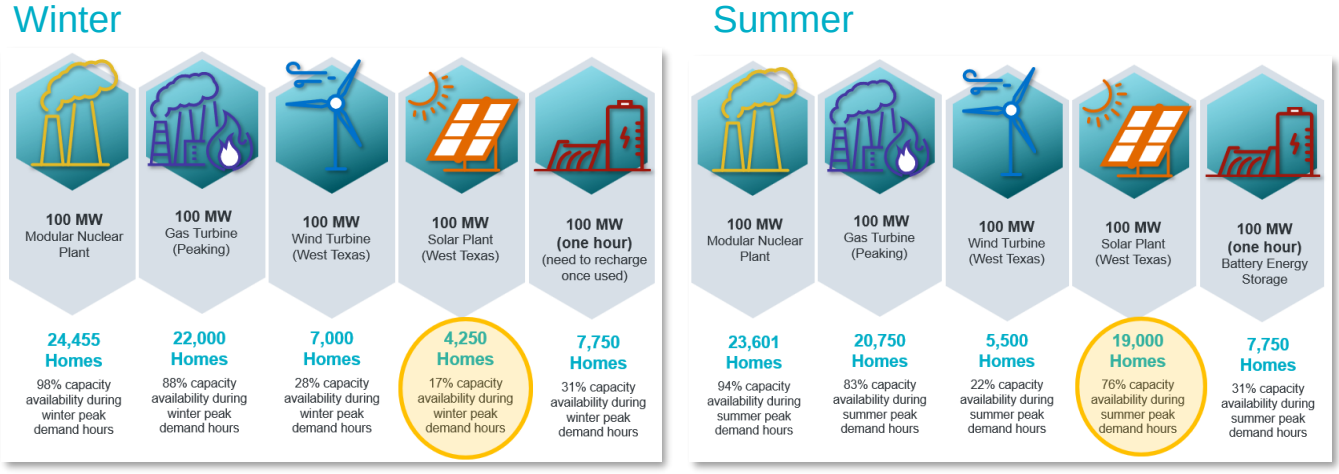
ERCOT has successfully used FFSS during recent winter storms.

Winter and Summer Generation Type Comparison Snapshot

The various generation types that make up the ERCOT grid have many different characteristics. To show their range of impact, the graphic below demonstrates what 100 MW can power in terms of customers in the winter versus summer.

It is important to note that the variability of both generation and load in winter is much greater than in summer. Some of the drivers of that variability include:

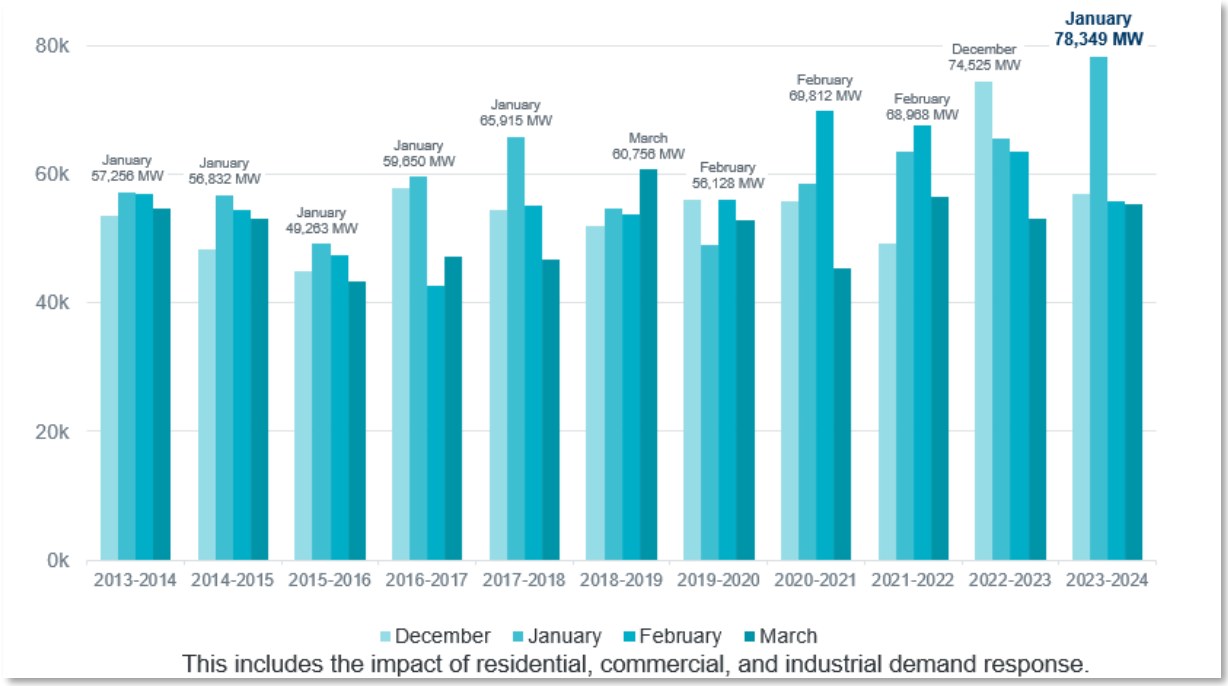
- The timing of winter storm fronts moving across the system creates large changes in load patterns.
- Wind chill during winter storms affects both load and generation.
- The wind speed on the forward and back sides of a moving winter storm creates rapid changes in wind generation output.
- Solar is not available during the early morning and evening hours creating large and rapid changes in net load.
- Batteries will help the grid; however, their limited duration will limit their usefulness during extended periods of scarcity conditions.



Note: 1 MW serves approximately 250 residential customers during peak demand.

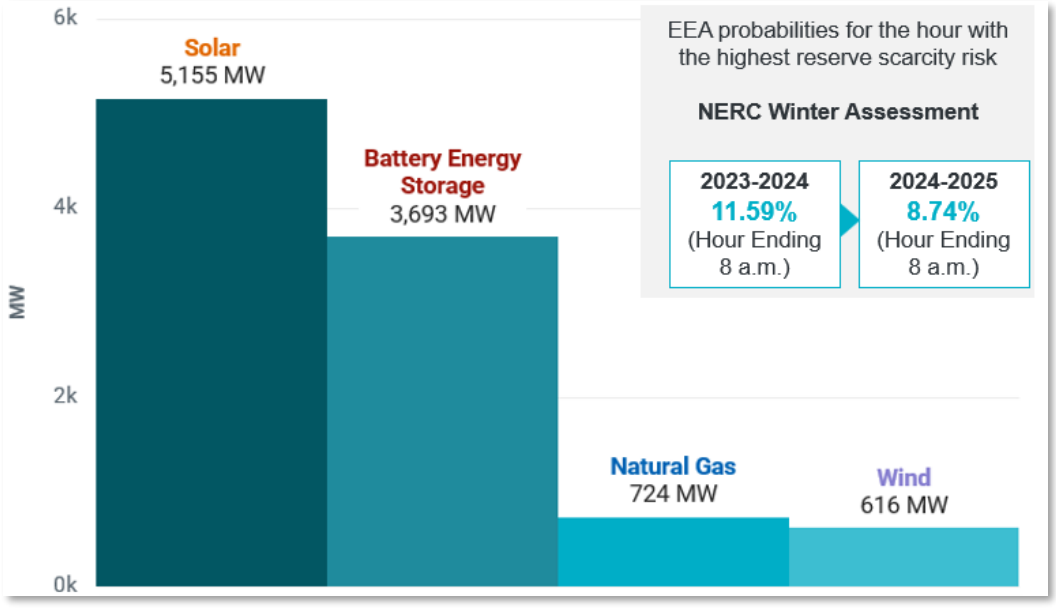
Winter Demand Growth Over Last 10 Years

- In the last 10 years, winter demand has grown more than 21,000 MW.
- The current winter peak demand is 78,349 MW (January 16, 2024, W.S. Heather, 7-8 a.m. hour).
- The previous winter peak was 74,525 MW (December 2022, W.S. Elliott, 7-8 a.m. hour).



New Generation Added Since Last Winter (March 1 – November 1)

- The ERCOT grid has added more than 10,000 MW of new generation capacity of various capability, but more dispatchable capacity is needed.
- Battery storage growth continues at a fast pace; thermal generation sees a slight increase.
- The ERCOT January MORA report (page 3) reflects more recent data than was used for the NERC WRA.



Weatherization Program

In early November, ERCOT held a Winter Weather Readiness Workshop with Market Participants (transmission and generation providers) to collaborate on weather preparedness ahead of the upcoming winter season. These collective sessions help strengthen our continued commitment to grid reliability and resiliency. Among other preparedness measures, they covered the requirements of the Public Utility Commission of Texas weatherization rule, 16 Texas Administrative Code § 25.55, ERCOT's associated weatherization inspection checklist, other relevant information for winter weather preparedness, and the use of the weatherization portal to submit winter weather preparedness documentation. Please see the ERCOT meeting calendar page for additional information.

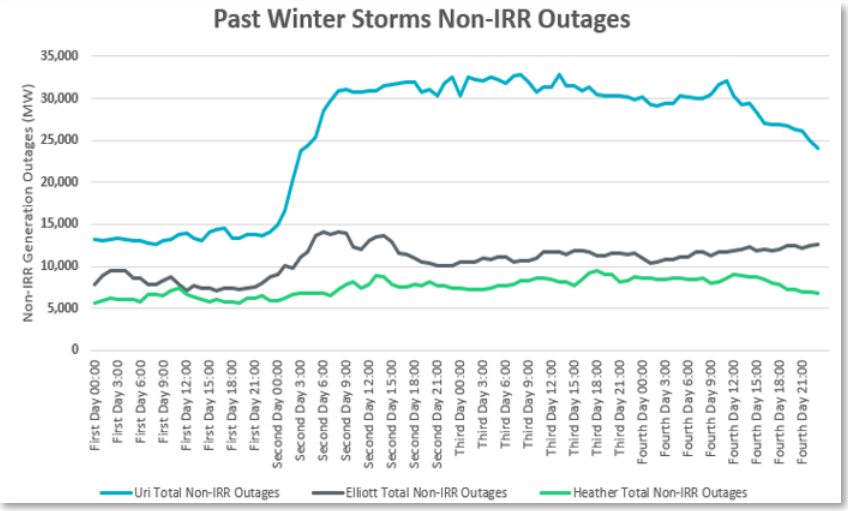
ERCOT also recently hosted a NERC Cold Weather Project Technical Conference with key industry stakeholders and equipment manufacturers to review seasonal preparedness plans. These collaborative information sharing events are important for long-term grid reliability and resiliency planning.

Program Summary

This winter marks the fourth year with a PUCT Weatherization Rule in place. Phase I of 16 TAC § 25.55 was adopted on October 19, 2021. Phase II was adopted on September 29, 2022, adding summer standards. Beginning in 2023:

- Weather zone-specific cold and hot conditions at which MPs must implement measures reasonably expected to ensure sustained operation
- List of all cold- and hot-weather-critical components

Inspections	Resources	TSP Facilities	Total
Winter '21-'22	302	22	324
Winter '22-'23	634	140	774
Summer '23	208	342	550
Winter '23-'24	340	129	469
Summer '24	417	358	775
Total to Date	**1,901**	**991**	**2,892**



Weatherization Program Seeing Positive Results

The graph at left shows the positive impact weatherization has had on non-intermittent renewable resources (IRR) during recent winter storms.

Key Takeaway

Non-IRR outages during W.S. Heather (Jan. 2024) remained lower than W.S. Elliott (Dec. 2022) and W.S. Uri (Feb. 2021).