March 2024
Look Back

GRID OVERVIEW

March Peak Demand
Set on March 5, the March peak demand of 55,298* MW is 2,204 MW more than the 2023 March peak demand of 53,094 MW set March 31, 2023.

*Based on the maximum net system hourly value from the 2024 March Demand and Energy report.
**Based on the minimum net system 15-minute interval value from the 2024 March Demand and Energy report.

Recent March Peaks
ERCOT peak demand records can be found on our website or by navigating to About Us > Helpful Resources > Peak Demand.

- The March demand record of 60,756 MW occurred March 5, 2019, in the 7-8 a.m. hour.
- March 2023 peak demand: 53,094 MW in the 5-6 p.m. hour on March 31
- March 2022 peak demand: 56,463 MW in the 7-8 a.m. hour on March 12
- March 2021 peak demand: 45,380 MW in the 5-6 p.m. hour on March 27
- March 2020 peak demand: 52,833 MW in the 4-5 p.m. hour on March 26
- View ERCOT’s peak demand records.

Solar and Wind Records

- ERCOT set two new solar generation records:
  - 18,881 MW March 28 at 11:24 a.m. with 42.97% penetration at record time
  - 18,442 MW March 26 at 1:57 p.m. with 42.36% penetration at record time
- A new renewable penetration record of 75.67% was set March 29 at 2:13 p.m. Renewable generation at record penetration time was 34,958 MW.
- These records and other grid facts can be found on the ERCOT Fact Sheet.
TOTAL SOLAR ECLIPSE RECAP

On Monday, April 8, a total solar eclipse passed over Texas from the southwest to the northeast. As forecasted, the eclipse impacted solar generation in Texas from approximately 12:10 p.m. to 3:10 p.m. CDT. The eclipse was comparable to ERCOT experiencing a faster-than-normal sunset and sunrise in the middle of the day. Solar generation was reduced, dropping from an instantaneous peak of 13.8 GW at the beginning of the eclipse to a low output of 0.7 GW at 1:36 p.m., and then rising to approximately 13.8 GW by 3:10 p.m. ERCOT committed additional generation, took manual actions to increase ramping capability, and deployed Ancillary Services to maintain reliability.

MONTHLY ENERGY GENERATION MIX

The monthly energy generation increased by 1.4% year-over-year to 32,201 GWh in March 2024, compared to 31,763 GWh in March 2023. The chart below shows the generation type fueling the grid each month.

Data for the last two months is based on preliminary settlements.
ANCILLARY SERVICES

ERCOT uses Ancillary Services (AS) to balance the next day’s supply and demand of electricity on the grid and mitigate Real-Time operational issues. Real-Time AS deployment is viewable on our dashboards.

ERCOT procured $27.52 million in Ancillary Services for grid reliability in March 2024.

WHOLESALE PRICES

Average energy prices for March were relatively low, which is typical during the fall and spring seasons. Low fuel costs, specifically natural gas prices, were also a contributing factor.
TRANSMISSION CONGESTION COSTS

Total Real-Time congestion rent increased in March 2024 compared to February 2024 with the highest congestion rent in the South and West Zones.

* Averages are weighted by Real-Time Market Load.

**Security Constrained Economic Dispatch (SCED) is the Real-Time market evaluation of offers to produce a least-cost dispatch of online resources. SCED calculates Locational Marginal Prices (LMPs) using a two-step methodology that applies mitigation to resolve non-competitive constraints. More information is on our website.

GENERATION INTERCONNECTION QUEUE BY FUEL TYPE

As of March 31, ERCOT was tracking 1,775 active generation interconnection requests totaling 346 GW. This includes 155 GW of solar, 35 GW of wind, 141 GW of battery, and 15 GW of gas projects.

*The dates shown are based on developers’ expected commercial delivery dates, and traditionally, we have only seen ~60% make their date.
ERCOT LARGE LOAD INTEGRATION OVERVIEW

The amount of Large Load connected to the ERCOT grid is projected to continue growing. ERCOT continues to work on rules with the Large Flexible Load Task Force to move forward where there is consensus and mitigate reliability risks on topics where there is not.

4,479 MW of Large Load have been approved to energize in the past two years. Of these, 2,844 MW are believed to be operational, and the remaining 1,635 MW may energize at any time without additional approval.

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<th>2024</th>
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RELIABILITY UNIT COMMITMENT

Reliability Unit Commitment (RUC) activity for March included 10 Resources committed due to capacity or congestion.

“Effective Resource-Hours” excludes any period during a Reliability Unit Commitment hour when the RUC-committed Resource was starting up, shutting down, off-line, or otherwise not available for dispatch by SCED.
AANS, OCNS, AND ERCOT SHOULDER MONTHS

In the previous issue (ERCOT-Monthly-March-2024.pdf page 6), we explained how the spring months (March, April, and May) are our shoulder months, when we work with generator and transmission owners to schedule maintenance outages for their equipment ahead of summer. This means on a given day during the spring, fewer operating reserves may be available while equipment is down for maintenance work.

We issue notices daily, which are one way we communicate with our generator and transmission owners (also referred to as Market Participants (MPs)). It’s important to note that these notices are directed to and intended for the generators and transmission owners and are posted for transparency into grid operations.

As ERCOT manages supply and demand on the grid, we might issue an Advance Action Notice (AAN), which is a tool we use to aid us in reliably managing the grid. The AAN is an operational notice used as a heads-up to MPs that ERCOT needs to adjust or delay some scheduled maintenance outages for a specific period of time due to a change in forecasted conditions. The reasons can include hotter temperatures, high number of scheduled and/or forced outages, and low renewable generation – or a combination of these.

The request to adjust or delay a maintenance outage often leads to a positive market response, which provides the additional capacity ERCOT was looking to obtain. We then work to reschedule any delayed maintenance so the operators can be ready for the upcoming peak demand season.

For context, two AANs have been issued this spring (as of April 30), while last spring at this same time, three had been issued (see box at left).

ERCOT might also issue an Operating Condition Notice (OCN) as a heads-up to MPs that certain protocol criteria have been met (for example from last May: Temperatures have met our criteria of 94 degrees or higher in the months of October-May between San Antonio and the Dallas Fort Worth region). The MPs then take any actions they may need to be best prepared for these hotter temperatures.

### AANs Issued with the requested MW:

#### Spring 2024
- Issued April 12 (4,867 MW)
- Issued April 26 (2,832 MW)

#### Spring 2023
- Issued March 16 (3,071 MW)
- Issued March 29 (7,808 MW)
- Issued April 20 (1,720 MW)
- Issued May 3 (2,900 MW)
- Issued May 4 (3,380 MW)
- Issued May 11 (4,500 MW)
- Issued May 16 (3,000 MW)

### Stay Informed

If tighter grid conditions with higher demand periods were expected, ERCOT would issue a notification to the public and media through TXANS, post on social media, and distribute a news release.

Another way to stay informed on current and extended grid conditions is to view our Grid and Market Conditions (ercot.com) dashboards. Two easy-to-view dashboards are Supply and Demand (left graph), which shows a current view and a 6-day look ahead, and the Grid Conditions (right graph), which shows Real-Time operating reserves.
May Look Forward

May Monthly Outlook for Resource Adequacy (MORA) Scenarios

Under typical grid conditions, the deterministic scenario indicates that there should be sufficient generating capacity available to serve the expected peak load. Scenario modeling results indicate a low risk, less than 1%, of ERCOT having to declare an Energy Emergency Alert (EEA). For the typical peak load day in May, the highest risk hours extend from 6 p.m. to 10 p.m. when daily loads are typically near their highest levels and solar production is ramping down. The highest risk hour is Hour Ending 9 p.m.

The ratio of available dispatchable to available total capacity for the peak load hour (9 p.m.) is 79%. This latter measure helps indicate the extent that the grid relies on dispatchable resources to meet the peak load. The possibility of low wind production remains a significant risk for maintaining adequate reserves for the May peak demand day. Probabilistic and deterministic scenarios that reflect an historically low May wind generation day (based on weather going back to 1980) indicate an increased reserve shortage risk during the early evening hours. (Please note, the MORA probabilistic assessment is not intended to forecast expected grid conditions.)

MORA reports can be found on ERCOT’s Resource Adequacy page.
Links to the May MORA:
MORA_May2024.pdf (ercot.com)
MORA_May2024.xlsx (live.com)
Additional Items of Note

May CDR

ERCOT publishes a Capacity, Demand, and Reserves (CDR) report twice a year to provide forecasted Planning Reserve Margins for the ERCOT summer and winter Peak Load Seasons (June - September and December - February, respectively). The Planning Reserve Margin represents the percentage of resource capacity in excess of firm electricity demand available to cover uncertainty in future demand, generator availability, and new resource supply.

In May, ERCOT will release the Summer 2025 CDR, which will include ERCOT Protocol required summaries for future years; however, it will also contain a supplemental tab with the numbers stemming from the incorporation of House Bill (HB) 5066 (88th Legislative Session) requiring ERCOT to include prospective load identified by Transmission Service Providers. This has led to significant increases in large loads (i.e., crypto mining, hydrogen and hydrogen-related manufacturing, data centers, and electrification).

Legislative Update

The Texas Senate has released the 2024 Interim Legislative Charges with many related to the electric industry and the ERCOT market. ERCOT looks forward to participating in the Interim Charge process to ensure we maintain an efficient and reliable electric market. Relevant electric industry-related Interim Charges include:

- **Electricity Market Design:** Assess state efforts to provide incentives for new thermal generation. Review and report on the state of the electricity market in Texas and issues impacting the reliability and resiliency of the Texas electric grid. Consider rulemaking related to wholesale market design, including the impact of these changes on grid reliability, market revenues, costs to consumers, and the efficiency of operations. Examine and report on the direct and indirect impacts that variable resources, such as wind and solar, have on grid resiliency, consumer prices, and market uncertainty. Monitor the implementation of House Bill 1500, 88th Legislature.

- **Texas Energy Fund:** Review and report on the impact of Senate Bill 2627, Powering Texas Forward Act, as passed by the 88th Legislature, which established the Texas Energy Fund (TEF) to provide grants and loans to finance the construction, maintenance, modernization, and operation of electric facilities in Texas.

- **Innovative Power Generation:** Explore emerging technologies with the potential to add new dispatchable power to our electric grid, including, but not limited to, small modular nuclear reactors, advanced batteries, and new developments in hydrogen and geothermal resources. Identify and recommend regulatory and policy actions required to deploy emerging technologies within the state's electric grid.

- **Transmitting Texas Power:** Identify the future electric transmission and distribution system needs of the state and recommend ways to reduce barriers to constructing the necessary electric infrastructure to support the growing demand and changes in technology. Review and make any necessary recommendations to enhance legislation.
passed during the 88th Legislative Session, including the status of projects to improve the safety and resiliency of the transmission system, as well as the effect of current and future projects on consumer costs.

- **Managing Texas-sized Growth:** Evaluate the state's ability to keep pace with increasing electricity demand related to population growth and energy intensive technologies, such as electric vehicles and data centers. Recommend ways to increase reliability via demand-side response programs. Study ERCOT's forecasting methodology and recommend ways to increase transparency. Monitor ongoing efforts at the Public Utility Commission related to energy efficiency programs and distributed energy resources, including the implementation of Senate Bill 1699 (88th Legislature).

- **Impact of Bitcoin Mining on the Texas Electric Grid:** Study the impact of energy-intensive cryptocurrency mining facilities on the Texas electric grid. Report on whether any changes should be made to ERCOT demand response programs and Large Flexible Load registration requirements to limit the impact of these facilities on system reliability and consumer costs.

- **Artificial Intelligence:** Examine the development and utilization of artificial intelligence (AI). Evaluate the implications of AI adoption across the public and private sectors. Make recommendations for a responsible regulatory framework for AI development, including data privacy, industry standards, consumer protections, risk mitigation, and compliance processes.

ERCOT also continues to implement the various legislative provisions from previous legislative sessions. A full listing of the of legislative provisions currently undergoing the implementation process can be found in the [ERCOT Legislative Status Report](#).

**Highlights from the April 23 Board of Directors Meeting**

- At the April [Board of Directors meeting](#), ERCOT President and CEO Pablo Vegas unveiled a “New Era of Planning” strategic initiative to help ensure that all areas of system planning – from generation and load interconnections, to transmission development – can adapt to better serve the needs of the rapidly growing Texas economy. The [presentation](#) detailed the challenges and opportunities ahead for the ERCOT region, which is forecasted to experience tremendous electric demand growth in the next 5-7 years at a time when the generation resource mix continues to diversify. In addition to utilizing the tools from the last two Texas legislative sessions, ERCOT is focused on changing transmission planning processes to adapt to the changing grid and exploring new opportunities to stay ahead of the growth curve. You can watch the CEO Board Update in the [ERCOT archived videos](#).

- The Board’s [Reliability and Markets Committee](#) discussed [results](#) of ERCOT’s reliability analysis for three natural-gas fired units owned by CPS Energy that gave notice to indefinitely suspend operations on March 31, 2025. ERCOT’s analysis identified performance deficiencies for which the three Braunig units have a material impact and determined that they are needed to support system reliability. Due to the results of the reliability analysis, ERCOT will issue a Request for Proposal (RFP) for Must-Run Alternatives (MRAs). The purpose of the RFP is to solicit more cost-effective alternatives rather than entering into a Reliability Must-Run (RMR) agreement for the impacted resources. The ERCOT Board will approve any potential agreement. In addressing the
need to support ERCOT System reliability, any decision on whether or not to enter into an RMR or MRA service agreement must evaluate the costs and benefits of the service. Additional information regarding the RMR process is available here.

- The ERCOT Board voted to approve the San Antonio South Reliability II Regional Planning Group (RPG) Project, a $435 million, Tier 1 project with expected in-service dates from 2028 to 2029. The Board designated the project as critical to the reliability of the ERCOT System pursuant to Public Utility Commission of Texas (PUCT) Substantive Rule § 25.101(b)(3)(D).

The project will support ERCOT reliability requirements through improvements to 45.8-miles of 345-kV and 13.4 miles of 138-kV transmission lines intended to address thermal overloads in the San Antonio area, located in Guadalupe, Wilson, and Atascosa Counties in the South and South-Central weather zones. The San Antonio South Reliability II Project will require PUCT approval of a Certificate of Convenience and Necessity (CCN) before construction can commence. The critical designation will allow the PUCT to consider the project on an expedited basis.

- The Board of Directors approved two revisions to the ERCOT Nodal Protocols along with a revision to the Retail Market Guide. These revisions are now pending final approval at the PUCT for consideration at the June 13, 2024, Open Meeting. Information regarding recently approved rules and the revision request process is available on the Market Rules section of the ERCOT website.

  - The Board also considered NOGRR245, Inverter-Based Resource (IBR) Ride-Through Requirements, ultimately moving to send the matter back to the Technical Advisory Committee (TAC) for further consideration. ERCOT will continue to work with stakeholders on the reliability initiative to develop voltage and frequency ride-through requirements for IBRs and Wind-powered Generation Resources consistent with new Institute of Electrical and Electronics Engineers (IEEE) Interconnection and Interoperability Standards. NOGRR245 is expected to be back in front of the ERCOT Board at the June 18 meeting.

  - The Board’s Reliability and Markets Committee received an update regarding ERCOT Contingency Reserve Service (ECRS) performance and potential changes to the Ancillary Service. (Please see the following section for more on ECRS).

- The Board of Directors accepted the ERCOT audited Consolidated Financial Statements for the Years Ending December 31, 2023 and 2022. ERCOT Bylaws provide that “[a]t least annually, an audit of the financial statements of ERCOT shall be performed by the Auditor approved by the Board.” Baker Tilly performed the audit along with an assessment of internal controls, recommendations, and other business items raised by the Board’s Finance and Audit Committee.
ERCOT Contingency Reserve Service Update

During review of the Ancillary Services (AS) Methodology for 2024, ERCOT committed to revisit ERCOT Contingency Reserve Service (ECRS) prior to summer, based on feedback from the Independent Market Monitor (IMM). Actions taken to date include:

- Reduced quantity during review of AS for 2024
- Will discuss quantity criteria later in the year as part of other AS efforts
- Current focus for this summer is whether or not to release ECRS earlier on tight days

ERCOT has worked with the IMM to develop potential mechanisms to release ECRS earlier during near-scarcity conditions, while still meeting system reliability requirements. One option is a continuous release of the portion of ECRS not used for frequency recovery behind an offer floor; however, this option requires Protocol and system changes by ERCOT and Market Participants, and, therefore, will not be implemented before this summer. The quicker option is to release blocks of ECRS automatically when SCED is short of capacity by a given amount.

ERCOT proposed NPRR 1224 to formalize the mechanism to be used to release ECRS when SCED is short. We worked with the IMM to propose a trigger level at which this release would occur to start the stakeholder discussion. We expect the ultimate trigger will be determined through the NPRR approval process, which would balance the impacts of this change on various stakeholders.

The Protocol Revision Subcommittee tabled NPRR 1224 at its April meeting, making a decision on NPRR 1224 unlikely before summer. Without this guidance on an appropriately-balanced trigger, ERCOT intends to release ECRS in a similar manner to last year until such guidance is received. ERCOT will, in parallel, be filing a separate NPRR to implement the “offer floor” option so that it can be considered.

New EPA Rules Impacting Power Plant Operations Announced

On April 25, the EPA finalized four new rules impacting power plant operations. These rules include the following:

- **Greenhouse Gas Rule.** Substantially limits emissions of carbon dioxide from existing coal-fired and new natural gas-fired power plants at levels determined based on operations using carbon capture and sequestration (CCS).

- **Mercury and Air Toxics Standards (MATS) Rule.** Substantially restricts emissions of mercury and other substances at coal-fired power plants.

- **Effluent Limitation Guidelines.** Establishes discharge standards for various wastewater pollutants at coal-fired power plants.

- **Coal Combustion Residuals (CCR) Rule.** Broadens the scope of existing coal ash impoundment restrictions to include additional sites that were previously unregulated at the federal level.

ERCOT is currently evaluating the potential impacts of these rules.
Consideration of Mitigation Solutions for South Texas Export Generic Transmission Constraints

ERCOT is working to identify solutions to mitigate the need for possible firm load-shedding if flows on certain lines transporting power from South Texas to the San Antonio area exceed certain limits. ERCOT has determined that flows exceeding these limits can, under certain operating conditions, place the reliability of the entire grid at risk. ERCOT established the South Texas Export Generic Transmission Constraints (GTC) to enable ERCOT's tools to ensure these flow limits are factored into generator dispatch. However, during high system demand and a deficiency of generation north of the GTC, flows on these lines could still exceed the limits. In those cases, ERCOT would be required to take all actions necessary to mitigate any overload of the South Texas Export GTC, including directing firm load-shedding if necessary.

ERCOT has already implemented operating procedures to help reduce the need for load-shedding under these conditions. For example, when loading approaches 90% of the limit, ERCOT will activate a series of pre-arranged transmission switching actions that will reduce the loading on the impacted transmission lines.

However, ERCOT is also investigating other additional measures that may help mitigate load-shedding risk by remediying the generation deficiency north of the GTC. ERCOT is currently developing a request for proposal (RFP) seeking the participation of demand response or generation capacity sources in certain high-impact locations. If the PUCT approves this proposal and valid offers are submitted and awarded, this solution could be in place as soon as early July.

ERCOT is also investigating changes to certain price parameters in its dispatch algorithm that could allow for more optimal management of congestion on these lines, reducing the likelihood of load-shedding. We have also initiated discussions with Transmission Service Providers (TSPs) regarding new technologies that may improve dynamic ratings of transmission lines, which may allow for greater transfer capability under certain weather conditions.
Upcoming Activities

BOARD OF DIRECTORS MEETINGS*

ERCOT Board of Directors meetings are livestreamed on ercot.com, where you can also find links, additional information, agendas, and supporting documents.

June 18    August 20    October 10    December 3

RELIABILITY & MARKETS (R&M) COMMITTEE MEETINGS*

ERCOT Reliability & Markets (R&M) meetings are livestreamed on ercot.com, where you can also find links, additional information, agendas, and supporting documents.

June 17    August 19    October 9    December 2

TECHNICAL ADVISORY COMMITTEE (TAC) MEETINGS*

ERCOT Technical Advisory Committee (TAC) meetings are livestreamed on ercot.com, where you can also find links, additional information, agendas, and supporting documents.

May 22    June 24    July 31
August 7 & 28    September 25    October 30    November 20

ERCOT has additional working groups and committees. *Meetings dates are subject to change so please check the meetings page for the latest and for more on the various groups, committees, dates, agendas, and meeting materials.

ERCOT INNOVATION SUMMIT, May 21

ERCOT’s first annual Innovation Summit, May 21, will discuss how rapid grid transformation is shaping the future of the grid and brainstorm solutions for using innovation to impact transformation. The curated agenda will feature discussions with industry executives and subject matter experts on topics including essential reliability services, demand flexibility, uncertainty management, energy storage resources, transmission planning, and technology trends.

Visit www.ercot.com/summit for more information and to register for the live stream.