
ERCOT Trending Topics

TOPIC: USING LOAD SHED TO ADDRESS SHORTAGES IN THE GENERATION SUPPLY

In this ERCOT Trending Topic, we explain why ERCOT may sometimes need to direct transmission operators to shed load (reduce demand) of customers during emergency operations and how load-shedding is carried out.

Summary

The use of load-shedding is a last-resort action for ERCOT and only occurs when all other options have been used. Using rotating outages ensures the Texas electric grid can continue to operate during times when there isn't enough supply available.



FACTS:

As the Texas electric grid operator, ERCOT is responsible for keeping the supply of electricity balanced with the amount of electricity being used (also called "demand") by customers. The supply of electricity primarily comes from generators located across the state. ERCOT does not own or operate these generators. Generating companies use a variety of fuels to produce electricity, including gas, coal, nuclear, wind, and solar. Wind and solar generators provide a supply of power that varies throughout the day – simply put, the wind doesn't always blow, and the sun doesn't always shine, so different types of generation are needed to provide power around the clock. Demand also varies throughout the day as customers increase and decrease their use of electricity for different reasons. Other emerging technologies, like rooftop solar on houses and grid-scale batteries, are becoming larger factors in balancing supply and demand.

On most days, ERCOT has more than a sufficient supply to meet demand. However, in unusual cases, the supply of generation may not be sufficient for a variety of reasons. For example, a number of generators could break down unexpectedly. In general, ERCOT calls these generator outages. Further, transmission lines can get overloaded when moving power around the grid and that limitation can reduce the amount of available generation. Or if the wind isn't blowing or the sun isn't shining, output from wind and solar generators can drop far below normal seasonal levels. Extremely hot or cold weather can also drive demand by customers well beyond what is ordinarily used. All of these

conditions are outside of ERCOT's control, and if any one or more of these occurs, this could result in an inadequate supply of generation to meet demand.

How does ERCOT address potential or actual shortfalls in the generation supply?

To help reduce the chance that these unexpected conditions result in grid balancing problems, ERCOT always holds an amount of generation in reserve. If these reserves fall below a minimum level, or are expected to fall below that level, ERCOT will ask customers to reduce their electricity usage. If voluntary conservation isn't sufficient, ERCOT will declare an Energy Emergency Alert, or EEA. ERCOT has three progressive levels – called EEA 1, EEA 2, and EEA 3. Each level allows ERCOT to access additional tools to manage the system conditions at that time. These tools include deploying certain special services that are available only in emergencies and requesting imports of power from neighboring regions, like coordinating with the grid operator to our north (Southwest Power Pool (SPP)), the grid operator to our east (Midcontinent Independent System Operator (MISO)), or the grid operator to our south in Mexico (CENACE). Learn more about our [EEA levels](#).

If those measures are not enough to keep supply and demand in balance, ERCOT's only option is to limit overall demand by directing transmission operators to temporarily disconnect some customers (also called "load-shedding") in a controlled manner so that the total demand does not exceed the available supply at that time. If ERCOT did not direct load-shedding, the imbalance of supply and demand could result in a blackout of the entire Texas grid, which could take many days or even weeks to recover from. ERCOT requests load-shedding only to the extent needed to maintain the balance between supply and demand. When enough supply becomes available and the Texas grid is stable, ERCOT directs transmission operators to restore service to all customers, and ERCOT returns to normal operations.

How do transmission operators implement these load-shedding directives?

When ERCOT directs load-shedding, transmission operators generally attempt to carry this out by using "rotating outages." Rotating outages limit the duration of power outages that any one customer must endure. When ERCOT issues a load-shedding instruction to transmission operators, it also notifies them of the total amount of load or demand that needs to be reduced across the grid. Each transmission operator then calculates its share of the total amount of load-shedding and applies it to their system. The transmission operator's share is calculated based on its percentage of the total system-wide peak demand from the previous year. ERCOT posts this information in what is called a "[Load Shed Table](#)." ERCOT has both a Summer Load Shed Table and Winter Load Shed Table.

Customers that provide critical public services, such as hospitals, police stations, critical water and wastewater facilities, critical gas facilities, nursing homes, and fire stations, are generally prioritized during rotating outages but may also be impacted depending on the depth and duration of the load-shed event. These customers have followed the local Distribution Service Provider’s process to be listed as a critical load. ERCOT is not involved in this process, nor does ERCOT know the locations of these critical customers.

Customers should always reach out to their local utility or Distribution Service Provider when experiencing any outage for additional information.

How long are customers subject to rotating outages?

The time a customer is subject to a rotating outage is determined by the transmission operator and the local distribution providers that they serve. The rotating outage time varies by utility, the specific event, weather, or other factors. Smaller transmission operators tend to have a shorter target time for rotating outages (e.g., 10-30 minutes), while larger operators may have longer times (e.g., 60 minutes or greater). The target times may be impacted by the size (MW quantity) of load shed directed by ERCOT. The utilities will rotate power as efficiently as possible to minimize individual customer outage times. The table below identifies the 20 transmission operators responsible for load-shedding across the Texas grid.

Transmission Operators	
AEP Texas Central Company	Denton Municipal Electric
Brazos Electric Power Cooperative Inc.	GEUS
Brownsville Public Utilities Board	Golden Spread Electric Cooperative
Bryan Texas Utilities	Lamar County Electric Cooperative Inc. dba LEC
CenterPoint Energy Houston Electric LLC	LCRA Transmission Services Corporation
City Of Austin dba Austin Energy	Oncor Electric Delivery Company LLC
City Of College Station	Pedernales Electric Cooperative Inc.
City Of Garland	Rayburn Country Cooperative Inc.
City Of Lubbock, acting through Lubbock Power & Light	South Texas Electric Cooperative Inc.
CPS Energy	Texas-New Mexico Power Company