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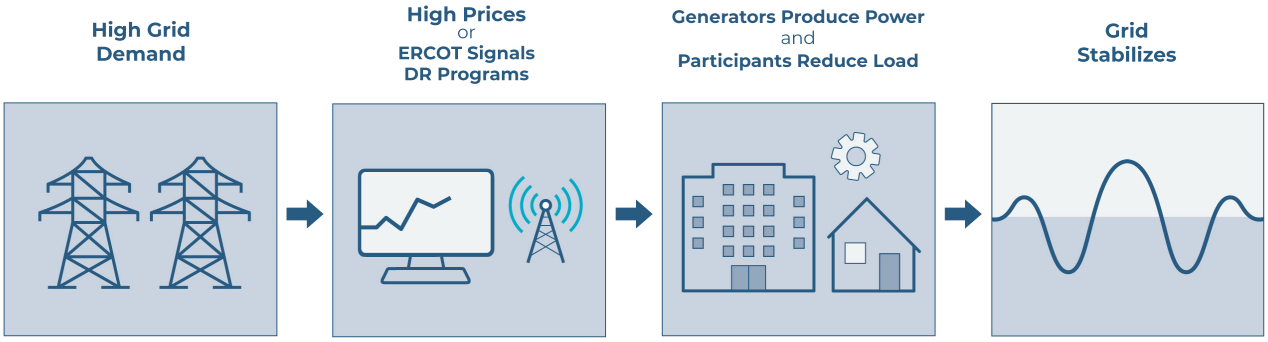
# ERCOT Grid Insights

**Addressing issues important to maintaining a reliable and resilient grid**

## ERCOT DEMAND RESPONSE

In this issue: A primary responsibility of ERCOT is to maintain reliability through real-time monitoring and management of supply and demand. This includes continually assessing grid conditions and adjusting resources, based on load forecasts, to ensure stability. As ERCOT continues to experience unprecedented load growth, there is a need to both increase the generation capacity of the system to serve that higher load as well as consider programs and incentives that aid in reducing load during periods when the system is stressed. These programs designed to reduce the total load on the system are called **Demand Response (DR) programs** and have been in place at ERCOT since before 2010.




*ERCOT's Demand Response process*

ERCOT's Demand Response has continued to evolve over the years with products and services that, as a key part of ERCOT's energy-only wholesale market, are designed to deploy to support the system during periods of high demand. Just like generators that are paid for the electricity that they produce, DR programs are tools used by ERCOT to help reduce load to balance electricity supply and demand, especially during scarcity periods on the grid, as in the case of extreme weather events or unexpected generation or transmission outages.

Demand Response efforts also enhance competition. When consumers reduce their usage during times of high demand and wholesale prices, it not only helps balance the grid, but brings those wholesale prices down. Both consumers and generators can compete to provide Ancillary Services, which are reliability insurance products that ERCOT buys on behalf of consumers to balance supply and demand on the grid. Since the cost of Ancillary Services is ultimately borne by all consumers, more participants competing to provide Ancillary Services results in lower prices ERCOT pays to acquire them.

Demand Response tools include programs administered by ERCOT as well as non-ERCOT programs. ERCOT's DR programs fall into three categories: Emergency Response Service (ERS), Load Resource Participation, and Voluntary Load Response. These tools and programs give Market Participants (MPs) the ability to reduce or modify their electric energy consumption if directed by ERCOT. MPs also may participate by offering power directly into the ERCOT wholesale market or indirectly by voluntarily reducing their energy usage in response to wholesale prices.


*ERCOT's three Demand Response categories*

## EMERGENCY RESPONSE SERVICE (ERS)

**What:** Emergency Response Service (ERS) is designed to help maintain grid reliability during emergency conditions. Consumers that are sometimes large users of energy, like factories, all the way to those who use a relatively smaller amount of energy, like residential homes, agree to reduce their power use during grid emergency conditions to decrease the likelihood of systemwide load-shedding. The use of load-shedding is a last-resort action for ERCOT and only occurs when all other options have been exhausted.

**How it Works:** ERCOT contracts with Qualified Scheduling Entities (QSEs) to make arrangements with residential, commercial, and industrial consumers by paying them to be available to either reduce consumption or increase their customer-owned generation across the grid when called upon by ERCOT. ERCOT procures ERS four times per year for terms that align with ERCOT's peak or shoulder energy seasons: December-March, April-May, June-September, and October-November. ERS participants are required to provide an agreed-upon number of

megawatts (MW) within 10 to 30 minutes when called upon. ERS is deployed when ERCOT's Physical Responsive Capacity (PRC), which is the total amount of generation and load resources that are available to respond quickly to system events, falls below 3,000 MW. There have been 11 ERS deployment events in the 18 years since the program's inception in 2007.

**Grid Significance:** ERS is designed to prevent or alleviate an actual or anticipated Energy Emergency Alert (EEA) event. ERCOT has seen a significant increase in participation in the ERS program over the past 18 months. At the same time, ERCOT has noticed an increase in large loads participating in Self-Deployment, the term used when a resource takes conservation actions prior to being called upon by ERCOT.

## LOAD RESOURCE PARTICIPATION

**What:** A Load Resource (LR) is a load that is capable of and participates in providing Ancillary Services, energy in the form of Demand Response to help mitigate reliability risks that may occur to the system. A Load Resource is capable of controllably reducing or increasing consumption at the direction of ERCOT.

**How it Works:** Several types of Load Resources participate in ERCOT Ancillary Services and Demand Response activities.

- Controllable Load Resources (CLRs) are integrated into ERCOT's Security-Constrained Economic Dispatch (SCED) system and are capable of incrementally reducing or increasing their consumption in real time under Dispatch control by ERCOT.
- Non-Controllable Load Resources (NCLRs) reduce load when called upon by ERCOT, but their response is generally in large blocks of reduced consumption.
- Aggregate Load Resources (ALRs) are collections of individual smaller loads, typically under 10 MW each of Demand Response capability, and in the same load zone that are aggregated into a group to participate in ERCOT's Ancillary Services and Energy Markets as a CLR.

**Grid Significance:** Load Resources that participate in ERCOT's Ancillary Services help balance supply and demand on the grid in real time during times of high demand or scarcity. In the ERCOT market, the value of an LR's load reduction is equal to that of an energy injection or an increase in generation by a generating facility. When LRs reduce demand during high-priced periods, they help mitigate price spikes in the wholesale market, which can translate to lower prices for consumers over time.

## VOLUNTARY LOAD RESPONSE

**What:** Voluntary Load Response is a type of demand-side participation where consumers volunteer to reduce their electricity usage during periods of high demand or elevated wholesale prices on the ERCOT grid. This includes increasing Demand Response capacity from 'smart'

devices (i.e., thermostats, EV chargers, batteries, water heaters, and pool pump switches) that are installed, as well as larger customers that can modify their operations to reduce demand. By doing so, consumers may receive bill credits or other incentives from their Load Serving Entity (LSE), which could be a competitive retailer, co-op, or city utility (depending on where the consumer lives). ERCOT does not provide direct compensation to consumers who conserve during peak demand periods, but consumers may save money via their specific contracts or simply by reducing consumption when energy wholesale prices are higher.

**How it Works:** Voluntary Load Response participation reduces strain on the grid during high demand periods and supports overall grid resiliency efforts. Consumers also may see lower energy bills during high-price periods and/or take advantage of financial programs offered by their LSEs.

**Additional Note:** ERCOT is reviewing existing Demand Response tools and developing new ones. For example, ERCOT is currently conducting a pilot program that allows Aggregate Distributed Energy Resources (ADERs) to participate in the ERCOT wholesale market. An ADER is a resource consisting of multiple individual metered sites connected at the distribution system level that has the ability to respond to ERCOT dispatch instructions.