

AECT

**ASSOCIATION OF ELECTRIC
COMPANIES OF TEXAS, INC**

Overview of Distributed Energy Resources (DERs) in ERCOT

What is a DER?

Distributed Energy Resources (DERs)
include devices connected to the
distribution grid that **generate electricity** or
reduce the customer's electricity usage.
DERs may or may not be compensated in
the market for doing so.

There are Two Basic Types of DER

Distributed Energy Resources (DERs)

SMALLER DERs:

Distributed Generation

Small DG (Under 1 MW)



Demand Response

Residential and Small Commercial



LARGER DERs:

Distributed Generation

Large DG (1MW – 10 MW Participating in the ERCOT Market)

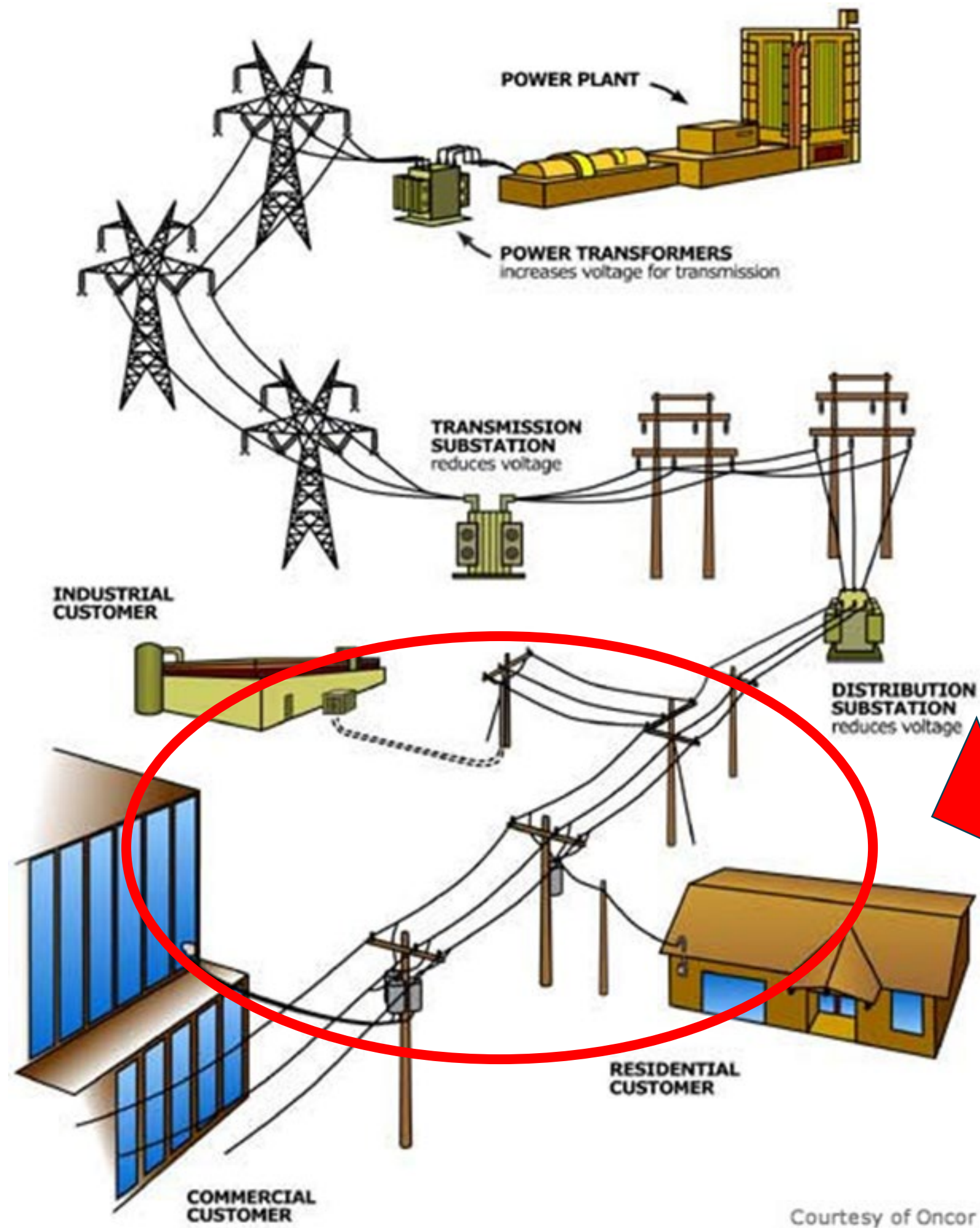


Demand Response

Large Commercial and Industrial



How the Grid Works



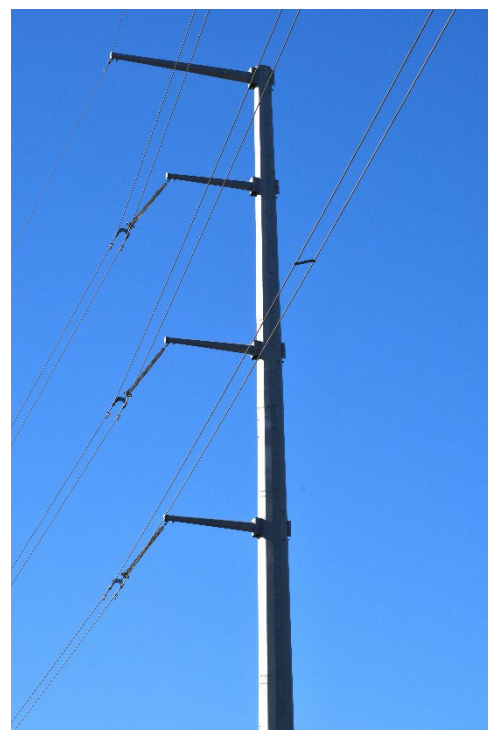
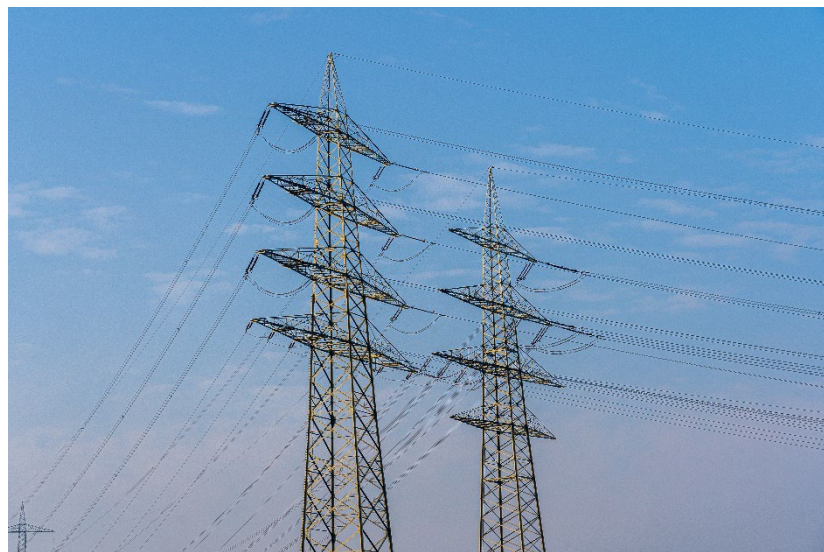
DERs located
in this part of
the system



What's the Difference Between Transmission and Distribution?

Transmission Lines

Large, high-voltage lines that carry electricity from generators to distribution systems and allow electricity to travel long distances



Substations step down the voltage between transmission and distribution lines

Distribution Lines

Smaller, lower-voltage lines that distribute power to homes and businesses



Transmission utilities share responsibility with ERCOT for managing the Transmission grid

Distribution utilities are solely responsible for the Distribution grid and maintaining system reliability

Distributed Generation (DG) Produces Electricity

Some Examples of Distributed Generation Resources

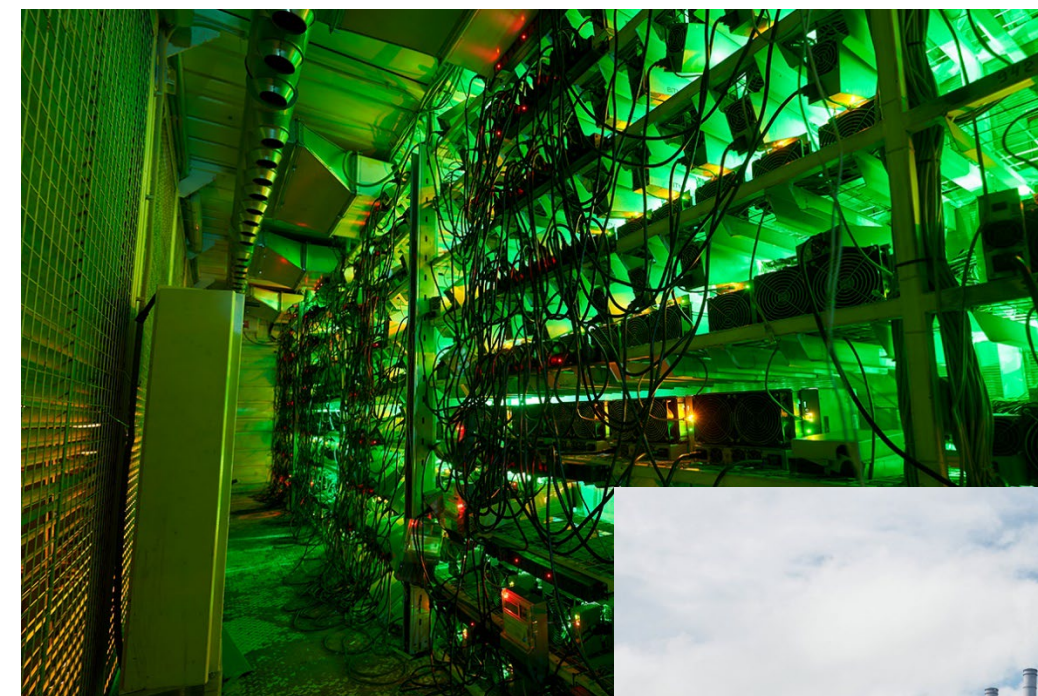
- **Distributed generation (< 1 MW):** Rooftop solar, small diesel, or gas generators
 - May register with ERCOT as Settlement-Only DG (SODG) and be paid for energy exports, but not make offers or sell ancillary services
 - Distributed renewable generation (DRG) (e.g., rooftop solar) are allowed to put energy on the distribution grid without registering with the PUC or ERCOT as a power generating company (PGC)
- **Distributed generation resources (DGRs) and Distributed energy storage resources (DESRs) (>1 MW and <10 MW):** Larger on-site generation
 - DG must register as a PGC if they are putting energy on the grid either as wholesale energy or ERCOT ancillary services. DG >1 MW may register with ERCOT to participate in ERCOT markets or choose SODG treatment.
 - Designated as “resources” because they are registered with the PUC and ERCOT, can be called upon, and receive compensation when putting energy on the distribution grid
 - Usually batteries / larger resources for ERCOT’s visibility and dispatched as a generation resource
- **Generation resources >10 MW:** Treated like any other traditional generation resource (power plant) and seldom located on the distribution system



Demand Response (DR) Reduces Customer Load

Examples of Demand Response

- **Residential load curtailment:** Opt-in smart thermostat programs and manual thermostat programs to reduce power usage, offered by some REPs, municipally-owned utilities and electric cooperatives.
- **Wholesale market participation:** Bids to buy electricity and provide certain ancillary services; compensation received for ancillary services
 - Often used by large industrial customers
 - Growing use by crypto mining facilities
- **Demand Response is used on both transmission and distribution grids**



Aggregated Distributed Energy Resources (ADERs): A Hybrid Concept

- **The PUC recently initiated an ADER pilot program in ERCOT that:**
 - Created a charter
 - Established a task force
 - Set a goal of launching Q1 of 2023
- **PUC rule on pilots require ERCOT Board of Directors to authorize**
- **Aggregating small DERs:**
 - Would allow an entity to combine multiple, behind the customer meter, small DERs (e.g., at-home batteries and treat them as a single generation resource
 - If approved, ADERs would be allowed to more fully participate in the ERCOT wholesale market



DERs: A Transmission & Distribution Perspective

- **DERs can provide congestion relief or may cause congestion**
 - When customers' electric demand is highest, such as during a capacity shortfall or on a hot summer or cold winter day, DERs could assist in temporarily reducing regional customer demand on the distribution grid, and avoid additional congestion on the ERCOT transmission system
 - This benefit relies on DER visibility to ERCOT
- **Distributed Generation (DG) like batteries must be incorporated safely**
 - Utilities are responsible for ensuring that DERs do not adversely affect operational safety, reliability, service quality, or increase cybersecurity and liability on their individual distribution grids
 - For example, a utility must be able to deenergize a downed power line, even if there is DG on that section of the grid
 - Utilities must maintain a consistent distribution voltage even when DG resources are turned on or off
- **Utilities must manage significant new resources on the distribution grid**
 - The distribution grid has not historically been used to support significant new generation
 - The PUC is studying these challenges now in Project 51603 and Project 53911

DERs: A Retail Perspective

- **Demand response (DR) and distributed generation (e.g., DRG and DG) create opportunities for innovation in the retail market**
 - Retail electric providers (REPs) can further design new or enhanced products for residential customers that use smart thermostats to reduce usage in response to market signals
 - Smaller customers are able to work with REPs to be compensated for output from rooftop solar, which is a form of distributed renewable generation (DRG), and other small distributed generation (DG)
 - Larger commercial customers with more sophisticated HVAC controls can have an even greater impact on reducing load during times of market scarcity
- **Customers need to know what they're signing up for**
 - Residential and small commercial customers must be provided the information they need to make informed choices on DR, DRG, and DG products on the market
 - In the competitive areas of Texas, DER providers should work through REPs to ensure there is coordination of the demand and production side of the customer's electricity use, and that the costs/values are being appropriately shared on mutually-agreed commercial terms
- **DER cost / benefit analysis**
 - The integration of some DERs can result in increased infrastructure costs
 - The PUC and the Legislature must determine which costs should be borne by resource developers and which costs are appropriate to be uplifted to the market as a whole
 - All customers must be treated fairly when allocating costs for supporting the distribution network

DERs: A Wholesale Market Perspective

- **DERs are a growing part of the ERCOT generation mix**
 - ERCOT continues to gather information to assess the benefits and impact of DERs on load forecasting and opportunities to respond during times of peak demand
- **DG providers must work within the existing market frameworks**
 - For ERCOT to effectively dispatch DG, they need to meet registration requirements and operate on par with larger electric generation
 - The goal is to use DG as effectively as possible, supporting a reliable grid
- **DERs are not a substitute for a more reliable electric market design**
 - These burgeoning new technologies are important for serving load or reducing it, but they cannot, by themselves, resolve the need for generation resource adequacy

AECT Guiding Principles on DERs

AECT member companies...

- Want to lead the industry in **effective integration of DERs into the ERCOT market** and facilitate their applications in a manner that **promotes competition and customer choice** and **preserves utilities' statutory obligation to maintain grid reliability** and reliably serve customers.
- Are **required to ensure the integration of these facilities is done without negatively affecting operational or personnel safety, reliability, or service quality** of the transmission or distribution grids – these activities include evaluating both small and large DER scenarios.
- Are **governed by the PUC with various performance metrics** – the integration and performance of DERs should be commensurate with this regulatory framework.
- Recognize that **some modifications to our control systems may be required** to reliably accommodate DERs.
- **Must work with the PUC and stakeholders to ensure appropriate cost recovery and cost allocation** of the additional expenses required to accommodate DERs.
- Will participate with ERCOT and associated stakeholders to ensure that ERCOT protocols are developed to help **ensure the benefits of DERs are realized, while ensuring that the ERCOT system, transmission grid, and distribution grid all operate in a safe, reliable fashion with good service quality.**
- **Support establishment of consumer protection requirements** regarding customer participation with DERs and associated providers, which should ensure a level playing field for entities providing this service.
- **Are dedicated to an ongoing and open dialogue to foster mutually-beneficial outcomes** for all stakeholders, as well as supporting the needs of the State of Texas and the ERCOT market.

AECT Member Companies



How to Reach Us



AECT.net



[@aectnet](https://twitter.com/aectnet)



Association of
Electric Companies
of Texas



Association of
Electric Companies
of Texas

