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| Electric Reliability Council of Texas**ELECTRIC RELIABILITY COUNCIL OF TEXAS** |
| Load Participation in the ERCOT Nodal Market |
| **A plain English guide to ERCOT’s wholesale market Demand Response products and services** |
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| Prepared by ERCOT Staff and stakeholders in the Demand-Side Working Group of the ERCOT Wholesale Market Subcommittee |
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This document is intended as an introductory guide to the opportunities available to demand-side resources to participate in various ERCOT nodal markets, and should not be treated as a comprehensive resource. The ERCOT Nodal Protocols are continuously subject to change, and therefore may be more current than the information presented here. If there is any variation between the information in this document and that contained in the Nodal Protocols, the Nodal Protocol language takes precedence.

# Introduction

The Electric Reliability Council of Texas (ERCOT), a non-profit corporation, is the Independent System Operator (ISO) formed to ensure the reliability of the electricity grid. The ERCOT region covers about 85 percent of Texas, including all areas that are open to retail competitive choice. (The El Paso area and portions of the Panhandle and East Texas are not connected to the ERCOT grid). As one of 10 North American Independent System Operators, ERCOT’s primary responsibility is to maintain the reliability of the electric grid by ensuring a precise balance between load and generation throughout its service area on a second-by-second basis, using market-based mechanisms to the fullest extent possible. ERCOT administers and facilitates market rules (Protocols and Guides) which are developed in a collaborative environment with stakeholders and regulators.

The Public Utility Commission of Texas has established a goal to “ensure not only that the load resources that have historically participated in the markets have reasonable opportunities to continue to participate, but also that a framework is established for even greater participation by load resources in the future.” In addition, the Texas Legislature in 2011 passed Senate Bill 1125, which establishes new goals and requirements for energy efficiency and also requires the PUCT to adopt rules and procedures “ensuring that (ERCOT) allows load participation in all energy markets for residential, commercial and industrial classes, either directly or through aggregators of retail customers, to the extent that load participation by each of those customer classes complies with reasonable requirements adopted by the organization relating to the reliability and adequacy of the regional electric network and in a manner that will increase market efficiency, competition, and customer benefits.”

Accordingly, demand response in the ERCOT Nodal market is viewed as a means of enhancing competition, mitigating price spikes, encouraging the demand side of the market to respond better to wholesale price signals, providing for resource adequacy, and preserving system reliability.

The purpose of this document is to provide additional background and supporting data to load entities who are interested in determining their eligibility for the load reduction programs in the Texas electricity market. This guide provides a high-level overview of the ERCOT Nodal market, basic information necessary for load entities to understand how the ERCOT market operations can affect their daily activities and processes, and provides an overview of the opportunities, rules and risks of actively participating in some of the ERCOT markets. This guide is intended only to provide a high-level overview of the ERCOT Nodal Protocols. For additional information, the reader should refer to the Nodal Protocols themselves, which may be found on the ERCOT website at: <http://www.ercot.com/mktrules/nprotocols/current>.

# What is Demand Response?

The Federal Energy Regulatory Commission (FERC) defines demand response as:

Changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized. (Group, Freeman, & Global Energy Partners, 2009, p. 13)

The changes to normal usage patterns mentioned above can be achieved by shutting off, not starting, or reducing power consumption in power consuming equipment; starting on-site generation or relying on alternate fuel sources if they are available.

Just as the method of response may differ, there are other components of demand response that may differ as well. These include the reasons for the demand response action (“signal” or “trigger”), the amount of time given in advance of the required action (“ramp period”), the length of time the demand response event lasts (“sustained response period”), measurement and verification (M&V) of the response, and many others.

As can be seen in the diagram from the North American Electric Reliability Council (NERC), demand response can be classified into many categories:



Broadly speaking, demand response can be broken down into two major categories: dispatchable or non-dispatchable. For purposes of this paper, we will define dispatchable as those demand response events that are initiated by ERCOT and non-dispatchable as an event not specifically initiated by ERCOT. These non-dispatchable events may include decisions made by the end-use customer to alter its usage pattern or may include contractual obligations with another entity, such as the end-use customer’s REP, to alter usage patterns.

Non-dispatchable demand response in ERCOT can include a response to [Four Coincident Peak (4CP)](#_4CP), LSE [contracted response to wholesale market energy prices](#_Contracted_or_Tariff-based), [self-directed response from prices in a retail price contract or Tariff, prices in the ERCOT Real Time or Day Ahead markets](#_Prices_from_the), or utility-managed [Load Management programs (LM)](#_Commercial_Load_Management).

ERCOT’s wholesale market is open to several types of dispatchable demand response, which are deployed for grid reliability. Loads providing Emergency Response Service (ERS) may qualify for a 10-minute ramp period or a 30 minute ramp period, and either can be provided by a category of resource (“weather-sensitive loads”) with DR driven by air conditioning controls. Registered and qualified Load Resources can provide Reserves in either [Responsive Reserve Service](#_Responsive_Reserve_Service) or [Non-Spinning Reserve Service](#_Non-Spinning_Reserve_Service). Regulation in the form of [Up Regulation Service and/or Down Regulation Service](#_Up_Regulation_Service) can currently be provided by a special type of demand resource called a Controllable Load Resource.

In addition, [Controllable Load Resources to](#_Load_Resources_in) may now qualify to submit offers into and be dispatched by ERCOT’s Real-Time Energy Market (RTEM)[[1]](#footnote-1).

In addition to the standard classification shown above, demand response events can be discussed using standards developed by the North American Energy Standards Board. These standardized terms will be used throughout this document. The following illustrates key stages of a typical DR event and defines it with these terms:



# Participation Checklist

Here is a checklist of criteria to help you determine whether participation through your REP or a demand response provider is appropriate or advisable for your company or facility:

* Your facility must have some load that can be reduced or shifted to other times of the day.
* In most situations, your facility must have either an Advanced Meter or an Interval Data Recorder, both of which measure energy usage in 15-minute intervals. For some services, your facility will also be required to have telemetry—real-time communication from your Load to ERCOT.
* You must have the ability to deliver the load reduction within a prescribed ramp period (such as 10 minutes or 30 minutes), or be able to shift your usage patterns on an hourly basis.
* For some services, you must register as a Load Resource with ERCOT, and your facility must be made available for testing prior to actual participation. For others, you need only contract with your REP or a QSE to participate in the Day Ahead and Real Time markets.
* You must contract with either your REP or a QSE to represent your available load to the system. A QSE is the only type of entity with which ERCOT has financial relationships. Your REP and QSE may be the same company or may be different companies.
* For some services, you must be able to maintain the load reduction for at least 15 minutes or an hour, or up to a period determined by your participation, or by the need of the electrical system.

The following pages offer an overview of the ERCOT Nodal Market and additional information about the financial opportunities available to customers for reducing or shifting their loads. A list of detailed Frequently Asked Questions appears at the end of the document. For any prospective load participant, familiarity with the details of the nodal market design and the ERCOT protocols is strongly recommended.

# ERCOT Market Structure

The primary role of ERCOT is to maintain reliability of the ERCOT electricity grid, using market-based mechanisms to the fullest extent possible. As the Independent System Operator (“ISO”), ERCOT is charged with maintaining a precise balance between load and generation on a second-by-second basis.

ERCOT administers markets to assist market participants in buying and/or selling capacity and energy to meet their energy and ancillary services requirements. To facilitate this, ERCOT administers various Day Ahead and Real Time operations markets where buyers and sellers of capacity and energy may participate.

Wholesale electricity market prices fluctuate based on simple rules of supply and demand—that is, the relationship between the level of power consumption (demand) being placed on the grid at any time and the generation resources (supply) available to meet that demand. During periods of peak demand, such as hot summer days, wholesale prices may reach many multiples of their off-peak levels. Even during milder weather when demand is lower, premium prices are often paid for available resources because many generation plants choose these times to shut down temporarily for maintenance.

The ERCOT Nodal market is designed with a number of features to reward energy consumers that are willing to curtail or shift load as a way of helping maintain system reliability. These “demand-side resources,” or loads, are encouraged to make their resources available by responding to wholesale price signals. Actual dollar values to be paid for these resources are established in the form of Market Clearing Prices, which in a Nodal market are based on bids and offers in the various ERCOT-operated markets described below. The Market Clearing Price for Capacity (MCPC) expressed in dollars per megawatt per hour represents the price paid for making a capacity resource (load reduction or generation increase) available to the ERCOT Grid. The Locational Marginal Price (LMP) expressed in dollars per megawatt-hour represents the price paid for generation at a specific location on the ERCOT Grid. The same calculation engine that ERCOT uses to dispatch generation also calculates the value of energy at every load point in the Transmission System. The individual load-weighted average of all the LMP prices in a Load Zone is the price paid by load serving entities who serve customers with the energy from the generation. This price is sometimes referred to as the Load Zone Market Price or LMPZ. Since this price is calculated in real-time, it is not known to energy consumers in advance but rather is posted to ERCOT’s web site immediately following each calculation of LMPZ. ERCOT has also implemented a system of projecting non-binding prices, covering the next hour.

## Ancillary Services (“AS”)

Ancillary Services are defined in the ERCOT Nodal Protocols (Section 2) as “services necessary to support the transmission of energy to Loads while maintaining reliable operation of the Transmission Service Provider’s transmission system using Good Utility Practice.” ERCOT requires REPs to carry a specified level of operating reserves, which provides the ISO with the ability to call up additional resources on varying levels of short notice. These operating reserves serve as "insurance" in case a generating unit goes down, load is higher than anticipated, or another problem emerges. Such reserves can be self-arranged. If a REP doesn't self-arrange all its reserves, then ERCOT will purchase the necessary reserves on the REP’s behalf. Such procurement occurs in a Day Ahead Market for the various Ancillary Services, and may also be procured through a Supplemental Ancillary Services Market (SASM) if a shortage occurs in real time. In the Nodal market, there are eleven AS programs in place, four of which are available for participation by loads. More detail is provided in the following pages.

## The Day Ahead Energy Market

The Day Ahead Market (DAM) is an energy market where QSEs may sell or buy energy at any settlement point on the ERCOT Grid. Settlement points exist at each generator’s electrical bus (“Resource Node”) in the transmission system, at trading Hubs and at Load Zones. In the Nodal market, a REP pays ERCOT for all the energy used by its customers, based on a price of energy established every 15 minutes in ERCOT’s Real Time market and adjusted for any energy purchased in the DAM. REPs may offer load customers the ability to also purchase all or a portion of their energy in the DAM. Similarly, loads may purchase their supply at a specified trading Hub with additional charges applying to the difference in the Hub price and the Load Zone prices. Such arrangements are virtually unlimited and allow loads to purchase their energy needs in these markets or in combination with traditional bilateral contracts or contracts for differences. Loads may choose to place bids in ERCOT markets to purchase energy only “up to” a certain price limit. This practice exposes the load to real time prices, which may be higher or lower than the limit specified by the purchaser in a specific interval, and effectively puts the Load in the position of bidding to provide demand response if prices clear at or above the specified level.

## The Real Time Market

When a customer uses energy its supplier must pay ERCOT for that energy at prices established by the Real Time market, adjusted for any energy purchased in the Day Ahead market at the same load zone. If a load-serving entity does not purchase energy in the Day Ahead market, then it is settled at the Real Time market price. A customer may participate in the Real Time market by requesting its REP provide pricing equal to the Real Time prices and then adjusting its usage to consume less energy when prices are high (or more energy when prices are low). However, the actual real-time prices that are faced by a consumer exposed to the Real Time market will not be known by the consumer until after-the-fact, since they are calculated on a real-time basis.

## Market Participants



# Summary of Demand Response Options in ERCOT

## Non-ERCOT-Dispatched DR

As mentioned previously, the options listed below are not dispatched by ERCOT but they may be dispatchable by another entity such as a REP or a transmission & distribution utility.

### Four Coincident Peak (4CP)

IDR-metered customers are subject to transmission charges based upon a Four Coincident Peak demand. The 4CP demand is determined by averaging the consumer’s actual demand during the settlement interval that occurs during the settlement interval of the highest ERCOT demand during each of the four summer months (June through September). This measured 4CP demand serves as the basis of the customer’s transmission tariff charges for the following year. By correctly predicting the ERCOT system peaks during the summer and curtailing load during those intervals, a consumer can help reduce the stress imposed on the electric system during peak periods of consumption and reduce their transmission charges for the following calendar year.

### LSE Contracted Price Response

In the competitive areas of ERCOT, consumers can contract with their REP to respond at the REP’s direction. The contract will usually outline the parameters of this response – at what times and frequency demand response events can be called, ramp periods, sustained response periods, compensation, etc. Because this response is a contractual matter between the REP and the consumer, a great deal of variety can be present in these arrangements. For example, a consumer’s response may be voluntary or required; compensation could come in the form of reduced energy prices or rebate payments for each curtailment event; consumers might be notified up to a day in advance, or could have no notification at all (for automated curtailment).

In areas of ERCOT not open to competition, interruptible tariffs may be available. These tariffs will usually offer a reduced energy price for defined curtailment obligations.

### Self-Directed Price Response

REPs may offer dynamic pricing options, or consumers within a municipality or co-operative may have their energy prices determined by a published tariff, which also may be structured based upon Time-of-Use (TOU) or have a Critical Peak Pricing (CPP) or Peak Time Rebate (PTR) component. Self-directed price response refers to consumers making an independent decision to respond to energy prices contained in a governing tariff or in either the ERCOT Day Ahead or Real Time energy markets.

Consumers within a municipality or co-operative may have their energy prices determined by a published tariff. Tariffs may be structured based upon TOU, CPP or PTR.

TOU offerings will typically have higher energy prices during traditionally peak periods – for example, a TOU tariff may charge one price during Monday through Friday from 2 p.m. through 8 p.m. and another price during all other times. Customers may choose to reduce consumption during these high priced periods. Load reduction can be accomplished by load shifting (loads can be shifted by re-scheduling certain processes or by utilizing thermal storage), ending certain processes that are no longer economic, or through energy efficiency measures.

Offerings that incorporate CPP usually have prescribed high prices only during certain defined periods – for example, when load or prices are expected to reach a certain level. Response to CPP may be similar to those employed under TOU tariffs, especially if CPP is reached frequently. More often, CPP is infrequent and as such, short term load curtailment may be the more appropriate response to meet economic objectives.

### Transmission & Distribution Utility Commercial Load Management Programs (CLM)

The law which restructured the state’s electric utility industry, and ensuing PUCT rules, require each investor-owned transmission and distribution utility to meet a percentage of their annual growth in system demand through savings achieved by energy efficiency programs. The PUCT has determined that the TDUs may implement and manage Load Management Standard Offer Programs, which pay participating eligible customers for agreeing to provide demand response when needed to help preserve electric grid integrity. Load Management is listed as an approved energy efficiency program to help meet the load growth reduction goals. These programs are not administered by ERCOT; however, the TDUs have executed agreements with the ISO to enable ERCOT to benefit from this demand response capacity during system emergencies. (Links available at <http://www.texasefficiency.com/>).

## ERCOT-Dispatched Demand Response

### Emergency Response Service (ERS)

ERCOT procures ERS to maintain grid stability during emergency conditions and reduce the likelihood of the need for rotating outages. ERS participants may offer to provide demand response with either a 10-minute ramp period requirement (similar to Load Resources providing Responsive Reserve Service) or a 30-minute ramp period requirement. ERS Resources do not have the same telemetry and UFR requirements as Load Resources.

ERS is defined by the PUC as a special emergency service (not an Ancillary Service). It is procured through an RFP process three times per year, for four-month contract terms, each of which is further split into smaller time periods based on business cycles and other factors. Loads may choose to submit offers in all time periods or only in those that best fit their unique circumstances, and may vary both the price and DR capacity offers by time period.

Settlements are performed with the QSE up to 80 days after each four month period has ended. Payments are subject to downward revision based upon delivered demand response capacity, and the load’s availability during the contract term.

ERS is open to aggregations of customers and is explicitly intended to attract customers of all types and sizes. Many national demand response aggregators are participating in ERS as QSEs[[2]](#footnote-2). Interested customers are encouraged to consult with a QSE; additional details are available at the ERS web page: <http://www.ercot.com/services/programs/load/eils/>.

ERS is also open to certain types of generators (those not registered with ERCOT as Generation Resources) that are capable of injecting power onto the ERCOT System. In addition, during the summer contract term (June through September), a different type of ERS Resource — Weather-Sensitive ERS Load — may participate under modified rules designed to accommodate air conditioning load.

### Ancillary Services Markets

ERCOT is responsible for developing a daily Ancillary Services (“AS”) Plan that procures AS in sufficient quantities to maintain the security and reliability of the ERCOT System consistent with ERCOT and North American Electric Reliability Corp. (NERC) standards. As discussed previously, ERCOT determines the amount of AS that each market participant is required to provide, based on its ratio share of the total ERCOT load. Each market participant may self-provide its AS or may elect to have all or a portion of its AS procured by ERCOT in the Day-Ahead Market. ERCOT will deploy the AS in order to maintain system reliability.

Customers with demand response capability that can meet various performance requirements can be qualified to provide Ancillary Services as **Load Resources**. In the eligible AS markets, the value of having a Load Resource available to reduce load is equal to the value of having a generator available to increase its generation at a generating plant. These providers of operating reserves selected through an ERCOT AS market are eligible for capacity payments, regardless of whether the Resource is actually deployed (or curtailed, in the case of the Load Resource).

Table 2 describes the various Load Resource types and their qualification requirements and eligible services.

TABLE 2: LOAD RESOURCE TYPES AND ANCILLARY SERVICES**[[3]](#footnote-3)**

|  |  |  |
| --- | --- | --- |
| **Service** | **Load Resource Type** | **Qualification** |
| Responsive Reserves (≤50%) | NCLR | Under-Frequency Relay and 10-minute response to manual Dispatch instruction |
| Responsive Reserves | CLR | Primary Frequency Response and follow SCED 5-minute Dispatch |
| Regulation-UpRegulation-Down | CLR | Primary Frequency Response and respond to AGC-type Regulation deployments |
| Non-Spin Reserves | CLR | Follow SCED 5-minute Dispatch |

Each QSE may arrange bilaterally for AS or may have ERCOT make the arrangements through a market (i.e., an auction) administered by ERCOT. ERCOT holds auctions on a daily basis for each of the following AS:

* Regulation Up
* Regulation Down
* Responsive Reserve
* Non-Spinning Reserve

Loads that agree to reduce when directed by ERCOT via their QSE, and that meet other metering and operational requirements as specified in the ERCOT Protocols, may participate in AS market auctions described above. As noted in Table 2, the type of ancillary service that a Load Resource may provide will depend upon the load’s response time and metering system, as well as other requirements described in the Protocols. In the Responsive Reserve and Non-Spin Reserve markets, the QSE will receive capacity payments regardless of whether or not the load was actually deployed, but the load must be available for deployment at any time while providing the service.

ERCOT qualifies Load Resources to be able to provide AS based on the load’s available technology, as follows:

#### Responsive Reserve Service (RRS)

RRS requires that an Under Frequency Relay (UFR) be installed that opens the load feeder breaker on automatic detection of an under frequency condition. Alternatively, a Controllable Load Resource must have the capability of responding to frequency change, similar to generator governor response. Both types of Load Resources providing RRS are also required to provide their committed demand response capacity within 10 minutes following an instruction. The official notice will come in the form of a Verbal Dispatch Instruction (VDI) to the QSE, preceded by an electronic message via XML to the QSE. Load Resources are randomly assigned to one of two deployment groups for response to such notice. ERCOT may deploy only one of these groups or both of these groups either concurrently or successively depending upon the reliability needs. The load, breaker status, and relay status, if applicable, must have real-time telemetry to ERCOT (through the QSE) installed. Loads qualified for the Responsive Reserve market are also automatically qualified for the Non-Spin market.

#### Non-Spinning Reserve Service (Non-Spin)

Non-spin requires that loads provide their committed demand response capacity within a 30 minute notice, based on an electronic dispatch instruction. Load Resources providing Nonspin must also have real-time telemetry installed, and must be qualified to be dispatched by ERCOT’s Real-Time Market software, Security Constrained Economic Dispatch (SCED) [see below]:

#### Up Regulation Service and/or Down Regulation Service

Requires that loads through automatic controls respond by changing usage in response to signals provided by ERCOT (similar to Automated Generation Control, or AGC, signals) to increase and decrease load while meeting rigorous performance monitoring criteria. Controllable Load Resources (CLRs) must also have real-time telemetry installed and be able to receive certain control information from ERCOT every 4 seconds. Loads qualified for Regulation Up and Down service are also qualified to provide Responsive Reserves and Non-Spinning Reserves.

For additional details regarding Ancillary Services, refer to Sections 2, 3, 4, 6 and 8 of the ERCOT Nodal Protocols posted at: <http://nodal.ercot.com/protocols/index.html>.

#### Real-Time Energy Market

Security Constrained Economic Dispatch (SCED), the primary software engine in ERCOT’s real-time energy market, is currently open to participation by Controllable Load Resources (CLRs) represented by their Load Serving Entity QSE (LSE QSE). CLRs may be single-site Loads, or may consist of aggregations of smaller Loads such as residential sites with air conditioning compressors under direct load control. SCED is executed every five minutes, so CLRs in SCED with bids at the marginal LMP must be capable of moving load incrementally in either direction every five minutes, based on SCED dispatch instructions (a.k.a., base points). CLRs providing Non-Spin or RRS are dispatched by SCED after their AS capacity is released to the real-time market. A presentation on Load Participation in SCED is available at[*http://www.ercot.com/calendar/2014/04/20140423-DSWG*](http://www.ercot.com/calendar/2014/04/20140423-DSWG)*.*

*Additional detail on all ERCOT-dispatched wholesale market DR services is available in the associated Excel document entitled “ERCOT DR Attributes,” linked at* [*http://www.ercot.com/services/programs/load/*](http://www.ercot.com/services/programs/load/)*. The tables in that document are extracted and updated from the document entitled “North American Demand Response Characteristics Comparison,” as published by the ISO-RTO Council (*[*http://www.isorto.org/Reports/default*](http://www.isorto.org/Reports/default)*). The ISO-RTO document also contains similar data for the DR services offered by all North American ISOs and RTOs.*

*Also available at* [*http://www.ercot.com/services/programs/load/*](http://www.ercot.com/services/programs/load/) *is a list of Demand Response Providers who are active in the ERCOT Region. (Note: inclusion on the list is voluntary, and not all entities listed are QSEs.)*

*Provisions for participation by Aggregate Load Resources (ALRs) are detailed in the Other Binding Document entitled “Requirements for Aggregate Load Resource Participation” at* [*http://www.ercot.com/mktrules/obd/obdlist*](http://www.ercot.com/mktrules/obd/obdlist)*.*

# Frequently Asked Questions

**Q. How do I register with ERCOT as a Load Resource?**

A. To participate as a Load Resource you must register as a Resource Entity, and then as a Load Resource asset. To register as a Resource Entity you will need to complete the Resource Registration Form and to register the Load Resource asset you must complete the Load Resource Asset Registration Form.

**Q. What level of compensation (dollars times kWh) makes it worthwhile or profitable for me to reduce the load?**

A. This is the key business decision you must make internally. Only you know the financial impact of shutting off or shifting electricity to some or all of your operations, and the cost of restarting operations. If you plan to use electricity generated on site to replace power from the grid, you should factor those costs into your decision. For example, if you are capable of providing DR in response to market prices through your REP, some REPs may offer you the ability to set the maximum real-time price at which you are willing to operate; if prices rise above that threshold you can agree to curtail load. The REP may notify you a day in advance what the projected market price will be and whether you are likely to be notified to curtail. Other REPs may offer other variations of products where you receive a discount off your bill for giving your REP the right to count on you to interrupt your load at their request for a specified number of hours and events during the hot summer. Your REP could offer you the ability to decide a day in advance whether to participate. For services that offer a reservation payment to reserve your DR capability for ERCOT dispatch, your interruption or shifting load schedule is something that can be negotiated between you and your REP or a third-party QSE. Some QSEs specialize in demand response and can work with you to determine the best curtailment plan for your facilities.

**Q. Can I “aggregate” a number of small residential and commercial loads that can be interrupted, and offer this aggregated resource into the market as an ancillary service?**

A. Yes. ERS is explicitly open to aggregations of DR-capable Loads, and the Real-Time Energy Market and Non-Spin Ancillary Services market are now open to participation by Controllable Load Resources which may also be Aggregate Load Resources (ALRs). Offers and bids to the ERCOT markets must be at least 100 kW in size.

**Q. Can I “directly” offer a demand-side resource to the market?**

A. No. Only a QSE — either a REP QSE or a third-party DR QSE — can offer a DR resource to an ERCOT market. (An individual Load could become a QSE, but that could be an expensive proposition.) As noted earlier, your REP already has a QSE, and there are other QSEs in the market who specialize in providing demand response. Your success in these load reduction programs will require you to have an informed working relationship with your QSE, and the terms of your participation in these programs should be clearly spelled out in your contract.

**Q. My industrial load can be interrupted. The REP that I’m negotiating with doesn’t have a standard contract to provide interruptible service, but is willing to negotiate with me. What do I need to do?**

A. Make sure this REP understands your degree of flexibility or ability to endure interruptions and load shifting and knows how to value these attributes, and keep in mind that your DR capability may also be represented in ERCOT by a third-party DR QSE. The manner in which any bill credits, payments from the market, or cost savings are shared among the parties is a contractual matter among the parties. Your contract with a REP or DR QSE must clearly describe how any payments or credits will be shared.

**Q. My electricity use at my industrial facility may be interrupted once or twice a year, provided I have a 30 minute notice, but I don’t want to endure too many interruptions. Should I participate as a Load Resource?**

A. You might consider offering a non-spinning reserve ancillary service. Your QSE can control the Offer price at which your load would be made available as a capacity resource to ERCOT. The higher the price, the less likely you will be selected to provide the service, and the less likely you will actually be called on to be interrupted. If you are a CLR providing Non-Spin, your dispatch will be based on your bid price in the Real-Time energy market — and such bids may be entered at any value between $0 and the System Wide Offer Cap ($7,000/MWh until June 1, 2015, and $9,000/MWh thereafter). Any time you do not wish to be deployed, you may notify your QSE and choose not to participate in the market. Another option could be to consider providing Emergency Response Service, which has a lower risk of deployment than Non-Spin.

**Q. How do I determine what value my demand response capability has in this new market?**

A. The value of an energy consumer’s demand response depends on at least three factors:

* How quickly you can respond to an instruction (this determines which services you can provide);
* The cost at which you are willing to reduce load; and
* The market conditions for that particular service

**Q. I want to make sure I’m getting the best value for my demand response. How will I know in advance which of the various ERCOT markets will pay the best price?**

A. Keeping in mind that the flexibility of your facility dictates which of the markets you can offer into, you can offer simultaneously into different markets. ERCOT will select you to provide only one. Under a new process called “simultaneous combinatorial auction,” QSEs may bid Load Resource capacity into all day ahead markets and ERCOT will determine where the load resources would have the most value.

**Q. How long will the interruption typically last, and how will I know when to restore my load to the grid?**

A. The minimum period of interruption is 15 minutes, but there is no “typical” period of interruption. The maximum time is determined by the need of the electric system for the resource you have offered, or the time you have established as your stated availability, whichever is more.

**Q. Under what circumstances would I get paid without having to actually interrupt my load?**

A. Ancillary Services available to Load Resource offer capacity payments through the Day Ahead Market. This means that if your offer for capacity is accepted, you’ll receive compensation simply for making your load available, even if you are not notified to deliver the actual reduction.

**Q. What happens if I can’t deliver the full load reduction for which I contracted?**

A. This is a contract issue between you and your QSE and could be a performance issue with the ERCOT compliance staff, the Texas Reliability Entity (a regional NERC entity), and/or the Public Utility Commission. ERCOT may disqualify a QSE or an individual resource for failure to provide the services according to performance criteria in the nodal protocols. Under-delivery of contracted demand response could result in penalties from ERCOT. In the case of Ancillary Services, if your Load is unable to deliver its awarded demand response capacity, your QSE will be required to notify ERCOT and replace the capacity in real-time, potentially by paying the full clearing price in a Supplemental Ancillary Services Market (SASM). Any violation of the performance standards defined in the protocols could also subject the QSE to administrative penalties by the PUC.

**Q. Do I receive extra payments if I deliver more of a load reduction than I contracted for?**

A. No, not from ERCOT. However, your QSE may stand to benefit from the market by providing extra resources, so that makes this another contract issue between you and your REP/QSE.

**Q. Can I use my backup generators to keep my plant running during a Load Resource curtailment?**

A. If you are going to use a backup power source (e.g., diesel generators) at any time other than an emergency (blackout or brownout) situation, you must obtain an Air Quality Standard Permit for Electricity Generating Units from the Texas Council on Environmental Quality (TCEQ). For some industrial customers, you may be able to include the increased emissions from your generators in your facility’s overall emissions limits, if you can show reduced emissions from other sources.

# Glossary of Market Participants

The following terms are used to identify the market participants in ERCOT:

**Aggregate Load Resource** is a Load Resource that is an aggregation of individual metered sites, each of which has less than ten MW of Demand response capability and all of which are located within a single Load Zone.

**Controllable Load Resource** is a Load Resource capable of controllably reducing or increasing consumption under dispatch control by ERCOT.

**ERS Load** is a Load or aggregation of Loads contracted to provide ERS.

**ERS Generator** is either (1) an individual generator contracted to provide ERS which is not a Generation Resource or a source of intermittent renewable generation and which provides ERS by injecting energy to the ERCOT System, or (2) an aggregation of such generators.

**Load Resource** is a load that can interrupt in response to a request from ERCOT under various Ancillary Services programs. Load Resources are eligible for capacity payments for making their loads available for curtailment. If they are deployed, they also may receive energy payments for actually delivering the load reduction.

**Non-Opt In Entity (“NOIE”)** is a municipally owned utility or electric cooperative that has not chosen to offer customer choice.

**Power Generation Company (“PGC”)** generates electricity that is intended for the wholesale market. A PGC cannot own a transmission or distribution facility other than that essential for interconnection.

**Qualified Scheduling Entity (“QSE”)** is the entity that coordinates the operation of PGCs and REPs with ERCOT. The QSE also manages Day Ahead Market bids and offers for energy, Ancillary Services offers, including those from the Load Resource program. QSEs are responsible for all financial settlement activities with ERCOT, and must obtain certification demonstrating that they are financially responsible to ERCOT for all bills and payments. A QSE may be a REP, a PGC, a NOIE, a PM, a demand response aggregator or provider, or a combination of several entities. A QSE may represent multiple REPs, and a REP may contract with multiple QSEs to schedule its services.

**Retail Electric Provider (“REP”)** is a category of market participant registered with the PUCT that sells electric energy to retail customers. A REP may not own or operate generation assets.

**Transmission Service Provider (“TSP”)** is an Entity under the jurisdiction of the PUCT that owns or operates Transmission Facilities used for the transmission of electricity and provides Transmission Service in the ERCOT Transmission Grid.

**Distribution Service Provider (DSP)** is an Entity that owns or operates a Distribution System for the delivery of energy from the ERCOT Transmission Grid to Customers.

For additional definitions and a list of acronyms, refer to Section 2 of the ERCOT Protocols.

# Works Cited

Group, T. B., Freeman, S. &., & Global Energy Partners, L. (2009). *A National Assessment of Demand Response Potential.* Federal Energy Regulatory Commission.

1. Security Constrained Economic Dispatch (SCED). [↑](#footnote-ref-1)
2. A list of demand response providers active in the ERCOT region, including many QSEs, is available at <http://www.ercot.com/content/services/programs/load/Demand%20Response%20Providers.xls>. Inclusion on the list is voluntary. [↑](#footnote-ref-2)
3. NCLR= Non-Controllable Load Resource; CLR = Controllable Load Resource; SCED = Security Constrained Economic Dispatch; AGC = Automatic Generation Control [↑](#footnote-ref-3)