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# *Public Utility Commission of Texas*

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## **Memorandum**

**TO:** Chairman Peter M. Lake  
Commissioner Will McAdams  
Commissioner Lori Cobos  
Commissioner Jimmy Glotfelty  
Commissioner Kathleen Jackson

**FROM:** Mariah Benson, Market Analysis Division

**DATE:** November 1, 2022

**RE:** November 3, 2022 Open Meeting – Item No. 32  
Project No. 53911 – *Aggregated Distributed Energy Resource ERCOT Pilot Project*

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At the October 6, 2022, Open Meeting the Commission affirmed their desire to approve the Electric Reliability Council of Texas (ERCOT) governing document for the Aggregated Distributed Energy Resource (ADER) ERCOT Pilot Project. Attached for Commission review and approval is the ERCOT governing document for the ADER ERCOT Pilot Project. ERCOT Board of Directors unanimously approved it at their October 18, 2022 meeting. Commission Staff recommends the approval.

2705 West Lake Drive  
Taylor, Texas 76574  
(512) 248-6800  
ercot.com

## **Aggregate Distributed Energy Resource Pilot Project Governing Document**

**Approved at the October 18, 2022 meeting of the ERCOT Board of Directors**

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## **1. Introduction**

As authorized by 16 Texas Administrative Code (TAC) § 25.361(k), and as directed by the Public Utility Commission of Texas (PUCT), the ERCOT Board of Directors (Board) hereby establishes a pilot project to evaluate the participation of Aggregate Distributed Energy Resources (ADERS) in the ERCOT wholesale market (Pilot Project). An ADER is a Resource consisting of multiple Premises connected at the distribution system level that has the ability in aggregate to respond to ERCOT Dispatch Instructions. As described by the Commissioner Memorandum filed on July 13, 2022, in Project No. 51603, the Pilot Project is intended to answer, “questions related to how ADERs can support reliability, enhance the wholesale market, incentivize investment, potentially reduce transmission and distribution investments, and support better load management during emergencies.” This document lays out the framework for the first phase of the Pilot Project and envisions a multi-phase Pilot Project in which future revisions to this Governing Document would establish the details for the additional phases. Lessons learned from the early phases will be considered when designing additional phases for the Pilot Project that could create opportunity to expand overall participation while maintaining the reliable operation of the transmission and distribution grid.

## **2. Purpose of the Pilot Project Phase 1**

The purpose of this phase of the Pilot Project is to:

1. Assess the operational benefits and challenges of heterogeneous Distributed Energy Resource (DER) aggregations which are net generation or net load and address those challenges to allow meaningful use of DER aggregation.
2. Understand the impact of having Ancillary Services and energy delivered by ADERs and assess how ADERs can best be used to support reliability.
3. Assess challenges to incentivizing competition and attract broad DER participation through Load Serving Entities (LSEs), while ensuring adequate customer protections are in place.
4. Allow Distribution Service Providers (DSPs), the Commission, and others to study distribution system impacts of ADERs which inject to the grid.
5. Evaluate the impacts to transmission system congestion management associated with the dispatch and settlement of ADERs at a zonal level.
6. Identify potential Pilot Project enhancements and study the need for and benefit of transitioning distribution-level aggregations to different levels of more granular dispatch and settlement and evaluate more complex use-cases and business models.

This Pilot Project is intended to provide a means for Premises with any combination of generation, energy storage technologies, or controllable load with the capability of 1 MW or less to participate in the ERCOT wholesale markets. This Pilot Project is not intended to investigate or propose changes to existing participation models, such as those for Distributed Generation Resources (DGRs), Distributed Energy Storage Resources (DESRs), Aggregate Load Resources (ALRs), or Settlement Only Distributed Generators (SODGs) greater than 1 MW. Aggregations of multiple Premises that include only Load may already participate as ALRs and are not eligible to participate in this Pilot Project.

## **3. Pilot Project Timeline and Duration**

The Pilot Project will continue until implementation of ERCOT market rules and systems are in place to accommodate participation by ADERs or until ERCOT, following PUCT consultation, or the PUCT deems the Pilot Project unnecessary. ERCOT expects that the Pilot Project will need to continue for a minimum of three years, across all phases, to allow for any incorporation of ERCOT system upgrades, testing of customer migration, and qualifying Resources for multiple ERCOT services, as determined to be allowable while maintaining grid reliability.

This Governing Document provides the necessary details for a first phase of the Pilot Project to quickly and efficiently implement an ADER program with minimum changes to ERCOT and DSP systems. Subsequent, future phases may introduce additional design elements to help expand participation opportunities while still maintaining distribution and transmission grid reliability. This phased approach will ensure that Pilot Project participation can commence at the earliest date possible.

Subject to any ERCOT decision or PUCT directive to delay project implementation, the Pilot Project will proceed according to the following timeline:

- October 18, 2022: Board approval of Pilot Project.
- November 4, 2022: ERCOT to begin accepting completed “Distribution Service Provider Acknowledgment” and “Supplement to the Standard Form Market Participant Agreement” forms from QSEs, as described below in subsection 5.c.2.
- November 18, 2022: ERCOT to begin accepting ADER registration forms from Resource Entities, as described below in subsection 5.c.3.
- January 3, 2023: ERCOT to begin ADER qualification testing. Energy and Ancillary Service Offers from QSEs for ADERs are valid once ERCOT has confirmed that qualification testing is complete and acceptable.
- Following a successful demonstration of the dispatch of energy and Non-Spin provision by ADERs in Phase 1 of the Pilot Project, as described in subsection 5.g, for a period of at least three months, ERCOT shall prepare an outline of Phase 2 of the Pilot Project.
- Following the development of an outline of Phase 2 of the Pilot Project: ERCOT shall prepare a Phase 2 Pilot Project Governing Document and submit it to the Board for approval.
- One year after the first wholesale offer from an ADER or simultaneously with submission of the Phase 2 Governing Document to Board for approval, the ADER Task Force established in PUCT Project No. 53911 (Task Force) and ERCOT will prepare a Phase 1 Report and consider the possible closing of Phase 1.
- Quarterly: Task Force to draft quarterly reports and file them with the PUCT.

#### **4. Policy Questions to be Considered in Phase 1**

During Phase 1, the Task Force must make a recommendation to the PUCT on the following issues, to be included in one of its quarterly reports to the PUCT:

- Device-level sub-meter data, power quality metering, or methods for independent certification of QSE-provided data: This Pilot Project will need to evaluate the need for and methods for collecting data from individual Premises or devices that can be used to validate ADER performance and compliance of ADERs, including for the provision of additional Ancillary Services. This may include requiring, for future Pilot Project phases, data recorders located on individual DERs and on the distribution system. If that is needed, who installs/owns these data recorders and how is the accuracy of data provided for performance and compliance guaranteed or certified?
- Provision of additional Ancillary Services: During Phase 1 of the Pilot Project, ERCOT will continue to work with the PUCT and stakeholders regarding the provision of additional Ancillary Services by Resources connected to the distribution system. The approach taken for ADERs will be linked to broader discussions on this topic, under PUCT Project No. 51603, as it relates to all distribution-connected Resources.
- ADER modeling with alternative dispatch and pricing schemes: As part of this Pilot Project, ERCOT will evaluate a Logical Resource Node (LRN) concept and other alternative dispatch and pricing schemes. Specific to the LRN concept, implementation of this model approach will require the Settlement Meter location for each Premise to be identical to the Premise’s telemetry location. If a Premise has only one Settlement Meter, then the telemetry location will be required to correspond to the Settlement Meter location. This implies that all native load behind the Settlement Meter will be settled at an LRN price. Among other issues, this scheme will require

consideration of the consistency with 16 TAC § 25.501(h), which requires load to be settled at a zonal price. While this issue may be resolved by both placing a Settlement meter that measures only the ADER dispatchable component at the Premise and having the telemetry correspond to the dispatchable (device-level) component at the Premise, this will also raise the question of who would be responsible for installing, maintaining, and reading this separate Settlement meter.

## **5. Phase 1 of the Multi-phase Pilot Project**

### **a. Background and Basic Program Parameters**

The first phase of the Pilot Project is designed to minimize ERCOT and DSP required system changes and expedite initiation of the Pilot Project. ERCOT expects to use lessons learned from this phase to evaluate further phases for the Pilot Project that could expand overall participation while ensuring the reliable operation of the electric grid. During the first phase of the Pilot Project, the registered ADER must always be seen in aggregate as a net consumer of energy by ERCOT, in terms of telemetry and other market submissions to ERCOT. However, it will be acceptable if individual Premises that are components of the aggregation are net injectors of energy and an ADER may provide a net injection on an aggregated basis. Details for the next phases will be determined and documented later.

- An ADER for purpose of this first phase of the Pilot Project will be modeled as a Load Resource and is an aggregation of Premises, where all the sites are located within a single Load Zone and have the same LSE and DSP. Each Premise within an ADER may be net load or net generation. The aggregation must have the capability to provide at least 100 kW of response (Demand response capability plus injection capability) and each Premise must provide 1 MW or less of response (Demand response capability plus injection capability). Premises or aggregations that are otherwise able to participate in the ERCOT market (e.g., as a DGR, DESR, SODG larger than 1 MW, or ALR) should not be included as part of an ADER. The ADER's performance should always be represented as a net Load for purposes of telemetry and other market submissions to ERCOT.
- For the initiation of Phase 1 of the Pilot Project, the total registered MW capacity of all the ADERs must be no greater than 80 MW system wide. These ADERs will be limited to providing no more than 40 MW of Non-Spin system wide. As part of the "Details of the Aggregation" provided to ERCOT, the QSE shall indicate the anticipated MW capacity that is intended to be registered as well as an amount of Non-Spin for which the QSE is intending to qualify the ADER. These ADER MW quantities will be evaluated against these ERCOT Pilot Project participation limits. Additionally, no QSE will be allowed to register more than 20% of these system-wide limits.
- To allow for participation to be dispersed across the ERCOT region, these system-wide limits will initially be ratio-shared by Load Zone, including Competitive and Non-Opt-In-Entity (NOIE) Load Zones, with a Load Zone's share based on net Load Zone demand coincident with ERCOT system peak for August 2022, as provided in the Demand and Energy Monthly Reports published by ERCOT.
- These ERCOT Pilot Project participation limits will be enforced as part of ERCOT's review of a QSE's submission for participation.
- When participation exceeds 80% of the limits described above, ERCOT shall review with the ADER Task Force any reliability concerns with potential increases in the ERCOT Pilot Project participation limits. ERCOT may increase any of the imposed participation limits, at its sole discretion and in consultation with the ADER Task Forces, after evaluating performance during the Pilot Project. Such increases will not be considered amendments to this Governing Document, and therefore will not require approval by the ERCOT Board.

- There may be other limitations on ADERs to be established by DSPs due to reliability concerns that will also be evaluated and addressed as the ADERs details are submitted to DSPs for their acknowledgement.

## **b. Exceptions to ERCOT Rules**

For the first phase of this Pilot Project, ADERs will be treated as ALRs for all purposes under the Protocols and will register and participate under the existing ALR participation model. ADERs must be registered and participate as ALRs except as follows:

- An ADER is allowed to have Premises that can inject energy into the distribution system, and an ADER may provide a net injection on an aggregated basis. A net injection from an ADER in response to an ERCOT Dispatch Instruction will be considered Demand response under the Protocols and other ERCOT rules. Any Premise with the potential to export energy beyond its Premise meter must have the correct meter profile code set, for meters in service territories where that is applicable, such that both the import and export channels of its Premise meter are provided to ERCOT.
- ADER withdrawal telemetry values must represent the sum of the consumption and export of each of the member Premises or devices plus any necessary MW offsets, as described in this Governing Document. Maximum Power Consumption and Low Power Consumption values must be modified to accommodate ADERs, as further provided in this Governing Document. An ADER using device-level telemetry must comply with the validation process for device-level telemetry provided in this document instead of existing validation rules.
- An ADER is not permitted to present statistical sampling for performance evaluation.
- The Resource Entity and QSE for the ADER are jointly responsible for maintaining ADER population information, as further described in subsection 5.c.3.
- ADERs will have Pilot Project-specific modeling and ERCOT Pilot Project participation limits.
- ERCOT will not use baseline evaluation for either qualification or performance validation purposes during the Pilot Project. Qualification and performance validation specific to the Pilot Project is described in subsection 5.c.4.
- Scheduled Power Consumption (SPC) +2 information will not be required to be provided for an ADER, as it is for an ALR.
- The telemetry validation procedures and metrics for ADERs are distinct from those for ALRs and are described in subsection 5.d.
- For Phase 1 of the Pilot Project, ADERs are encouraged to, but will not be required to, provide Primary Frequency Response (PFR), as is required for ALRs. This exception is specific to Phase 1 and may not be granted for future phases. ADERs unable to provide PFR may be considered for potential, alternative participation models in future phases, such as a participation model in which the aggregation may provide some Ancillary Services but is not dispatchable by Security-Constrained Economic Dispatch (SCED).

## **c. Eligibility and Qualification**

As a condition for participation in Phase 1 of the Pilot Project, a QSE must meet the conditions described in this section. Note that the QSE associated with a proposed ADER must submit the information identified in c.1 and c.2 below, while the Resource Entity for the proposed ADER must submit the registration and qualification information in c.3 through c.5, below.

1. QSE must provide written consent from DSP (See Appendix A)
  - No DSP is required to participate in this program.
  - To be eligible to participate in the ADER Pilot Project, a QSE must provide the following information to the applicable DSP that serves each of the Premises that make up the



aggregation. The information should be submitted to the DSP on the “Details of the Aggregation” form posted on the [Pilot Projects page](#) of the ERCOT website (hereinafter, this information is referred to as “Details of the Aggregation”):

- Premise unique identifier (name/ID);
  - An indication of whether the ADER telemetry contribution from the Premise is at its TDSP-read meter location or device location;
  - ESI ID (or unique meter identifier, if the ADER is in a NOIE territory) of the TDSP-read meter that measures consumed energy from the grid and/or injected energy into the grid at the Premise;
  - LSE associated with ESI ID or unique meter identifier; and
  - For each controllable device at a Premise that is part of the ADER:
    - The type of device (battery, rooftop solar, pool pump, synchronous generator, etc.);
    - The rated dispatchable range (kW) of the individual ADER components at this Premise (for example, the rated dispatchable range of the battery may be +/-5kW maximum discharge/charge; or 3kW maximum consumption for a pool pump);
    - For a Premise that has a battery as part of the ADER, maximum rated operating state of charge (kWh) and the minimum rated operating state of charge (kWh); and
    - Which, if any, communication standards the devices are certified to meet.
  - An attestation provided by the Resource Entity which includes:
    - that any inverter-based device is either certified to UL1741-SB or complies with the requirements of UL1741-SA and that the inverter settings are programmed to ride through frequency and voltage excursions in a manner consistent with requirements for DGRs and DESRs in ERCOT Nodal Operating Guide sections 2.6.2.1(2) and 2.9.2(3); and
    - that any synchronous generator relays are programmed to ride through frequency and voltage excursions in a manner consistent with requirements for DGRs in ERCOT Nodal Operating Guide sections 2.6.2.1(2) and 2.9.2(2).
  - The MW capacity that is intended to be registered with ERCOT as an ADER and the amount of Non-Spin which the QSE is intending to qualify the ADER. An ADER may include additional customer premises or devices as long as the capacity registered and Non-Spin qualification amounts remain lower than these values.
  - A flag indicating whether or not the ADER is able to provide PFR.
  - The information in the “Details of the Aggregation” form is Protected Information.
- Upon request by a QSE that is developing ADERs, a participating DSP must provide any relevant non-confidential information to support the commencement of the enrollment process for the Pilot Project and the addition of new metered Premises on an ongoing basis for the duration of the Pilot Project.
  - Upon receiving the “Details of the Aggregation,” a DSP that has elected to participate in the Pilot Project shall review the “Details of the Aggregation” for feasibility of participation of the Premises in the proposed Resource on the distribution network. If the DSP has concerns with all or a portion of the ESI IDs or, for NOIEs, unique meter identifiers, listed in the “Details of the Aggregation,” the DSP will notify the QSE. The DSP may, on a non-discriminatory basis, for reasons of safety, reliability, or regulatory impediments, reject all or a portion of the ESI IDs or unique meter identifiers listed in the “Details of the Aggregation.” If the DSP chooses to reject all or a portion of the ESI IDs or unique meter identifiers listed in the “Details of the Aggregation,” the DSP shall notify the QSE managing that ADER and provide the QSE the reason for the rejection.
  - As part of its review of an ADER, the DSP, in conjunction with the TSP, shall map each of the Premises that make up the ADER to their respective Common Information Model (CIM) Loads and add this information to the “Details of the Aggregation” as part of the DSP’s response to the submission.

- DSPs will respond to QSE submissions of “Details of the Aggregation” within ten Business Days. If additional time is needed to evaluate the ADER, then the DSP will provide notice to the QSE within ten Business Days, and will provide final review no later than 45 days from the submission.
  - The DSP may consent to the participation of the Premises identified in the “Details of the Aggregation,” only by executing the “Distribution Service Provider Acknowledgment” (hereinafter, “DSP Acknowledgment”), Appendix A to this Governing Document, also available on the [Pilot Projects page](#) of the ERCOT website.
  - The DSP’s execution of the DSP Acknowledgment shall be taken as the DSP’s confirmation that the DSP provides delivery service to each of the Premises that are the subject of the request.
  - If any additions or removals have occurred for the month from each aggregation, the QSE will submit monthly updates to the DSP, as further described in subsection 5.c.3, which the DSP will review in the same manner as above.
2. QSE executes a supplement to the Standard Form Market Participant Agreement for Pilot Project participation (See Appendix B)
- In addition to obtaining the DSP’s consent, the QSE representing a proposed ADER must execute a supplement to its Standard Form Market Participant Agreement and submit it to ERCOT for counter-signature. The “Supplement to the Standard Form Market Participant Agreement” (hereinafter “QSE Supplement”), Appendix B to this document, is available on the [Pilot Projects page](#) of the ERCOT website.
  - The “DSP Acknowledgment” and the “QSE Supplement,” as well as the “Details of the Aggregation,” as described above, shall be submitted as a package to ERCOT via e-mail to [pilotprojects@ercot.com](mailto:pilotprojects@ercot.com). QSEs may request that a secure email account be created with ERCOT if using standard email is of concern.
  - Upon receiving the three documents noted above, ERCOT will review the documents. ERCOT may reject the submission for the following reasons:
    - Accepting the submission would cause the program to exceed any ERCOT Pilot Project participation limits, as defined in subsection 5.a;
    - ESI IDs or unique meter identifiers included in the submission:
      - Were already part of an accepted submission from a different QSE;
      - Are not associated with the submitting LSE;
      - Have a status of not active in the ERCOT database;
      - Do not have an interval data recorder meter type;
      - Are not in the ERCOT region;
      - Are participating in the ERS or a TDSP Load Management Programs;
      - Are duplicated within the QSE’s submission; or
      - Are a Generation Resource.
    - The Load Zone information is incorrect;
    - Premises included in the ADER are otherwise able to participate in the ERCOT market in a similar manner using existing participation models; or
    - ERCOT determines that the ADER would otherwise not comply with the Protocols or this Governing Document.
  - ERCOT shall accept or reject the submission within ten Business Days and respond to the QSE via email.
  - Upon receiving ERCOT’s acceptance, the QSE shall, within 20 Business Days, register the ADER as a CLR with ERCOT.

### 3. Registration of the ADER:

- Following ERCOT's acceptance of the QSE's submission for a given ADER:
  - ERCOT shall provide the MW offset to be used to register as a CLR and operate as a net load under all circumstances, in terms of telemetry and other market submissions to ERCOT
  - The Resource Entity must register the ADER as a CLR with ERCOT using a load RARF, available [here](#).
  - The location of an ADER in the Network Model will be identified by its Resource Dispatch Asset Code and the associated CIM Load in the model. Consistent with current practice for distribution-level single-site Load Resources, the DSP, in collaboration with ERCOT and the interconnecting TSP, if necessary, will assign each ADER to a CIM Load.
  - The total response capability of all ADERs assigned to any single CIM Load shall be capped at 100% of the rating of the CIM Load. The rating of a CIM Load is defined as the value estimated by the ERCOT State Estimator for that CIM Load at the time of the ERCOT historic coincident peak Demand.
- The telemetry and other market submissions for a registered ADER must always show the ADER as a net consumer of energy. This may require use of an offset, which will be a static MW value provided by ERCOT, as earlier described. Regardless of use of the MW offset, it will be acceptable if individual Premises that are components of the aggregation are net injectors of energy, based on TDSP metering at the Premises. In the future ERCOT plans to introduce an ADER participation model that can inject and withdraw in aggregate to and from the grid, in which the use of the MW offset would no longer be necessary.
- Known limitations relevant to the DSP, such as Premise injection limitations, must be reflected in the registration of the ADER. Identified limitations on the distribution system will not explicitly be enforced by ERCOT's systems in awarding or dispatching the ADER.
- The ADER shall be registered and associated with a QSE.
- If an individual Premise that is part of the ADER can inject into the distribution system, the profile code for the TDSP read meter at the Premise must be updated such that any exports at the Premise will be treated as negative load. For ADERs in a NOIE Load Zone, a similar process needs to be done in coordination with the NOIE DSP and, if applicable, the TSP serving that NOIE.
- Changes to the population of the ADER must be managed as follows:
  - The Resource Entity and the QSE are jointly responsible for maintaining ADER population information using an Excel spreadsheet form posted on ERCOT's website. These updates should be provided to ERCOT via e-mail at [pilotprojects@ercot.com](mailto:pilotprojects@ercot.com).
  - ADER parameters will be established in the Network Model by the ADER's Resource Entity using the approved Resource Registration process. ADERs that are subject to dynamically changing populations may need to set their Resource Registration data parameters at levels that will accommodate potential growth so as to reduce the need for frequent Resource Registration updates. This accounting for potential growth during registration should be done in consultation with ERCOT staff.
  - The QSE may add or subtract Premises from an ADER at any time so long as still operating within the caps established by this Governing Document. However, any additions of Premises to an ADER will be reviewed and confirmed by the relevant DSP prior to be included by the QSE.
    - Following the first month of having an active ADER, on the first day of each month, the QSE shall provide notice to each affected DSP any and all changes to the "Details of Aggregation" form by providing an updated "Details of Aggregation" form. This updated "Details of the Aggregation" form will include not only any Premises that are proposed to be added to or subtracted from the ADER, but will also retain the Premises that are unchanged from the last update, and will clearly note the Premises that are proposed to be added or subtracted.

- Consistent with the timelines in subsection 5.c.1 above, the DSP will have the ability to accept or reject any proposed additions of Premises to a QSE's ADER. The DSP may reject any proposed additions for the same reasons described in subsection 5.c.1, and shall provide the reasons for any rejection as also described in that subsection.
- The DSP's consent to the addition of any Premises to an ADER shall be documented by an email from the Authorized Representative. For each new Premise to which it consents, the DSP should add the appropriate Common Information Model (CIM) Load information to the "Details of Aggregation" form (as described in subsection 5.c.1), and forward the form via email to both the QSE and to ERCOT ([pilotprojects@ercot.com](mailto:pilotprojects@ercot.com)). DSPs may request that a secure email account be created with ERCOT if using standard email is of concern. When the DSP submits this form to ERCOT, it shall constitute a confirmation that the DSP serves each added Premise, and consents to the additional participation of these Premises in the Pilot Project.
- ERCOT will process the changes request by the QSE within five Business Days. ERCOT shall notify the QSE of the time and date the updated "Details of Aggregation" list has been validated by ERCOT.
  - The QSE shall update appropriate telemetry values and market submissions when a change is made to the population. All Premises included in the list provided should be currently enrolled with the REP. Any future switches should be accounted for in the monthly update based on start and stop dates.
  - The updates shall include start and stop dates for new Premises in the ADER and/or Premises that have left the ADER. If a Premise is vacated or the customer has/is being switched to a different REP, the Stop Date should reflect that date; and if a new customer later moves into that Premise and joins the ADER (or joins with a different REP), a new start date should be used.
  - In competitive choice areas, QSEs will manage the ADER population by ESI ID, which ERCOT will then cross-reference to its internal systems. In the NOIE territories, QSEs shall provide unique meter identifiers consistent with the requirements detailed elsewhere in this document.

#### 4. Qualification

For purposes of ERCOT systems and all ERCOT rules, ADERs in the Pilot Project for Phase 1 will be considered ALRs, as that term is used in the ERCOT Protocols. Hence, registered ADERs must qualify as ALRs for the following:

- Participation in Security-Constrained Economic Dispatch (SCED), per Nodal Protocol Section 3.6.1, Load Resource Participation.
- Non-Spinning Reserve Service (Non-Spin). Both the ADER and the associated QSE must qualify to provide Non-Spin in accordance with existing ERCOT Nodal Protocol, in order to provide Non-Spin during the Pilot Project. During the first phase of the Pilot Project, Non-Spin is the only Ancillary Service for which the ADER can qualify.

#### **d. Metering, Telemetry, and Market Submissions**

- Terminology:
  - Telemetry: Refers to the ADER bi-directional, Inter-Control Center Communications Protocol (ICCP) telemetry between QSE and ERCOT systems for the ADER as an aggregate.
  - Metering: Refers to the 15-minute Settlement Quality TDSP read meters at the individual Premises that make up the ADER.
  - Market Submissions: Refers to the ADER-related XML submissions that the QSE submits to and receives from ERCOT.
- ADER telemetry must meet the following requirements:
  - ADERs are considered ALRs for the purposes of this Pilot Project and must therefore comply with ALR metering and telemetry requirements.
  - A QSE representing an ADER must send Resource-level Real-Time telemetry to ERCOT every two seconds in accordance with Protocol Section 6.5.5.2, Operational Data Requirements; Nodal Operating Guide, Section 7, Telemetry and Communication, and the ERCOT Nodal ICCP Communication Handbook available on the ERCOT website. Telemetered data points are specific to the service being provided and are listed in detail in Protocol Section 6.5.5.2(5).
  - An ADER's telemetry must be an accurate representation of the aggregate values of all sites in the Resource. Those values may be based on device-level or Premise-level conditions or a combination of both. An offset value will be added to the aggregate values, if needed, to ensure the telemetry is always communicated to ERCOT as a net load. That offset value will be established between the QSE and ERCOT as part of the qualification process at a static level that will allow for some growth in the ADER. The offset may be adjusted over time but only with the mutual agreement between the QSE and ERCOT.
  - ADER telemetry values to ERCOT (Low Power Consumption (LPC), Maximum Power Consumption (MPC), Net Power Flow, etc.) must represent the sum of the corresponding values at the individual Premises or devices based on the approved "Details of the Aggregation" form submitted to ERCOT by the Pilot Project participant and must include any MW offset values provided by ERCOT. The difference between the value of the telemetered MPC and the value of the telemetered LPC for the ADER must equal the difference between the greatest possible injection quantity and the greatest possible withdrawal quantity.
  - ADER ramp rate telemetry to ERCOT must represent the weighted average of the ramp rates at the individual Premise or device based on the approved "Details of the Aggregation" form submitted to ERCOT by the Pilot Project participant. As part of the validation of ADER telemetry, QSEs participating in the Pilot Project shall provide time series data of the net MW at the Premise level and/or device-level.
  - If the ADER includes energy storage devices, time series data on state-of-charge for the device will also be required.
  - This data must be provided to ERCOT when requested, within a reasonable storage requirement timeframe. The data storage requirements and the mechanism of delivering this data to ERCOT will be determined later.
- ADER metering must meet the following requirements:
  - Premises in an ADER are required to have 15-minute interval meter data, whether ESI ID data from the competitive choice areas of ERCOT, or revenue-quality meter data within a NOIE territory. ERCOT will use this Premise-level interval meter data as the primary

foundation of the telemetry validation process and as a secondary tool for event performance measurement and verification. For any Premises that export power to the distribution system, both the consumption data and export data must be provided to ERCOT.

- Interval meter data must be time-stamped within appropriate standards in correlation with ERCOT 15-minute Settlement clock intervals, and shall be provided to ERCOT for Premises within the ADER through one of the following methods:
  - For ADERs in competitive choice areas of ERCOT, investor-owned Transmission and/or Distribution Service Providers (TDSPs) submit ESI ID-level Interval Data Recorder (IDR) or Advanced Metering System (AMS) data via the Texas Standard Electronic Transaction (TX SET) process (for IDR metering) or via the approved file format defined in Retail Market Guide, Section 9, Appendix G, ERCOT Specified File Format for Submission of Interval Data for AMS metering.
  - For ADERs in a NOIE service area, the NOIE shall submit IDR, AMS, or equivalent Premise-level meter data if associated with a non-Settlement ESI ID or a designated unique meter identifier. Such meters shall be maintained and read by the NOIE meter-reading entity. The data shall be submitted to ERCOT either via TX SET or in a format and transport method defined by ERCOT no later than 35 days after each corresponding Operating Day. NOIE Premise-level unique meter identifiers must use ESI ID-style nomenclature, in which the NOIE TDSP Department of Energy (DOE) code comprises the first digits of the identifier. The unique meter identifier must remain constant in perpetuity at the Premise.
- A NOIE meter-reading entity shall validate Premise-level interval meter data; however, periods of time (intervals) with missing data should not be edited or estimated. For those premises with missing interval data, those intervals will not be included in the aggregate values and may result in failed telemetry validation. Ongoing telemetry validation and performance measurement and verification are dependent upon a NOIE making timely and accurate Premise-level meter data submissions. Failure to meet the data submission requirements may result in suspension of the ADER's qualification to participate in the Pilot Project. An ADER that has been suspended for this reason may be reinstated only upon successful restoration of accurate and timely meter data submissions.
- NOIEs shall archive Premise-level data sufficient to meet these requirements.
- Telemetry Validation
  - The objective of ADER telemetry validation is to create an acceptable standard that provides ERCOT operations with assurance that the telemetered values from the QSE provide a reasonable representation of the physical characteristics of the ADER. This section describes the processes ERCOT will use to conduct validation for QSE telemetry, with the goal of insuring that an ADER's telemetered data points provide a representation of ADER performance that meets reasonableness criteria consistent with good utility practice. With the submission of the "Details of the Aggregation" form the QSE must indicate whether the ADER telemetry contribution from each Premise in the aggregation is at the TDSP read meter location or device location.
  - Premise-Level Telemetry
    - The ADER telemetry values are to be a reasonable representation of the aggregate sum of the import and export values of the ADER member Premises plus the established offset. ERCOT will aggregate the Premise-level 15-minute interval meter data to the ADER level and will compare this data to the QSE telemetry values for Net Real Power Consumption less offset, averaged over each 15-minute interval during the period being evaluated.
    - ERCOT will conduct this telemetry validation as part of the ADER qualification process and periodically during the term of the Pilot Project with each test

encompassing all 15-minute Settlement intervals during the evaluation period. The telemetry must validate to the following criteria: for each period being evaluated, the 15-minute aggregated Net Real Power Consumption values must be within 10% of the resource-level interval meter data.

- Device-Level Telemetry
  - If the ADER telemetry values represent the sum of the Devices under control, the QSE will be required to provide device-level sub-meter (data recorder) data for each site in the aggregation contributing to the device-level telemetry to ERCOT upon request. This device-level sub-meter (data recorder) data must meet the minimum specifications established by ERCOT. As part of the qualification process, ERCOT will use the following 2-step validation process for the QSEs device-level telemetry.
  - Step 1: The ADER Net Power Consumption (NPC) telemetered values minus offset averaged over each 15-minute interval must be within 10% of the aggregate of the device-level sub-meter (data recorder) data, averaged over each 15-minute interval during the period being evaluated.
  - Step 2: ERCOT will instruct the QSE to deploy the ADER to a mutually agreed value but one that represents a significant portion of its capability. This instruction will last for at least one full 15-minute settlement interval. The change in the telemetered NPC in response to the instruction must be within 10% of the total response observed in the aggregate Premise-level 15-minute interval meter data during each interval in the sustained response period
  - In addition to the telemetry validation as part of the qualification ERCOT may also perform additional periodic validation of the telemetry during the term of the Pilot Project. For Step 2 the SCED basepoint instruction will be used in lieu of an ERCOT initiated instruction.
- Telemetry composed of both Premise and Device-level data
  - If the ADER telemetry values represent a composition of both Premise-level and device-level data ERCOT will perform the following:
  - Step 1: Add the aggregate of the sub-meter (Data Recorder) data averaged over each 15-minute interval to the aggregate of the Premise-level meter data and compare it to the QSE telemetry values for Net Real Power Consumption, less offset, averaged over each 15-minute interval during the period being evaluated. The NPC telemetered values minus offset averaged over each 15-minute interval must be within 10% of the aggregate of the device-level sub-meter data averaged over each 15-minute interval during the period being evaluated.
  - Step 2: ERCOT will instruct the QSE to deploy the ADER to a mutually agreed value but one that represents a significant portion of its capability. This instruction will last for at least one full 15-minute settlement interval. The change in the telemetered NPC in response to the instruction must be within 10% of the total response observed in the aggregate Premise-level 15-minute interval meter data during each interval in the sustained response period.
  - In addition to the telemetry validation as part of the qualification, ERCOT may also perform additional periodic validation of the telemetry during the term of the Pilot Project. For Step 2 the SCED basepoint instruction will be used in lieu of an ERCOT initiated instruction.
- Regarding telemetry and other market submissions, an ADER providing Non-Spin may not have an Ancillary Service Offer into the DAM for Non-Spin or an Ancillary Service Resource Responsibility for Non-Spin that exceeds the Non-Spin MW amount in the QSE submission signed by ERCOT.

#### **e. Additional Data from the QSE Representing the ADER**

1. The QSE shall provide allocation factors to ERCOT representing the fraction of the ERCOT-issued instruction to the ADER that is being provided by each particular metered Premise that is part of the aggregation. For Phase 1 of the Pilot Project, this information could be static, and does not need to be provided in Real-Time or for the entire period of participation in the Pilot Project. Data that is provided will be used in off-line simulations to simulate different dispatch and pricing schemes. This data must be provided to ERCOT when requested, within a reasonable storage requirement timeframe. The data storage requirements and the mechanism of delivering this data to ERCOT will be determined later.

#### **f. Procurement and Deployment**

ADER participation will be through existing ALR ERCOT market mechanisms.

1. ADERs qualified for Non-Spin may be offered into the Day-Ahead Market (DAM) to provide Non-Spin and will be cleared with other participating Resources, in accordance with existing ERCOT rules. Additionally, self-arranged or traded Non-Spin may be provided by qualified ADERs. This Pilot Project is not intended to directly impact ERCOT's determination of Ancillary Service quantities to be procured. However, ERCOT at its sole discretion, may consider increases to Non-Spin quantities, if deemed necessary, due to concerns regarding ADER performance.
2. Deployment of an ADER, either for Non-Spin or for energy through SCED, will be in accordance with ALR requirements and other ERCOT rules. This includes dispatch using Load Zone shift factors.

#### **g. Performance Evaluation and Compliance Metrics**

ADERs will be registered as ALRs in ERCOT systems. ADER performance will be evaluated using the existing CLREDP and Base Point Deviation processes for ALRs. The performance analysis results will be included in the monthly performance reports for CLRs. ERCOT may revoke an ADER's qualification to provide Non-Spin if the ADER demonstrates a continuing failure to perform.

#### **h. Settlement and Cost Allocation**

Energy from ADERs will be settled in accordance with the ERCOT Nodal Protocols regarding ALR energy settlement, and the Load Zone price will be used for settlement of energy. In the event there are Premises within the ADER that inject into the distribution system, that injection will be treated as negative Load and the ERCOT energy settlement will value it as negative Load in the settlement for the QSE. The ADERs participating in the Pilot Project will be subject to other ERCOT settlement calculations for Resources as described in the ERCOT Nodal protocols including the Ancillary Service imbalance Settlement calculations.



## **i. Evaluation and Analysis of Different ADER Participation Models for Phase 1**

This section outlines some of the studies that ERCOT will be conducting during Phase 1 of the Pilot Project:

- During the first phase of the Pilot Project, off-line studies using archived production data will be performed by ERCOT to analyze different dispatch and pricing schemes and their comparative effectiveness in managing congestion. These include dispatch and Settlement using:
  - Logical Resource Nodes (LRNs):
    - Dispatch with static allocation factors used to determine the LRN shift factor and pricing; and
    - Dispatch with dynamic allocation factors used to determine the LRN shift factor and pricing.
    - The process by which allocation factor data will be provided to ERCOT for each ADER will be determined later.
  - Smaller Load Zones.

These different ADER modeling approaches will be compared and trade-offs between accuracy and complexity will be evaluated.

- During the first phase of the Pilot Project, analysis should be performed to evaluate the ability of ADERs to provide Primary Frequency Response (PFR), identify processes for verifying any PFR response from ADER, and understand how the provision of PFR by ADERs may impact, or be limited by, the distribution system. While ADERs are not explicitly required to provide PFR in Phase 1, ADERs that can provide PFR are requested to do so, as this participation will allow this needed analysis during Phase 1 of the Pilot Project to occur.
- Currently, ALRs are treated as SCED dispatchable. That will be the case for ADERs as well during Phase 1 of the Pilot Project. Additionally, ERCOT will evaluate the feasibility of ADERs providing Non-Spin using a step change or “blocky” response, similar to the manner in which Load Resources other than CLRs are able to provide Non-Spin under existing ERCOT Protocols. This is likely to be the preferred participation model for any ADERs who are unable to provide PFR in Phase 1.
- During Phase 1 of the Pilot Project, ERCOT will continue to work with the PUCT and stakeholders regarding the provision of Ancillary Services by Resources connected to the electric distribution system. The approach taken for ADERs will be linked to broader discussions on this topic as it relates to all distribution-connected Resources.
- Pilot Project participants will collaborate with ERCOT to provide relevant data relating to these studies upon request. ERCOT will report back on the progress of these studies and availability of data from Pilot Project participants to the Task Force.

## **j. Program Costs**

ERCOT does not anticipate any cost impacts attributable to Phase 1 of the Pilot Project. ERCOT anticipates that the approach discussed in this document will not require any changes to its existing software systems and that it will be able to absorb staffing impacts in its current Operations and Maintenance budget.

## **k. Reports**

Based on Phase 1 evaluations, ERCOT will report on the following:

- Recommendations for performance and compliance verification and metrics for ADERs, including additional data recorder requirements;
- Recommendations regarding alternative dispatch and pricing schemes for consideration in future phases of the Pilot Project, such as recommendations on the LRN concept;
- Recommendations regarding the potential for ADERs to participate in the ERCOT market in a manner similar to Load Resources other than Controllable Load Resources, possible Protocol language for “blocky” ADERs/ALRs, and new participation rules for being a “blocky” Ancillary Service-only provider;
- Recommendations for processes, Protocol language, or changes necessary to address feedback from TDSPs and Aggregators on the program;
- Size of participation in aggregate and by Load Zone; and
- How many devices are reported to have communication standards, and of those that do, what those standards are.

These reports and other information related to this Pilot Project will be stored on the [Pilot Projects page](#) on ERCOT’s website.

## **l. Construction**

This Governing Document and appendices will be liberally construed to achieve the purposes of the Pilot Project. Except where explicitly provided in this Governing Document, capitalized terms will be given the meaning assigned by the ERCOT Protocols, provided that terms unique to ADERs shall be construed consistently with the requirements of this Governing Document for the purposes of the ADER Pilot Project. In the event of any conflict between this Governing Document and the ERCOT Protocols, Operating Guides, or any Other Binding Document, the Governing Document will govern, but only to the extent the conflict relates to the administration of this Pilot Project.

## Appendix A

### **Distribution Service Provider Acknowledgment** ERCOT Aggregate Distributed Energy Resource Pilot Project

This Acknowledgment is signed by an officer of the Distribution Service Provider (DSP) identified below.

By my signature, I confirm that the below-identified DSP has received from [QSE PARTICIPANT's NAME], a Qualified Scheduling Entity in the ERCOT Region ("QSE"), an initial "Details of the Aggregation" submittal as that term is defined in the "Aggregate Distributed Energy Resource Pilot Project Governing Document," and that the DSP provides delivery service to each of the Premises identified in the initial "Details of Aggregation," and that the DSP consents to the participation of those Premises in this Pilot Project. For any subsequent updates to the ADER population, the below-identified DSP confirms that it will verify that it provides delivery service to each of the Premises identified, and will consent to or exclude each Premise's participation in this Pilot Project. The DSP acknowledges that it understands the potential for simultaneous injection of power from each Premise into the DSP's system as a consequence of that participation.

I understand that the below-identified DSP may rescind this acknowledgment by providing 30 days' notice to the QSE and ERCOT, but that no termination of this acknowledgment will be effective before the end of any period for which ERCOT has already issued an award notification to QSE Participant.

DSP: \_\_\_\_\_

Officer Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix B

**Supplement to the Standard Form Market Participant Agreement  
Between  
[Name of QSE]  
and  
Electric Reliability Council of Texas, Inc.**

This Supplement to the Standard Form Market Participant Agreement ("Supplement"), effective as of [START DATE] ("Start Date"), is entered into by and between [PARTICIPANT's NAME], a Qualified Scheduling Entity in the ERCOT Region ("QSE" or "QSE Participant"), and Electric Reliability Council of Texas, Inc., a Texas non-profit corporation ("ERCOT").<sup>1</sup>

Recitals

WHEREAS:

- A. The Public Utility Commission of Texas ("PUCT") has authorized ERCOT to conduct pilot projects in 16 Texas Administrative Code § 25.361(k);
- B. The ERCOT Board has approved an Aggregate Distributed Energy Resource (ADER) pilot project ("Pilot Project"), as described in the Governing Document for Aggregate Distributed Energy Resource Pilot Project ("Governing Document");
- C. Specific terms used in this Supplement that are defined in the Governing Document have the meanings assigned to them in that document;
- D. QSE Participant is a QSE in the ERCOT Region and has executed a Standard Form Market Participant Agreement ("Market Participant Agreement") with ERCOT;
- E. QSE Participant wishes to submit bids and/or offers from ADERs; and
- F. The Parties enter into this Supplement in order to establish the terms and conditions by which ERCOT and QSE Participant will discharge their respective duties and responsibilities with respect to the ADER Pilot Project.

Agreements

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein, ERCOT and QSE Participant (the "Parties") hereby agree as follows:

- A. All terms and conditions of the Market Participant Agreement between QSE Participant and ERCOT remain in full force and effect.
- B. QSE Participant and ERCOT will abide by and comply with the rules of the ADER Pilot Project set out in the Governing Document.
- C. Any Party may terminate this Supplement to the Market Participant Agreement by providing 30 days' notice to the other Parties; however, no termination of this Supplement will be effective before the end of any period for which ERCOT has already issued an award notification to Participant.

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<sup>1</sup> Unless otherwise indicated, capitalized terms in this Supplement have the meanings ascribed to them in the ERCOT Protocols.

- D. Otherwise, this Supplement to the Market Participant Agreement will terminate upon the completion of all obligations incurred under the terms of the Governing Document.
- E. This Supplement to the Market Participant Agreement may be executed in two or more counterparts, each of which is deemed an original, but all constitute one and the same instrument.

SIGNED, ACCEPTED, AND AGREED TO by each undersigned signatory who, by signature hereto, represents and warrants that he or she has full power and authority to execute this Supplement.

***Electric Reliability Council of Texas, Inc.:***

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

***QSE Participant:***

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

***Attached to this Agreement, QSE Participant shall include the “Details of the Aggregation,” as that term is defined in the “Aggregate Distributed Energy Resource Pilot Project Governing Document.”***