Filing Receipt

Filing Date - 2023-06-09 03:39:10 PM

Control Number - 54233

Item Number - 50

Public Utility Commission of Texas

Memorandum

TO: Interested Parties

FROM: Mariah Benson, Market Analysis Division

DATE: June 9, 2023

RE: Project No. 54233, *Technical Requirements and Interconnection Process for Distributed Energy Resources (DERs)* – DER Workshop

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Commission staff (staff) will host a distributed energy resource (DER) workshop on June 16, 2023, at 10 A.M. central time in the Commissioners' Hearing Room.

The workshop will provide interested parties the opportunity to comment on staff's proposed language updates to the interconnection process for DERs with a nameplate capacity over 250 kilowatts (kW). The following agenda and attached language will be discussed at the workshop. For agenda items one through five, the attached language is a redline version of the discussion draft filed in Docket No. 54233 Item No. 2. Discussion on agenda item six will contemplate the need for a hosting capacity requirement and the attached proposed language provided by Texas Solar Power Association in Docket No. 54233 Item No. 47.

Agenda:

1) (a) – Applicability
2) (b) – Definitions
3) (c) – Requirement for Interconnection of DER
4) (d) – Terms of Service
5) (g) – Responsibilities During and After Interconnection
6) Hosting Capacity

All persons who wish to provide comments should first identify their name and the market participant they represent.

Redline Discussion Draft Language for Agenda Items 1-5

~~**§25.211. Interconnection of On-Site Distributed Generation (DG). (REPEAL)**~~

§25.21~~1~~01. Interconnection of Distribution Energy Resources (DERs) with a Nameplate Capacity Over 250kW for Parallel Operation.

(a) **Application.** This section applies to distribution service providers (DSPs), ~~distribution~~distributed energy resource (DER) providers, and ~~distribution resources~~ DERs with a nameplate capacity over 250kW or if interconnecting in the Electric Reliability Council of Texas (ERCOT) power region and registering with ERCOT, interconnected or seeking ~~interconnection~~to interconnect with a DSP's distribution system in the state of Texas, except as provided under Public Utility Regulatory Act (PURA) § 35.037, or to the extent provided by federal law.

(b) **Definitions.** The following words and terms when used in this section have the following meanings, unless the context indicates otherwise:

(1) **Allowable Expenditure** – An amount included in the DSP's tariff unless a different amount or calculation is otherwise provided by commission rules.

(2) **Certified equipment** -- A specific generating and protective customer equipment system ~~or systems~~ that ~~have~~has been certified by a National Recognized Testing Lab (NRTL) as ~~meeting the~~ complying with applicable ~~requirements~~portions of ~~§25.212 of this title~~ (UL-1741 and IEEE-1547 standards, as determined by the distribution utility relating to ~~Technical and Operational Requirements for Parallel Operation of Interconnected Distribution Resources).~~safety and reliability when paralleling with the utility grid at the time of interconnection.

~~(2) **Distribution energy storage resource (DESR)** -- As defined in the Electric Reliability Council of Texas (ERCOT) Protocols.~~

(3) **Distributed natural gas generation facility** -- A ~~distribution resource~~DER installed on the ~~distribution resource~~DER provider's side of the meter that uses natural gas to generate not more than ~~-~~two megawatts (MW) of electricity.

(4) **Distribution energy resource (DER)** -- A source of electric power ~~that is located at a customer's point of interconnection of ten MW or less,~~ connected at a voltage of less than 60 kilovolts (kV), that can be interconnected in parallel operation to the distribution system ~~and not directly connected to a bulk power system. Distribution resource also~~. The term includes ~~both~~ generators ~~and~~, energy storage ~~technologies, including a DESR, capable of exporting energy to a distribution system. Distribution resource includes a~~ systems, and distributed renewable generation ~~facility~~facilities as defined in § 25.217 of this title (relating to Distributed Renewable Generation).

(5) ~~**Distribution resource**~~**DER provider** -- Any entity operating a ~~distribution resource~~DER in Texas.

(6) **Distribution system** -- A DSP's electric delivery system operating under 60 kV ~~that provides electric service to any entity that purchases electricity for consumption~~.

(7) **Interconnection** -- The physical connection of a ~~distribution resource~~DER to a distribution system in accordance with the requirements of this section to enable parallel operation with the distribution system.

~~(8) **Interconnection agreement** -- The standardized agreement for interconnection and parallel operation of a distribution resource with a DSP's distribution system prescribed in subsection (m) of this section.~~

~~(9) **Interconnection application** -- The application form for interconnection and parallel operation of a distribution resource with a DSP's distribution system prescribed in subsection (n) of this section.~~

(8) **Network** – Two or more utility primary distribution feeder sources electrically connected on the secondary (or low voltage) side to form a power source for one or more customers. A network is designed to maintain service to the customers even after the loss of one of these primary distribution feeder sources.

(9~~10~~) **Parallel operation** -- The operation of a ~~distribution resource~~DER while the ~~distribution resource~~DER is interconnected to the distribution system ~~for more than 100 milliseconds~~.

(10~~1~~) **Point of interconnection** -- Any point where the electrical conductors of the distribution system are interconnected to ~~the distribution resource's~~a DER's conductors and where any transfer of electric power between the ~~distribution resource~~DER and the distribution system takes place, such as the switchgear near the meter.

(11) **Protective Function** – A function carried out using hardware and software that is designed to prevent unsafe operating conditions from occurring before, during, and after the interconnection of a DER with a distribution system. For purposes of this definition, unsafe operating conditions are conditions that, if left uncorrected, would result in harm to personnel, damage to equipment, unacceptable system

instability or operation outside legally established parameters affecting the quality of service to other customers connected to the distribution system.

(12) **Stabilized** – A distribution system is considered stabilized when, following a disturbance, the distribution system returns to the normal range of voltage and frequency for a duration of no less than two minutes. A shorter time may be mutually agreed to by the DSP and DER provider.

(13) **Substantial modification** – For a given DER, a change in the fuel type of one or more of the energy resources at the facility, the replacement of any inverter or protective relay, or an increase in the facility's capacity (kW output) by more than 10%.

(c) **Requirement for interconnection of a ~~distribution resource.~~** ~~A distribution resource~~**DER.** A DER may not be interconnected with a DSP's distribution system unless the criteria of this subsection are met and, as applicable, maintained on an ongoing basis.

(1) A ~~distribution resource~~DER provider must comply with the technical and operational requirements of §25.212 of this title on an ongoing basis upon interconnection of the ~~distribution resource~~DER with the distribution system.

(2) For a given DER, a DER provider must have a currently effective executed interconnection agreement with the DSP using the form prescribed by the commission.~~A DESR must have a seasonal net maximum sustainable rating of ten MW or less or otherwise be limited to ten MW or less in output capacity using a power control system.~~

~~(3) A distribution resource with an output capacity greater than one MW must be registered with the commission as either a power generation company or a self-~~

~~generator as required by §25.109 of this title (relating to Registration of Power Generation Companies and Self-Generators).~~

(d) **Terms of service.** A DSP must provide service to an interconnected ~~distribution resource~~DER under the following terms.

(1) **Prohibited costs.** A DSP must not charge a ~~distribution resource provider the following costs associated with a distribution resource interconnected with the DSP's distribution system.~~

~~(A) Charges assessed for the export of energy by the distribution resource to the DSP's distribution system.~~

~~(B) Charges assessed for operation and maintenance of the DSP's distribution system due to the exports of energy by a distribution resource.~~

~~(C) Charges assessed for the export of energy by the distribution resource to the transmission system.~~

~~(D) Charges~~DER provider charges assessed for the disconnection of a ~~distribution resource~~DER at the order of a DSP ~~as a result of the DSP's distribution system conditions under clauses~~ in accordance with subparagraph (3)(D)-(E) ~~(2)(A)(v)-(vi)~~ of this subsection.

(2) **DSP service obligations**. A DSP must comply with the requirements of this paragraph when providing service to a ~~distribution resource~~DER interconnected to the DSP's distribution system.

(~~A~~3) **Disconnection and reconnection.** A DSP may only disconnect a ~~distribution resource~~DER from the DSP's distribution system in accordance with the conditions of this paragraph.

~~(i) **Lack of approved interconnection application** or~~ (A) **Termination of interconnection agreement.** ~~To interconnect a distribution resource to a DSP's distribution system, a distribution resource provider must first submit to the DSP an interconnection application and execute an interconnection agreement using the forms prescribed by the commission. The DSP may refuse to interconnect or may disconnect the distribution resource if such an interconnection application or interconnection agreement has not been received and approved by the DSP.~~

~~(ii) **Expiration or termination of interconnection agreement.**~~ Upon expiration or termination of the executed interconnection agreement with the ~~distribution resource~~DER provider, in accordance with the terms of the executed interconnection agreement, the DSP may disconnect the ~~distribution resource~~DER.

~~(iii) **Non-compliance with technical requirements.** If a distribution resource is not in compliance with the technical and operational requirements specified in §25.212 of this title, the DSP must disconnect the distribution resource. Within two business days from the time the distribution resource provider notifies the DSP that the distribution resource~~(B) **Safety and reliability caused by DER.** Upon the DER provider discovering an issue that represents a threat to public safety, to the safety of the DSP's or DER provider's personnel, to the safety of the DSP's customers, or to the reliability and continuity of electric service, then the DER provider must

immediately notify the DSP. When a DSP becomes aware of an issue that represents a threat to public safety, to the safety of the DSP's or DER provider's personnel, to the safety of the DSP's customers, or to the reliability and continuity of electric service then the DSP must immediately disconnect the DER if necessary to resolve or address the issue. If the interconnected DER is the cause of a safety or reliability issue, such an issue must be resolved prior to reconnection, and in accordance with subsection (f) and (h) of this section, a DSP may require:

(i) a DER provider to submit a new interconnection application;

(ii) a new impact study to be performed;

(iii) the executed interconnection agreement to be amended; or

(iv) additional testing in accordance with subsection (h) of this section.

(C) **DER non-compliance.** If at any time a DER no longer meets the requirements listed in subsection (c) of this section, then a DSP must disconnect the DER. Upon notification from the DER provider that the DER has been restored to compliance with the technical and operational requirements of §25.212 of this title, in accordance with subsection (c) of this section, the DSP must have an inspector verify such compliance~~. Upon such verification, the distribution resource provider, in coordination with the DSP, may reconnect the distribution resource~~ as quickly as is reasonably practicable.

~~(iv) **Distribution resource non-compliance.** If at any time a distribution resource no longer meets the requirements listed in subsection (c) of this section, then a DSP must disconnect the distribution resource.Within two business days from the time the distribution resource provider notifies the DSP that the distribution resource has returned to compliance with subsection (c) of this section, the DSP must verify such compliance via written confirmation from the distribution resource provider. The distribution resource provider, in coordination with the DSP, may reconnect the distribution resource once the DSP is satisfied the distribution resource is in compliance with subsection (c) of this section.~~

~~(v) **System emergency causing an unscheduled outage.** A DSP may temporarily disconnect a distribution resource~~(D) **System emergency causing an unscheduled outage.** A DSP may temporarily disconnect a DER without prior written notice in cases where continued interconnection may endanger persons or property. During an unscheduled outage of a DSP's distribution system, the DSP may temporarily disconnect a ~~distribution resource~~DER to make immediate repairs. ~~The~~ As quickly as is reasonably practicable, the DSP must notify the ~~distribution resource~~DER provider of the unscheduled outage and reconnect the ~~distribution resource as quickly as is reasonably practicable~~DER.

(~~vi~~E) **Scheduled outages for routine maintenance, repairs, and modifications.** A DSP may temporarily disconnect a ~~distribution resource~~DER from the DSP's distribution system for a scheduled outage, provided that the DSP issues notice in writing to the ~~distribution resource~~DER provider at least seven business days prior to such a disconnection. The DSP must reconnect the ~~distribution resource~~DER as quickly as is reasonably practicable following any such service interruption.

(F) **Unauthorized modifications.** A DSP may disconnect a DER from the DSP's distribution system upon discovery of a modification that was not previously authorized by the DSP in accordance with paragraph (h)(3) of this section. The DSP may reconnect the DER as stipulated by the executed interconnection agreement. Prior to reconnection and in accordance with subsection (f) of this section, a DSP may require:

(i) a DER provider to submit a new interconnection application;

(ii) a new impact study to be performed;

(iii) the executed interconnection agreement to be amended; or

(iv) additional testing in accordance with subsection (h) of this section.

~~(B) **Metering.** Consistent with Chapter 25, Subchapter F of this title (relating to Metering), a DSP may supply, own, and maintain all necessary meters and associated equipment to record energy exports by a distribution resource and energy imports to the DSP's distribution system. If the distribution resource provider selects the DSP as the entity to provide the meter, a distribution resource provider must supply, at no cost to the DSP,~~

~~a suitable location on its premises for the installation of the DSP's meters and other equipment. If the distribution resource provider selects an entity other than the DSP to provide a meter, then the distribution resource provider must allow the DSP access to the location the meter is installed. A meter is not required if a distribution resource's control package provides metering that meets all of the measurement criteria that would be required by a separate stand-alone meter.~~

~~(C~~(4) **Metering.** Metering must be consistent with Chapter 25, Subchapter F of this title (relating to Metering).

(5) **Tariff updates.** Not later than 30 calendar days after the effective date of this section, a DSP who is also a TDU must file a tariff amendment with the commission for approval to comply with this section. A DSP that is not also a TDU must amend its tariffs, as appropriate, to comply with this section. A DSP that is not also a TDU ~~that is authorized to~~and sells electricity must also include back-up, supplemental, and maintenance power services for ~~distribution resources~~DERs in its tariff.

(~~D~~6) **New or amended interconnection agreements.** ~~A new or amended~~Newly executed or amendments to existing executed interconnection agreement ~~executed~~that are completed 30 or more calendar days after the commission's approval of a DSP's compliance tariff, filed in accordance with ~~subparagraph (C~~paragraph (5) of this ~~paragraph~~subsection, must meet the requirements of this subsection.

(g) **Responsibilities during ~~the~~and after interconnection ~~process~~.**

(1) **Communications.** A ~~distribution resource~~DER provider must provide the DSP with complete and detailed written information concerning the proposed ~~distribution resource~~DER during each stage of the interconnection process. Communications concerning the nature of a proposed ~~distribution resource~~DER must be consistent with §25.84 of this title (relating to Reporting of Affiliate Transactions for Electric Utilities), §25.272 of this title (relating to Code of Conduct for Electric Utilities and their Affiliates), and §25.273 of this title (relating to Contracts between Electric Utilities and their Competitive Affiliates).

(2) **Anticompetitive practices.** A DSP and its affiliates must not use knowledge of a proposed ~~distribution resource~~DER submitted to it for pre-screen study, impact study, or interconnection to prepare competing proposals to the ~~distribution resource~~DER provider that offer either discounted rates in return for not installing the ~~distribution resource~~DER, or offer competing ~~distribution resources~~DERs.

(3) **Contribution in aid of construction.** A DSP must acquire and construct any facilities necessary to interconnect a ~~distribution resource~~DER in accordance with good utility practice.

(A) ~~A~~Notwithstanding any other law, a DSP may require a CIAC from a ~~distribution resource~~DER provider for the reasonably estimated costs that a DSP incurs to construct, install, or upgrade any distribution system or interconnection facilities that are necessary to operate the ~~distribution resource~~DER at its requested service level, including such facilities inside the DSP's substation, and for the costs of any acquisitions of the additional facilities that would affect the tax liability of a DSP. Such reasonably

estimated costs are limited to those specified in an executed interconnection agreement and, if applicable, exceed the allowable expenditure amount ~~included in a DSP's tariff.~~. The DSP must provide the DER provider an estimation of the itemized costs to be collected through the CIAC.

(B) ~~A~~ Notwithstanding any other law, a DSP may require a ~~distribution resource~~DER provider to post a security for the costs of planning, licensing, and constructing new or updated distribution or transmission facilities not covered by the CIAC.

(i) A DSP must return the security to a ~~distribution resource~~DER provider within ~~20~~10 business days after a ~~distribution resource~~DER provider notifies a DSP in writing of commencement of commercial operation.

(ii) If a ~~distribution resource~~DER provider abandons a site and new distribution or transmission facilities are no longer required, a DSP may retain as much of the security as is required to recover the costs the DSP incurred in planning, licensing, and construction activities related to the planned new or upgraded distribution or transmission facilities.

(C) A DSP must commence procurement of the additional facilities that are required to enable the interconnection no later than 30 calendar days after payment in full of the CIAC and, if applicable, a security.

(D) Within 180 calendar days of the date the DSP is notified that the DER is commencing commercial operations, a DSP must provide invoices to the

DER provider for the facilities the DSP procured and installed to enable the DER to interconnect to the distribution system. If the invoiced amounts are less than the total of the allowable expenditure and the CIAC, then the DSP must reimburse the DER provider all excess funds the DER provider paid the DSP.

(4) **Financial assurance for removal and disposal of DER.** Notwithstanding any other law, a DSP may require additional financial assurance, in addition to the CIAC and security described under paragraph (3) of this subsection, from a DER provider for costs associated with removal and disposal of the DER and related equipment and facilities once the DER is no longer intended to be operational at its sited location. A DER provider may provide the financial assurance as an irrevocable stand-by letter of credit or a cash deposit to be held by the DSP in a segregated cash account.

(A) If the DER provider removes the DER and related equipment and facilities, then the DSP must return the financial assurance to the DER within 10 business days of the completion of the removal of the DER and related equipment and facilities.

(B) If the DER provider does not remove the DER and related equipment and facilities within 60 calendar days of the date the DER is no longer intended to be operational at its sited location or upon termination of operation of the facility as intended, then the DSP may use the financial assurance to cover the costs of removing and disposing of the DER and related equipment and facilities.

(C) The DSP must determine an appropriate amount of financial assurance and provide the DER provider this amount with the results of the impact study.

(D) The DER provider must provide the DSP the required financial assurance prior to the DER commencing commercial operations.

Texas Solar Power Association language on hosting capacity, filed in Docket No. 54233 Item No. 47, for agenda item 6.

(A) Not later than December 31, 2024, each utility shall submit to the commission a distribution resource plan proposal to identify optimal locations for the deployment of distribution resources.

(1) Each utility shall preform an initial base case Integration Capacity Analysis down to the line section. This analysis quantifies the capability of the system to integrate the DER within thermal ratings, protection system limits and power quality and safety standards of existing equipment. Results of the analysis are to be published via online maps maintained by each utility and available to the public. The initial Integration Capacity Analysis is to be completed by each utility by September 1, 2024.

(2) The utility shall conduct an analysis that assesses current system capability together with any planned investments within a 2 year period and clearly articulate the assumptions and methodology used for load and DER forecasts over that 2 year period.

(3) The utility shall perform an analysis using a dynamic modeling method and circuit performance data.

(4) Each utility shall assess the state of DER deployment and DER deployment projections. For each of the identified DERs, the utility will provide current levels of deployment territory wide, plus an assessment of geographic dispersion with circuits that exhibit high levels of penetration identified.

(5) Each utility shall apply its Integration Capacity Analysis to all line sections within its distribution network and include two scenarios: (1) The DER capacity does not cause power to flow beyond the substation busbar; and (2) The DERs technical maximum capacity is considered irrespective of power flow toward the transmission system.

(6) The distribution resourced plan shall include recommendations for utilizing the Integration Capacity Analysis to support planning and streamlining of interconnection for DERs.

(b) The commission shall review each distribution resource plan proposal submitted by a utility and approve, or modify and approve, or deny each plan.