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PROJECT NO. 54233

TECHNICAL REQUIREMENTS AND)	PUBLIC UTILITY COMMISSION
INTERCONNECTION PROCESSES)	
FOR DISTRIBUTED ENERGY)	OF TEXAS
RESOURCES)	

**COMMENTS OF BASE POWER ON STAFF DISCUSSION DRAFT PROPOSED
CHANGES TO 16 TAC §§ 25.211 AND 25.212**

Base Power appreciates the opportunity to provide written comments in Project No. 54233 regarding the Commission staff proposal to modify Technical Requirements and Interconnection Processes for Distributed Energy Resources (“DER Interconnection Discussion Draft” or “Discussion Draft”).¹ Per the Discussion Draft, the Commission staff requested comments on a proposal to: (1) repeal existing DER interconnection Rule 16 TAC §25.211 and propose new 16 TAC § 25.211 (“R. 211” or “211”), relating to *Interconnection of On-Site Distributed Generation* (DG), and (2) repeal existing TAC §25.212 and propose new 16 TAC §25.212 (“R. 212” or “212”), relating to Technical Requirements for Interconnection and Parallel Operation of On-Site Distributed Generation.

I. Statement of Interest

Base Power is a Texas energy storage developer & Retail Electricity Provider (REP)² with a unique business model: Base Power owns and operates batteries deployed behind-the-meter on the homes of its retail energy customers. These customers benefit from outage protection provided by residential storage (<1 MW in size) installed on their premises, without having to purchase the battery storage devices at cost. Base Power deploys aggregated installed DER storage devices at residential interconnection points, and participates in the ERCOT wholesale markets via its Qualified Scheduling Entity.

Base Power has therefore launched as a new type of full service energy and storage provider for residential customers in Texas. Base investors are significant players in the national tech investor community who are for the first time in Texas, directly injecting capital in a competitive retail energy provider business model that is dependent on expedient and reliable residential interconnection outcomes in competitive areas of ERCOT.

Base Power is currently installing residential batteries, delivering energy as a service through a retail energy provider program, and thus managing all aspects of residential DER interconnection. Our business model allows us to serve residential customers who cannot otherwise afford the full up-front cost of battery-based home backup today in Texas. Through

¹ See Discussion Draft and Request for Comments in Project No. 54233 (filed November 22, 2022), available at: https://interchange.puc.texas.gov/Documents/54233_2_1254389.PDF [Hereinafter, Discussion Draft].

² Base Power operates a residential retail energy plan as Base Texas REP, LLC PUCT #10338.

this model, Base Power is able to gather full-lifecycle feedback from the residential customer interconnection experience, and the retail service experience, to contribute meaningful and unique value in this Project. In that regard, Base Power is situated to provide specific data and experience on the full life cycle of interconnection challenges which uniquely and disproportionately affect residential customers in Texas.

Importantly, while Project 54233 has been open for commentary and workshop discussions since the November 2022 release of the Discussion Draft, Base Power is a new provider which undertook its public launch on May 7, 2024. Given the recent launch of the company, Base Power has not had prior opportunity to present its comments and considerations for this Discussion Draft with the Commission or Commission staff.

For the above-discussed reasons, Base Power and its affiliates have a new, direct and substantial interest in development and outcomes of this Project.

II. Contact

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III. Summary of Comments

- The draft rules should include nondiscriminatory policies for interconnection of residential and small commercial distribution resources of less than 1 MW in size behind retail load meters. This is especially important given the fact that the residential sector in ERCOT is responsible for half of the peak demand during both summer and winter.³
- A streamlined residential DER Interconnection Program is essential to increasing dispatchable battery participation in ERCOT and NOIE DER Programs - a statewide energy policy goal highlighted in the 2024 Interim Charges of both the Texas House of Representatives and the Texas Senate. Residential DER interconnection reform will help the Commission and the Texas Legislature fulfill goals in support of all-of-the-above reliability solutions and dispatchability for the ERCOT Texas grid. This is a critical juncture in energy policymaking where it must be recognized that multiple policy and legislative initiatives in the state are directly and incontrovertibly dependent on the success of residential distributed energy interconnection reform.
- In furtherance of these charges, the Commission has set policy goals in Project 53911 to encourage <1 MW DERs to participate in providing ERCOT flexible dispatchable grid

³ The Electricity Journal, *Perspectives on Peak Demand: How is ERCOT peak electric load evolving in the context of changing weather and heating electrification?*
<https://www.sciencedirect.com/science/article/abs/pii/S1040619023000210>.

export-ready resources via the Aggregated Distributed Energy Residential (“ADER”) project. Increasing participation in the ADER project and achieving its goals to study impacts on the distribution system, means Texas must have a faster and predictable path for residential customers to obtain and accelerate their return on investment on DER devices. Without a large concentration of devices on the system through affordable, accessible processes like streamlined interconnection, Texas cannot deliver on the promise of more dispatchability from distributed assets and the related objectives of: (i) innovative retail offers that rely on home-installed DERs to provide grid services and demand response; (ii) more price competition in Texas to keep down consumer costs associated with delivering power; (iii) better understanding for distribution system providers as to the necessary (and avoidable) upgrades needed for their systems to keep pace with customer choices to install home backup systems; and, (iv) more opportunities through customer load-serving entities (retailers or NOIE providers) to access grid services programs which can pay residents for load-shifting behavior, similar to larger flexible loads which benefit from lucrative behavioral response programs today.

- DER Interconnection reform serves multiple, interlinked policy objectives for: (i) boosting fairness in market-compensated programs for residential customers; (ii) creating efficiency for the largest and most underrepresented class of interconnection customers; and, (iii) achieving innovation objectives in technology adoption in Texas.
- Accordingly, Base Power respectfully requests that the Commission consider development of a streamlined residential interconnection program, which includes the following elements:
 1. Implement dynamic export limits to allow DERs to provide both whole-home backup and grid support by mitigating costly transformer upgrades, ensuring fair access for all income levels.
 2. Develop live hosting capacity maps to enable preemptive decision-making for DER projects, reducing unnecessary capital allocation and delays by providing visibility into the distribution system's capacity.
 3. Streamline interconnection timelines and processes by adopting automated solutions similar to NREL SolarAPP, accommodating consistency and efficiency in application processing for residential customers.
 4. Promote the use of Meter Socket Adaptors (MSAs) for safe and cost-effective DER interconnections, minimizing installation labor and material costs for residential consumers. MSAs are a critical interconnection innovation that energy policy makers interested in equitable, consumer-focused resiliency outcomes, cannot overlook.

IV. Comments

- A. Multiple Texas state policy drivers necessitate the development of a specific residential DER interconnection program, and this proceeding is the appropriate venue to do so.**

Base Power emphasizes that there are multiple critical policy objectives that will be served by an interconnection program for expedited and efficient interconnection for behind-the-meter, sub-1 MW, small distributed energy resource interconnections.

1. **Texas ERCOT would be following in the footsteps of other jurisdictions in the United States which have experienced seasonal and annual weather-induced and load growth-induced planning imbalances and unforeseen vulnerabilities. These jurisdictions have taken serious steps to expedite small residential interconnection so that more homes and small businesses can benefit from behind-the-meter backup solutions such as residential home batteries (paired with solar and standalone).** Some examples include: various programs at the PUC of Hawaii through Order Number 37066 to expedite residential interconnection and provide incentive for new home battery storage paired with solar that dispatches daily during the grid's peak hours⁴ and the Puerto Rico Energy Bureau's comprehensive interconnection requirements for DERs and microgrids.⁵
2. **Residential DER interconnection reform will help the Commission and the Texas Legislature with its articulated goals in support of all-of-the-above reliability solutions and dispatchability for the ERCOT Texas grid.** This is a critical juncture in energy policymaking where it must be recognized that **multiple policy and legislative initiatives in the state are directly and incontrovertibly dependent on the success of residential distributed energy interconnection reform.** These include:
 - a. **A Streamlined Residential Distributed Energy Resources Interconnection Program is essential to Increasing Dispatchable Battery Participation in ERCOT and NOIE Programs - a goal in the 2024 Interim Charges of both the Texas House of Representatives and the Texas Senate.**

The 2024 Texas Senate Interim Charges include the issue of "Managing Texas Sized Growth: Evaluate the state's ability to keep pace with increasing electricity demand related to population growth and energy intensive technologies such as electric vehicles and data centers. Recommend ways to increase reliability via demand-side response programs. Study ERCOT's forecasting methodology and recommend ways to increase transparency. Monitor ongoing efforts at the Public Utility Commission related to energy efficiency programs and distributed energy resources, including the implementation of Senate Bill 1699, 88th Legislature." Similarly, the Texas House is charged to "Conduct active oversight of all associated rulemaking and other governmental actions taken to ensure the

⁴ See Order No. 37066 [Available at <https://puc.hawaii.gov/energy/der/programs/>]

⁵ See Case No. CEPR-MI-2018-0008 [Available at <https://energia.pr.gov/wp-content/uploads/sites/7/2021/07/20210713-MI20190009-20180008-Resolution-and-Order-and-Draft.pdf>]

intended legislative outcome of all legislation, including [...] SB 1699, relating to electricity service in the ERCOT power region, including the participation of aggregated distributed energy resources in the ERCOT market.”

- b. Directly in furtherance of these charges, the Commission has set policy goals in Project 53911 to encourage <1 MW DERs to participate in providing ERCOT flexible dispatchable grid export-ready resources via the Aggregated Distributed Energy Resource pilot. Increasing participation in the Pilot and achieving its goals to study impacts on the distribution system, means Texas must have a faster and predictable path for residential customers to obtain and accelerate their return on investment on DER devices.**

In order for there to be a sufficient concentration of these devices across the state to create more opportunities for Retail Energy Providers and load-serving non-opt-in entities (“NOIEs”) to develop cost-effective aggregation solutions, and for utilities to study the need for investment in their systems to support concentrations of DERs, there simply needs to be a faster process to interconnect, permit and bring these devices into service. Critical reliability-driven market participation objectives for residential DERs cannot be fulfilled without streamlined interconnection processes. As was stated in the Commissioners’ Memorandum initiating the ADER pilot project in Project 51603, the intent of the pilot is to “answer questions related to how aggregated distributed generation can support reliability, enhance the wholesale market, incentivize investment, potentially reduce transmission and distribution investments, and support better load management during emergencies. In the short term, we expect the pilot will bring in vital megawatts (MWs) of resources for participation in the ERCOT market.” These goals require accelerated uptake in DERs across residential load zones in Texas, and state policy must be laser-focused on residential interconnection reform to achieve these larger, critical statewide reliability objectives.

- c. Residential DER Interconnection reform serves multiple, interlinked policy objectives for: (i) boosting fairness in market-compensated programs for residential customers; (ii) creating efficiency for the largest and most underrepresented class of interconnection customers; and achieving innovation objectives in technology adoption in Texas.**

Conventional ERCOT demand response (“DR”) programs reward market participants for fitting their load profile to limit stress on the grid during peak load events. Because the benefits of DR programs are proportional to the size and flexibility of the load and the ability of the end consumer to offer in their responses into real time and day ahead markets, participation in demand

response has been largely concentrated among large flexible loads. For the most part, residential consumers need smart home devices and batteries to meaningfully contribute to such programs and receive accessible and fair compensation for the same services large loads can provide. The ADER pilot, providing access to ERCOT wholesale price signals through residential load serving entities, is a model for fair compensation for residential customers who shift their behavior to meet grid needs. However, in this pilot and other programs available today for conventional DR, residential participation has lagged due to long interconnection processes and high up-front costs for consumers associated with consumer installation of dispatchable, fast-ramping devices like batteries, which can be sized to serve home outage protection needs *and* support the grid, without compromising either objective. Base's business model enables more equitable access across income brackets by eliminating the high upfront cost of the hardware to do exactly this. To achieve equitable outcomes and fairness in residential access to available ERCOT and TDSP DER/DR programs, however, there must be easy access to interconnect devices that make residential customers eligible for these programs in the first place. This is enabled through equal oversight and careful, customer-specific reforms which support the interconnection process for residential DERs.

Further, residential DER interconnection reform is an untapped and easy lift opportunity to quickly streamline interconnection requirements for the most vulnerable, relatively unsophisticated, but largest, class of interconnection customers in ERCOT Texas which faces the most complex and bespoke set of interconnection and AHJ/permitting requirements today. While many programs exist to support more sophisticated commercial and industrial customer classes through a smaller set of vendors and developers who can effectively represent the collective interests of a single customer class, there is no single point of accountability from which individual residential customers statewide can expect consistent, equitable interconnection experiences and outcomes across multiple vendors, developers and service providers available to them across disparate competitive service areas in ERCOT. It is well recognized that the haphazard nature of residential interconnection processes adds substantial cost to the interconnection process, interconnection timelines, and ultimately, to the cost-to-serve. As a result, residential DER investment continues to lag far behind desirable levels needed to support the tremendous load growth pressure coming to Texas and the far slower and costlier pace of resource additions needed on the

transmission system.^{6 7} The benefits of DER and aforementioned challenges are well documented in docket 51603, a review of Distributed Energy Resources.⁸

3. **Texas has multiple mandates and policy motivators at play to encourage energy sector innovation, which can be driven by an uptick in DER adoption at the residential customer level.** For example, the US Department of Energy recently granted funds to UT Arlington Department of Electrical Engineering to study the impact of DER concentrations on distribution circuits, which addresses one of the many charges of the ADER project. A key motivator of the grant is the recognized value of small <1 MW DERs in an aggregated resource to provide the same benefits to the grid while also providing colocated benefits to grid consumers at lowest possible cost.⁹ Also, there are a variety of parallel tracked disaster resilience efforts at the Texas legislature that encourage energy resilience and backup protection in the face of extreme weather and disasters like wildfires.¹⁰
4. **ERCOT's most recent Innovation Summit was also focused on key solutions for addressing future load growth in Texas** – demand flexibility, uncertainty management, and battery storage were overarching topics for three of the six panels at the summit. DERs, like Base's batteries, fall at the intersection of these priorities for market operators. Dr. Le Xie from Texas A&M on the panel about demand flexibility spoke broadly about what is needed to encourage adoption for DERs and other demand response solutions: "ERCOT is not in the business of picking winners and losers, but ERCOT should be in the business of creating the right incentives and processes [for demand flexibility]." Standardized processes for interconnection for DERs <1 MW is a critical first step.

B. The Commission should Establish a Separate Program for Sub-1 MW Residential and Small Commercial Interconnections Located behind a Utility Service Meter (Behind-the-Meter Interconnection for Small DERS)

⁶ Brown, K. (2024, March 29). *Virtual power plants (VPPs) could save US utilities \$15-\$35 billion in capacity investment over 10 years*. Brattle.

<https://www.brattle.com/insights-events/publications/real-reliability-the-value-of-virtual-power/>

⁷ U.S. Department of Energy. (2024, March 25). *Virtual power plants - pathways to commercial liftoff*. Pathways to Commercial Liftoff. <https://liftoff.energy.gov/vpp/>

⁸ See project 51603 [available at https://interchange.puc.texas.gov/Documents/51603_52_1215863.PDF]

⁹ See RMI report on how residential batteries add the most value for customers as they are located closest to load [available at <https://rmi.org/wp-content/uploads/2017/03/RMI-TheEconomicsOfBatteryEnergyStorage-FullReport-FINAL.pdf>]

¹⁰ See report from the Texas House Investigative Committee on the panhandle wildfires [available at <https://house.texas.gov/media/pdf/committees/reports/88interim/House-Interim-Committee-on-The-Panhandle-Wildfires-Report.pdf?v=88.1>]

DERs bring a variety of grid and consumer benefits – they increase renewable utilization, decrease system costs by deferring infrastructure upgrades, lower electricity procurement rates for utilities and the individuals they serve, relieve transmission and distribution line congestion, and provide a variety of grid services including blackstart, frequency and voltage control.

Although residential and large-scale DERs provide the same benefits, they are fundamentally different grid resources with different ownership models, which necessitates distinct technical requirements and interconnection processes. Some of these differences for small DERs include: (1) residential customers must agree to purchase DERs before an interconnection application or pre-screen study can be submitted; (2) residential DERs are deployed behind residential meters and provide outage protection in the case of grid failure; (3) residential DERs must utilize transformer infrastructure that was not explicitly sized for the purposes of dispatch; and, (4) deployment rates of residential batteries are, unsurprisingly, far higher than those of large scale DERs.

In light of these differences, Base Power joins the comments of several parties who have prior-filed in this proceeding, to request that a DER interconnection program design be promulgated in this proceeding for DERs up to 1 MW, which are installed behind a residential or small commercial load meter in TDSP regions of ERCOT.¹¹ Base Power echos these comments and provides specific recommendations to develop a small DER interconnection rule, as follows:

1. Dynamic Export Limits

Most transmission distribution service providers restrict permission to operate to storage systems with *nameplate* capacities that do not exceed transformer limits. This ignores the ability of battery providers to set firmware-level export limits that prevent damage to distribution infrastructure, while still providing sufficient power for whole-home backup during times of high demand. These interconnection limitations driven by lack of specificity in the process threaten the ability of residential DERs to provide both grid balancing services and reliable outage protection to the customers. To upgrade transformer infrastructure levies enormous financial burden onto citizens of Texas, in particular in the lowest income neighborhoods. We recommend that the commission instruct TDSPs to allow for dynamic export limits that preserve the ability of DERs to both provide whole home backup and grid support without triggering transformer upgrades.

2. Live Hosting Capacity Maps

The pre-screen study described in R. 211 allows capital allocators for DERs to determine the technical viability of a DER project before they invest in the asset. Today, residential DERs must submit an interconnection application and proceed through the 4-week waiting period in order to determine technical viability, which occurs after the end user of the DER has purchased the product. As a result, most DER customers, providers and installers will not know if the

¹¹ See item numbers 22, 10, and 7 from Docket No. 54233

distribution system can support their DER until the customer has allocated capital for it and the provider or installer has submitted an interconnection application.

We recommend that the Commission encourage utilities to devise the equivalent of a pre-screen study for residential DERs – specifically, a live hosting capacity map like, like Xcel Energy’s map in Colorado, which allows DER providers and customers alike to take pre-emptive action in avoiding unnecessary interconnection capital allocation and labor.¹² Access to this map can be restricted to certified Original Equipment Manufacturers (“OEMs”) for data security purposes. This recommendation is a variation of earlier comments from the Texas Solar Power Association on the requirement to report hosting capacity.

3. Expedited/Improved Interconnection Timelines, Processes, & Tools

Unlike large-scale DERs, when Base Power submits individual residential customer applications on behalf of each customer in a TDSP area, most of the information is identical across forms. Particularly because Base Power does not provide rooftop solar, Base uses the same manufactured hardware at each residential customer site and maintains the same installation configuration represented by the same engineering documentation. Therefore, there is an opportunity for achieving a much higher degree of consistency of information shared about Base Power residential installations across multiple interconnection application platforms without repeating processes for each site. This is a major efficiency improvement that capitalizes gains in interconnection management for TDSPs and installers alike, given the sheer volume of deployments underway. There is a clear need for automation to deliver operational DERs to customers in a timely¹³ manner and streamline how TDSPs and residential installers/developers can work together to deliver that improved experience to their shared customer.

Base Power notes that NREL SolarAPP has provided a simple standardized solution for interconnection automations.¹⁴ Base Power requests that the Commission consider program rules and workshopping public policy objectives that could lead to the creation of a framework for TDSPs to adopt similar automations through software that streamlines interconnection applications for residential DERs.

4. Meter Socket Adaptors

We echo the comments provided by ConnectDER regarding the importance of Meter Socket Adaptors (“MSAs”) in promoting safe and inexpensive deployment of residential DERs in Texas. MSAs represent a fully certified, safe, effective way to interconnect DERs, further reducing costs

¹² Excel Energy Cacity Map [Available at <https://www.arcgis.com/apps/webappviewer/index.html?id=9c96992b9060402495765bdf67cd1a9>]

¹³ In some territories, TDSPs are allowed 30 days to review interconnection requests and another 30 days to review post-installation photos, which means battery owners must wait months in order to receive permission to operate.

¹⁴ NREL SolarAPP+ [Available at <https://solarapp.nrel.gov/>]

for Texans via decreased installation labor and materials.¹⁵ MSA technology has evolved dramatically in just two years since first being piloted in utility service territories around the country. This technology requires access to the customer-owned meter can, and sits behind the utility meter (between the utility's meter and the customer's meter can) to facilitate rapid disconnect of residential DER so that devices behind the meter can operate in parallel to or islanded from the electric grid. Meter collar adapters are a widely recognized solution in the United States to save dozens of man hours, and thousands of dollars in residential main panel upgrade and rewiring costs, to install home backup devices like batteries. As noted in a ConnectDER article publicly available on this topic, MSAs are particularly important to encourage installation of outage protection technology for "underserved low- and moderate-income populations that more frequently live in older homes, which were never intended to generate power on site."¹⁶ These older constructions, and the communities of Texans living in them, deserve the most innovative, convenient, and affordable options on the market today for home outage protection: MSAs are a critical interconnection innovation that energy policy makers interested in equitable, consumer-focused resiliency outcomes, cannot overlook.

V. Conclusion

Standardization around interconnection processes for <1MW projects follows in the footsteps of many states that have separated small residential DER interconnection processes, which bring cascading benefits for residential energy consumers, TDSPs, and ERCOT: Texans can benefit cost effective grid outage protection, Texas TDSPs can benefit from a faster and more transparent understanding of the cost and physical impacts of increased two-way power flow on distribution systems, thereby enhancing system planning efforts. ERCOT can benefit from a wider array of dispatchable resources interconnected at the distributed level which are capable of responding to ERCOT prices and conveying critical data about DER devices, all while Base and other DER providers bring dispatchable power faster to the grid.

Signature,

Jackson Parell

¹⁵ See item 83 in Docket No. 54233 [Available at https://interchange.puc.texas.gov/Documents/54233_83_1371992.PDF]

¹⁶ Article: How to Avoid Main Panel Upgrades to Help Increase Deployment of Home Solar and Batteries, *T&D World* (Nov. 7, 2023), at <https://www.tdworld.com/smart-utility/metering/article/21276930/how-to-avoid-costly-main-panel-upgrades-to-help-increase-deployment-and-affordability-of-home-solar-and-batteries>.



Base Power Company

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