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| NOGRR Number | [272](https://www.ercot.com/mktrules/issues/NOGRR272) | NOGRR Title | Advanced Grid Support Requirements for Inverter-Based ESRs |

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| Date | January 15, 2025 |

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| Comments |

Plus Power appreciates the opportunity to file these comments on Nodal Operating Guide Revision Request (NOGRR) 272. Plus Power currently owns and operates four standalone Energy Storage Resources (ESRs) in ERCOT and has more in development. Our earliest ESR has been operating in ERCOT since 2021. Our Kapolei Energy Storage (“KES”) facility in Oahu, Hawaii, performs grid-forming services as a condition of its contract for Hawaiian Electric, in which we are remunerated for these additional services.

Plus Power appreciates ERCOT’s efforts in investigating and proactively proposing a grid forming specification for the ERCOT region. Plus Power also appreciates ERCOT’s effort to ‘right-size’ the performance requirements through its efforts to test vendor models and not immediately require capabilities such as Black Start capability and inertia requirements, in order to prioritize more universally available capabilities.

As the owner and operator of a Battery Energy Storage System (“BESS”) that is currently providing grid-forming services in Hawaii, Plus Power agrees that grid-forming capabilities can be part of ERCOT’s overall approach to improve reliable operations of the ERCOT grid, especially in weak grid areas. Plus Power also agrees with making the requirements of having the grid-forming capabilities (not required services) forward-looking for Resources that execute a Standard Generation Interconnection Agreement (SGIA) on or after a date in the future and not retroactively to avoid potential challenges of such a policy. Plus Power believes that preparing for and delivering the grid-forming capabilities will provide essential reliability benefits but also will have associated costs that should be remunerated. While grid-forming technology is more readily available today, these costs cannot be ignored and in fact, many other grid operators around the world have recognized these services and have compensated them to prevent an economic disadvantage or discouragement for such capable Resources. Plus Power believes a key difference in understanding may be that ERCOT may believe that providing the new reliability service is free or very low cost. However, ESR owners and operators understand that it will have a significant cost impact on the initial capital investment and ongoing Operations and Maintenance (“O&M”) expenses that uniquely affect ESR owners and operators, but not to other Inverter-Based Resource (IBR) owners and operators. Nonetheless, these ESR resources will be providing a benefit for all other non-ESR Generation Resources (e.g., non-ESR Generation Resources in weak grid areas or behind Generic Transmission Constraints (GTCs)).

At the outset, ESRs are uniquely capable of performing a range of capacity and grid services, particularly rapidly with a millisecond response, and should be compensated separately for each service that is bid. Moreover, remuneration for grid-forming services from non-conventional technologies has occurred in other regions. For example, in 2019, Hawaiian Electric Company issued a Request for Proposals (“RFP”) that, among a range of needs, sought bids for fast-frequency response or other grid services and requested grid-forming services. The RFP sought up to 50 MW / 25 MWh of Fast Frequency Response (FFR) along with 200 MW / 4 hours of load shifting. Plus Power bid fast frequency response with virtual inertia and a form of Black Start as part of the 185 MW / 565 MWh KES facility and was awarded a contract in 2020 that remunerated for each of the bid services. The KES facility now often performs FFR and virtual inertia services for Hawaiian Electric.

As noted above, there are additional costs to the operator to enable the ESRs to provide grid-forming services, and Plus Power strongly urges ERCOT to establish a clear compensation framework for these grid-forming services, as is consistent with industry practice in other jurisdictions. Although components of battery storage systems inherently may be technically able to function as grid-forming assets, there is substantial additional planning, design, and operational work to actually enable the function and monitor its performance. Examples of these additional costs include:

* Design planning costs;
* Headroom must be maintained to allow for a level of charging at high State of Charge (SOC) levels and conversely a level of discharging at low SOC levels. These operational points are not static and may vary over time and with calibration and balancing activities. Additional resources may be needed to monitor and maintain enough charge and discharge capabilities on a daily basis;
* This additional headroom preservation (in addition to other SOC requirements imposed by ERCOT) will result in opportunity costs for the ESR operator to maintain SOC readiness for potential grid-forming responses versus providing real time energy or providing other Ancillary Services. This headroom preservation also may alter or affect other ESR performance guarantees, contracts, and support costs;
* Additional tests must be run, requiring coordination from multiple parties; and
* Additional modeling activities must be performed which have significant costs.

As the foregoing examples reflect, the cost of this planning and operational burden to ensure grid-forming readiness is significant.

While this proposal appears narrowly crafted, mandating grid-forming services for ESRs without appropriate compensation mechanisms would establish a concerning precedent in Texas on the subject without a more fulsome discussion of where, why, and when these services are needed and a full picture of impacts to affected ESRs and the benefits for less capable non-ESR Generation Resources.

Plus Power respectfully recommends that ERCOT address a range of questions about how these services will be integrated before moving forward with this NOGRR. The following are issues that require more discussion and planning before moving ahead on this NOGRR:

* How does ERCOT intend to build grid-forming services into its planning?
* How will ERCOT handle performance where the unit did ride-through but did not perform as modeled?
* What is ERCOT’s roadmap to integrating and compensating for other new grid-forming services not being required by NOGRR 272, such as Black Start Services and virtual inertia?
* How will ERCOT compensate ESRs for the lost opportunity costs of preserving headroom at high and low SOC levels?
* How will ERCOT compensate ESRs for their increased initial and ongoing costs to provide this new service?

Plus Power appreciates the opportunity to provide these comments and looks forward to working with ERCOT and other stakeholders on these important issues. As noted at the outset, Plus Power agrees that grid-forming capabilities that ESRs can provide can be a valuable part of ERCOT’s overall strategy to improve the reliable operations of the ERCOT grid. Plus Power strongly emphasizes that a fundamental prerequisite to realizing these benefits is establishing a fair and transparent compensation mechanism that recognizes both the capital and operational costs incurred by ESRs in providing these essential grid-forming services.

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| Revised Cover Page Language |

None

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| Revised Proposed Guide Language |

None