

Energy Storage and Distributed Energy Resources Phase 2 (ESDER 2) Third Revised Straw Proposal

**Comments by Department of Market Monitoring
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Summary

DMM appreciates the opportunity to comment on the ESDER 2 Third Revised Straw Proposal. Energy storage resources incur operational costs in some unique ways that are not currently reflected in NGR models or models used for traditional generation resources. DMM recommends that the ISO continue to work on modeling these unique cost structures so that the ISO software can consider the actual costs of energy storage resources when determining their optimal dispatch. An alternative discussed in this initiative is for energy storage resources to simply use hard limits to prevent the ISO software from dispatching them into more costly operational ranges. However, restricting the operational capabilities of energy storage resources would prevent the ISO from optimally dispatching these valuable new resources. Therefore, DMM opposes the ISO permitting energy storage resources to model contractual arrangements as physical limitations in the ISO software. Until such time as the ISO is able to model the unique cost structures of energy storage resources, these resources should be able to more efficiently manage their operational costs by adjusting energy bids rather than declaring artificial operational limitations. DMM supports the ISO clarifying that in the future, the ISO will not grandfather any signed contracts as the basis for cost-based caps or operating limitations, unless contract provisions directly represent actual costs or physical resource limitations.

Additionally, DMM generally supports the use of new baseline methodologies for proxy demand response resources which may improve accuracy. However, it is important the ISO maintain appropriate baseline audit procedures. Finally, DMM supports the consideration of additional gas pricing locations in the demand response net benefits test to accommodate demand response resources in the EIM. DMM suggests clarification and refinement of modeling options for hybrid storage-generation resources as a topic for ESDER 3.

I. NGR Enhancements

Overview

DMM understands that energy storage resources may face unique constraints compared to conventional generation resources. Examples of these constraints which have been discussed in the course of the ESDER stakeholder initiatives include megawatt-hour energy limits over a defined period of time, limits on the frequency of battery cycling, and limitations on depth of charge and discharge. As these limitations

have been discussed in the ESDER 2 initiative, and through independent engagement with some stakeholders, it has been clarified that the nature of these constraints may be primarily economic rather than a true reflection of the physical capabilities of the battery resource.

In an effort to address the characteristics and limitations of NGR resources which have been raised by stakeholders in the ESDER 2 initiative, the ISO has considered a variety of NGR model enhancements. These proposed enhancements have been primarily focused on new model parameters intended to restrict the ways in which an NGR resource may be dispatched in the CAISO market. This type of model parameter is essential to properly reflect limitations imposed by the physical characteristics of a resource. However, limitations imposed by contracts, negotiated performance guarantees, or other purely economic considerations are more efficiently modeled through explicit inclusion of costs in market optimization. These costs may include costs for additional maintenance activities resulting from a particular type of operation, or other costs associated with operation of the resource in a particular manner. DMM supports the ISO continuing to work with stakeholders to understand all costs faced by NGR resources, and working toward NGR modeling enhancements which seek to explicitly incorporate these costs in market optimization.

Comments on Third Revised Straw Proposal

In the ESDER 2 third revised straw proposal, the ISO states that the focus going forward will be in reflecting use limitations of NGR resources, understanding the physical use limitations of storage resources, and the potential modeling, market optimization, and settlement treatment impact of these limitations. The proposal specifically identifies and addresses stakeholder requests to model megawatt limitations based on time of day or depth of cycling, modeling reduced megawatt throughput, and modeling of charge/discharge limitations over a defined period of time. The ISO is proposing to address some of these requests while closing out others. DMM offers comments on each of these areas below.

Megawatt limitations

In the general area of megawatt limitations on NGR resources under different circumstances, the ISO concludes that such limitations are manageable through the use of appropriate bidding strategy and, when the limitation is truly physical in nature, outage management. No further action is proposed by the ISO in this area. DMM supports the conclusion that megawatt limitations can be effectively managed through the use of appropriately structured bids. Through the use of bids, a scheduling coordinator for an NGR resource can reflect the cost of operating in a particular megawatt output (or charging) range without imposing a hard constraint on resource dispatch. This allows full consideration of resource costs in the market optimization which ensures an efficient dispatch. It would be neither appropriate nor efficient to include model parameters to reflect these limitations when the limitation is driven by a contract or negotiated performance guarantee. The use of energy bids to manage a

variety of economic limitations may be particularly effective in the short-run as NGR resources are not currently subject to market power mitigation. However, in the long-run, NGR resources may be subject to mitigation and the price to which they may be mitigated would only reflect incremental energy costs rather than the full range of potential costs. This points to the long term need to enable NGR resources to appropriately reflect all costs in market optimization.

DMM also generally agrees that the use of outages would be appropriate to reflect temporary physical megawatt limitations, and DMM appreciates the ISO's emphasis in the third revised straw proposal that outages should be used for physical reasons. However, there remains a clear need to solidify the definition of a physical limitation for NGR energy storage resources. For example, in the third revised straw proposal of ESDER 2, the ISO explicitly identifies "the need to maintain battery health and adverse cell degradation" as a physical limitation which would be appropriately managed through the use of an outage. DMM does not agree that this should always—if ever—be an acceptable use of an outage. This is particularly true to the extent that maintaining a given level of battery health or avoiding cell degradation is associated with a contract or negotiated performance guarantee. Such limitations would be more appropriately and efficiently managed through the use of energy bids to reflect the costs of operating the resource in a particular manner.

The ISO also states in the third revised straw proposal that existing outage reason codes may not necessarily reflect the needs of storage resources, and that the ISO is soliciting comment from stakeholders to suggest potential updates to outage reasons. DMM appreciates this point and appreciates any effort to improve outage reporting. However, the larger issue appears to be the need to reflect NGR resource limitations imposed by contracts and performance guarantees, rather than a need to enhance physical outage reporting capabilities for energy storage resources. Pursuing a broader set of potential outage reasons should not be viewed as a substitute for continuing to understand NGR costs, and continuing to explore ways in which these costs could be explicitly incorporated in the market.

Cumulative limitations on charging and discharging

An additional limitation of energy storage resources identified by stakeholders is that of charging and discharging limits over a defined period of time. For example, stakeholders have expressed that a resource may be limited in the megawatt-hours spent charging or discharging in month or year. Stakeholders have requested NGR modeling enhancements to reflect megawatt-hour limitations to assist in the management of battery cycling. This request was made by many stakeholders for the specific purpose of managing contractual limitations and performance guarantees. Additionally, some parties have requested that a daily megawatt-hour limit be incorporated such that resources with resource adequacy capacity be exempted from penalty for failing to offer the resource adequacy capacity once the daily megawatt-hour limit is exhausted.

The ISO is proposing no further consideration of annual or monthly charge and discharge limitations. This position is based on the point that CAISO market optimization occurs over periods of a day or less (for the day-ahead and real-time markets, respectively). However, the ISO is instead proposing a daily megawatt-hour throughput bid parameter to limit total charge and discharge over a day.

As with other NGR model parameters under consideration, DMM supports the inclusion of megawatt-hour limitations within a set period of time only if used to reflect a physical limitation of the resource. However, DMM opposes the incorporation of a megawatt-hour limit on charging or discharging of energy storage resources on the basis of contractual limitations or negotiated performance guarantees. DMM further opposes the suggestion that resources exhausting such a limitation should be exempted from Resource Adequacy Availability Incentive Mechanism (RAAIM) penalties. The limitations imposed by contractual obligation, while expressed for a defined period of time, appear to have little physical relationship with the period of time beyond ensuring a particular level of battery life and cell health for an agreed upon period of time, or delaying maintenance activities for a specified period of time. These limitations are not exogenous to the resource operator, and indeed may be made more restrictive in exchange for more favorable terms in capacity acquisition. For this reason particularly, it is not appropriate to exempt NGR storage resources from RAAIM penalties when contractual use limits are exhausted. Under this construct, entities contracting with energy storage resource owners may have greater financial incentive to minimize capacity procurement cost at the expense of market availability. This maximizes profits on resource adequacy capacity sold from energy storage resources while simultaneously working to undermine the intent of resource adequacy capacity by limiting its availability.

In the near term, DMM believes that many of the megawatt-hour and cycling limitations faced by energy storage resources may be effectively managed through energy bids. As a longer term solution, megawatt-hour constraints imposed by contractual limitations or limitations associated with performance guarantees would be more efficiently incorporated in market optimization through explicit inclusion of cost. For example, if there is a particular maintenance activity associated with the number of charge or discharge cycles of an energy storage resource, the cost of that maintenance should be reflected per cycle in the market optimization. This could prevent excessive cycling of the resource by ensuring that the cost of cycling was recognized by the market. DMM understands this may be a longer term solution which may require changes to the market optimization to include such costs. However, this type of approach appears to have some stakeholder support. Concepts such as commitment costs for NGR resources and inclusion of major maintenance costs have been raised in the course of discussion and stakeholder comments in the ESDER 2 initiative. DMM encourages the ISO to continue to work with stakeholders to fully understand costs faced by energy storage resources, and to consider necessary market enhancements to incorporate those costs.

Potential for use limited status

In an effort to reflect various limitations of NGR energy storage resources, stakeholders have requested that the ISO consider use-limited status for NGR resources. DMM does not oppose the consideration of use-limited status for NGR resources, provided that the basis of the use-limitation is consistent with those of other generation resources. Use limitations based on contracts or performance guarantees should not qualify an NGR resource for use-limited status. These limitations are economic in nature and would not qualify any other resource for use-limited status. Use-limited status could exempt resources with resource adequacy capacity from RAAIM penalties when the use limitations are exhausted. DMM does not believe it is appropriate to exempt resources from RAAIM penalties on account of contractual arrangements that do not reflect physical or environmental use limitations.

II. Alternative DR Baselines

DMM appreciates the efforts of the Baseline Analysis Working Group (BAWG) to improve the accuracy of PDR and RDRR baselines. As an additional element of the ESDER 2 proposal, the ISO proposes to move the obligation of calculating DR baselines and settlement quality meter data for PDR and RDRR resources from the ISO to the scheduling coordinator. The ISO notes that it will retain the right to audit baseline calculations and the derived settlement quality meter data on a random basis, as well through an annual scheduling coordinator self-audit. DMM agrees that this is important to maintain the integrity of scheduling coordinator calculated baselines. As such we note the importance of the ISO having resources and a process readily available to thoroughly conduct such audits as necessary.

III. DR NBT for EIM

Currently, the ISO tariff explicitly states that only the SoCal Citygate and PG&E Citygate futures prices will be considered in the demand response net benefits test (DR NBT). The ISO is proposing in the ESDER 2 third revised straw proposal to revise the tariff to remove the listing of these specific gas pricing locations, and to refer to a more general list to be published and maintained in a business practice manual. This is being proposed to accommodate a wider range of possible gas pricing locations which may be applicable to the Energy Imbalance Market (EIM). DMM believes that the ESDER 2 initiative is an appropriate forum to consider this change, and DMM supports the revision to facilitate the participation of proxy demand response resources in current and future EIM areas.

IV. Suggested Items for ESDER 3

In the ESDER 2 third revised straw proposal, the ISO solicits suggestions for potential topics to include in the next phase of the initiative, ESDER 3. DMM recommends that the ISO include in ESDER 3 clarification and enhancements of modeling options for hybrid storage-generation resources. As an increasing number of these resources begin to seek options for participation in ISO markets, questions have arisen on the subjects of how to best model the resources, which fuel type is appropriate, how to handle default energy bids and commitment costs, and how issues such as charging and state of charge are best handled. Many of these questions come up when considering the differences between the non-generator resource (NGR) model, which would be used to model the battery as a separate resource, and the model of a typical generator which is currently the option available to hybrid resources. Given that these resources already exist in the ISO market and more are expected, DMM believes it is increasingly important to have a clear understanding of the cost structure and physical characteristics of these resources, why it would be preferable to establish this type of resource, and that the ISO clearly document and enhance modeling options as needed to accommodate these resources.