

# Comments on Resource Adequacy Enhancements Sixth Revised Straw Proposal – Phase 2A

## Department of Market Monitoring

February 1, 2021

### I. Summary

The Department of Market Monitoring (DMM) appreciates the opportunity to comment on the *Resource Adequacy Enhancements Sixth Revised Straw Proposal*.<sup>1</sup> DMM provides comments on the following aspects of phase 2A of the sixth revised straw proposal:

- DMM supports the ISO developing a more effective framework to provide incentives for resource adequacy capacity to be available and perform as a replacement for RAAIM. DMM sees two major shortcomings in the RAAIM framework today. First, RAAIM provides weak incentives for resources to be available and perform, particularly resources with high marginal costs (or bids) that are only called upon on very constrained operating days. Second, potential exposure to RAAIM discourages suppliers from showing excess capacity on resource adequacy supply plans. The ISO's proposed UCAP framework would address the second shortcoming of the RAAIM framework. The UCAP proposal would also provide incentives for all resources to remain available, not just shown resource adequacy resources. However, the ISO's UCAP proposal may only be a marginal improvement over RAAIM in terms of incentivizing availability and performance on very constrained operating days.
- The ISO's UCAP assessment methodology could be modified to strengthen incentives for resources to be available and operational. DMM continues to suggest that the ISO consider applying a weighting mechanism to UCAP assessment hours to better capture the importance of availability of resources under tighter supply conditions. Availability of capacity in hours where all resource adequacy capacity is needed to meet load and reserve requirements is much more valuable than availability when there are potentially thousands of megawatts of surplus capacity on the system. The ISO proposal does not distinguish between these different system conditions, so that unavailability of a resource under these very different conditions would have the same impact on a resource's UCAP. DMM believes that assigning a higher weight to hours with a tighter supply cushion (even if the weighting is only done within the top 20% of hours) could provide better incentives for resources to be available and operable on days where all resource adequacy capacity is needed by the ISO. Assigning a lower weighting to hours with larger supply cushions could also be less

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<sup>1</sup> *Resource Adequacy Enhancements Draft Final Proposal – Phase 1 and Sixth Revised Straw Proposal*, California ISO, December 17, 2020: <http://www.caiso.com/InitiativeDocuments/DraftFinalProposal-SixthRevisedStrawProposal-ResourceAdequacyEnhancements.pdf>

punitive when the ISO may have thousands of megawatts of surplus capacity available on the system.

- DMM is concerned that the ISO's approach to calculating UCAP for storage resources would not capture instances where a storage resource limits its state of charge such that it cannot provide its full resource adequacy value. Storage resources can limit their maximum state of charge in various ways and the ISO's UCAP calculations for storage resources should account for state of charge de-rates which limit resources' ability to provide resource adequacy. In prior iterations, the ISO proposed to consider state of charge limitations in UCAP calculations. DMM commented that those proposals could be excessively punitive, and offered some examples of how the ISO could more narrowly identify when self-imposed state of charge limitations may legitimately limit their resource adequacy availability.<sup>2</sup> DMM encourages the ISO to reconsider its UCAP proposal for storage resources.
- DMM remains concerned that resources which are pivotal or are required to meet local area capacity requirements would have limited incentives to be available under the UCAP framework. Since the ISO would continue to define local requirements in terms of today's NQC (DQC under the UCAP framework), pivotal local or pivotal sub-area resources would continue to be needed up to DQC values. The UCAP framework (and removal of RAAIM) may result in limited incentives for pivotal local resources to remain highly available. DMM continues to suggest that the ISO consider a separate availability incentive mechanism for local resources.
- DMM continues to recommend that the ISO consider developing a separate performance-based penalty or incentive mechanism which would apply to a more limited set of intervals than the proposed UCAP assessment hours. This separate incentive penalty or payment structure could strengthen incentives for resources to not only be available, but also to perform according to their stated availability in critical hours.<sup>3</sup> An additional performance incentive mechanism could also strengthen incentives for local resources to be available and perform given potentially limited incentives to do so under the proposed UCAP framework.
- DMM supports the ISO's proposed must-offer obligations which are largely consistent with must-offer obligations today, but would extend the standard 24 by 7 must-offer obligation and bid insertion to most use-limited and conditionally available resources. However, the ISO should remove from this proposal any potential changes to the must-offer obligation

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<sup>2</sup> *DMM comments on resource adequacy enhancements working group June 10, 2020*, DMM, June 26, 2020, pp. 4-7: <http://www.caiso.com/InitiativeDocuments/DMMComments-ResourceAdequacyEnhancementsWorkingGroup-Jun102020.pdf>

<sup>3</sup> *Comments on Reliability Service Initiative – Phase 2 Second Revised Draft Final Proposal*, DMM, October 4, 2016, p. 2: <http://www.caiso.com/Documents/DMMComments-ReliabilityServicesInitiativePhase2-SecondRevisedDraftFinalProposal.pdf>

related to the Day-Ahead Market Enhancements (DAME) initiative. The DAME proposal is still being developed, and any changes to must-offer obligations related to the DAME proposal should be addressed in that proposal, not presupposed in the RA Enhancements proposal that the ISO expects to take to the CAISO Board in May 2021.

- The ISO should continue to calculate UCAP values for RMR resources since these resources may return to the market in subsequent years.

DMM provides additional details and comments on these issues below:

## II. UCAP

### ***DMM supports developing an alternative framework as a replacement for RAAIM, but believes the ISO proposal could be significantly improved***

DMM sees two major shortcomings in the RAAIM framework today. First, RAAIM provides fairly weak incentives for resources to be available and perform, particularly resources with high marginal costs (or bids) that are only called upon on very constrained operating days. While the RAAIM equations are somewhat dense, one can perform a back of the envelope calculation to estimate the penalty per unavailable MWh in an availability assessment hour using about 100 assessment hours a month and a maximum penalty of just under \$4,000/MW-month.

First, because no RAAIM penalty is assessed unless an increment of capacity is unavailable for more than 5.5% of assessment hours in a month, a resource can effectively be on outage for one full day a month without facing any penalty. For each assessment hour that a megawatt of capacity is unavailable after that first penalty-free day, the penalty is less than \$40. DMM understands that unavailability penalties for capacity resources in other ISOs, such as ISO New England, can be almost two orders of magnitude larger than CAISO's low availability penalty.

Second, potential exposure to RAAIM discourages suppliers from showing excess capacity on supply plans, as suppliers seek to minimize the amount of capacity that could be exposed to RAAIM. The ISO's proposed UCAP framework would address the second shortcoming of the RAAIM framework. The UCAP proposal would also provide incentives for all resources to remain available, not just shown resource adequacy resources. However, the ISO's UCAP proposal may only be a marginal improvement over RAAIM in terms of incentivizing availability and performance.

DMM has offered examples of how the ISO's proposed UCAP methodology could be modified to strengthen incentives for resources to remain available and operable on critical operating days such as those observed in August and September 2020.<sup>4</sup> DMM provides a more detailed

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<sup>4</sup> DMM comments on resource adequacy enhancements working group September 15 and 17, DMM, October 1, 2010, p. 4: <http://www.aiso.com/Documents/DMMComments-ResourceAdequacyEnhancementsWorkingGroupSept15and17-Oct12020.pdf>

example of a potential weighting mechanism below. DMM hopes to submit a second set of comments which will provide additional analysis on the impacts of applying a potential weighting scheme to UCAP assessment hours.

***The ISO’s UCAP assessment methodology could be modified to strengthen incentives for resources to be available and operational.***

DMM continues to suggest that the ISO consider applying a weighting mechanism to UCAP assessment hours to better capture the importance of availability of resources under tighter supply conditions. The ISO has shown that the 20% of tightest supply hours across a season has historically captured hours where there has been up to 8,700 megawatts of resource adequacy capacity available in excess of load and reserve requirements.<sup>5</sup> Availability in hours where all resource adequacy capacity is needed to meet load and reserve requirements is much more valuable than availability when there are potentially thousands of megawatts of surplus capacity on the system.

The ISO proposal does not distinguish between these different system conditions, so that unavailability of a resource under these very different conditions would have the same impact on a resource’s UCAP. DMM believes that assigning a higher weight to hours with a tighter supply cushion (even within the top 20% of hours) could provide better incentives for resources to be available and operable on days where, for example, all resource adequacy capacity is needed by the ISO. Assigning a lower weighting to hours with larger supply cushions could also be less punitive if a resource happens to be on outage when the ISO may have thousands of megawatts of surplus capacity available on the system.

There are various ways that hours across a season could be weighted based on the difference between available resource adequacy capacity and load and reserve requirements. One example of the hourly unavailability factor for each resource in each hour *j* in the top 20% of hours in a season could be weighted is provided below:

$$\frac{\left( \frac{\text{Net Load} + \text{Contingency Reserve}_j}{\text{Daily Shown RA (excluding wind, solar, and outages)}_j} \right)^{\text{Exponent}}}{\sum_j \left( \frac{\text{Net Load} + \text{Contingency Reserve}_j}{\text{Daily Shown RA (excluding wind, solar, and outages)}_j} \right)^{\text{Exponent}}}$$

Where the *Exponent* in the equation above could be increased to give a larger weighting to hours with tighter supply conditions.

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<sup>5</sup> *Resource Adequacy Enhancements Draft Final Proposal – Phase 1 and Sixth Revised Straw Proposal*, p. 82.

DMM provides this as just one example of a simple method that could be used to weight the availability of a resource in different hours based on the difference between (1) total available resource adequacy capacity and (2) load and reserve requirements.

***DMM is concerned that the ISO's approach to calculating UCAP for storage resources would not capture instances where a storage resource limits its state of charge such that it cannot provide its resource adequacy value.***

The ISO proposes to apply the same UCAP methodology to storage resources that would be applied to most thermal resources. A storage resource's availability reflected in UCAP calculations would be measured based on de-rates or outages submitted in OMS relative to resources' PMAX values.

However, in addition to PMAX de-rates, storage resources can limit their availability through de-rates to state of charge values. Storage resources can de-rate state of charge values through the Maximum Charge Limit field which can be updated daily in SIBR, by submitting a de-rated Max Energy values in OMS, or when ESDER 4 goes live, by submitting target end-of-hour state of charge values that are lower than resources' registered maximum state of charge. The ISO should consider the impact that de-rates to state of charge values could have on a storage resource's ability to provide resource adequacy values.

In prior iterations of the RA Enhancements proposal, the ISO proposed to consider suppliers' self-imposed state of charge limitations in UCAP calculations. DMM commented that those proposals could be excessively punitive, but offered some examples of how the ISO could more narrowly identify when state of charge limitations enforced by suppliers might legitimately limit their resource adequacy availability.<sup>6</sup> In response to stakeholder comments, the ISO seems to have moved away from its original approach entirely. DMM encourages the ISO to consider approaches for determining storage UCAP values that are not as punitive as its original proposals, but do not ignore de-rates to resources' state of charge entirely.

The ISO suggests that its proposed minimum state of charge proposal and its proposed must-offer obligation for storage resources under the NGR model (the ISO would require bids on both charge and discharge ranges) would obviate the need to consider any state of charge limitations or alternative UCAP rules for storage resources. However, while a storage resource may submit bids for its full charge and discharge range, a resource could still limit its availability through state of charge de-rates. For example, a battery with 20 megawatts of charge and discharge capability (that is shown for 5 megawatts of resource adequacy) could de-rate its max

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<sup>6</sup> DMM comments on resource adequacy enhancements working group June 10, 2020, DMM, June 26, 2020, pp. 4-7: <http://www.caiso.com/InitiativeDocuments/DMMComments-ResourceAdequacyEnhancementsWorkingGroup-Jun102020.pdf>

energy in OMS to 1 megawatt hour, while having no de-rate submitted to its PMAx. Under the ISO's UCAP framework, this resource would face no potential impact to UCAP.

Additionally, while the ISO proposes that storage resources will not be able to set their end-of-hour state of charge in a way that would not allow them to meet their day-ahead discharge schedule<sup>7</sup>, a storage resource can de-rate its maximum state of charge before the day-ahead market runs via SIBR or OMS which could significantly limit the day-ahead schedule to begin with.

DMM suggests that the ISO consider the impact that de-rates to maximum state of charge values could have on a storage resource's ability to provide resource adequacy values. To prevent the ISO's original proposals from being excessively punitive, DMM suggested that the ISO could consider for example, whether a storage resource's use of state of charge constraints limited its availability below its resource adequacy value across UCAP assessment hours.<sup>8</sup> For example, for storage resources that must be able to provide resource adequacy values for 4 consecutive hours, the ISO could identify first whether the maximum state of charge was limited below a resource's 4 hour resource adequacy value, and then assess whether the constraint actually limited availability across contiguous UCAP assessment hours.

In comments on the ISO's ESDER 4 proposal, DMM suggested that the ISO could identify if self-imposed state of charge constraints were actually binding (and thus impacting resources' schedules) in determining whether resources could be eligible for bid cost recovery when such constraints were used.<sup>9</sup> Similarly, the ISO could attempt to identify when self-imposed state of charge constraints were binding (i.e. exhibiting non-zero shadow prices) and limiting resources' availability in or across UCAP assessment hours.

***The UCAP framework provides very limited incentives for resources which are required to meet local reliability requirements to be available.***

Since the ISO would continue to define local requirements in terms of today's NQC (DQC under the UCAP framework), pivotal local or pivotal sub-area resources would continue to be needed up to DQC values. The UCAP framework and removal of RAAIM therefore may result in limited incentives for pivotal local resources to remain highly available. DMM continues to suggest that the ISO consider a separate availability incentive mechanism for local resources.

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<sup>7</sup> *Resource Adequacy Enhancements Draft Final Proposal – Phase 1 and Sixth Revised Straw Proposal*, p. 108.

<sup>8</sup> *DMM comments on resource adequacy enhancements working group June 10, 2020*, DMM, June 26, 2020, pp. 5-6: <http://www.aiso.com/InitiativeDocuments/DMMComments-ResourceAdequacyEnhancementsWorkingGroup-Jun102020.pdf>

<sup>9</sup> *DMM comments on energy storage and distributed energy resources phase 4 draft final proposal*, DMM, June 18, 2020, p. 9: <http://www.aiso.com/InitiativeDocuments/DMMComments-EnergyStorage-DistributedEnergyResourcesPhase4-DraftFinalProposal.pdf>

***In addition to its UCAP proposal, the ISO could consider developing a separate performance-based penalty or incentive mechanism which could apply to a more limited set of intervals than the proposed UCAP assessment hours.***

The ISO has explained that its proposal to use the top 20% of smallest supply cushion hours in a season as UCAP assessment hours attempts to incentivize availability across a wide range of hours, while not allowing any single event to significantly impact a resource's UCAP value. The tradeoff of using a wide range of hours with equal weighting is that there are limited incentives for resources to be available and operational on very constrained operating days when all resource adequacy capacity may be needed by the ISO.

Because the ISO's proposed UCAP framework may not provide strong incentives for resources to be available and operational in very constrained hours, the ISO could consider developing a separate performance-based penalty or incentive mechanism which could apply to a more limited set of intervals than the UCAP assessment hours. For example, the ISO could identify performance assessment intervals based on whether there were reserve shortages or whether resource adequacy capacity was sufficient to meet load and reserve requirements. A separate incentive structure based on resource performance could strengthen incentives for resources to only bid in available capacity and to be operational and perform when called in very constrained hours. A performance incentive mechanism could also strengthen incentives for local capacity resources to be available and perform given potentially limited incentives to do so under the proposed UCAP framework.

DMM suggested that the ISO consider a performance-based resource adequacy incentive mechanism in comments on the ISO's original RAIM proposal.<sup>10</sup> A performance-based incentive framework could strengthen incentives for resources to not just be available, but to perform up to their contracted resource adequacy values when dispatched in critical hours.

### **III. Must-offer obligations**

DMM supports the ISO's proposed must-offer obligation rules which are largely consistent with must-offer obligations today – where resource adequacy resources are generally subject to standard 24 by 7 must offer obligations in the day-ahead and real-time markets and offer capacity into RUC at \$0. DMM also supports extending the 24 by 7 must-offer obligation and bid insertion to use-limited and conditionally available resources unless the underlying technology has a specific exemption.

However, the ISO should remove from this proposal any potential changes to the must-offer obligation related to the Day-Ahead Market Enhancements (DAME) initiative. The DAME

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<sup>10</sup> *Comments on Reliability Service Initiative – Phase 2 Second Revised Draft Final Proposal*, DMM, October 4, 2016, p. 2: <http://www.aiso.com/Documents/DMMComments-ReliabilityServicesInitiativePhase2-SecondRevisedDraftFinalProposal.pdf>

proposal is still being developed, and any changes to must-offer obligations related to the DAME proposal should be part of that proposal, not presupposed in the RA Enhancements proposal that the ISO expects to take to the Board in May 2021.

#### **IV. RMR availability incentives**

In the sixth revised straw proposal, the ISO proposes that a new availability incentive mechanism be applied to RMR resources in place of RAIM.

While a revised incentive framework for RMR resources is warranted while a resource is under an RMR contract if RAIM is removed, the ISO should continue to calculate UCAP values for RMR resources as these resources may return to the market in subsequent years.