



California ISO

Extended Day Ahead Market
Working Group 1 Weekly Report

Supply Commitment and Resource Sufficiency
Week 4 Report
1/24/22 – 1/28/22

Progress Tracker

Topic	Schedule
Core Design Decision	
Resources qualifying	Discussed 1/12,19,21,24,26; in progress
Expected granularity and detail	Discussed 1/10,12,19,21; in progress
Ancillary Services requirement	Discussed 1/12; in progress
Transfer Reliability	
Reliability and confidence in EDAM transfers	
RSE Advisory Showing	
Characteristics of 45 day ahead advisory showing	Discussed 1/5&10; on hold
RSE Timing	
Timing of conducting the EDAM RSE	Discussed 1/10&12; in progress
EDAM RSE Components	
Capacity Test	Reviewed concepts 1/12
Ramp Capability Test	Reviewed concepts 1/12
Test Constraints	
Inputs	
EDAM RSE	
Resource Counting Rules	Discussed 1/12,19,21,24,26; in progress
Failure Consequences	
EDAM to EIM RSE	
Interaction with Western RA Programs and Reserve Sharing Groups	
Reserve Sharing	
RA Programs	

Weekly Discussion

January 24

Scope Items Discussed: Resource Sufficiency Evaluation; Resource Details

Presenters: George Angelidis - CAISO

Discussion

Multi-Stage Generating (MSG) Resources

Following the usual meeting logistics and topic dialogue, the presentation was preceded with a commitment to develop slides for a future meeting to examine the details of hydro and storage qualification and verification rules, and then the presentation began with the Multi-Stage Generating (MSG) resource qualification and verification. The MSG model does not allow forbidden regions because the model accommodates these through the definition of available operating regions in selected configurations. MSG capacity qualification is based on the maximum capability using initial conditions and considering ramping limitations based on range up and down from the lowest and highest points, respectively. The proposal then maximizes both the capacity and flexibility to give the best chance for the EDAM Entity to pass the resource sufficiency evaluation (RSE). The responses to questions regarding initial conditions clarified the initial conditions are from the end of the previous day and an entity has the ability to indicate a self-schedule to ensure a resource is included at lowest or current configuration. A question regarding consideration of procured capacity was answered with clarification that the proposed resource sufficiency only looks at bids, so to the extent a resource procurement paradigm requires and results in bid submission then the resources will be considered.

A gas consideration question was deferred to planned discussion later for conventional resources, then a continuation of the MSG discussion included a restatement that MSGs will count to the maximum value a given resource can reach based on initial conditions. A question regarding which configurations are bid into the market generated the following clarification: the RSE will only consider the configurations with bids; however, the bidding rules may result in modifications, only as necessary to ensure the bids submitted are feasible. For example, if bids were submitted for configurations 1 and 3 but not 2, and reaching configuration 3 requires a transition through 2, then bids will be added for configuration 2. In response to further questions regarding treatment of bids in RSE versus market, clarification stated the submitted bids are used by both RSE and the market and the use in each will be as defined by design. This was followed by a suggestion to provide clarity in examples. Discussion then shifted to entities responsible for bidding and related questions.

RSE Responsibilities

There were comments and questions surrounding the expectations for the entity submitting bids versus the entity with the obligation to the RSE. The proposal expectation is the Scheduling Coordinator (SC) responsible for the resource will submit the bids, and each Balancing Authority Area (BAA) may need to develop a mechanism to ensure passage. The details of this have not been discussed, so this area is open for suggestions. A question of who would see the advisory screen was answered with the expectation the BAA would be the entity able manage and view to the RSE advisory screen. Further comment stated this raises questions regarding how the BAA can ensure the SCs are submitting sufficient bids to meet the RSE. A comment relative to the energy profile discussion from last Friday

indicated a concern with a requirement for SCs to submit a profile because this is not currently part of the defined bids and SCs may not be willing to submit the new information. With these concerns acknowledged, the work group is discussing a new market which may include new requirements as needed. The discussion transitioned to hybrid resources.

Hybrid Resources

The hybrid qualification discussion used an example of a 100 MW hydro resource with a 0 MW pmin, a 100 MW solar resource, and a 25 MW battery resource. Rules were discussed that hybrid resources are seen as normal resources and will be treated similar to conventional resources in the market. A comment suggested an expectation that hybrid resources may also be energy limited. A question regarding the use of the State of Charge (SOC) parameter received clarification that resources modeled with the Limited Energy Storage Resource (LESR) fuel type would result in the use of SOC in calculations. Absent further questions on hybrid resources, the discussion moved on to the conventional resource qualification.

Conventional Resources

An example 100 MW gas resource with 1 daily start limitation was described along with consideration of inter-temporal constraints and an expectation that bids reflect any constraints. A question about the optimization drew a reinforcement that the submitted bids must reflect constraints for the RSE. An inquiry regarding optimizing gas in the market for any gas constraints, generated the response as an example in which the bids need to reflect capability for gas procurement. A comment from an entity not currently participating in a day ahead market inspired a description of the gas burn report and the gas nomogram, a comment in the chat that market participants are responsible for managing gas supply risks as best they can, and other comments regarding gas markets and timing considerations that may make the RSE challenging. One comment indicated that the discussions are very detailed and due to time required to digest the ideas, a lack of comments should not be interpreted as reaching consensus. Further regarding the RSE verification, there needs to be an understanding of the test methodology or structure and how resource capability is applied to particular hours. A statement that a high level principle should reflect actual resource capability showing de-rates and limitations was asked for something specific. Clarification suggested the RSE should test whether resources can deliver at the bid level in real time and further clarified the RSE should reflect limitations applied in the market. Discussion turned to additional considerations for demand response (DR) and uncontracted supply.

Demand Response Resources

The discussion of additional considerations for DR began with the statements generally indicating entities would use available practices to manage demand response resources. The proposal was described as follows: to the extent resources can be represented by bids, resources can submit bids for use in the RSE. There was an expectation stated that there may be some bids that are used conditionally, so these should only be used when available to the market. This topic was then opened for discussion and a request for input regarding existing programs and how to consider these. Programs mentioned included ones with up to 10% of load that must be considered, a description of phase 1 DR for EIM use and several supported the idea of allowing inclusion of the approved DR programs. Comments also suggested an intent to allow for broader participation and that it is better to place bids into the day ahead as a resource rather than an adjustment to forecast. This discussion concluded with an unanswered question of whether stakeholders are advocating for a better model to reflect the DR

programs more accurately and a commitment to give the topic more thought. Discussion turned to additional considerations for uncontracted 3rd party supply.

Uncontracted 3rd Party Supply

The topic of uncontracted supply opened with the question of how to model this in the RSE. The initial idea is to consider submitted bids and capacity sold through bucket 1 transfers. An example was offered for discussion of a 500 MW resource with 200 MW sold as RA, 200 MW sold to transfer and 100 MW uncontracted, accompanied by the question of how is the 100 MW considered. The response suggested that for a resource modeled in the CAISO, the 200 MW transfer is a bucket 1 transfer and the remaining 100 MW would be counted in the CAISO BAA to the extent a bid is submitted into the market. A question was raised to ask if a BAA is resource sufficient but there is an uncontracted resource, could this be counted to short BAAs and the responses was not in the RSE, because it would have to be shown in the bucket 1 transfers. A question regarding intertie bidding framework was deferred until some details are worked out. Regarding the questions of how uncontracted supply should count towards the BAA, the reply stated it will be counted to the BAA unless declared as bucket 1 transfer. A follow up asked what if the resource is off loaded or not operating, which yielded the high level principle, if the resource doesn't bid they will not be considered. There was also the clarification that a self-schedule is considered a bid. The uncontracted supply topic concluded with an expressed concern regarding the notion of whether uncontracted supply should be considered in the RSE if there is no obligation to bid. Comments then shifted to tangential topics.

Other Comments

A comment regarding use limited resources supported the idea that bids should reflect the resource capability. There was also a comment supporting the concept that the BAA has responsibility for passing the RSE, this was accompanied by a suggestion it would be helpful to have a mechanism to facilitate resource sufficiency. The response to this comment was that this has not been considered so as not to presume a design as to how to do this for BAAs. This has been seen as an activity each BAA would be expected to perform based on their own process and circumstances. The discussion concluded with a question regarding the goal of the group and the response confirmed the goal is to establish a resource sufficiency evaluation common design to ensure the EDAM entities have sufficient capacity coming into the market.

Conclusion:

The meeting began with a commitment to cover more detailed examples for the hydro and battery resources in the Wednesday meeting. The focus for the day was to have detailed examination of the resource qualification and verification for Multi-Stage Generating (MSG), hybrid, conventional, demand response and uncontracted 3rd party supply resources. While there seemed to be general understanding and agreement around the concepts discussed for MSG, hybrid and conventional resources, stakeholders expressed caution with concluding consensus without time to think through the details. The demand response and uncontracted supply resource details were discussed and need additional examination. During the deliberation of these resource types, there was also a significant amount of dialog regarding the roles and responsibilities of Scheduling Coordinators (SC)s and Balancing Authority Areas (BAA)s and need for a mechanism to ensure a passing Resource Sufficiency Evaluation (RSE).

January 26

Scope Items Discussed: Energy-Limited Resource Consideration in the EDAM Resource Sufficiency Evaluation

Presenters: George Angelidis - CAISO

Discussion:

Resource Sufficiency Evaluation (RSE) Calculation Example

The meeting discussion began with a review of the Calculation Example for the Extended Day-Ahead Market (EDAM) Resource Sufficiency Evaluation (RSE) in a simple Excel spreadsheet which will be posted as an educational tool to help with understanding. Response to a question about energy limited resources, clarified that the example does not have a limit on energy and this concept would be covered in the energy limited slides. Regarding the question whether the energy transfer would have any confirmation from BAA1 to BAA2, the answer was that one approach is to establish that a transmission schedule is registered in Master File with one entity establishing the transfer limit. A question regarding whether the energy transfer is between EDAM BAAs versus bidding was confirmed. The bid process and timing questions were discussed as bids can be submitted up to 7 days in advance and the RSE would be expected to run immediately after the close of the market just after 10:00 am, then bids are submitted into the market if they pass while the action in the event of RSE failure has yet to be determined. Bids cannot be revised after deadline. This was followed by a lengthy conversation about upward uncertainty versus imbalance up reserve transfer elements of the example, and this concluded with the clarification that the imbalance reserve up transfer is an additional obligation in which one BAA provides reserves to another BAA, similar to a bi-lateral transfer of an ancillary service (AS) obligation. The discussion transitioned to consideration of energy limits.

Energy-Limited Resource Sufficiency Evaluation

After reviewing the *Considering energy limits in the Resource Sufficiency Evaluation* slide there was a comment to reinforce the idea that the operating plans would only be used in the RSE. A question whether there might need to be a step to look for an additional feasible schedule to meet the demand forecast was responded to with comment the assumption is the operating schedule would be submitted with knowledge of the need based on a known demand forecast and other considerations. This generated an interchange regarding ability of entities to submit an hourly operating schedule due to uncertainty of need, timing challenges or reliance on the optimization. With these questions looming, the presentation moved to the hydro example.

Hydro Operating Schedule Example

The hydro operating schedule example used a net demand forecast as the basis to create the hydro operating profile. There was a question regarding whether there are other things to look at beyond net demand, and the response was there are certainly other basis to consider beyond the net demand. There was also a comment that the test will need both energy and capacity bids and the entity was invited to provide a presentation on the suggestion. Further concerns were expressed regarding the requirement to provide an energy profile in bids and a suggestion of using the bids as is. The response to these comments explained that the profile was an option to avoid running the market. This was followed by suggestion to have an RSE that recognizes constraints. Then there was a dialog that this can be an option but there is a trade off in which the on demand feature may not be available because

recognizing all the constraints requires an optimization which takes more time. The dialog included comments that both paths may be worth exploring and the hydro forecast for purposes of the RSE would be the best available information at time of the showing. Entities with ideas were encouraged to present in future meetings. At this point the discussion moved to related topics.

The comments and questions shifted to issues such as does the RSE test for max capacity in a given hour and also test across 24 hours as well as a concern to test for flexibility and feasibility. There was a suggestion the EDAM entity would provide the operating plan/profile and this would address some of the concerns raised. Further comments agreed with idea the BAA would present the operating plan although there is a concern the BAA may not know how the SC will submit bids. With two extremes, a there may need to be a solution in the middle. This dialog reverted the discussion back to the question of how all entities coordinate to ensure a passing RSE. While the BAA approach seemed to gain some traction, there were concerns this would not be workable in the event of failure which may require an optimization approach. Then returning to the energy limited topic, there was recognition that the energy limited concepts would also apply for a gas resource with gas fuel volume limitations. The question regarding the intent of the advisory schedule was described as an indication how to meet schedules and reflect energy limitations. Then a comment explained the energy limit bid parameter could also be used to reflect the gas fuel volume limit. Another option suggested was for the BAA Entity to provide a unified plan for the BAA. Alternatively, there was an idea that the EDAM entity would receive the bid information and use the information to create a plan at the EDAM level. The question then becomes are the EDAM entities prepared and capable of providing this service? The level of optimization is assumed to be relatively simple without including the congestion and some other constraints. EIM entities were asked to weigh in on this question. Responses included needs more evaluation, iteration may be necessary to consider inter-temporal constraints and ensure passing the test, the burden would be too much, and suggestion the market perform this function. One consideration to think through is the BAA must have a mechanism to satisfy their obligations.

Conclusion:

The discussion covered an RSE simplified sample calculation to provide some clarity regarding the computation methodology without considering energy limits. The work group spent much of the remainder of the meeting deliberating over the energy limited resource considerations in RSE which included who should submit the operating plan/profile, whether the RSE should use an optimization type function to assign energy limited resource capacity or use something in the middle, and what is the process for ensuring resource sufficiency when there is a failure event. There appeared to be two frameworks arising that the group will need vet further in the coming weeks. The first seemed to be a provision of a load/resource plan that would identify resources meeting RSE, including how energy limited resources would be utilized across the 24 hour horizon. The second was generally described as submission of bids that include an operating schedule component to recognize energy constraints or limitations, and use of the bids in the RSE.